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AUGUST 1967

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- ORNL-NSIC-32 INDEXED BIBLIOGRAPHY OF CURRENT NUCLEAR SAFETY
LITERATURE - 8 MARCH 1967
- ORNL-NSIC-34 INDEXED BIBLIOGRAPHY OF CURRENT NUCLEAR SAFETY
LITERATURE - 9 MAY 1967

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CATEGORY SCOPE NOTES

A BRIEF EXPLANATION OF THE COMPOSITION OF EACH CATEGORY WITHIN THE SCOPE OF THE NUCLEAR SAFETY INFORMATION CENTER FOLLOWS

1. GENERAL SAFETY CRITERIA

THIS CATEGORY ENCOMPASSES ALL SAFETY ASPECTS OF RADIATION PHILOSOPHY, STANDARDS, CODES, COST, FINANCIAL LIABILITY AND INSURANCE. OTHER ITEMS OF INTEREST ARE THE COMPARATIVE RISK TO THE PUBLIC HEALTH AND SAFETY FROM NUCLEAR AND NONNUCLEAR HAZARDS.

2. SITING OF NUCLEAR FACILITIES

THIS CATEGORY DEALS WITH DOCUMENTS RELATED TO THE FACTORS USED IN EVALUATING SITES SUCH AS CHARACTERISTICS OF THE FACILITY DESIGN, PROPOSED OPERATION, POPULATION DENSITY, USE CHARACTERISTICS OF THE SITE ENVIRONS, PHYSICAL CHARACTERISTICS OF THE SITE, AND THE RELATIONSHIP OF ENGINEERED SAFEGUARDS TO NUCLEAR FACILITY SITING.

3. TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

THIS CATEGORY CONTAINS ARTICLES DEALING WITH SHIPPING CONTAINERS, SHIPPING REGULATIONS, CRITICALITY SAFETY AS RELATED TO SHIPPING AND HANDLING, TRANSPORTATION ACCIDENTS, AND ALL OTHER ITEMS DEALING WITH SAFETY DURING THE TRANSPORTATION AND/OR HANDLING OF RADIOACTIVE MATERIALS.

4. AEROSPACE SAFETY

THIS CATEGORY COVERS SAFETY CONSIDERATIONS SUCH AS LAUNCH AND REENTRY PROBLEMS THAT ARE UNIQUE TO NUCLEAR SYSTEMS USED IN AEROSPACE VEHICLES.

5. ACCIDENT ANALYSIS

ALL FACETS OF THE ANALYSIS OF POSTULATED ACCIDENTS ARE CONSIDERED IN THIS CATEGORY. INCLUDED ARE BURNOUT HEAT FLUX, CRITICAL HEAT TRANSFER, RELIABILITY ANALYSIS, IN PILE EXPERIMENTS, COOLANT ACTIVITY BUILDUP, PIPE RUPTURE, AND EXPERIMENTS, I.E. LOFT. EXPERIMENTS RELATED TO REACTOR KINETICS ARE CATALOGED IN CATEGORY 6.

6. REACTOR TRANSIENTS, KINETICS, AND STABILITY

THIS CATEGORY INCLUDES THE VARIOUS STUDIES, BOTH ANALYTICAL AND EXPERIMENTAL, SUCH AS TREAT AND SPERT IN WHICH THE TRANSIENT BEHAVIOR OF REACTORS AND CRITICALITY ACCIDENTS ARE EXAMINED.

7. FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

THE RELEASE OF FISSION PRODUCTS FROM VARIOUS MATERIALS AND THEIR MOVEMENT WITHIN A NUCLEAR FACILITY CONTAINMENT SYSTEM ARE INCLUDED IN THIS CATEGORY. TRANSPORT OF THE FISSION PRODUCT INVOLVES THE PHYSICAL AND CHEMICAL CHARACTERIZATION OF THE RELEASED RADIOACTIVE MATERIALS, AS WELL AS THE VARIOUS MECHANISMS SUCH AS DEPOSITION, ADSORPTION, FILTRATION, FALLOUT, ETC., THAT WOULD ATTENUATE THEIR CONCENTRATION WITHIN THE CONTAINMENT SYSTEM.

8. SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

SOURCES OF ENERGY CONSIDERED IN THIS CATEGORY INCLUDE NUCLEAR, WIGNER, AND GAMMA ENERGIES, AS WELL AS CHEMICAL REACTIONS, METAL-WATER REACTIONS, AND ANY OTHER TYPES OF ENERGY THAT MIGHT BE RELEASED AS THE RESULT OF A NUCLEAR ACCIDENT.

9. NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

THE DESIGN OF CONTROL AND SAFETY SYSTEMS FOR VARIOUS NUCLEAR PROCESSES, AS WELL AS THE REQUIRED INSTRUMENTATION AND HARDWARE, ARE INCLUDED IN THIS CATEGORY. THE PROBLEMS INVOLVED ARE THE PERFORMANCE REQUIRED OF SAFETY SYSTEMS THE SPECIFICATION OF INSTRUMENTATION THE CONCEPTS OF COINCIDENCE, REDUNDANCE, FAILURE MODES, AND RELIABILITY THE ADEQUACY OF SHUTDOWN MARGINS THE DESIGN FEATURES OF DIFFERENT MECHANICAL DEVICES AND RELATED SUBJECTS.

10. ELECTRICAL POWER SYSTEMS

INFORMATION RELATED TO ROUTINE AND EMERGENCY MEANS OF SUPPLYING ELECTRICAL POWER TO NUCLEAR FACILITIES IS COVERED IN THIS CATEGORY.

11. CONTAINMENT OF NUCLEAR FACILITIES

THIS CATEGORY ENCOMPASSES ALL ASPECTS OF PRESSURE CONTAINMENT, PRESSURE RELEASE CONTAINMENT, AND MULTIPLE BARRIER CONTAINMENT FOR REACTORS, RADIOCHEMICAL PLANTS, HOT CELLS, SOURCES, ETC., AND WILL INCLUDE SUCH ASPECTS AS DESIGN CONSIDERATIONS, LEAKAGE, PENETRATIONS, STRUCTURAL INTEGRITY, AND TEST TESTING.

12. PLANT SAFETY FEATURES

THE SAFETY ASPECTS OF MAINTENANCE, DECONTAMINATION, REACTOR SYSTEMS, URANIUM MINING AND MILLING, AND FUEL FABRICATION AND STORAGE ARE COVERED IN THIS CATEGORY. ENGINEERING DEVICES SUCH AS PRESSURE AND TEMPERATURE REDUCING SYSTEMS, AIR CLEANING SYSTEMS, AND CORE SPRAY AND SAFETY INJECTION SYSTEMS THAT ARE DESIGNED TO MINIMIZE THE CONSEQUENCES OF NUCLEAR ACCIDENTS ARE INCLUDED.

13. RADIOCHEMICAL PLANT SAFETY

NUCLEAR SAFETY INFORMATION RELATED SPECIFICALLY TO RADIOCHEMICAL PLANTS IS COVERED IN THIS CATEGORY.

14. RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

ALL ASPECTS OF THE INTENTIONAL OR ACCIDENTAL RELEASE OF RADIOACTIVITY TO THE ENVIRONMENT ARE INCLUDED IN THIS CATEGORY. RADIOACTIVE WASTE MANAGEMENT, INCLUDING WASTE TRANSPORTATION, TREATMENT, DISPOSAL AND EFFLUENT CONTROL IS OF PRIMARY IMPORTANCE AS IS RADIONUCLIDE OCCURRENCE AND MOVEMENT. THE LATTER INCLUDES FALLOUT, GEOLOGICAL CONSIDERATIONS, COUNTERMEASURES, ANALYTICAL TECHNIQUES, HYDROLOGIC CONSIDERATIONS, AND RADIONUCLIDE MOVEMENT IN SOIL AND WATER.

15. ENVIRONMENTAL SURVEYS, MONITORING, AND RADIATION EXPOSURE OF MAN

THIS CATEGORY INCLUDES ITEMS RELATED TO (1) ENVIRONMENTAL AND PERSONNEL MONITORING DURING ROUTINE AND ACCIDENTAL RADIONUCLIDE RELEASE, (2) MONITORING METHODS AND TECHNIQUES, (3) DOSE MEASUREMENT AND CALCULATION, (4) DETERMINATION OF MAXIMUM PERMISSIBLE DOSE AND CONCENTRATION, AND (5) INTERNAL AND EXTERNAL EXPOSURE TO RADIONUCLIDES.

16. METEOROLOGICAL CONSIDERATIONS

THIS CATEGORY CONSIDERS NOT ONLY DIFFUSION AND DEPOSITION OF RADIOACTIVE MATERIAL NEAR THE EARTH'S SURFACE IN CONNECTION WITH REACTOR OPERATIONS BUT ALSO THE ATMOSPHERIC TRANSPORT AND FALLOUT IN THE TROPOSPHERE AND STRATOSPHERE AS A RESULT OF NUCLEAR WEAPONS TESTS.

17. OPERATIONAL SAFETY AND EXPERIENCE

THIS CATEGORY INCLUDES COVERAGE OF THE SAFETY ASPECTS OF ROUTINE REACTOR OPERATION AND OF INCIDENTS OR UNUSUAL OPERATING OCCURRENCES, LARGE OR SMALL. POWER, RESEARCH, AND TEST REACTORS AND FUEL REPROCESSING PLANTS WILL BE COVERED. ALL AVAILABLE OPERATING, INCIDENTS, SAFEGUARDS, AND INSPECTION REPORTS WILL BE COLLECTED AND INDEXED.

18. SAFETY ANALYSIS AND DESIGN REPORTS

ROUTINE LISTINGS OF THE LATEST NUCLEAR FACILITY SAFETY ANALYSIS AND DESIGN REPORTS ARE TO BE FOUND IN THIS CATEGORY. INCLUDED ARE BOTH ANALYSES AND REPORTS BY FACILITY DESIGNERS AND BY THE AEC REGULATORY STAFF.

19. BIBLIOGRAPHIES

THIS CATEGORY CATALOGUES DOCUMENTS ON NUCLEAR SAFETY TOPICS THAT ARE EXCLUSIVELY BIBLIOGRAPHIES AS WELL AS THOSE THAT INCLUDE EXTENSIVE BIBLIOGRAPHIES WITH OTHER MATERIAL.

CATEGORY 1
GENERAL SAFETY CRITERIA

1-08665 PURPOSE, ORGANIZATION, AND CONTENTS OF HAZARDS SUMMARY REPORTS FOR POWER REACTORS
DIVISION OF LICENSING AND REGULATION
114 PAGES, AEC LICENSING GUIDE NO. 13, AUGUST 28, 1962, GPO \$0.45 CY

THIS DRAFT PROVIDES A LIST OF CHAPTERS AND DETAILED SUBHEADINGS WITH DISCUSSION OF WHAT IS TO BE EXPECTED IN EACH.

*REACTOR, POWER + *REGULATION, AEC + *SAFETY ANALYSIS REPORT, GENERAL +
SAFETY REVIEW (OPERATIONS, EXPERIMENTS)

1-08774 SPINRAD BI + MEIER RW
FIRST BIENNIAL REPORT OF THE ACTIVITIES OF THE EUROPEAN AMERICAN COMMITTEE ON REACTOR PHYSICS
EUROPEAN NUCLEAR ENERGY AGENCY + EUROPEAN-AMERICAN COMMITTEE ON REACTOR PHYSICS
EACRP-U-17 +. 30 PAGES, JUNE 1964

ON PAGE 13 THERE IS A REMARK THAT EACRP COULD PLAY A USEFUL ADVISORY ROLE IN REACTOR SAFETY.
THE 1ST, 3RD, AND 5TH REFERENCE ON PAGE 26, AND THE 9TH ON PAGE 27 DEAL WITH TEMPERATURE
COEFFICIENTS.

AVAILABILITY -- O.E.E.C. MISSION, PUBLICATIONS OFFICE, SUITE 1223, 1346 CONNECTICUT, WASHINGTON 6, D.C.

*CROSS SECTION + CODES AND STANDARDS + REACTOR PHYSICS

1-10190 DAVIS M
ATOMIC DEATH FACTORIES IN YOUR BACKYARD
6 PAGES, BLUEBOOK MAGAZINE, PAGE 23-25, 61-63 FEBRUARY, 1966

QUOTE. WITH GOVERNMENT AND PRIVATE INDUSTRY BUILDING NUCLEAR REACTORS BY THE DOZEN ACROSS THE
COUNTRY (150 GOING UP RIGHT NOW) THE CHANCES OF ACCIDENTS TURNING OUR CITIES INTO HOT
RADIOACTIVE MOUNDS OF CONCRETE AND STEEL INCREASE WITH EACH DAY. CANT HAPPEN... IT ALREADY
HAS, MANY TIMES. UNQUOTE. THE LEAD PARAGRAPH IS TYPICAL OF THE MISREPRESENTATION IN THE
ENTIRE ARTICLE. THE USUAL REHASH OF INAPPLICABLE INCIDENTS AND EXPERT QUOTES ARE BLENDED
WITH CONJECTURE AND ERROR. ONE GOOD POINT - FAILURE TO PUBLISH ACCIDENT STATISTICS - LEADS
TO SPECULATION AND CHARGES OF HIDING SOMETHING.

*INCIDENT, ACTUAL, GENERAL + *RADIATION, PUBLIC EDUCATION/ACCEPTANCE + *SITING, GENERAL

1-10203 SAFETY OF AEC-OWNED REACTORS. AEC MANUAL, CHAPTER 8401
UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES, AEC MANUAL, CHAPTER 8401, NUMBER 495-92 (JULY 6, 1964), SOURCE

TO THE EXTENT PRACTICABLE, SITING, DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE OF
AEC-OWNED REACTORS WILL BE IN ACCORDANCE WITH GENERALLY UNIFORM STANDARDS, GUIDES, AND CODES.
AS NECESSARY, NEW STANDARDS, GUIDES AND CODES WILL BE FORMULATED, OR, EXISTING STANDARDS,
GUIDES, AND CODES WILL BE ADOPTED AND SHOULD BE CONSISTENT INsofar AS POSSIBLE WITH THOSE
APPLIED TO AEC-LICENSED REACTORS. WHEN OVERRIDING NATIONAL-SECURITY CONSIDERATIONS DICTATE,
THE STANDARDS, GUIDES, AND CODES SHALL BE ESTABLISHED BY THE COMMISSION AS THE SITUATION
REQUIRES. PROPOSED CONSTRUCTION, OPERATION (INCLUDING MAINTENANCE) OR SIGNIFICANT
MODIFICATION OF THE DESIGN OR OPERATING CONDITIONS OF AN AEC-OWNED REACTOR SHALL BE PROPERLY
ANALYZED, EVALUATED, AND DOCUMENTED PRIOR TO COMMENCEMENT OF SUCH ACTIVITY.

*REACTOR, AEC OWNED + *REGULATION, AEC + ADMINISTRATIVE CONTROLS AND PRACTICES

1-10355 BASSO G + HERBERT JE + SWANSON NJ
DESIGN AND PERFORMANCE OF ORGANIC COOLED REACTORS
COMITATO NAZIONALE PER L'ENERGIA NUCLEARE, ROME, ITALY
RT/ING(65)10 +. 71 PAGES, SEPTEMBER 1965, DEP.MN

SOME DISTINGUISHING ECONOMIC FEATURES OF PLANTS POWERED BY ORGANIC REACTORS AS COMPARED TO
LIGHT WATER REACTORS, ARE LESS-EXPENSIVE STRUCTURAL MATERIALS MAY BE USED FOR THE ORGANIC
SYSTEMS (E.G., CARBON STEEL INSTEAD OF STAINLESS), LOWER OPERATIONAL PRESSURES MAY BE USED
FOR THE PRIMARY LOOPS, LIGHTER GAGE MATERIAL MAY BE USED, HIGHER TEMPERATURE STEAM, WITH A
CERTAIN DEGREE OF SUPERHEATING, MAY BE PRODUCED, LOW HEAT-EXCHANGE COEFFICIENTS WITH LOW
CORE-POWER DENSITIES LEAD TO LARGER SIZES OF THE PRIMARY-SYSTEM COMPONENTS, INSTRUMENTATION
IS MORE COMPLEX AND THEREFORE MORE EXPENSIVE, AUXILIARY SYSTEMS ARE MORE EXPENSIVE
(PURIFICATION, DEGASSING, FILTRATION, ETC.). THE FUEL CYCLE COSTS ARE ESSENTIALLY THE SAME.
OPERATIONAL AND MAINTENANCE COSTS FOR ORGANIC REACTORS ARE HIGHER. THIS PAPER IS AN ATTEMPT
TO DESCRIBE THE PRESENT STATUS OF ORGANIC-REACTOR TECHNOLOGY AND TO SHOW ITS POTENTIAL.

*DESIGN STUDY + *ECONOMIC STUDY + *REACTOR, ORGANIC COOLED + CONTROL, GENERAL + COOLANT CHEMISTRY +
INSTRUMENTATION, GENERAL + MAINTENANCE AND REPAIR + REACTOR KINETICS

1-10358 CLAYTON ED
PLUTONIUM CRITICALITY EXPERIMENTS
BATTELLE-NORTHWEST
7 PAGES, PHYSICS TODAY, 18(9), PP. 46-52 (SEPTEMBER 1965)

CRITICALITY MEASUREMENTS WERE MADE ON PLUTONIUM NITRATE AND PUO₂-PLASTIC MIXTURES.
COMPARISONS ARE MADE BETWEEN CRITICAL MASSES OF VARIOUS URANIUM AND PLUTONIUM ISOTOPES AS A
FUNCTION OF REFLECTOR AND CONCENTRATION. EXPERIMENTAL EQUIPMENT AND PAST HISTORY ARE BRIEFLY

CATEGORY 1
GENERAL SAFETY CRITERIA

1-10358 *CONTINUED*
DESCRIBED. DATA ARE PRESENTED IN GRAPHS AND TABLES.

*CRITICALITY EXPERIMENT + *PLUTONIUM + ELEMENTS AND ISOTOPES + NITROGEN + OXYGEN + URANIUM

1-10482 LEWIS L
THE ADMINISTRATION OF RADIATION SAFETY AT THE CVTR
CAROLINAS-VIRGINIA NUCLEAR POWER ASSOCIATES, INC.
12 PAGES, 2 FIGURES, REFERENCES, NUCLEAR SAFETY, 7(2), PP. 137-148 (WINTER 1965-1966)

ARTICLE DESCRIBES THE BROAD ASPECTS OF THE RADIATION-SAFETY PROGRAM AT THE CVTR, A PRIVATELY OWNED AND OPERATED, HEAVY-WATER-MODERATED AND -COOLED POWER DEMONSTRATION REACTOR, LOCATED IN PARR, S.C. THE OPERATING POLICY, THE ORGANIZATION FOR SAFETY, AND SOME IMPORTANT CONSIDERATIONS OF THE RADIOLOGICAL PROTECTION PROGRAM ARE OUTLINED. NOTE IS ALSO MADE OF THE USE OF AEC LICENSING AND REGULATORY REQUIREMENTS AS A BASIS FOR THE SAFETY PROGRAM AND EFFORTS. THE ARTICLE ALSO DESCRIBES HOW SAFETY COGNIZANCE IS INCORPORATED IN OPERATING AND TEST PROCEDURES AND DOCUMENTS. PLANT OPERATING EXPERIENCE, EMERGENCY PROCEDURES, AND ECONOMICS OF THE HEALTH AND SAFETY PROGRAM ARE ALSO DESCRIBED.

*ADMINISTRATIVE CONTROLS AND PRACTICES + *CVTR (CAROLINAS VIRGINIA TUBE REACTOR) +
*SAFETY REVIEW (OPERATIONS, EXPERIMENTS) + REACTOR SAFETY SYSTEM + REACTOR, HEAVY WATER +
REACTOR, PRESSURE TUBE + REACTOR, WATER + REGULATION, AEC + SAFETY PRINCIPLES AND PHILOSOPHY

1-10483 CRAMER EN
REPORT ON THE 1965 CONFERENCE ON REACTOR OPERATING EXPERIENCE
OAK RIDGE NATIONAL LABORATORY
11 PAGES, 1 TABLE, REFERENCES, NUCLEAR SAFETY, 7(2), PP. 148-159 (WINTER 1965-1966)

SIXTY-FIVE PAPERS WERE PRESENTED, AND ONE PANEL DISCUSSION WAS HELD DURING THE CONFERENCE ON REACTOR OPERATING EXPERIENCE HELD JULY 28-29, 1965. ABSTRACTS OF THE PAPERS WERE PUBLISHED IN A SUPPLEMENT TO VOLUME 8 OF THE ANS TRANSACTIONS. THE SUBJECTS OF THE EIGHT SESSIONS WERE - I. REACTOR AND SYSTEMS COMPONENTS. II. ADMINISTRATIVE AND OPERATIONAL PHILOSOPHY. III. PANEL DISCUSSION ON REACTOR OPERATING PROCEDURES. IV. OPERATING PARAMETER MEASUREMENTS AND TECHNIQUES. V. REACTOR OPERATING EXPERIENCE. VI. FISSION-PRODUCT CONTROL. VII. SPECIAL TESTS AND OPERATIONS. VIII. CONTROL AND SAFETY SYSTEMS. THIS REVIEW REPORTS PERTINENT THOUGHTS AND TRENDS NOTED, WITH DETAILED REVIEW OF ONLY A FEW SIGNIFICANT PAPERS.

*OPERATING EXPERIENCE + *REACTOR, GENERAL + ADMINISTRATIVE CONTROLS AND PRACTICES + CONTROL, GENERAL +
FISSION PRODUCT RELEASE, GENERAL + SAFETY PRINCIPLES AND PHILOSOPHY

1-10484 NOTES ON REACTOR SAFETY IN THE USSR
3 PAGES, REFERENCES, NUCLEAR SAFETY, 7(2), PP. 159-161 (WINTER 1965-1966)

THE INTEREST OF SOVIET ENGINEERS IN ASSURING SAFETY OF PEOPLE FROM POTENTIAL REACTOR OPERATING HAZARDS DID NOT APPEAR TO BE TOO DIFFERENT FROM OUR OWN (U.S.). THERE ARE DIFFERENCES IN IMPLEMENTATION, BUT THESE ARE LARGELY MATTERS OF DEGREE AND EMPHASIS. THE BASIC STANDARDS FOR PROTECTION OF PUBLIC HEALTH AND FOR FACILITY DESIGN EMBODY LIMITS ON MAXIMUM PERMISSIBLE CONCENTRATION OF RADIOACTIVITY IN THE AIR AND WATER. THE SOVIETS STRESSED THE POINT THAT THEIR EFFLUENT RELEASES FROM NORMAL OPERATION OF THEIR FACILITIES ARE KEPT WITHIN THE PRESPECIFIED MAXIMUM ALLOWABLE LIMITS AT THE POINT OF RELEASE.

*REACTOR SAFETY SYSTEM + *REGULATION, GENERAL + *SAFETY PRINCIPLES AND PHILOSOPHY +
*UNION OF SOVIET SOCIALIST REPUBLICS + FISSION PRODUCT RELEASE, GENERAL +
MAXIMUM PERMISSIBLE CONCENTRATION (MPC)

1-10510 BRITISH FAST REACTOR GOES AHEAD
3 PAGES, 5 FIGURES, EURONUCLEAR, 3(3), PP. 123-125 (MARCH 1966)

CONSTRUCTION ON THE UKAEA PROTOTYPE FAST REACTOR IS TO START IMMEDIATELY. THE PFR HAS BEEN DESIGNED TO HAVE GOOD INHERENT SAFETY. THE SODIUM IN THE REACTOR VESSEL IS AT ATMOSPHERIC PRESSURE AND THE PIPEWORK ON THE HIGH PRESSURE SIDE OF THE PRIMARY PUMPS IS CONTAINED WITHIN THE VESSEL. PUMP MOTORS ARE INCLUDED ON THE PRIMARY PUMPS AND EVEN IF THESE SHOULD FAIL THE NATURAL CIRCULATION OUGHT TO BE SUFFICIENT TO COOL THE SHUTDOWN CORE. IF THE SECONDARY COOLANT CIRCUIT SHOULD FAIL THERE ARE ALTERNATIVE THERMAL SYPHON AND HEAT EXCHANGERS INCORPORATED IN THE VESSEL AND CONNECTED TO AIR-COOLED HEAT EXCHANGERS IN THE MAIN VENTILATION STACK OF THE BUILDING.

*DESIGN STUDY + *PFR (PROTOTYPE FAST REACTOR, UK) + DOUNREAY (UK) + NAK (SODIUM POTASSIUM ALLOY) +
REACTOR, FAST + REACTOR, LIQUID METAL COOLED + SODIUM + UNITED KINGDOM

1-11850 VERGNE JA
PROCEDURE FOR LICENSING AND CONTROL OF NUCLEAR REACTORS AND THE CIVIL LIABILITY OF THE OPERATOR IN FRANCE
COMMISSARIAT A L'ENERGIE ATOMIQUE
1 PAGE FROM JOURNAL OF THE BRITISH NUCLEAR ENERGY SOCIETY 5(2), PAGE 165, (APRIL 1966)

THE GENERAL HEALTH ACT OF 19 DECEMBER 1917 (FRANCE) WAS AMENDED IN APRIL 1958 AND DECEMBER 1963 TO DEAL WITH NUCLEAR INSTALLATIONS. THE AMENDMENT (1963) DOES NOT APPLY ONLY TO REACTORS, BUT ALSO TO PARTICLE ACCELERATORS OF POWER GREATER THAN 300 MEV- TO FACTORIES FOR THE SEPARATION OF ISOTOPES OF URANIUM OR PLUTONIUM- TO FACTORIES FOR THE PROCESSING OF URANIUM, PLUTONIUM OR IRRADIATED THORIUM- TO FACTORIES FOR THE HANDLING OF RADIOACTIVE WASTE-

CATEGORY 1
GENERAL SAFETY CRITERIA

1-11850 *CONTINUED*

TO FACILITIES FOR STORAGE, INCLUDING STORAGE INCIDENTAL TO CARRIAGE, AND USE OF RADIOACTIVE SUBSTANCES IN QUANTITY, INCLUDING WASTE WHICH HAS A TOTAL RADIOACTIVITY GREATER THAN A MINIMUM FIXED BY LAW.

*FRANCE + *LIABILITY + *REGULATION, GENERAL

1-12030 MURPHY PM
THE INFLUENCE OF PLUTONIUM ON THE DESIGN OF ADVANCE REACTORS
GENERAL ELECTRIC COMPANY

19 PAGES, 3 FIGURES, 5 TABLES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS 9(1), PAGES 1-19, (JUNE 1966)
PRESENTED AT ANS 12TH ANNUAL MEETING DENVER, COLORADO, JUNE 20-23, 1966

LARGE PLUTONIUM RESERVES BY 1980 WILL PROVIDE AN INCENTIVE TO UPGRADE PLUTONIUM VALUES THROUGH ITS USE IN FAST REACTORS RATHER THAN IN THERMAL RECYCLE. THE LONG DEVELOPMENT REQUIREMENTS OF THE SODIUM-COOLED SYSTEM PROVIDE TIME FOR THE EFFECTIVE APPLICATION OF AN ALTERNATIVE PLUTONIUM-FUELED FAST REACTOR HAVING LESS ADVANCED NUCLEAR PERFORMANCE, PROVIDED THAT IT HAS ATTRACTIVE ECONOMICS. THE STEAM-COOLED FAST REACTOR SHOWS PROMISE OF MEETING THESE REQUIREMENTS ON A SCHEDULE THAT ACCOMMODATES THE NEEDS OF THE PRESENT ACCELERATED GROWTH OF THE NUCLEAR POWER BUSINESS. BASED ON THE PLUTONIUM THAT WILL BE AVAILABLE THROUGH MID-1980, THERE WILL BE AN INTERIM MARKET FOR AN EARLY FAST-REACTOR SYSTEM (ABOUT 50,000,000 KW - SEVERAL TIMES THE SIZE OF THE NUCLEAR BUSINESS IN 1966.

*DESIGN STUDY + *PLUTONIUM + *REACTOR, BREEDER

1-12109 HOUSE SUBCOMMITTEE RECOMMENDS INCREASED R AND D FUNDING FOR WASTE MANAGEMENT
SUBCOMMITTEE ON SCIENCE, RESEARCH AND DEVELOPMENT, HOUSE COMMITTEE ON SCIENCE AND ASTRONAUTICS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(46), PAGE 1 (NOVEMBER 14, 1966)

THE HOUSE SUBCOMMITTEE ON SCIENCE, RESEARCH, AND DEVELOPMENT RECOMMENDS, IN A REPORT ON HEARINGS ON ADEQUACY OF THE TECHNOLOGY FOR POLLUTION ABATEMENT, THAT PRESENT 30 MILLION/YEAR FUNDING BE INCREASED TO 300 MILLION/YEAR TO BRING WASTE MANAGEMENT UNDER CONTROL. THEN, REFERRING TO THE AEC, THE SUBCOMMITTEE SAID THAT THEY HAD DONE AN EXCELLENT JOB OF RESTRICTING WASTES FROM NUCLEAR POWER. REFERRING TO SOMEWHAT MORE WASTE-HEAT REJECTION THAN COAL PLANTS, THEY REMINDED THAT NUCLEAR PLANTS DO NOT PRODUCE CO₂, AND THAT COAL PLANTS DISCHARGE MORE RADIONUCLIDES UP THE STACK THAN NUCLEAR PLANTS DO.

*AIR POLLUTION + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + WASTE MANAGEMENT

1-12159 GOSLIN WO
SAFETY CONTROL PROGRAM
GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-SA-3631 + CONF-670-1 +. 6 PAGES, JULY 23, 1964, FROM ANNUAL AEC MEETING ON INDUSTRIAL SAFETY AND FIRE PROTECTION, IDAHO FALLS, IDAHO, JULY 1964

SAFETY CONTROL PROGRAM IS A SYSTEM FOR MEASURING EMPLOYEE ATTITUDE AND ACCIDENT POTENTIAL THROUGH THE MEDIUM OF LOOKING FOR UNSAFE ACTS AND UNSAFE CONDITIONS THAT OCCUR IN THE PLANT. INSPECTIONS ARE MADE OF SAMPLE PARTS OF THE PLANT, AND THE INFORMATION GAINED IS PROJECTED FOR THE ENTIRE PLANT. A CONTROL CHART OF THE NUMBER OF DEFECTS FOUND IN ANY INSPECTION WILL SHOW SIGNIFICANT TRENDS AND OUT-OF-CONTROL PERIODS, WHICH CAN BE USED AS WARNING SIGNALS THAT THE PROBABILITY OF SERIOUS ACCIDENT HAS INCREASED AND THAT REMEDIAL ACTION MUST BE TAKEN. THIS REMEDIAL ACTION MUST BE APPLIED ACROSS THE WHOLE PLANT, NOT IN JUST THE SAMPLE SEGMENTS INDICATING LOSS OF CONTROL.

*PLANT PROTECTIVE SYSTEM + *SAFETY REVIEW (OPERATIONS, EXPERIMENTS) + *SAFETY STUDY + HANFORD SITE

1-12160 WHAT ABOUT ATOMIC POWER PLANTS
THE UNITED MINE WORKERS OF AMERICA, WASHINGTON, D. C.
25 PAGES, 66 REFERENCES, 1965, SOURCE

THIS IS A PROBING PROPAGANDA PAMPHLET PREPARED AND DISTRIBUTED BY THE UMW. BY JUDICIOUS QUOTING FROM THE ACRS, ASLB, SEABORG, BECK, HOLIFIELD, PASTORE, THE BROOKHAVEN REPORT. (WASH-740), VARIOUS AEC ANNUAL AND CONFERENCE REPORTS, THE QUESTION IS RAISED REGARDING THE SAFETY, EFFECTIVENESS, AND PRESENT NEED OF NUCLEAR POWER-GENERATING PLANTS. THE FINAL ARGUMENT IS THAT RESEARCH AND EXPERIMENTATION SHOULD CONTINUE, BUT THAT FEDERAL SUPPORT BE REDUCED DRASTICALLY, THAT INSURANCE LIABILITY LIMITS OF NUCLEAR FACILITY OPERATIONS BE REMOVED, AND THAT THE SAFETY ASPECTS OF REACTOR OPERATIONS AND WASTE-DISPOSAL METHODS BE MARKEDLY IMPROVED BEFORE FURTHER LICENSING.

*COMPARISON, THEORY AND EXPERIENCE + *ECONOMIC STUDY + *REACTOR, POWER + *SAFETY STUDY

1-12161 COMPARISON OF COAL-FIRED AND NUCLEAR POWER PLANTS FOR THE TVA SYSTEM
TENNESSEE VALLEY AUTHORITY
36 PAGES, FIGURES, TABLES, JUNE 1966, SOURCE

THE BOILING-WATER REACTOR WOULD PROVIDE THE LOWEST COST ENERGY TO THE SYSTEM IN THE INITIAL 12-YR PERIOD. IT WOULD BE 0.17 MILL/KWH LOWER THAN THE PRESSURIZED-WATER REACTOR, AND 0.51 MILL/KWH LOWER THAN THE COAL-FIRED PLANT AT CUMBERLAND CITY. THE ADVANTAGES, EXPRESSED AS TOTAL LEVELED COST DIFFERENCES FOR THE OUTPUT OF THE TWO-UNIT PLANT, ARE 2.7 MILLION AND 8.1 MILLION RESPECTIVELY. THE BWR HAS OTHER ADVANTAGES WHICH ARE ALSO DISCUSSED.

CATEGORY 1
GENERAL SAFETY CRITERIA

1-12161 *CONTINUED*
*BROWNS FERRY + *DESIGN STUDY + *ECONOMIC STUDY + REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER

1-12170 ACKERMAN AJ
ATOMIC POWER PLANTS-WHATS WRONG WITH THEM
19 PAGES, 3 FIGURES, 2 TABLES, 3 REFERENCES, PAGES 737-755 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

REVIEWS DRESDEN 1, YANKEE-ROWE, INDIAN POINT 1, HALLAM, ELK RIVER, AND FERMI PLANT RECORDS ON RELIABILITY, ECONOMICS, PUBLIC SAFETY, AND UNRESOLVED PROBLEMS FROM A CONSULTING ENGINEERS VIEWPOINT TO ALERT CIVIL ENGINEERS. INCLUDED IN COMMENTS ON MANAGEMENT RESPONSIBILITY IS THE IMPLICATION THAT REACTOR TECHNOLOGY IS RUN BY SCIENTISTS (WHOSE CHIEF ACTIVITY IS TO MAKE MISTAKES AND THEN CORRECT THEM), WHILE STIFLING THE NORMAL DEVELOPMENT OF STANDARDS BY ENGINEERS (WHO ARE TRAINED NOT TO MAKE MISTAKES). OTHER REMARKS POINT OUT OVER-PROMOTION, GOVERNMENT SUBSIDIES, UNFAIR COMPETITION, ETC.

*FAILURE, GENERAL + *OPERATING EXPERIENCE + *RELIABILITY, SYSTEM + REACTOR, POWER

1-12185 BUCK KE
RISE. RADIOISOTOPE SUBMERSIBLE ENGINE
AEROJET-GENERAL NUCLEONICS, SAN RAMON
AGN-8128 +. 98 PAGES, TABLES, JANUARY 7, 1965, CFSTI \$3.00 CY, \$0.50 MN

THE INCREASED AVAILABILITY AND DECREASED COST OF RADIOISOTOPE ENERGY SOURCES WILL MAKE POSSIBLE THE USE OF RADIOISOTOPE ENGINES OF MUCH HIGHER POWER LEVELS THAN WERE PREVIOUSLY CONSIDERED FEASIBLE. ENGINES PRODUCING TENS OF KILOWATTS OF SHAFT POWER APPEAR TO BE PRACTICAL. ONE OF THE MOST INTERESTING APPLICATIONS OF SUCH AN ENGINE IS THE PROPULSION OF SMALL (15 TO 150 TONS) SUBMERSIBLES. SUBSTITUTION OF A RADIOISOTOPE ENGINE FOR THE EXISTING BATTERY POWER SUPPLY WILL GIVE SIGNIFICANTLY LONGER ENDURANCE TO A VEHICLE DESIGNED FOR LONG ENDURANCE WHICH IS LARGE ENOUGH AND HABITABLE FOR THE CREW FOR LONG PERIODS.

*DESIGN STUDY + *ISOTOPIC GENERATOR + *RADIOISOTOPE + *REACTOR, MARITIME + ENERGY SOURCE

1-12251 AEC APPROVES AMENDMENTS TO REGULATIONS AND POLICY STATEMENT ON REACTOR LICENSING PROCEDURES
ATOMIC ENERGY COMMISSION
PRESS REL. J-227 +. 4 PAGES, SEPTEMBER 29, 1966, DPI

THE U.S. AEC APPROVED AMENDMENTS TO ITS REGULATIONS DESIGNED TO EXPEDITE REACTOR LICENSING PROCEEDINGS AND TO CLARIFY SOME PROVISIONS OF EXISTING REGULATIONS. THE COMMISSION ALSO ADOPTED A STATEMENT OF GENERAL POLICY CONCERNING THE CONDUCT OF PUBLIC HEARINGS BY ATOMIC SAFETY AND LICENSING BOARDS. THE AMENDMENTS AND THE POLICY STATEMENT REFLECT SEVERAL RECOMMENDATIONS MADE BY A SPECIAL REGULATORY REVIEW PANEL APPOINTED BY THE COMMISSION TO STUDY WAYS OF STREAMLINING REACTOR LICENSING PROCEDURES.

*LICENSING STATUS OF NUCLEAR PROJECTS + *REGULATION, AEC

1-12252 RODGERS SJ + EVERSON WA
EXTINGUISHMENT OF ALKALI METAL FIRES
MSA RESEARCH CORPORATION
AD-607978 + APL-TDR-64-114 + N65-11910 +. 86 PAGES, 4 FIGURES, 22 TABLES, 26 BIBLIOGRAPHIES, OCTOBER 1964, CFSTI \$3.00 CY, \$0.75 MN

REDUCTION OF OXYGEN PARTIAL PRESSURE WAS EFFECTIVE IN INHIBITING IGNITION AND DEGREE OF COMBUSTION OF LITHIUM, SODIUM, NAK AND POTASSIUM. RUBIDIUM AND CESIUM DID NOT IGNITE. REDUCED OXYGEN PARTIAL PRESSURE WAS ALSO EFFECTIVE IN INHIBITING IGNITION OF ALKALI METAL JET STREAMS. A NUMBER OF DIFFERENT SALTS, ORGANIC LIQUIDS, AND POLYURETHANE FOAM WERE EVALUATED WITH RESPECT TO ALKALI METAL FIRE EXTINGUISHMENT. MET-L-X AND TEC POWDER WERE THE MOST EFFECTIVE SALTS, WHICH WERE EVALUATED. THE RATIO OF TEC POWDER ALKALI METAL WAS 0.4 FOR 100 LB SODIUM FIRES AND 0.2 FOR 500 LB SODIUM FIRES. POLYURETHANE FOAM WAS FOUND TO BE EFFECTIVE ON LOW TEMPERATURE (1000 F) FIRES AND WAS USEFUL ON ALKALI METAL FIRES ON OR UNDER INSULATION. ORGANIC LIQUIDS WERE NOT PARTICULARLY EFFECTIVE ON ALKALI METAL FIRES.

*CONTROL, GENERAL + *FIRE + *METAL, ALKALI + CESIUM + NAK (SODIUM POTASSIUM ALLOY) + POTASSIUM + RUBIDIUM + SODIUM

1-12264 STEWART JC
THE UNITED KINGDOM NUCLEAR POWER PROGRAMME
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY
TRG-REPORT-1169 (R) +. 14 PAGES, 10 FIGURES, NOVEMBER 1965, UKAEA

NUCLEAR POWER STATIONS OF ALREADY PROVED TYPES ARE NOW FULLY COMPETITIVE IN MANY COUNTRIES AND WILL PLAY AN INCREASING ROLE IN FULFILLING WORLD ENERGY REQUIREMENTS FOR MANY APPLICATIONS. IN THE UNITED KINGDOM OUR PROGRAM IS BEING INCREASED TO 13,000 MW(E) ON LINE BY 1975, AND WE SPECULATE THAT WE SHALL HAVE SOME 50,000 MW(E) OF NUCLEAR POWER STATIONS BY 1985 AND WELL OVER 100,000 MW(E) BY THE END OF THE CENTURY. OUR LARGE-SCALE EXPERIENCE OF DESIGN, CONSTRUCTION AND OPERATION OF GAS-COOLED REACTORS HAS BEEN EXTREMELY FAVOURABLE. AT DUNGENESS B A 1200 MW(E) GAS-COOLED REACTOR STATION IS NOW BEING CONSTRUCTED WHICH WILL HAVE GENERATING COSTS LOWER THAN COAL-FIRED STATIONS AND IS EXPECTED TO BE THE FORERUNNER OF EVEN

CATEGORY 1
GENERAL SAFETY CRITERIA

1-12264 *CONTINUED*

MORE ECONOMIC AND OPERATIONALLY ATTRACTIVE PLANTS. GRANTED SUCCESSFUL RESULTS WITH THE SODIUM-COOLED FAST BREEDER REACTOR PROTOTYPE, WHICH WE ARE ABOUT TO CONSTRUCT, WE EXPECT THAT FAST REACTORS FULLY COMPETITIVE WITH ANY OTHER NUCLEAR SYSTEM WILL BE AVAILABLE FOR COMMERCIAL SALE IN THE EARLY 1970S.

*REVIEW + *UNITED KINGDOM + REACTOR, BREEDER + REACTOR, GAS COOLED + REACTOR, LARGE + REACTOR, POWER

1-12265 SCIENCE AT AECL
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2460 +. 59 PAGES, 19 FIGURES, 104 REFERENCES, JUNE 1966, AECL \$1.50 CY

THIS THE SECOND OF A GENERAL SERIES OF AECL PROGRESS REVIEWS, COVERING WORK IN PHYSICS, BIOLOGY AND HEALTH PHYSICS, CHEMISTRY AND METALLURGY, REACTOR RESEARCH, AND WHITESHELL RESEARCH AND DEVELOPMENT.

*CANADA + *REVIEW + REACTOR, RESEARCH

1-12266 MARTIN PE
THERMAL RADIATION FROM BURNING HYDROGEN PLUME
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-DC-7313 + CONF-651002-6 +. 5 PAGES, AUGUST 25, 1965, FROM INSTRUMENT SOCIETY OF AMERICA, 20TH ANNUAL CONFERENCE, LOS ANGELES, CFSTI \$1.00 CY, \$0.50 MN

LIQUID HYDROGEN PASSES THROUGH A NUCLEAR REACTOR, IS EJECTED SKYWARD, AND IGNITED. ITS THERMAL RADIATION PATTERN IS TO BE STUDIED SO THAT EXPECTED HEAT RADIATIONS MAY BE CALCULATED FOR LOCATIONS NEAR THE TEST PAD. SEVERAL SENSORS - COMMERCIAL AND HOMEMADE - ARE USED TO DETERMINE THE THERMAL RADIATION RECEIVED AT DISCRETE POINTS. FROM MEASURED RADIATION, RANGE, ASSUMED PLUME HEIGHT, AND SENSOR ORIENTATION AND HEIGHT, THE AVERAGE THERMAL EMITTING POWER PER UNIT DISTANCE ALONG THE VERTICAL PLUME IS CALCULATED. THE RANGES VARY FROM 30 TO 9,720 FEET, AND THE ELEVATIONS FROM 0 TO 120 FEET.

*HYDROGEN + *IGNITION + *PLUME BEHAVIOR, GENFRAI. + *THERMAL EXPERIMENT

1-12267 SUMMARY OF THE ANNUAL REPORT
AKTIEBOLAGET ATOMENERGI, THE SWEDISH ATOMIC ENERGY COMPANY
8 PAGES, 5 FIGURES, 1965, SOURCE

THIS SUMMARY OF THE 1965 SWEDISH ATOMIC ENERGY ANNUAL REPORT COVERS R AND D, POWER REACTORS, INTERNATIONAL COOPERATION, INFORMATION AND PUBLIC RELATIONS, AND STUDIES AT STODSVIK.

*REVIEW + *SWEDEN + REACTOR, POWER

1-12268 AEC APPROVES AGREEMENT WITH NEBRASKA
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
PRESS REL. J-195 +. 1 PAGE, AUGUST 19, 1966, DPI

CHAIRMAN GLENN T. SEABORG OF THE ATOMIC ENERGY COMMISSION ANNOUNCED THAT THE COMMISSION APPROVED AN AGREEMENT UNDER WHICH NEBRASKA WILL ASSUME PART OF AEC REGULATORY AUTHORITY OVER THE USE OF RADIOACTIVE MATERIALS IN THAT STATE. THE TRANSFER OF REGULATORY RESPONSIBILITY WILL INCLUDE LICENSING, RULE MAKING AND ENFORCEMENT IN THE USES OF RADIOISOTOPES, THE SOURCE MATERIALS URANIUM AND THORIUM, AND SMALL QUANTITIES OF FISSIONABLE MATERIALS. THE NEBRASKA DEPARTMENT OF HEALTH IS THE AGENCY RESPONSIBLE FOR THE RADIATION CONTROL PROGRAM. THE DIVISION OF RADIOLOGICAL HEALTH WILL CONDUCT THE LICENSING, RULE MAKING AND ENFORCEMENT PROGRAM. THERE ARE 105 AEC LICENSES IN NEBRASKA FOR THE USE OF RADIOACTIVE MATERIALS.

*LICENSING STATUS OF NUCLEAR PROJECTS + *REGULATION, AEC + *REGULATION, STATE

1-12270 ZIEGLER E
LEGAL QUESTIONS CONCERNING GERMAN PARTICIPATION IN THE AMERICAN SEFOR REACTOR
7 PAGES, ATOMWIRTSCHAFT 11(3), PAGES 122-128, (MARCH 1966)

THE USAEC LICENSING BOARD WHICH HAD GRANTED THE PROVISIONAL BUILDING LICENSE FOR SEFOR JANUARY 7, 1966, UNEXPECTEDLY ORDERED A CESSATION OF CONSTRUCTIONAL WORK, BECAUSE GERMAN PARTICIPATION INFRINGED PROVISIONS OF THE US ATOMIC ENERGY ACT OF 1954 WHICH PROHIBIT THE ISSUING OF A BUILDING LICENSE FOR A PLANT IN THE USA IF FOREIGNERS ASSUME AN UNDUE INFLUENCE ON THE PLANT. OBJECTIONS WERE LODGED BY THE SOUTHWEST ATOMIC ENERGY ASSOCIATES AND GENERAL ELECTRIC. THE USAEC ON JANUARY 11, 1966, PROVISIONALLY WITHDREW ITS SUSPENSION ORDER ON THE CONSTRUCTION AND SO DEFERRED ACTION IN RESPECT OF THE OBJECTION. CONSTRUCTIONAL WORK WAS IMMEDIATELY RESTARTED AND CAN CONTINUE AT THE RISK OF THE CUSTOMER PENDING THE FINAL DECISION OF THE AEC.

*GERMANY + *LAW + *LICENSING STATUS OF NUCLEAR PROJECTS + *SEFOR (SOUTHWEST EXP. FAST OXIDE REACTOR) + REACTOR, BREEDER + REACTOR, FAST

1-12272 PELZER N
LIABILITY, INSURANCE COVER AND GOVERNMENT INDEMNITY IN THE OPERATION OF THE OTTO HAHN
4 PAGES, ATOMWIRTSCHAFT 11(4), PAGES 183-186, (APRIL 1966)

ACCESSION NUMBER 1-12264 TO 1-12272

CATEGORY 1
GENERAL SAFETY CRITERIA

1-12272 *CONTINUED*

THE NATURE AND SCOPE OF NUCLEAR LIABILITY, THE REQUIRED INSURANCE COVER AND THE COMPENSATION OUT OF PUBLIC FUNDS ARE OF GREAT SIGNIFICANCE FOR THE OWNER OF AN ATOMIC SHIP. THE INVESTIGATION OF THE GERMAN LEGAL POSITION APPEARS IMPORTANT IN VIEW OF THE FUTURE OPERATION OF THE GERMAN ATOMIC SHIP OTTO HAHN, NOW UNDER CONSTRUCTION. THE GERMAN ATOMIC LAW AFFORDS THE SHIPOWNER THE SAME PROTECTION AS ANY OTHER OWNER OF AN ATOMIC INSTALLATION. EVEN IF THE QUESTIONS OF INSURANCE COVER AND COMPENSATION OUT OF PUBLIC FUNDS ARE, IN PRINCIPLE, SOLVED, IT SHOULD NEVERTHELESS BE INVESTIGATED WHETHER, IN THE LONG RUN, NUCLEAR MERCHANT SHIPPING SHOULD NOT OCCUPY A MORE DIRECT PLACE IN LEGISLATION.

*GERMANY + *INSURANCE + *LIABILITY + *REACTOR, MARITIME

1-12273 HAYWOOD LR

TRENDS IN ATOMIC POWER COSTS

ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO

AECL-2534 +. 9 PAGES, 5 TABLES, 8 FIGURES, 4 REFERENCES, MARCH 1966, PRESENTED TO THE AIME ANNUAL MEETING NEW YORK CITY, FEBRUARY 27-MARCH 3, 1966, AECL \$1.00 CY

THE TREND OF UNIT SIZE WITH TIME INDICATES A DISTINCT POSSIBILITY OF THE COMMISSIONING OF A 2000 MWE NUCLEAR UNIT IN THE UNITED STATES IN 1976. BY APPLYING A CAPITAL COST REDUCTION FACTOR OF 3.6 PERCENT PER YEAR, IN ACCORDANCE WITH THE TREND INDICATED FOR THE UNITED STATES, AND FUELING COST REDUCTION FACTORS AS FOR CANADA (EXCEPT FOR KNOWN DIFFERENCES), A COST OF ENERGY FROM SUCH A PLANT OF BETWEEN 2.30 AND 3.90 MILLS/KWH IS INDICATED. THE UNIT CAPITAL COST FOR THE NORMALIZED 500 MWE SINGLE UNIT WOULD BE BETWEEN 95 AND 127 DOLLARS/KWE WHICH CAN BE COMPARED TO THE 1966 COSTS OF BETWEEN 131 AND 177 DOLLARS. THE UNIT CAPITAL COST FOR THE 2000 MWE PLANTS WOULD BE BETWEEN 67 AND 89 DOLLARS/KWE. THE MOST LIKELY UNIT CAPITAL COST FOR CANADA IN 1976, NORMALIZING TO 500 MWE SINGLE UNITS, IS ABOUT 190 DOLLARS (US)/KWE.

*CANADA + *ECONOMIC STUDY + *REACTOR, LARGE + *REACTOR, POWER

1-12295 TECHNICAL SAFETY EVALUATION OF THE N.S. SAVANNAH. FOURTH SUPPLEMENT

EUROPEAN ATOMIC ENERGY COMMUNITY + BUREAU VERITAS + GERMANISCHER LLOYD

EUR-1621.E(VOL.3) +. 46 PAGES, APRIL 1966, DEP. MN

THE MAXIMUM POWER OUTPUT OF THE NS SAVANNAH NUCLEAR PLANT HAS BEEN RAISED FROM 69 MW TO 80 MW. MODIFICATIONS TO THE EMERGENCY COOLING PROVISIONS AND THE SCRAM SETTINGS, TOGETHER WITH THE ASSESSMENT OF THE HIGHER POWER LEVEL INFLUENCE ON THE TRANSIENT AND ACCIDENT BEHAVIOUR OF THE PLANT, SHOW THAT THERE IS NO SIGNIFICANT INCREASE OF POTENTIAL HAZARDS ASSOCIATED WITH 80 MW OPERATION. THE OPERATIONAL EXPERIENCE OF NS SAVANNAH HAS DEMONSTRATED THAT THE ACTIVE WASTES TO BE DISPOSED OF WERE WITHIN ACTIVITY LIMITS WELL BELOW THOSE ALLOWED. IT APPEARS THAT THE PORT OPERATING CRITERIA COULD BE RELAXED FOR NS SAVANNAH ON THE BASIS OF MODIFIED ASSUMPTIONS IN THE MCA FOR THIS SHIP.

*ACCIDENT ANALYSIS + *EURATOM + *N S SAVANNAH + *REACTOR, MARITIME +
*SAFETY REVIEW (OPERATIONS, EXPERIMENTS)

1-12296 PROPOSED EXTENSION OF AEC INDEMNITY LEGISLATION

U.S. ATOMIC ENERGY COMMISSION

459 PAGES, 1965, HEARINGS BEFORE THE SUBCOMMITTEE ON LEGISLATION OF THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, 89TH CONGRESS, 1ST SESSION, JUNE 22, 23, AND 24, 1965, GPO \$1.25

THIS DOCUMENT RECORDS THE JCAE SUBCOMMITTEE HEARINGS ON PROPOSED EXTENSION OF AEC INDEMNITY LEGISLATION. THE HEARINGS WERE HELD JUNE 22-24, 1965. INCLUDED ARE STATEMENTS BY REPRESENTATIVES OF INDUSTRY, MUNICIPAL POWER, INSURANCE UNDERWRITERS, NATIONAL COAL ASSOCIATION, ACRS, AND AEC.

*CONGRESSIONAL ACTIVITY + *INSURANCE + *LIABILITY + *REGULATION, AEC

1-12313 CONSOLIDATED EDISON 10 YEAR PROGRAM TO MEET GROWING NEW YORK CITY ENERGY NEEDS AND REDUCE AIR POLLUTION

CONSOLIDATED EDISON COMPANY, NEW YORK

3 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(48), PAGES 2-4 (NOVEMBER 28, 1966)

CONSOLIDATED EDISON HAS SCHEDULED ONLY NUCLEAR REACTORS AFTER THE CORNWALL PUMPED-STORAGE PLANT BECOMES OPERATIONAL IN 1971. A THIRD NUCLEAR UNIT IS NEEDED IN 1971, AND A FOURTH IN 1976. THIS WOULD REDUCE CONSOLIDATED EDISON FORMED FOSSIL-FUEL AIR POLLUTANTS TO ONE-THIRD IN 1976 BECAUSE SOME OLDER PLANTS WOULD BE SHUTDOWN.

*AIR POLLUTION + INDIAN POINT 1 + INDIAN POINT 2 + REACTOR, PRESSURIZED WATER

1-12327 BRINKWORTH MJ + GRIFFITHS JA

METHUSELAH II. A FORTRAN PROGRAM AND NUCLEAR DATA LIBRARY FOR THE PHYSICS ASSESSMENT OF LIQUID-MODERATED REACTORS

UNITED KINGDOM ATOMIC ENERGY ESTABLISHMENT, WINFRITH

AEW-R-480 +. 48 PAGES, 10 REFERENCES, MARCH 1966, BIS \$1.40 CY

METHUSELAH II IS A FORTRAN PROGRAM WITH A NUCLEAR DATA LIBRARY, USED TO CALCULATE CELL REACTIVITY AND BURN-UP IN LIQUID-MODERATED REACTORS. IT HAS BEEN DEVELOPED FROM METHUSELAH I BY REVISING THE NUCLEAR DATA LIBRARY, AND BY INTRODUCING INTO THE PROGRAM IMPROVEMENTS RELATING TO NUCLEAR DATA, IMPROVEMENTS IN EFFICIENCY AND ACCURACY, AND ADDITIONAL FACILITIES

CATEGORY 1
GENERAL SAFETY CRITERIA

1-12327 *CONTINUED*

WHICH INCLUDE A NEUTRON BALANCE EDIT, SPECIALIZED OUTPUTS, FUEL CYCLING, AND FUEL COSTING. THESE DEVELOPMENTS ARE DESCRIBED AND INFORMATION IS GIVEN ON THE CODING AND USAGE OF VERSIONS OF METHUSELAH II FOR THE IBM 7030 (STRETCH), IBM 7090, AND KDF9 COMPUTERS.

*COMPUTER PROGRAM + *DATA PROCESSING + *MATHEMATICAL STUDY

1-12329 COTTRELL WB

ORNL NUCLEAR SAFETY RESEARCH AND DEVELOPMENT PROGRAM BIMONTHLY REPORT FOR JULY - AUGUST 1966
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1636 +. 60 PAGES, 1 TABLE, SEPTEMBER 15, 1966

INCLUDED IN THIS REPORT ARE WORK ON VARIOUS CHEMICAL REACTIONS, AS WELL AS THE RELEASE, CHARACTERIZATION, AND TRANSPORT OF FISSION PRODUCTS IN CONTAINMENT SYSTEMS UNDER VARIOUS ACCIDENT CONDITIONS AND ON PROBLEMS ASSOCIATED WITH THE REMOVAL OF THESE FISSION PRODUCTS FROM GAS STREAMS. MOST OF THE WORK CONTINUES TO BE IN GENERAL SUPPORT OF WATER POWER REACTOR TECHNOLOGY, INCLUDING SOME IN DIRECT SUPPORT OF THE LOFT AND CSE PROGRAMS.

AVAILABILITY -- WM B COTTRELL, OAK RIDGE NATIONAL LABORATORY, P.O. BOX Y, OAK RIDGE, TENN.

*FISSION PRODUCT RELEASE, GENERAL + *ORNL (OAK RIDGE NATIONAL LABORATORY) + *REACTOR, WATER +
*RESEARCH CONTRACT

1-12333 PARO JN

BIBLIOGRAPHIES IN NUCLEAR SCIENCE AND TECHNOLOGY. SECTION 22 - NUCLEAR SHIP PROPULSION
ZENTRALSTELLE FÜR ATOMKERNENERGIE-DOKUMENTATION, GELIN-INSTITUT FÜR ANORGANISCHE CHEMIE UND
GRENZGEBIETE, FRANKFURT AM MAIN, WEST GERMANY
AED-C-22-06 +. 48 PAGES, JUNE 1966, DEP. MN

THE GERMAN BUNDESMINISTERIUM FÜR WISSENSCHAFTLICHE FORSCHUNG HAS ASSIGNED TO THE DOCUMENTATION AND INFORMATION SERVICES IN THE NUCLEAR ENERGY FIELD THE TASK TO SUPPLY SCIENTISTS AND ENGINEERS WITH ALL RELEVANT INFORMATION AND KNOWLEDGE CONTAINED IN THE INTERNATIONAL LITERATURE. THIS APPLIES PARTICULARLY TO MATERIAL WHICH IS NOT AVAILABLE AT ALL THROUGH FOREIGN DOCUMENTATION SERVICES, OR ONLY WITH CONSIDERABLE DELAYS. TO THIS END, VARIOUS MEANS HAVE BEEN EMPLOYED, ALL DIRECTED TOWARDS PROCURING INFORMATION ON SPECIFIC SUBJECT CATEGORIES OR ON PUBLICATIONS WHICH ARE NOT EASILY ACCESSIBLE. THE MATERIAL PROVIDED BY THESE INSTITUTIONS IS ISSUED AS FAST AS POSSIBLE, BUT AT IRREGULAR INTERVALS.

*DATA PROCESSING + *GERMANY + *INFORMATION RETRIEVAL

1-12343 RAMEY JT

QUALITY ASSURANCE AS A MATTER OF PUBLIC POLICY IN THE SAFETY OF ATOMIC POWER PLANTS
ATOMIC ENERGY COMMISSION
1 PAGE, 7 REFERENCES, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, TRANSACTIONS OF AMERICAN NUCLEAR SOCIETY 9(2), PAGE 407

DESCRIBES THE REACTOR LICENSING PROCESS AND DISCUSSES RECENT AND FUTURE GROWTH OF NUCLEAR POWER. BECAUSE OF THE RAPID EXPANSION OF THE NUCLEAR POWER INDUSTRY, A MORE EFFECTIVE QUALITY-ASSURANCE PROGRAM IS REQUIRED WHICH WILL (1) ESTABLISH QUALITY SYSTEM REQUIREMENTS, (2) ESTABLISH STANDARDS FOR DESIGN, CONSTRUCTION, INSPECTION, TESTING AND OPERATIONS, AND (3) ESTABLISH MEANS OF IMPLEMENTING THE FIRST TWO BY REVIEWS AND INSPECTION.

*QUALITY CONTROL + *SAFETY PRINCIPLES AND PHILOSOPHY + CODES AND STANDARDS + ENGINEERED SAFEGUARD +
REGULATION, AEC

1-12353 SHAW M

AEC VIEWS ON QUALITY ASSURANCE IN THE CIVILIAN REACTOR PROGRAM
U.S. ATOMIC ENERGY COMMISSION
1 PAGE, NOVEMBER 1966, ANS TRANSACTIONS 9(2) PAGES 410, 1966 WINTER MEETING OF AMERICAN NUCLEAR SOCIETY, OCTOBER 30 - NOVEMBER 3, 1966, PITTSBURGH, PENNSYLVANIA

QUALITY ASSURANCE EMBRACES ALL ACTIONS NECESSARY TO MAKE MORE PREDICTABLE THE SUCCESS OF THE RESEARCH AND DEVELOPMENT PROGRAMS FROM DEFINITION AND CLEAR UNDERSTANDING OF GOALS, DEFINITION OF PLANS AND MEANS OF MEASURING PROGRESS, THROUGH ALL THE DIRECTED, POSITIVE AND DISCIPLINED METHODS THAT MUST BE EMPLOYED TO MAKE CERTAIN THAT THE ENGINEERING ASPECTS OF THE UNDERTAKING ARE PROCEEDING AS PLANNED. IT IS BASED UPON A WILLINGNESS, DETERMINATION AND DEDICATION OF ALL CONCERNED TO FACE REALITY OBJECTIVELY IN PROVIDING THOSE TOOLS AND FACILITIES NEEDED TO CARRY OUT THE RESEARCH AND DEVELOPMENT PROGRAMS. FROM THE DEFINITION OF SPECIFIC CRITERIA AND REQUIREMENTS, A COMPREHENSIVE EVALUATION MUST BE MADE OF THE ALTERNATE WAYS BY WHICH THESE REQUIREMENTS CAN BE ATTAINED.

QUALITY CONTROL + REACTOR, POWER + RESEARCH CONTRACT

1-12950 NATIONAL FIRE CODES. VOLUME 9. OCCUPANCY STANDARDS AND PROCESS HAZARDS
NATIONAL FIRE PROTECTION ASSOCIATION
1 PAGE, NATIONAL FIRE CODES, 9, P. 683 (1965-66)

SELECTED NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS AND MANUALS ON OCCUPANCIES AND PROCESS HAZARDS RELATED TO MARINE, AVIATION, AND GROUND TRANSPORTATION AND INCLUDING SOME OCCUPANCY AND PROCESS HAZARDS ASSOCIATED WITH THESE THREE FORMS OF TRANSPORTATION ARE PRESENTED.

ACCESSION NUMBER 1-12327 TO 1-12950

CATEGORY 1
GENERAL SAFETY CRITERIA

1-12950 *CONTINUED*

SEPARATE ABSTRACTS WERE PREPARED ON THE SECTIONS ON HANDLING RADIOACTIVE MATERIALS AND FIRE PROTECTION PRACTICES FOR NUCLEAR REACTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

CODES AND STANDARDS + FIRE + TRANSPORTATION AND HANDLING

1-12955 APPLETON GJ + SERVANT JY

PACKAGING STANDARDS

1 PAGE, CHEMICAL ENGINEERING PROGRESS, SYMPOSIUM SERIES, 61(56), P. 50 (1965)

THE AGENCY REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS WERE FIRST PUBLISHED IN 1960. AT THIS TIME THE CONCEPT OF TWO TYPES OF PACKAGING, TYPE A AND TYPE B, WAS INTRODUCED WITH GENERAL DEFINITIONS IN TERMS OF NORMAL CONDITIONS OF TRANSPORT AND THE SO-CALLED MAXIMUM CREDIBLE ACCIDENT, RESPECTIVELY. DURING THE REVISION OF THE REGULATIONS IN 1963, IT WAS AGREED THAT MORE DETAILED PACKAGING DESIGN STANDARDS SHOULD BE PROVIDED TO FACILITATE THE INTERNATIONAL ACCEPTANCE OF PACKAGING. THIS PAPER REVIEWS THE ANALYSIS THAT WAS MADE OF THE NORMAL AND ACCIDENT TRANSPORT ENVIRONMENT TO SELECT A SERIES OF PHYSICAL AND MECHANICAL TESTS, AND DESCRIBES THESE TESTS.

REGULATION, GENERAL + REGULATION, IAEA + REGULATION, ICC + SHIPPING CONTAINER + TEST, PROOF + TRANSPORTATION AND HANDLING

1-12959 SAFETY STANDARDS FOR THE PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS

U. S. ATOMIC ENERGY COMMISSION

AUGUST 22, 1966, AEC MANUAL, CHAPTER 0529

THIS CHAPTER ESTABLISHES THE RESPONSIBILITIES AND STANDARDS TO BE USED IN GRANTING AEC APPROVAL TO CONTRACTORS FOR PACKAGING OF FISSILE MATERIALS AND LARGE QUANTITIES OF RADIOACTIVE MATERIALS. THE STANDARDS ARE IDENTICAL TO THOSE CONTAINED IN 10 CFR 71, PUBLISHED IN THE FEDERAL REGISTER, JULY 22, 1966.

REGULATION, AEC + TRANSPORTATION AND HANDLING

1-12962 GEORGE TC

REGULATIONS FOR TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES BY LAND AND WATER IN RAIL FREIGHT SERVICE AND BY MOTOR VEHICLE (HIGHWAY) AND WATER, INCLUDING SPECIFICATIONS FOR SHIPPING CONTAINERS. TARIFF NO. 19

INTERSTATE COMMERCE COMMISSION, NEW YORK

SEPTEMBER 5, 1966, ICC TARIFF NO. 19

PRESENTS REGULATIONS GOVERNING THE SHIPMENT OF DANGEROUS ARTICLES (RADIOACTIVE MATERIAL) IN INTERSTATE COMMERCE. MAIN PARAGRAPHS OF CONCERN ARE 73.391 THROUGH 73.396, AND 78.250.

REGULATION, ICC + TRANSPORTATION AND HANDLING

1-13317 BAKER L + TEVEBAUGH AD

SECTION V. REACTOR SAFETY

ARGONNE NATIONAL LABORATORY

ANL-6925 +. 47 PAGES, 9 TABLES, 50 FIGURES, MAY 1965, PAGES 187-234 OF CHEMICAL ENGINEERING DIVISION SEMIANNUAL REPORT. JULY-DECEMBER 1964, CFSTI \$6.00 CY

THE REACTOR-SAFETY PROGRAM AT ANL COMPRISES (1) THE STUDY OF METAL-WATER REACTIONS, (2) FAST-REACTOR SAFETY, AND (3) METAL OXIDATION AND IGNITION KINETICS. ITEM (1) IS STUDIED BY A HIGH-TEMPERATURE, HIGH-PRESSURE FURNACE METHOD (STEAM WITH STAINLESS STEEL, ZIRCONIUM, ALUMINUM, UO₂), BY REACTION KINETICS OF STEAM WITH REFRACTORY METALS (MOLYBDENUM, RHENIUM, TUNGSTEN, NIOBIUM, AND TANTALUM), BY LASER HEATING (TO DETERMINE RATES OF CHEMICAL REACTION AND HEAT TRANSFER BETWEEN INDIVIDUAL METAL PARTICLES AND WATER), BY TREAT EXPERIMENTS. ITEM (2) RELATES METAL-WATER REACTIONS TO FAST-REACTOR SAFETY. ITEM (3) RELATES EFFECT OF IRRADIATION ON IGNITION.

*LASER HEATING + *METAL WATER REACTION + *METAL, REFRACTORY + ACCIDENT, LOSS OF COOLANT + ALUMINUM + ANL (ARGONNE NATIONAL LABORATORY) + ENERGY SOURCE + OXIDATION + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, TEST + STEAM + STEEL, STAINLESS + TREAT (TRANSIENT TEST REACTOR FACILITY) + URANIUM OXIDE + ZIRCONIUM

1-13632 INTERNATIONAL CONVENTIONS ON CIVIL LIABILITY FOR NUCLEAR DAMAGE, LEGAL SERIES NO. 4

INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA

STI-PUB-102 +. 252 PAGES, MAY 1966

THIS FOURTH VOLUME IS DEVOTED TO CIVIL LIABILITY FOR NUCLEAR DAMAGE WHICH MIGHT OCCUR IN THE COURSE OF THE OPERATION OF A NUCLEAR INSTALLATION OR A NUCLEAR SHIP OR DURING TRANSPORT OF NUCLEAR MATERIAL. THE VOLUME CONTAINS THE FOUR MULTI-LATERAL CONVENTIONS ON THIS SUBJECT WHICH SO FAR HAVE BEEN CONCLUDED. THEY WERE ADOPTED AT THE FOLLOWING INTERNATIONAL CONFERENCES - INTERNATIONAL CONFERENCE ON CIVIL LIABILITY FOR NUCLEAR DAMAGE, VIENNA 1963 (VIENNA CONVENTION) - DIPLOMATIC CONFERENCE ON MARITIME LAW, BRUSSELS 1962 (CONVENTION ON THE LIABILITY OF OPERATORS OF NUCLEAR SHIPS) DIPLOMATIC CONFERENCE FOR THE CONCLUSION OF A CONVENTION SUPPLEMENTARY TO THE PARIS CONVENTION ON THIRD PARTY LIABILITY IN THE FIELD OF

CATEGORY 1
GENERAL SAFETY CRITERIA

1-13632 *CONTINUED*
NUCLEAR ENERGY, BRUSSELS 1963.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA, \$5.00 COPY

*INSURANCE + *LIABILITY + ACCIDENT ANALYSIS + ADMINISTRATIVE CONTROLS AND PRACTICES +
IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + LAW + REACTOR, MARITIME + REACTOR, POWER +
TRANSPORTATION AND HANDLING

1-13787 AEC DENIES CONSERVATION CENTER APPEAL ON INDIAN POINT 2
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 19-20 (DECEMBER 26, 1966)

CC HAD APPEALED ATOMIC SAFETY AND LICENSING BOARDS RECOMMENDATION FOR ISSUANCE OF A
CONSTRUCTION PERMIT. AEC RULED THE INTERVENTION WAS NOT TIMELY FILED, HAD NOT SHOWN AN
INTEREST WHICH MIGHT BE AFFECTED, AND SHOWED NO REASON FOR DEPARTURE FROM THE ORDERLY HEARING
PROCESS. (COMPLETE TEXT OF THE DECEMBER 20 DENIAL GIVEN).

*CONSTRUCTION PERMIT PROCESS + INDIAN POINT 2 + RADIATION, PUBLIC EDUCATION/ACCEPTANCE +
REACTOR, PRESSURIZED WATER

1-13788 CONSOLIDATED EDISON COMPANY FILES DEFENSE OF INDIAN POINT 2 WITH NEW YORK SUPREME COURT IN
STOCKHOLDERS SUIT
CONSOLIDATED EDISON COMPANY
10 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 20-29 (DECEMBER 26, 1966)

CONSOLIDATED EDISON DEFENSE OF ITS BUSINESS JUDGEMENT POINTED OUT ITS INDIVIDUAL AND
CORPORATED EXPERIENCE WITH NUCLEAR POWER, THE PROVEN TECHNOLOGY ASPECT OF MANY OTHER PWRS AND
THE DESIGNER (WESTINGHOUSE), THE BREAKDOWN OF ALTERNATE-ELECTRICAL-SOURCE NEGOTIATIONS, AND
THE GENERAL UTILITY-ACCEPTANCE OF REACTORS. (COMPLETE TEXT OF DECEMBER 19 AFFIDAVIT GIVEN).

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + INDIAN POINT 2 + LAW + REACTOR, PRESSURIZED WATER

1-13829 TRANSPORTATION OF RADIOACTIVE MATERIALS FILM AND LECTURE
ATOMIC ENERGY COMMISSION
6 PAGES, HEALTH AND SAFETY BULLETIN NO. 226, FEBRUARY 18, 1966

DESCRIBES THE SERIES OF LECTURE DEMONSTRATION MOTION PICTURES COVERING THE SUBJECTS OF
PROBLEMS, ACCIDENTS, PRINCIPLES OF REGULATION, AND SHIPMENT OF FISSILE MATERIAL. THE TEXT ON
THE PROBLEM OF TRANSPORTATION OF RADIOACTIVE MATERIALS IS GIVEN WHICH DEFINES AND CLARIFIES
THE PROPERTIES AND ASPECTS OF RADIATION AND CONTAMINATION.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + RADIATION SAFETY AND CONTROL + REGULATION, AEC +
TRANSPORTATION AND HANDLING

1-14442 TEXT OF AEC FORMAL BUDGET TESTIMONY FOR FY1968
UNITED STATES ATOMIC ENERGY COMMISSION
10 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGES 3-13 (JANUARY 30, 1967)

FISCAL YEAR 1968 APPROPRIATION REQUIRED IS \$2.485 BILLION, UP 10 PERCENT FROM 1967. NUCLEAR
SAFETY IS \$35 M, UP \$3 M FROM 1967. TRAINING, EDUCATION, AND INFORMATION IS \$17.9 M, UP \$1.7
M FROM 1967 (\$1 M FOR INFORMATION DISSEMINATION).

*ECONOMICS + INFORMATION RETRIEVAL + SAFETY STUDY

1-14443 REQUEST FOR A PUBLIC HEARING ON COLUMBIA UNIVERSITY REACTOR
COLUMBIA UNIVERSITY
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGES 15-16 (JANUARY 30, 1967) DOCKET NO. 50-208

A JANUARY 16, 1967, LETTER FROM THE MORNINGSIDE RENEWAL COUNCIL INDICATED THEY WERE SHOCKED TO
LEARN FROM TV THAT COLUMBIA UNIVERSITY WAS BUILDING A TRIGA IN SUCH A DENSELY POPULATED AREA
OF NEW YORK CITY. A NUMBER OF COLUMBIA UNIVERSITY PROFESSORS ARE OPPOSED TO THIS AND LEAKED
THE INFORMATION. COUNCIL REQUESTS A PUBLIC HEARING IN THE BOROUGH OF MANHATTAN.

*CONSTRUCTION PERMIT PROCESS + *RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REACTOR, RESEARCH +
TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

1-14444 NUCLEAR POWER BRIEFING CONFERENCE, JANUARY 1967
UNITED STATES ATOMIC ENERGY COMMISSION
4 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGES 21-24 (JANUARY 30, 1967)

COMMENTS INCLUDED. (COMMISSIONER RAMEY) WE LEARNED EARLY THAT THE CHANCES OF GETTING QUALITY
PERFORMANCE ARE GREATLY ENHANCED BY GETTING COMPETITIVE PROPOSALS FROM A SELECTED LIST OF
QUALIFIED CONTRACTORS. THIS PRACTICE GOT LOST IN SOME FALLACIOUS DEFERENCE TO THE
CONVENTIONAL WISDOM OF FORMAL COMPETITIVE BIDDING. (REP. HOSMER) THE BUILDING OF PAPER
REVIEWS AND PROCEDURES IS NOT ONLY WASTEFUL BUT DANGEROUS, BECAUSE IT CAN LULL US INTO A

CATEGORY 1
GENERAL SAFETY CRITERIA

1-14444 *CONTINUED*

FALSE SENSE OF SECURITY. WE MUST BE CAREFUL TO AVOID FALLING INTO THE TRAP OF THINKING WE CAN REDUCE RISKS BY ADDING MORE AND MORE BACKUP CIRCUITS. ACTUALLY THIS MIGHT TEND TO INCREASE THE RISKS.

*REGULATION, AEC + CONSTRUCTION PERMIT PROCESS + ENGINEERED SAFEGUARD + QUALITY CONTROL

1-14463 AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS
UNITED STATES ATOMIC ENERGY COMMISSION
PRESS REL. K-13 +. 1 PAGE, JANUARY 23, 1967

THE ATOMIC ENERGY COMMISSION IS AMENDING ITS REGULATIONS TO EXEMPT FROM LICENSING THE POSSESSION AND USE OF TRITIUM TO PROVIDE ILLUMINATION IN MARINE NAVIGATIONAL INSTRUMENTS. THE COMMISSION RECENTLY APPROVED A SIMILAR USE OF UP TO 750 MILLICURIES OF TRITIUM IN MARINE COMPASSES. UNDER THE PRESENT AMENDMENT, NO OTHER MARINE NAVIGATIONAL INSTRUMENT WOULD CONTAIN MORE THAN 250 MILLICURIES OF TRITIUM GAS, AND THE TRITIUM IN MARINE COMPASSES WOULD HAVE TO BE IN THE FORM OF GAS.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*REGULATION, AEC + *TRITIUM + INSTRUMENTATION, GENERAL

1-14869 APPLETON G
SAFE TRANSPORT OF RADIOACTIVE MATERIALS
INTERNATIONAL ATOMIC ENERGY AGENCY
10 PAGES, INTERNATIONAL ATOMIC ENERGY AGENCY BULLETIN 8(4) PAGES 21-30 (DECEMBER 1966)

THIS ARTICLE WAS PREPARED FROM A LECTURE ON THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS DELIVERED TO THE AGENCY STAFF BY GEORGE APPLETON OF THE IAEA. THE TOPICS COVERED INCLUDE METHODS OF SAFETY CONTROL, MARKING AND LABELING, LARGE SOURCES AND FISSILE MATERIAL, FULL-LOAD STOWAGE, DOCUMENTATION, AND THE ROLE OF THE CARRIER.

CONTAINMENT DESIGN + IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + REGULATION, IAEA + TRANSPORTATION AND HANDLING

1-15746 COTTRELL WB
COMPILATION OF UNITED STATES NUCLEAR STANDARDS. 3RD EDITION, 1966
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENN
ORNL-NSIC-30 +. 108 PAGES, DECEMBER 1966

ALL UNITED STATES NUCLEAR STANDARDS ACTIVITIES AND REGULATIONS KNOWN TO THE REACTOR SAFETY STANDARDS USASI COMMITTEE N6 ARE PRESENTED IN SIMPLE TABULAR FORM. THE STANDARDS ACTIVITIES OF ALL ORGANIZATIONS INCLUDING TECHNICAL SOCIETIES, AS WELL AS RELEVANT REGULATIONS ESTABLISHED BY GOVERNMENT AGENCIES, ARE LISTED IN ALPHABETICAL ORDER BY ORGANIZATION, ETC. IN INSTANCES WHERE THAT ORGANIZATION ITSELF UNDERTAKES THE DEVELOPMENT OF NUCLEAR STANDARDS. IN THE UNITED STATES THE MOST CONCERTED STANDARDS EFFORT IS CHanneled THROUGH THE USASI, WHICH IS A NATIONAL FEDERATION OF MORE THAN 110 TECHNICAL SOCIETIES AND TRADE ASSOCIATIONS AND, IN ADDITION, HAS 2300 COMPANY MEMBERS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*CODES AND STANDARDS + *UNITED STATES + BIBLIOGRAPHY

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-10190 DAVIS M
ATOMIC DEATH FACTORIES IN YOUR BACKYARD
6 PAGES, BLUEBOOK MAGAZINE, PAGE 23-25, 61-63 FEBRUARY, 1966

QUOTE. WITH GOVERNMENT AND PRIVATE INDUSTRY BUILDING NUCLEAR REACTORS BY THE DOZEN ACROSS THE COUNTRY (150 GOING UP RIGHT NOW) THE CHANCES OF ACCIDENTS TURNING OUR CITIES INTO HOT RADIOACTIVE MOUNDS OF CONCRETE AND STEEL INCREASE WITH EACH DAY. CANT HAPPEN... IT ALREADY HAS, MANY TIMES. UNQUOTE. THE LEAD PARAGRAPH IS TYPICAL OF THE MISREPRESENTATION IN THE ENTIRE ARTICLE. THE USUAL REHASH OF INAPPLICABLE INCIDENTS AND EXPERT QUOTES ARE BLENDED WITH CONJECTURE AND ERROR. ONE GOOD POINT - FAILURE TO PUBLISH ACCIDENT STATISTICS - LEADS TO SPECULATION AND CHARGES OF HIDING SOMETHING.

*INCIDENT, ACTUAL, GENERAL + *RADIATION, PUBLIC EDUCATION/ACCEPTANCE + *SITING, GENERAL

2-10326 GALL WR
REVIEW OF CONTAINMENT PHILOSOPHY AND DESIGN PRACTICE
OAK RIDGE NATIONAL LABORATORY
5 PAGES, 3 FIGURES, 2 TABLES, REFERENCES, NUCLEAR SAFETY, 7(1), PP. 81-86 (FALL 1965)

THIS ARTICLE REVIEWS THE STATE OF THE ART IN REACTOR CONTAINMENT AS OF 1965. AS LARGER, MORE POWERFUL REACTORS ARE BUILT TO GENERATE NUCLEAR POWER, AND AS THE SITES ARE SELECTED CLOSER TO POPULATION CENTERS, THE NEED FOR ADDITIONAL ENGINEERED SAFEGUARDS IS EVIDENT. MULTIPLE CONTAINMENT WITH PUMPBACK, RECIRCULATION COOLING, CORE-SPRAY INJECTION, RECIRCULATION CLEANUP SYSTEMS, AND EXTERNAL SHIELDING MAKE IT POSSIBLE TO SHRINK THE EXCLUSION ZONE AND LOW-POPULATION ZONES TO SMALLER RADII THAN THOSE REQUIRED BY METHODS GIVEN IN T10-14844. SIMILAR CAPABILITIES ARE OBTAINED BY PRESSURE-SUPPRESSION SYSTEMS BACKED UP BY THE CONVENTIONAL BUILDING CONTAINMENT WITH HIGHLY EFFICIENT AIR CLEANUP SYSTEMS.

*CONTAINMENT, GENERAL + *CONTAINMENT, MULTIPLE + *CONTAINMENT, PRESSURE SUPPRESSION + *ENGINEERED SAFEGUARD + *SITING, REACTOR + HADDAM NECK + MALIBU + NINE MILE POINT + OYSTER CREEK + REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER + SAN ONOFRE

2-12176 VANONI VA + RAICHLEN F
LABORATORY DESIGN-STUDIES OF THE EFFECT OF WAVES ON A PROPOSED ISLAND SITE FOR A COMBINED NUCLEAR POWER AND DESALTING PLANT
CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA
KH-R-14 +. 139 PAGES, 102 FIGURES, 8 TABLES, JULY 1966, SOURCE

AN ARTIFICIAL ISLAND, 1500 FT BY 1200 FT, HAS BEEN PROPOSED AS A SOUTHERN CALIFORNIA SITE FOR A COMBINED NUCLEAR POWER AND DESALTING PLANT. THE ISLAND WOULD BE LOCATED NEAR THE SHORE. THERE WERE FOUR MAJOR OBJECTIVES TO THIS INVESTIGATION - (1) THE DETERMINATION OF THE DEGREE OF STABILITY OF THE ISLAND FACE WHEN CONSTRUCTED OF ARMOR UNITS OF VARIOUS WEIGHTS, (2) THE RUN-UP FOR A TWO-DIMENSIONAL WAVE SYSTEM IMPINGING ON THE ISLAND FACE, (3) THE RUN-UP ENVELOPE ON THE FOUR SIDES OF THE ISLAND IN A THREE-DIMENSIONAL MODEL, AND (4) THE WAVE PATTERNS CAUSED BY THE EFFECT OF THE ISLAND ON ITS WAVE ENVIRONMENT. MODELS HAVING THREE DIFFERENT LENGTH SCALES WERE TESTED IN THE WAVE TANK (1 TO 50, 1 TO 45, AND 1 TO 40). ONE MODEL WAS TESTED IN THE WAVE BASIN AT AN UNDISTORTED SCALE OF 1 TO 150.

*MOCKUP + *SITING, OFF SHORE + *SITING, REACTOR + *TESTING + CONTAINMENT, WATER FILLED + REACTOR, DESALINATION + REACTOR, POWER

2-13640 BECK CK
BASIC ELEMENTS IN THE CHOICE OF REACTOR SITES
ATOMIC ENERGY COMMISSION
9 PAGES, 1966 NUCLEX FAIR

THREE LINES OF DEFENSE - ACCIDENT-PREVENTING SAFEGUARDS, CONSEQUENCE-LIMITING SAFEGUARDS, AND SITING. GENERAL REQUIREMENTS FOR METROPOLITAN SITING.

*SAFETY PRINCIPLES AND PHILOSOPHY + ENGINEERED SAFEGUARD + SITING, REACTOR

2-13821 LUKS H
AN ANALYSIS OF LOCATION CONDITIONS FOR REACTORS
KERNFORSCHUNGSANLAGE, JULICH, GERMANY
JUL-189-VW + ORNL-TR-508 +. 132 PAGES, FIGURES, TABLES, REFERENCES, JULY 1964

GENERAL AND SPECIAL PROBLEMS IN SITE SELECTION FOR REACTORS ARE DISCUSSED. PHYSICAL CHARACTERISTICS OF A REACTOR, OPERATING CONDITIONS, AND ENVIRONMENTAL DANGERS ARE CONSIDERED. THE LOCATION AS A FUNCTION OF REACTOR TYPE, HYDROLOGICAL VIEWPOINTS, GEOLOGICAL RELATIONS, TOPOGRAPHICAL CIRCUMSTANCES, METEOROLOGICAL CONDITIONS, POPULATION DENSITY, ADJACENT INDUSTRIES AND OTHER INSTALLATIONS, SOIL USES IN THE ENVIRONS, AND TRAFFIC SITUATIONS ARE DISCUSSED AND EVALUATED. ACCIDENTS AT REACTORS ARE REVIEWED. GERMAN AND FOREIGN REACTOR LOCATIONS ARE DESCRIBED.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISCONSIN 54669

*GERMANY + *SITING, REACTOR + ACCIDENT, HYPOTHETICAL + AGRICULTURAL CONSIDERATION + ECOLOGICAL CONSIDERATION + ENVIRONMENTAL CONDITION + GEOLOGICAL CONSIDERATION, GENERAL + HAZARD, RELATIVE + HAZARDS ANALYSIS + HYDROLOGICAL CONSIDERATION, GENERAL + METEOROLOGY + POPULATION DISTRIBUTION + WASTE DISPOSAL, GENERAL

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14087 FARA HD
A NEW CATALOGUE OF EARTHQUAKE FAULT PLANE SOLUTIONS
16 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(5), PART A, PP. 1491-1517 (OCTOBER 1964)

THE EARTHQUAKE FAULT PLANE SOLUTIONS AVAILABLE TO SPRING 1964 IN THE LITERATURE ARE LISTED IN STANDARD FORM.

*EARTHQUAKE RECORDS + *SOURCE MECHANISM + EARTHQUAKE, GENERAL + FAULT + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + ROCK MECHANICS

2-14088 RANDALL MJ
SEISMIC ENERGY GENERATED BY A SUDDEN VOLUME CHANGE
7 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(5), PART A, PP. 1291-1298 (OCTOBER 1964)

THE RECENT SUGGESTION THAT SUDDEN PHASE TRANSITIONS MAY PROVIDE A MECHANISM FOR EARTHQUAKES IS EXAMINED MATHEMATICALLY FOR THE SIMPLE CASE OF SUDDEN CHANGE OF VOLUME. SUCH A TRANSITION, EVEN FOR A SMALL DENSITY CHANGE, OFFERS A MUCH MORE CONCENTRATED SOURCE OF SEISMIC ENERGY THAN DOES SUDDEN FAULTING.

*ENERGY LEVEL + *SOURCE MECHANISM + EARTHQUAKE, GENERAL + FAULT + ROCK MECHANICS + WAVE, STRESS

2-14089 HUDSON DE + SCOTT RF
FAULT MOTIONS AT THE BALDWIN HILLS RESERVOIR SITE
15 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 55(1), PP. 165-180 (FEBRUARY 1965)

A DISTINCTION IS MADE BETWEEN THE DAMAGING POTENTIAL OF RAPID FAULT MOTIONS ASSOCIATED WITH EARTHQUAKES AND THOSE HAVING A RELATIVELY SLOW CREEP-TYPE MOTION. INFORMATION IS GIVEN ON NONSEISMIC MOVEMENTS THAT HAVE BEEN OCCURRING ON FAULTS PASSING THROUGH THE BALDWIN HILLS RESERVOIR DURING THE PAST 10 YEARS. THE RELATIONSHIP BETWEEN THOSE FAULTS AND THE INGLEWOOD FAULT SYSTEM IS DESCRIBED, AND CORRELATIONS ARE PRESENTED WITH LOCAL ELEVATION CHANGES, HORIZONTAL GROUND MOVEMENTS, AND SEISMIC ACTIVITY. COMPARISONS ARE MADE WITH SIMILAR SLOW FAULT MOTIONS OCCURRING AT OTHER PLACES IN CALIFORNIA, AND ATTENTION IS DRAWN TO THE POTENTIAL DAMAGING EFFECTS OF SUCH MOVEMENTS.

*CREEP + *FAULT + *SUBSIDENCE + EARTHQUAKE, GENERAL + GEOLOGICAL CONSIDERATION, GENERAL

2-14095 LOMNITZ C
ON ANDEAN STRUCTURE, PART II - EARTHQUAKE RISK IN CHILE
10 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(5), PART A, PP. 1271-1281 (OCTOBER 1964)

THE PROBLEM OF EARTHQUAKE RISK IN CHILE IS DISCUSSED IN TERMS OF SEISMIC HISTORY, GEOTECTONIC PROVINCES, AND REGIONAL VARIATIONS IN EARTHQUAKE INCIDENCE. SEISMIC ZONING IS IMPRACTICAL BECAUSE ALL OF CHILE ABOVE PARALLEL 42 DEGREES SOUTH HAS BEEN WITHIN THE EPICENTRAL AREA OF SOME DESTRUCTIVE EARTHQUAKE. THE PROBABILITY CONCEPT OF EARTHQUAKE RISK IS DISCUSSED IN REFERENCE TO THE SEISMICITY OF SANTIAGO. IT IS FOUND THAT THE EARTHQUAKE RISK AT SANTIAGO FOR AN ACCELERATION OF 0.1 G IS 62.5 PERCENT IN ANY 10-YEAR PERIOD. FOR THE SAME INTERVAL, THE RISK OF A DESTRUCTIVE EARTHQUAKE (INTENSITY 8-1/2) IS ABOUT 20 PERCENT.

*EARTHQUAKE PREDICTION + *SEISMIC ZONE + EARTHQUAKE EPICENTER + EARTHQUAKE RECORDS + EARTHQUAKE, GENERAL + TSUNAMI

2-14096 RANDALL MJ
ON THE MECHANISM OF EARTHQUAKES
7 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(5), PART A, PP. 1283-1289 (OCTOBER 1964)

AN EARTHQUAKE MAY BE REGARDED AS RESULTING FROM A SUDDEN CHANGE IN THE CONDITION OF ELASTIC EQUILIBRIUM IN THE EARTH. A NEW FORM OF THE GENERAL SOLUTION OF THE ELASTIC-WAVE EQUATION RELATES SEISMIC RADIATION TO DISPLACEMENT FROM EQUILIBRIUM. CALCULATION OF THE RADIATION PATTERN FOR A PROPOSED MECHANISM IS THUS REDUCED TO AN ELASTOSTATIC PROBLEM.

*FAULT + *SOURCE MECHANISM + EARTHQUAKE, GENERAL + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + ROCK MECHANICS + WAVE, STRESS

2-14097 KNOPOFF L
EARTH TIDES AS A TRIGGERING MECHANISM FOR EARTHQUAKES
5 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(6), PP. 1865-1870 (DECEMBER 1964)

SINCE EARTH TIDES REPRESENT THE LARGEST SHORT-PERIOD OSCILLATORY STRAINS IN THE EARTH, A TEST WAS MADE TO SEE IF ANY CORRELATION EXISTS BETWEEN THE TIMES OF OCCURRENCE OF EARTHQUAKES IN SOUTHERN CALIFORNIA AND THE TIDAL POTENTIAL. TWO TESTS WERE MADE, ONE OF THEM A CROSS-CORRELATION. ON EITHER BASIS, A STATISTICALLY SIGNIFICANT SAMPLE OF EARTHQUAKE EVENTS GIVES A CORRELATION WITH THE TIDAL POTENTIAL THAT IS OF THE SAME MAGNITUDE AS A RANDOM SAMPLE.

*SOURCE MECHANISM + EARTHQUAKE PREDICTION + EARTHQUAKE, GENERAL + MATHEMATICAL STUDY + ROCK MECHANICS

2-14098 BURRIDGE R + KNOPOFF L
BODY FORCE EQUIVALENTS FOR SEISMIC DISLOCATIONS
14 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(6), PP. 1875-1888 (DECEMBER 1964)

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14098 *CONTINUED*

AN EXPLICIT EXPRESSION IS DERIVED FOR THE BODY FORCE TO BE APPLIED IN THE ABSENCE OF A DISLOCATION, WHICH PRODUCES RADIATION IDENTICAL TO THAT OF THE DISLOCATION. THIS EQUIVALENT FORCE DEPENDS ONLY UPON THE SOURCE AND THE ELASTIC PROPERTIES OF THE MEDIUM IN THE IMMEDIATE VICINITY OF THE SOURCE AND NOT UPON THE PROXIMITY OF ANY REFLECTING SURFACES. THE THEORY IS DEVELOPED FOR DISLOCATIONS IN AN ANISOTROPIC INHOMOGENEOUS MEDIUM. IN THE EXAMPLES, ISOTROPY IS ASSUMED. FOR DISPLACEMENT DISLOCATION FAULTS, THE DOUBLE COUPLE IS AN EXACT EQUIVALENT BODY FORCE.

*MATHEMATICAL STUDY + *SOURCE MECHANISM + EARTHQUAKE, GENERAL + FAULT + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + ROCK MECHANICS

2-14099 NIAZI M

PARTITION OF ENERGY IN THE FOCAL REGION OF EARTHQUAKES

9 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(6), PART B, PP. 2175-2183 (DECEMBER 1964)

A SPHERICAL FOCAL MODEL IS CONSIDERED IN WHICH THE RELEASE OF THE SHEAR ENERGY AT THE TIME OF RUPTURE SETS UP A LAMINAR DISPLACEMENT FIELD. BASED ON SOME GEODETIC OBSERVATIONS, THE FIELD IS ASSUMED TO DECREASE GRADUALLY AS THE DISTANCE FROM THE FOCAL POINT INCREASES. THIS ASSUMPTION ALLOWS THE FAULT PLANE TO BE OF FINITE EXTENT. THE CONCEPT OF STATIC ELASTICITY IS APPLIED TO EVALUATE THE FRACTION OF STORED SHEAR ENERGY WHICH IS RELEASED WITH THE OCCURRENCE OF AN EARTHQUAKE. COMPARISON OF THE DISTRIBUTION OF THE STRAIN-ENERGY DENSITY IN THE FOCAL REGION BEFORE AND AFTER RUPTURE LEADS TO SOME EXPLANATION ABOUT THE PARTITION OF ENERGY IN THAT REGION. THE APPLICATION OF THE MODEL TO THREE SHALLOW EARTHQUAKES IN THE WESTERN UNITED STATES YIELDS ENERGIES COMPARABLE TO THOSE GIVEN PREVIOUSLY.

*ROCK MECHANICS + *SOURCE MECHANISM + EARTHQUAKE, GENERAL + ENERGY LEVEL + FAULT + GEOLOGICAL CONSIDERATION, GEOPHYSICAL

2-14100 ZEEVAERT L

STRONG GROUND MOTIONS RECORDED DURING EARTHQUAKES OF MAY THE 11TH AND 19TH, 1962 IN MEXICO CITY
22 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(1), PP. 209-231 (FEBRUARY 1964)

THE GROUND ACCELERATIONS DURING THE EARTHQUAKES OF MAY 11 AND 19, 1962, WERE RECORDED IN MEXICO CITY ON A SOFT CLAY BED THAT WAS FORMERLY THE FLOOR OF AN OLD LAKE. RECORDS WERE OBTAINED FROM TWO ACCELEROMETERS. ONE WAS LOCATED IN THE BASEMENT OF A MULTISTORY BUILDING, AND THE OTHER WAS LOCATED IN A NEARBY PARK. RESPONSE SPECTRA OF THE GROUND MOTIONS ARE PRESENTED, AND ANALYSIS IS MADE OF THE LOCAL SOIL CONDITIONS WITH THE VIEW TO EXPLAINING THE CHARACTERISTICS OF THE SPECTRUMS.

*GROUND MOTION + *SOIL MECHANICS + ACCELERATION + EARTHQUAKE, GENERAL + RESPONSE SPECTRUM + WAVE, STRESS

2-14101 MANSINHA L

THE VELOCITY OF SHEAR FRACTURE

7 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(1), PP. 369-376 (FEBRUARY 1964)

THE MAXIMUM VELOCITY OF FRACTURE IN A HOMOGENEOUS ISOTROPIC ELASTIC MEDIUM UNDER PURE SHEAR STRESS AND WITH AN ADDED COMPRESSIVE STRESS IS COMPUTED BY AN EXTENSION OF YOFFES METHOD. THE MAXIMUM VELOCITY OF SHEAR FRACTURE IS SMALLER THAN THE VELOCITY OF TRANSVERSE WAVES IN THE MEDIUM. IT INCREASES AS POISSON'S RATIO INCREASES, AND DECREASES AS THE COMPRESSIVE STRESS INCREASES. THE MAXIMUM VELOCITY OF PURE SHEAR FRACTURE IS HIGHER THAN THE VELOCITY OF PURE TENSILE FRACTURE IN THE SAME MEDIUM. FOR A MEDIUM WITH POISSON'S RATIO OF 0.25, THE FORMER IS 0.775, AND THE LATTER IS 0.631 OF THE TRANSVERSE-WAVE VELOCITY.

*FAULT + *SOURCE MECHANISM + EARTH MATERIAL, DYNAMIC PROPERTY + EARTHQUAKE, GENERAL + MATHEMATICAL STUDY + ROCK MECHANICS

2-14102 BERNINGHAUSEN WH

TSUNAMIS AND SEISMIC SEICHES REPORTED FROM THE EASTERN ATLANTIC SOUTH OF THE BAY OF BISCAY

4 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(1), PP. 439-442 (FEBRUARY 1964)

TSUNAMIS HAVE BEEN REPORTED FROM WIDELY DISTRIBUTED LOCATES WITH THE AREA UNDER CONSIDERATION. THEY SEEM TO BE MORE COMMON IN THE AZORES AND THE IBERIAN PENINSULA THAN ELSEWHERE. THIS MAY RESULT PARTLY FROM THE LACK OF OR UNAVAILABILITY OF DATA RATHER THAN THE ABSENCE OF THE PHENOMENA.

*EARTHQUAKE RECORDS + *TSUNAMI + EARTHQUAKE, GENERAL + SEICHE + SEISMIC ZONE

2-14103 BERG JW + GASKELL R + RINEHART V

EARTHQUAKE ENERGY RELEASE AND ISOSTASY

8 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(2), PP. 777-784 (APRIL 1964)

THE RELATIONSHIP BETWEEN ISOSTATIC ANOMALIES AND AVERAGE ANNUAL EARTHQUAKE ENERGY RELEASED WAS INVESTIGATED. DATA WERE USED FOR THE UNITED STATES, WEST INDIES, EAST INDIES, JAPAN, AFRICA, AND INDIA. THE ABOVE AREAS WERE SUBDIVIDED INTO SMALLER AREAS, 5 DEGREES ON THE SIDE, AND THE DATA FOR THE SMALLER AREAS WERE USED TO DETERMINE A RELATIONSHIP BETWEEN THE VARIABLES. BECAUSE THE DATA WERE CONSIDERABLY SCATTERED, AN AVERAGING METHOD WAS USED FOR SMOOTHING. RESULTS OF THE RESEARCH INDICATE THAT (1) A RELATIONSHIP EXISTS BETWEEN THE AVERAGE ANNUAL EARTHQUAKE ENERGY RELEASED FROM REGIONS AND THE ISOSTATIC RELIEF (OR GRADIENT) OF THE REGIONS, AND (2) THE ISOSTATIC RELIEF CAN BE USED AS AN INDEX OF THE STRAIN LEVEL OF THE

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14103 *CONTINUED*
CRUST AND UPPER MANTLE.

*ENERGY LEVEL + *TECTONICS + EARTHQUAKE, GENERAL + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + SOURCE MECHANISM

2-14104 NIAZI M
SEISMICITY OF NORTHERN CALIFORNIA AND WESTERN NEVADA
5 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(2), PP. 845-850 (APRIL 1964)

NEARLY 1500 RECENT NORTHERN CALIFORNIA AND WESTERN NEVADA EARTHQUAKES OF MAGNITUDE 2 AND ABOVE WERE USED TO STUDY ASPECTS OF THE SEISMICITY OF THE REGION. IN AN AREA COVERING 5-1/2 DEGREES OF LATITUDE BY 8 DEGREES OF LONGITUDE, EACH SQUARE DEGREE WAS SUBDIVIDED INTO 16 APPROXIMATELY EQUAL QUADRILATERAL BLOCKS. THE SEISMIC ENERGY AND ASSOCIATED STRAIN RELEASE IN EACH BLOCK WERE COMPUTED FOR TIME INTERVALS UP TO FIVE YEARS. THE COMPUTED REPRESENTATIONS OF STRAIN RELEASE FOR EACH YEAR ARE CONTOURED TO DEFINE THE DISTRIBUTION OF SEISMIC ZONES IN THE AREA AND TO GIVE A DYNAMIC MEASURE OF THEIR VARIATION. THE OBSERVED SURFACE CREEP ALONG THE SAN ANDREAS FAULT AT THE VINEYARD SEISMOGRAPHIC STATION IS COMPARED WITH THE INTENSITY OF THE SEISMIC ACTIVITY IN THE IMMEDIATE NEIGHBORHOOD OF THE FAULT ZONE. THE FREQUENCY DISTRIBUTION OF EARTHQUAKES OF DIFFERENT MAGNITUDE IS DISCUSSED.

*ENERGY LEVEL + *SEISMIC ZONE + CREEP + EARTHQUAKE PREDICTION + EARTHQUAKE, GENERAL + FAULT

2-14105 STAUDER W
A COMPARISON OF MULTIPLE SOLUTIONS OF FOCAL MECHANISMS
10 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(3), PP. 927-937 (JUNE 1964)

THE OCCURRENCE OF FOCAL-MECHANISM SOLUTIONS OF THE SAME EARTHQUAKE BY DIFFERENT AUTHORS IS EXAMINED. OF 42 INSTANCES OF SUCH MULTIPLE SOLUTIONS FOR EARTHQUAKES WHICH OCCURRED AROUND THE BORDERS OF THE PACIFIC OCEAN, IN 84 POSSIBLE PAIRS OF MULTIPLE SOLUTIONS, AGREEMENT IS EXCELLENT IN 8 CASES, GOOD IN 13, FAIR IN 19, POOR IN 19, AND NO AGREEMENT IN 25. THE IMPLICATION FOR FOCAL-MECHANISM STUDIES IS ILLUSTRATED BY EXAMINING THE FOCAL-MECHANISM SOLUTIONS OF DEEP-FOCUS EARTHQUAKES UNDER THE SEA OF JAPAN.

*SOURCE MECHANISM + EARTHQUAKE RECORDS + EARTHQUAKE, GENERAL + FAULT +
GEOLOGICAL CONSIDERATION, GEOPHYSICAL

2-14106 BOSTROM RC
SEISMICITY IN A RESTRICTED REGION
14 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(3), PP. 987-1001 (JUNE 1964)

THE BENIOFF SEISMIC MODEL AND A REE-EYRING VISCOSITY EQUATION WERE USED TO EVALUATE THE EFFECTS OF SEISMICITY IN A CONFINED REGION. VISCOSITY CHANGES PRECLUDE THE CONTINUANCE OF SEISMICITY AT ITS PEAK VALUE FOR MORE THAN ABOUT 10,000,000 YEARS. THE ZONE OF SEISMICITY DIPPING BENEATH THE CIRCUM-PACIFIC TECTONIC ARCS MAY MARK THE SITE OF AN ALTERATION FRONT.

*EARTHQUAKE PREDICTION + *SEISMIC ZONE + EARTHQUAKE EPICENTER + EARTHQUAKE, GENERAL + SOURCE MECHANISM +
TECTONICS

2-14107 MCIVOR IK
METHODS OF SPECTRAL ANALYSIS OF SEISMIC DATA
20 PAGES, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, 54(4), PP. 1213-1232 (AUGUST 1964)

THREE METHODS OF SPECTRAL ANALYSIS ARE COMPARED ON THE BASIS OF A COMMON INTERPRETATION IN TERMS OF TIME-VARYING FOURIER ANALYSIS. THE SPECTRA OBTAINED BY THESE METHODS FOR A PARTICULAR SEISMIC EVENT ARE GIVEN, AND DIFFERENCES IN THE RESULTS ARE RESOLVED.

*EARTHQUAKE RECORDS + *RESPONSE SPECTRUM + EARTHQUAKE, GENERAL + MATHEMATICAL STUDY + VIBRATION

2-14126 PLAFKER G
TECTONIC DEFORMATION ASSOCIATED WITH THE 1964 ALASKA EARTHQUAKE
12 PAGES, SCIENCE, 148(3678), PP. 1675-1687 (JUNE 25, 1965)

ALASKA'S GOOD FRIDAY EARTHQUAKE OF 27 MARCH 1964 WAS ACCOMPANIED BY VERTICAL TECTONIC DEFORMATION OVER AN AREA OF 170,000 TO 200,000 SQUARE KILOMETERS IN SOUTH-CENTRAL ALASKA. THE DEFORMATION INCLUDED TWO MAJOR NORTHEAST-TRENDING ZONES OF UPLIFT AND SUBSIDENCE SITUATED BETWEEN THE ALEUTIAN TRENCH AND THE ALEUTIAN VOLCANIC ARC - TOGETHER THEY ARE 700 TO 800 KILOMETERS LONG AND FROM 150 TO 200 KILOMETERS WIDE. THE SEAWARD ZONE UNDERWENT UPLIFT OF 10-15 METERS AS A RESULT OF BOTH CRUSTAL WARPING AND LOCAL FAULTING. THE ADJACENT ZONE TO THE NORTHWEST UNDERWENT A SUBSIDENCE OF 1-2.3 METERS.

*FAULT + *TECTONICS + DISPLACEMENT, GENERAL + EARTHQUAKE RECORDS + EARTHQUAKE, GENERAL +
GEOLOGICAL CONSIDERATION, GENERAL + SUBSIDENCE + TSUNAMI

2-14212 PFLUKE JH + HOWELL BF
SEISMIC MODEL STUDIES OF FIRST MOTIONS PRODUCED BY AN ACTUAL FAULT
UNITED ELECTRODYNAMICS, ALEXANDRIA, VA. + PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK
13 PAGES, JOURNAL OF GEOPHYSICAL RESEARCH, 69(4), PP. 653-65 (FEBRUARY 1964)

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14212 *CONTINUED*

IN AN EFFORT TO DISCOVER THE EXPECTABLE SOURCE MECHANISM OF EARTHQUAKES DUE TO FAULTING IN THE EARTH, TWO-DIMENSIONAL SEISMIC MODELS WERE INVESTIGATED. THE MODELS WERE CONSTRUCTED WITH FAULTS WHOSE SURFACES ARE LOCKED TOGETHER IN THE REST POSITION. THERE WAS A PROVISION FOR STRAINING THE FAULT REGION UNTIL THE LOCKING STRENGTH WAS OVERCOME, ALLOWING A SUDDEN, SPONTANEOUS RELEASE OF THE ACCUMULATED STRAIN ENERGY AND CONSEQUENT GENERATION OF ELASTIC WAVES. A NUMBER OF MODELS MADE OF PLEXIGLAS AND OF STEEL PLUS PLEXIGLAS WERE CONSTRUCTED WITH DIFFERENT-LENGTH FAULTS, RANGING FROM A SMALL FRACTION OF THE P WAVELENGTH TO A FAULT LENGTH EQUAL TO THE P WAVELENGTH. THE AMPLITUDES OF THE FIRST MOTIONS OF P AND S WAVES WERE RECORDED AND PLOTTED. THE AMPLITUDE DISTRIBUTIONS FROM ALL MODELS APPROXIMATED THAT OF THE DOUBLE-COUPLE SOURCE MECHANISM AND WERE IN GOOD AGREEMENT WITH THE KNOPOFF AND GILBERT DISLOCATION THEORY OF FIRST MOTIONS. THE EFFECTS OF A THEORETICAL SHEAR-STRAIN DISLOCATION COULD NOT BE DETECTED IN THE AMPLITUDE DISTRIBUTIONS EVEN THOUGH THEORY SUGGESTED THAT THE STEEL AND PLEXIGLAS MODELS SHOULD HAVE YIELDED THE AMPLITUDE PATTERNS OF SHEAR-STRAIN DISLOCATION.

*SOURCE MECHANISM + EARTHQUAKE, GENERAL + FAULT + GROUND MOTION + VIBRATION

2-14390 RIZNICHENKO YV
FROM THE ACTIVITY OF EARTHQUAKE FOCI TO SURFACE TREMORS
ACADEMY OF SCIENCES, USSR
7 PAGES, PHYSICS OF THE SOLID EARTH, (11), PP. 715-21 (NOVEMBER 1965)

WAYS ARE INVESTIGATED OF PASSING FROM THE SEISMIC ACTIVITY OF A REGION CONTAINING EARTHQUAKE FOCI TO THE PRODUCTION OF TREMORS AT POINTS ON THE EARTH'S SURFACE BY SEISMIC SHOCKS OF A SPECIFIC INTENSITY.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1145-19TH STREET, WASHINGTON, D.C., 20036

*EARTHQUAKE PREDICTION + EARTHQUAKE, GENERAL + ENERGY LEVEL + GROUND MOTION + SEISMIC ZONE

2-14391 ESSA SYMPOSIUM ON EARTHQUAKE PREDICTION, ROCKVILLE, MARYLAND, FEBRUARY 7,8,9, 1966
167 PAGES, 1966

THE PROCEEDINGS OF THIS SYMPOSIUM PRESENTS 32 SHORT PAPERS COVERING (1) PHYSICAL BASIS OF EARTHQUAKES, (2) INSTRUMENTED EARTHQUAKE FAULT ZONES, (3) ENGINEERING SEISMOLOGY AND EARTHQUAKE ENGINEERING, AND (4) GEOPHYSICAL AND GEOLOGICAL SURVEY OF EARTHQUAKE FAULT ZONES AND MISCELLANEOUS PROJECTS. THE FLOOR DISCUSSIONS ACCOMPANYING THE PRESENTATIONS ARE ALSO GIVEN. ALTHOUGH MOST OF THE INFORMATION IS COVERED IN BETTER DETAIL IN THE OPEN LITERATURE, THIS PROCEEDINGS COLLECTS THE MAIN POINTS IN A SUMMARY STATE-OF-THE-ART FORM DIRECTED TOWARD THE PROBLEM OF EARTHQUAKE PREDICTION.

AVAILABILITY - U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C., 20402, \$1.00 COPY

*EARTHQUAKE PREDICTION + EARTHQUAKE EPICENTER + EARTHQUAKE RECORDS + EARTHQUAKE, ENGINEERING + EARTHQUAKE, GENERAL + FAULT + SEISMIC ZONE

2-14394 CHINNERY MA
THE VERTICAL DISPLACEMENTS ASSOCIATED WITH TRANSCURRENT FAULTING
UNIVERSITY OF BRITISH COLUMBIA, DEPARTMENT OF GEOPHYSICS, VANCOUVER, BRITISH COLUMBIA, CANADA
6 PAGES, JOURNAL OF GEOPHYSICAL RESEARCH, 70(18), PP. 4627-32 (SEPTEMBER 1965)

THE RESULTS OF AN EARLIER PAPER (CHINNERY, 1961) ARE USED IN THIS DISCUSSION OF THE NATURE OF THE VERTICAL DISPLACEMENTS THAT SHOULD ACCOMPANY MOVEMENT ON A TRANSCURRENT FAULT. IN SPITE OF THE INADEQUACIES OF THE MODEL, IT IS SHOWN THAT THE UPLIFT AND SUBSIDENCE CAUSED IN THIS WAY MAY BE QUITE LARGE AND MAY FORM A COMPLEX PATTERN. THE THEORY ALSO SUGGESTS THAT PERMANENT VERTICAL DEFORMATIONS OF SOME MAGNITUDE MAY OCCUR AT CONSIDERABLE DISTANCES FROM SUCH A FAULT. SINCE SOME FAULTS APPEAR TO HAVE VERY LARGE HORIZONTAL MOVEMENTS, THESE RESULTS COULD BE OF GREAT SIGNIFICANCE IN GEOTECTONICS, AND A PROGRAM OF GEOPHYSICAL AND GEOLOGICAL INVESTIGATIONS TO STUDY THIS EFFECT IS SUGGESTED.

*FAULT + *TECTONICS + DISPLACEMENT, GENERAL + EARTHQUAKE, GENERAL + MATHEMATICAL STUDY + SOURCE MECHANISM

2-14395 CAPUTO M
THE MINIMUM STRENGTH OF THE EARTH
UNIVERSITY OF CALIFORNIA, INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS, LOS ANGELES
9 PAGES, JOURNAL OF GEOPHYSICAL RESEARCH, 70(4), PP. 955-63 (FEBRUARY 1965)

THE DE SITTER THEORY OF THE HYDROSTATIC FLATTENING OF THE EARTH IS REVIEWED AND SLIGHTLY MODIFIED, AND THE SHAPE OF ROTATING EARTH MODELS IN HYDROSTATIC EQUILIBRIUM IS DISCUSSED. IT IS ONCE MORE VERIFIED THAT THE EARTH IS NOT IN HYDROSTATIC EQUILIBRIUM, AND SEVERAL INTERPRETATIONS OF ITS DEPARTURE FROM THAT EQUILIBRIUM ARE GIVEN. THE INTERNAL STRENGTH NEEDED TO MAINTAIN THE GLOBAL DEPARTURES FROM HYDROSTATIC EQUILIBRIUM IS DISCUSSED. THE MOST PROBABLE VALUE APPEARS TO BE ABOUT 30 BARS, OR ABOUT THE SAME AS THE STRESSES ASSOCIATED WITH REGIONAL ANOMALIES OF THE EARTH'S GRAVITY FIELD.

*TECTONICS + EARTHQUAKE, GENERAL + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + MATHEMATICAL STUDY

2-14396 MCGARR A
EXCITATION OF SEICHES IN CHANNELS BY SEISMIC WAVES

ACCESSION NUMBER 2-14212 TO 2-14396

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14396 *CONTINUED*
COLUMBIA UNIVERSITY, LAMONT GEOLOGICAL OBSERVATORY, PALISADES, NEW YORK
8 PAGES, JOURNAL OF GEOPHYSICAL RESEARCH, 70(4), PP. 847-54 (FEBRUARY 1965)

DESCRIPTION OF SEICHES WHICH OCCURRED ALONG THE GULF COAST OF THE UNITED STATES AND IN NORWAY AT THE TIMES OF THE ALASKAN EARTHQUAKE OF 1964 AND THE ASSAM EARTHQUAKE OF 1950 ARE REVIEWED. AN ANALYTICAL EXPRESSION IS DERIVED FOR THE EFFECT OF SEISMIC SURFACE WAVES ON A WATER CHANNEL OF WIDTH L AND DEPTH H . THE EXPRESSION IS USED TO EXPLAIN MANY OF THE OBSERVATIONS OF NORWEGIAN SEICHES AND ALSO TO COMPUTE A THEORETICAL MARIGRAM WHICH IS COMPARED WITH AN ACTUAL MARIGRAM RECORDED IN A CHANNEL AT FREEPORT, TEXAS. THE HORIZONTAL COMPONENTS OF SEISMIC SURFACE WAVES ARE SHOWN TO BE THE DOMINANT CAUSE OF SEICHES DUE TO TELESEISMS. THE MAXIMUM SEICHES AMPLITUDES VARY AS (1) THE SEISMIC WAVE AMPLITUDE, (2) $(H)^{-1/2}$ WHERE H IS THE CHANNEL DEPTH, AND (3) THE DEGREE OF RESONANCE BETWEEN THE SEISMIC WAVES AND THE NATURAL PERIODS OF OSCILLATION OF STANDING WATER WAVES IN THE CHANNEL.

*SEICHE + EARTHQUAKE, GENERAL + MATHEMATICAL STUDY + TSUNAMI

2-14397 PETER G + ELVERS D + YELLIN M
GEOLOGICAL STRUCTURE OF THE ALEUTIAN TRENCH SOUTHWEST OF KODIAK ISLAND
U. S. COAST AND GEODETIC SURVEY, WASHINGTON, D.C.
13 PAGES, JOURNAL OF GEOPHYSICAL RESEARCH, 70(2), PP. 353-366 (JANUARY 1965)

GEOPHYSICAL DATA ARE PRESENTED AND DISCUSSED FOR AN AREA APPROXIMATELY 290 KM LONG AND 220 KM WIDE IN THE ALEUTIAN TRENCH SOUTH OF KODIAK ISLAND. VARIATIONS IN TOTAL MAGNETIC INTENSITY (RESIDUAL) OF MORE THAN 600 GAMMAS WERE FOUND IN THE CENTER OF THE TRENCH, AND MORE THAN 1100 ON THE SOUTHERN FLANK. THE FREE-AIR GRAVITY VALUES VARIED BY AS MUCH AS 150 MGAL. THE RESIDUAL MAGNETIC AND GRAVITY ANOMALIES SUGGEST THAT A FISSURE ZONE, FILLED WITH BASIC IGNEOUS MATERIAL, IS LOCATED IN THE CENTER OF THE TRENCH. IT IS CONCLUDED THAT THE GEOPHYSICAL RESULTS IN THIS AREA ARE COMPARABLE TO THOSE OBTAINED IN MANY OTHER CONTINENTAL MARGINS OF THE EARTH. THIS CONCLUSION SUPPORTS THE THEORY THAT CONTINENTAL MARGINS AND TRENCHES ARE AFFECTED BY TENSIONAL FORCES IN THE EARTH'S CRUST.

*TECTONICS + EARTHQUAKE, GENERAL + GEOLOGICAL CONSIDERATION, GENERAL + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + SEISMIC ZONE

2-14398 SYTINSKIY AD
ATMOSPHERIC PROCESSES AS THE MECHANISM OF THE EFFECT OF SOLAR ACTIVITY ON TECTONIC PHENOMENA
ACADEMY OF SCIENCES, USSR
3 PAGES, DOKLADY AKADEMII NAUK SSSR, 155(1-6), PP. 1-3 (OCTOBER 1965)

THE SOLAR CORPUSCULAR FLUX CAN AFFECT ATMOSPHERIC PROCESSES OF THE EARTH SIMULTANEOUSLY IN THE SOUTHERN AND NORTHERN HEMISPHERES, AND BY ALTERING THE EARTH'S ANGULAR MOMENTUM CAN AFFECT SEISMICITY OF THE EARTH.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

*EARTHQUAKE PREDICTION + *SOURCE MECHANISM + EARTHQUAKE, GENERAL + TECTONICS

2-14399 TAMRAZYAN GP
CORRELATION BETWEEN RHYTHMIC FLUCTUATIONS OF THE EARTH'S CRUST AND SOLAR ACTIVITY
ACADEMY OF SCIENCES, USSR
4 PAGES, DOKLADY AKADEMII NAUK SSSR, 147(1-6), PP. 22-5 (OCTOBER 1965)

THE QUESTION OF WHETHER SOLAR ACTIVITY IS REFLECTED IN TECTONIC MOVEMENTS OF THE SOLID EARTH AS IT IS IN OTHER GEOPHYSICAL PROCESSES HAS BEEN ANSWERED AFFIRMATIVELY BY ANALYSIS OF SPECIFIC TIDE-GAGE DATA IN THE CASPIAN SEA.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

EARTHQUAKE PREDICTION + EARTHQUAKE, GENERAL + SOURCE MECHANISM + TECTONICS

2-14400 RIZNICHENKO YV + SHMIDT OY
DETERMINATION OF THE ENERGY FLUX OF EARTHQUAKE FOCI ON THE BASIS OF SEISMIC ACTIVITY
ACADEMY OF SCIENCES, USSR
2 PAGES, DOKLADY AKADEMII NAUK SSSR, 159(1-6), PP. 3-4 (OCTOBER 1965)

FAIRLY DETAILED MAPPING OF THE SEISMIC ENERGY FLUX MAY BE POSSIBLE BY MEANS OF THE RELATION BETWEEN SEISMIC ACTIVITY AND SEISMIC ENERGY FLUX OF EARTHQUAKE FOCI, TAKING INTO ACCOUNT FREQUENCY AND THE CONNECTION BETWEEN THE STRONGEST EARTHQUAKES AND ACTIVITY.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

*ENERGY LEVEL + EARTHQUAKE PREDICTION + EARTHQUAKE, GENERAL + SEISMIC ZONE

2-14401 RIZNICHENKO YV + SHMIDT OY
RELATIONSHIP BETWEEN THE ENERGY OF THE STRONGEST EARTHQUAKES AND SEISMIC ACTIVITY
ACADEMY OF SCIENCES, USSR
2 PAGES, DOKLADY AKADEMII NAUK SSSR, 157(1-6), PP. 5-6 (OCTOBER 1965)

A CORRELATION PROCEDURE BASED ON SEVERAL PHYSICAL ASSUMPTIONS IS SUGGESTED FOR RELATING THE

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14401 *CONTINUED*

ENERGY LEVEL OF THE STRONGEST EARTHQUAKES TO THE SEISMIC ACTIVITY OF A REGION. A METHOD IS INDICATED FOR USING THESE RELATIONS TO CALCULATE E-SUB-MAX AND TO MAP ISOLINES OF E-SUB-MAX OR K-SUB-MAX FROM MAPS OF SEISMIC ACTIVITY.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

*EARTHQUAKE PREDICTION + *ENERGY LEVEL + EARTHQUAKE, GENERAL + SEISMIC ZONE

2-14402 RIZNICHENKO YV + SHMIDT OY
RELATION BETWEEN THE FLOW OF ROCK MASSES AND SEISMICITY
ACADEMY OF SCIENCES, USSR
2 PAGES, DOKLADY AKADEMII NAUK SSSR, 161(1-6), PP. 1-2 (OCTOBER 1965)

SEISMIC DATA RELATING TO SPATIAL AND TEMPORAL DISTRIBUTION OF EARTHQUAKE FOCI AND THEIR ENERGY DISTRIBUTION ARE COMPARED MATHEMATICALLY WITH OTHER GEOLOGIC AND GEOPHYSICAL PARAMETERS, INCLUDING GEODETIC MEASUREMENTS AND VARIATIONS IN THE VALUE OF GRAVITY TO ESTABLISH A CLOSER QUANTITATIVE RELATIONSHIP BETWEEN THE RESULTS OF SEISMIC STUDIES AND TECTONIC STUDIES OF MASS MOVEMENTS.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

*CREEP + *TECTONICS + EARTHQUAKE, GENERAL + MATHEMATICAL STUDY + SEISMIC ZONE

2-14403 POPOV VV
TEMPERATURE INHOMOGENEITIES AS A POSSIBLE CAUSE OF EARTHQUAKES
ACADEMY OF SCIENCES, USSR
3 PAGES, PHYSICS OF THE SOLID EARTH, (1), PP. 34-6 (1966)

THIS PAPER DISCUSSES THE POSSIBILITY THAT EARTHQUAKES RESULT FROM TEMPERATURE INHOMOGENEITIES. IT COMPARES THE THERMOELASTIC ENERGY, STORED AT THE INCLUSION, WITH THE SEISMIC ENERGY OF EARTHQUAKES. THE MECHANISM LEADING TO THE FORMATION OF AN EARTHQUAKE CENTER, I.E., THE FRACTURE MECHANISM ITSELF, IS NOT CONSIDERED.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1145-19TH STREET, WASHINGTON, D.C., 20036

*SOURCE MECHANISM + EARTHQUAKE, GENERAL + TECTONICS

2-14404 PSHENNIKOV KB
THE ENERGY BALANCE IN THE FOCAL REGION OF A STRONG EARTHQUAKE
ACADEMY OF SCIENCES, USSR
5 PAGES, PHYSICS OF THE SOLID EARTH, (10), PP. 667-71 (1965)

THE POSSIBLE EFFECT OF HEAT LIBERATED IN THE FOCUS OF A STRONG EARTHQUAKE ON THE THERMAL REGIME OF THE EARTH'S CRUST IN SEISMICALLY ACTIVE REGIONS IS CONSIDERED, TAKING AS AN EXAMPLE EARTHQUAKES OF THE KURIL-KAMCHATKA ZONE.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

*ENERGY LEVEL + EARTHQUAKE, GENERAL + ROCK MECHANICS + SOURCE MECHANISM + TECTONICS

2-14405 RIZNICHENKO YV
PROBLEMS OF EARTHQUAKE PHYSICS
ACADEMY OF SCIENCES, USSR
14 PAGES, PHYSICS OF THE SOLID EARTH, (2), PP. 73-86 (1966), JOINT MEETING OF THE SEISMOLOGY COUNCIL, USSR ACADEMY OF SCIENCES, AND THE ACADEMIC COUNCIL OF THE INSTITUTE OF PHYSICS OF THE EARTH, APRIL 22, 1965

A REVIEW IS GIVEN OF THE PRESENT STATE OF KNOWLEDGE ON THE EARTHQUAKE FOCUS AND GROUPS OF FOCI - THE NATURE OF MOVEMENT IN THE FOCUS, THE SEISMIC ENERGY OF THE FOCUS, THE PRINCIPAL CHARACTERISTICS OF THE SEISMIC REGIME, THE PROBLEM OF THE MAXIMUM POSSIBLE EARTHQUAKE, THE SEISMIC DISPLACEMENT (FLOW) OF ROCK MASSES, CONVERSION FROM THE FOCAL ACTIVITY OF EARTHQUAKES TO TREMOR CONDITIONS AT THE EARTH'S SURFACE, THE TEMPORAL VARIATION OF THE SEISMIC REGIME AND EARTHQUAKE PREDICTION.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1145-19TH STREET, WASHINGTON, D.C., 20036

*EARTHQUAKE PREDICTION + DISPLACEMENT, GENERAL + EARTHQUAKE, GENERAL + ENERGY LEVEL + SEISMIC ZONE + SOURCE MECHANISM

2-14406 RIZNICHENKO YV
CALCULATION OF THE TREMOR FREQUENCY AT POINTS ON THE EARTH'S SURFACE DUE TO EARTHQUAKES IN THEIR VICINITY
ACADEMY OF SCIENCES, USSR
10 PAGES, PHYSICS OF THE SOLID EARTH, (5), PP. 287-96 (1966)

A PREVIOUSLY DEVELOPED GENERAL METHOD FOR DETERMINING THE AVERAGE REPETITION FREQUENCY OF SEISMIC SHOCKS AT A GIVEN POINT IS EXTENDED TO THE CONDITIONS ENCOUNTERED IN PRACTICAL SEISMOLOGY.

AVAILABILITY - AMERICAN GEOPHYSICAL UNION, SUITE 506, 1146-19TH STREET, WASHINGTON, D.C., 20036

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-14406 *CONTINUED*
*EARTHQUAKE PREDICTION + EARTHQUAKE, GENERAL + ENERGY LEVEL + SEISMIC ZONE

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-08717 SHAPPERT LB
AN ECONOMIC ANALYSIS OF THE DOMESTIC AND OVERSEAS SHIPMENT OF SPENT REACTOR FUEL
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-590 +. PAGES, FIGURES, TABLES, REFERENCES, JUNE 27, 1963, CFSTI \$2.60 CY

THE COST OF SHIPPING SPENT REACTOR FUEL FROM A DOMESTIC AND FOREIGN NATURAL URANIUM REACTOR TO A REPROCESSING PLANT IN THE U.S. WAS INVESTIGATED. THE DOMESTIC REACTOR WAS LOCATED AT POINT LOMA, CALIF., AND THE SPENT FUEL WAS SHIPPED 1176 MILES TO HANFORD, WASH. THE FOREIGN REACTOR WAS LOCATED IN ITALY, AND THE SPENT FUEL WAS SHIPPED TO SOUTHERN CALIFORNIA. TWO REACTORS WERE CONSIDERED - ONE WITH THERMAL POWER OF 3500 MW (CASE 1, DOMESTIC ONLY) AND THE OTHER WAS A 25,000-MW REACTOR (CASE 2). RESULTS INDICATED THAT FOR THE LARGEST REACTOR (CASE 2) SITUATED IN THE U.S., TRUCK TRANSPORTATION WAS THE CHEAPEST PRACTICAL METHOD - \$1.30 PER KILOGRAM OF URANIUM SHIPPED UNDER THE CONDITIONS SPECIFIED. BARGING WAS ASSUMED IMPRACTICAL DUE TO THE CONDITIONS ENCOUNTERED ON THE WEST COAST. DUE TO THE LARGE QUANTITY OF FUEL TO BE SHIPPED FROM THE FOREIGN REACTOR, IT WAS CONSIDERED PRACTICAL TO TIME CHARTER A VESSEL TO SHIP THE FUEL TO THE U.S. IF THE FUEL WAS SHIPPED BY WAY OF THE PANAMA CANAL WITH ALMOST NO OVERLAND TRANSPORTATION, TRANSIT TIME WOULD INCREASE 28 PERCENT, BUT THE UNIT COST WOULD BE \$1.25 PER KILOGRAM OF URANIUM.

*ECONOMIC STUDY + *TRANSPORTATION AND HANDLING + FUEL HANDLING + INSURANCE + LIABILITY

3-09287 AMENDMENT NO. 11 TO LICENSE APPLICATION FOR NUCLEAR TEST REACTOR
GENERAL ELECTRIC COMPANY, SAN JOSE
17 PAGES, 1 TABLE, OCTOBER 4, 1965, DOCKET NO. 50-73, PDR

OBJECTIVE OF THIS AMENDMENT - TO SUBMIT TECHNICAL SPECIFICATIONS PROPOSED FOR OPERATION OF NTR AS ESSENTIALLY FINALIZED THROUGH DISCUSSIONS WITH THE AEC STAFF.

CONTROL ROD + CONTROL SYSTEM + FUEL HANDLING + FUEL STORAGE + INSTRUMENTATION, NUCLEAR + LICENSING STATUS OF NUCLEAR PROJECTS + OPERATING LIMITS/TECHNICAL SPECIFICATIONS + REACTOR SAFETY SYSTEM + REACTOR, RESEARCH + SITING, REACTOR + VENTILATION SYSTEM

3-10522 SMITH DR
CRITERIA AND EVALUATION FOR THE STORAGE OF FISSILE MATERIAL IN A LARGE AND VARIED REACTOR RESEARCH AND DEVELOPMENT PROGRAM
LOS ALAMOS SCIENTIFIC LABORATORY
LA-DC-7248 + CONF-651103-13 + SM-70-50 +. 13 PAGES, 1965, IAEA SYMPOSIUM ON CRITICALITY CONTROL OF FISSILE MATERIALS, STOCKHOLM, CFSTI, \$1.00 CY, \$0.50 MN

A SIMPLIFIED METHOD FOR EVALUATING CRITICAL PARAMETERS OF FISSILE MATERIAL WHICH AFFECTS ITS STORAGE CAPABILITY IS DISCUSSED. THE DENSITY-ANALOG APPROACH PROVIDES A CONSERVATIVE ANALYSIS OF SUBCRITICAL, REFLECTED ARRAYS STORED IN VARIOUS CONFIGURATIONS. SEVERAL ILLUSTRATIONS OF THE USE OF THE METHOD ARE GIVEN, ALONG WITH THE SIGNIFICANCE OF VARIOUS PARAMETERS THAT INFLUENCE THE QUANTITY OF MATERIAL WHICH CAN BE STORED IN A PARTICULAR VAULT.

*CRITICALITY SAFETY + *FUEL STORAGE + HAZARDS ANALYSIS + NEUTRON INTERACTION

3-10841 CAPSULE OF RADIUM LOST IN SHIPMENT
NEWSPAPER ARTICLES, THE CHATTANOOGA TIMES, PP. 1-2, THE OAK RIDGER, PP. 1 AND 6, THE KNOXVILLE NEWS-SENTINEL, P. 28, AUGUST 18, 1966

A CAPSULE CONTAINING 300 MG. OF RADIUM WAS LOST WHILE ENROUTE BETWEEN FORT WORTH AND QUEENS COUNTY, NEW YORK. THE MATERIAL WAS SHIPPED FROM GEARHART-OWEN COMPANY AND CONSIGNED TO THE RADIUM CHEMICAL COMPANY.

*RADIOACTIVITY, RELEASE + *RADIUM + *TRANSPORTATION AND HANDLING

3-12215 IRL WISHES TO CARRY OUT SHIPPING CASK SUBCRITICALITY STUDIES FOR POOL TYPE REACTOR ELEMENTS
COLUMBIA UNIVERSITY, NEW YORK
86 PAGES, FIGURES, TABLES, JULY 8, 1966, DOCKET NO. 50-17, PDR

NATIONAL LEAD CO. HAS A 28-ELEMENT SHIPPING CASK FOR SPENT, POOL-TYPE REACTOR ELEMENTS, POISONED WITH 1/4-IN. BORAL PLATES. MULTIPLICATION MEASUREMENTS MADE EARLIER WERE OVERLY CONSERVATIVE BECAUSE OF PU-BE HIGH-ENERGY NEUTRONS. THIS SET OF CRITICALITY MEASUREMENTS IS INTENDED TO IMPROVE CALCULATIONAL TECHNIQUES AND PROVIDE ACCURATE MEASUREMENTS OF SUBCRITICALITY IN VARIOUS ARRAYS OF 18-PLATE, PARTIALLY SPENT IRL ELEMENTS, WITH ELEMENT ROWS SEPARATED BY BORAL. REVIEWS OF PREVIOUS DATA, SIMILAR EXPERIMENTS, AND HEAT-TRANSFER CALCULATIONS.

*CRITICALITY EXPERIMENT + *MEASUREMENT, SUBCRITICALITY + FUEL STORAGE + REACTOR, POOL TYPE + SHIPPING CONTAINER

3-12277 SCHAFFER WF + BOEGLY WJ + PARKER FL + BRADSHAW RL + EMPSON FM + MCCLAIN WC
PROJECT SALT VAULT - DESIGN AND DEMONSTRATION OF EQUIPMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-P-1987 + CONF-660208-4 +. 36 PAGES, (1964), FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, CFSTI \$3.00 CY, \$0.50 MN

HANDLING, TRANSFER, AND STORAGE TECHNIQUES APPLICABLE TO HIGH-LEVEL SOLID WASTE DISPOSAL OPERATIONS HAVE BEEN SUCCESSFULLY DEMONSTRATED WITH SHORT-COOLED ETR FUEL ASSEMBLIES. THE

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-12277 *CONTINUED*

DESIGN OF PROJECT SALT VAULT EQUIPMENT FOR THE ENCAPSULATION OF THE FUEL ASSEMBLIES, CROSS COUNTRY SHIPMENT, TRANSFER FROM THE SURFACE TO THE MINE LEVEL, MOVEMENT WITHIN THE MINE, AND TRANSFER INTO STORAGE IS DESCRIBED. THE OPERATIONS ARE UNIQUE IN THAT HIGH-LEVEL RADIOACTIVE MATERIALS ARE TRANSFERRED FROM A SHIPPING CASK ON THE SURFACE TO THE MINE LEVEL 1000 FEET BELOW WITHOUT THE USE OF HOT CELLS.

*WASTE DISPOSAL, SALT + *WASTE HANDLING + FUEL ELEMENT + WASTE TRANSPORTATION

3-12347 INVESTIGATION OF LEAKING POLYETHYLENE BOTTLES
ATOMIC ENERGY COMMISSION

6 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 244, OCTOBER 12, 1966

THE ROCKY FLATS L-3 SHIPPING CONTAINER DEVELOPED LEAKS IN THE INNER POLYETHYLENE BOTTLE WHEN USED WITH PLUTONIUM OR URANYL NITRATE. ISOCEM HAS SINCE DETERMINED THAT THE NECKS OF THE BOTTLES WERE IMPROPERLY FINISHED AND OFFERED EIGHT RECOMMENDATIONS. SEALING PROCEDURE IS INCLUDED.

*SHIPPING CONTAINER + FAILURE, DESIGN ERROR + FUEL STORAGE + LIQUID FUEL + TEST, LEAK RATE + TRANSPORTATION AND HANDLING

3-12348 CAUTION WARRANTED IN USING POLYETHYLENE CONTAINERS IN CHEMICAL SERVICE
ATOMIC ENERGY COMMISSION

3 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 246, NOVEMBER 14, 1966

FOUR YEARS OF TESTING BY THE MANUFACTURING CHEMISTS ASSOCIATION ON ICC-SPECIFICATION POLYETHYLENE BOTTLES FILLED WITH NITRIC ACID (20-67.5 PERCENT) LED TO THE CONCLUSION RECOMMENDING AGAINST USE OF SUCH CONTAINERS FOR SHIPPING NITRIC ACID IN MULTIPLE-OR SINGLE-TRIP SERVICE. DATA INCLUDED. AEC IS STUDYING THE STORAGE OF VARIOUS CHEMICALS IN SUCH CONTAINERS.

*STORAGE CONTAINER + TEST, LEAK RATE + TRANSPORTATION AND HANDLING

3-12709 LICHETER JS
EVALUATION OF URANIUM SHIELDING IN THE TRANSPORTATION OF RADIOISOTOPES
UNIVERSITY OF CALIFORNIA, BERKELEY, LAWRENCE RADIATION LABORATORY
TID-7599 (P. 450-7) +. 7 PAGES, 1965

URANIUM HAS SEVERAL ADVANTAGES AS A GENERAL SHIELDING MATERIAL FOR RADIOISOTOPE SHIPPING CONTAINERS. IT HAS A DENSITY OF 18.7, WHILE THAT OF LEAD IS ONLY 11.34. URANIUM IS MORE READILY MACHINABLE THAN TUNGSTEN, AND LESS EXPENSIVE FOR LARGE CONTAINERS THAN THE TUNGSTEN-NICKEL-COPPER ALLOYS. EACH INCH OF URANIUM GIVES ABOUT 65 PERCENT MORE SHIELDING THAN 1 INCH OF LEAD FOR 1-MEV GAMMA RAYS. THE URANIUM METAL IS EASILY CONTAINED TO PREVENT CONTAMINATION. IN WEEKLY AIR SHIPMENTS OF NA-24 FROM OAK RIDGE TO LAWRENCE RADIATION LABORATORY, URANIUM SHIELDING MATERIAL SAVED AN ESTIMATED \$5,000 PER YEAR IN SHIPPING COSTS. VARIOUS COMBINATIONS OF NESTING URANIUM CONTAINERS WERE DESIGNED AND FABRICATED FOR SAFE SHIPMENT OF IRRADIATED SLUGS FROM REACTORS. SPECIAL PROBLEMS OF DESIGN TO MEET COMPLEX REQUIREMENTS OF AIR TRANSPORTATION ARE CONSIDERED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$26.00 CY, \$16.94 MF

AIRCRAFT + ECONOMIC STUDY + EQUIPMENT DESIGN + SHIPPING CONTAINER + URANIUM

3-12710 HUGHES CW
METAL SPACE FRAME SHIPPING CONTAINERS
WESTINGHOUSE ELECTRIC CORP., BETTIS ATOMIC POWER DIVISION
TID-7581 (PP. 215-23) +. 9 PAGES, 1965

THE DEVELOPMENT OF INSIDE AND OUTSIDE SHIPPING CONTAINERS ARE REPORTED. ONE CONTAINER WAS BUILT OUT OF WELDED STEEL ANGLE. THE COST AND LENGTH OF TIME FOR CONSTRUCTION OF THIS CONTAINER SHOWED THAT ANOTHER METHOD WAS NEEDED. A CONTAINER BUILT OF PRE-SLOTTED STEEL ANGLE PROVED TO BE INEXPENSIVE, QUICKLY ASSEMBLED, AND LIGHT IN WEIGHT. A SERIES OF DROP AND VIBRATION TESTS WAS PERFORMED ON THE PRE-SLOTTED STEEL ANGLE CONTAINERS. THEY WERE FOUND TO PERFORM SATISFACTORILY. THREE DIFFERENT TYPES OF INNER CONTAINERS ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$15.00 CY, \$7.01 MN

ECONOMIC STUDY + EQUIPMENT DESIGN + FABRICATION + SHIPPING CONTAINER + TEST, DROP + VIBRATION

3-12759 SAXTON PLUTONIUM PROGRAM PROGRESS REPORT FOR THE PERIOD ENDING MARCH 31, 1965
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH
WCAP-3385-3 + EURAEC-1368 +. 54 PAGES, APRIL 1965

REPORTS ACTIVITIES IN A PROGRAM TO DEVELOP INFORMATION CONCERNING THE UTILIZATION OF PU-ENRICHED FUEL IN PRESSURIZED WATER REACTOR SYSTEMS, THROUGH DESIGN, FABRICATION AND OPERATION OF A PARTIAL CORE OF PUO₂--UO₂ FUEL IN THE SAXTON REACTOR. IN ADDITION, A FUEL SHIPPING-CONTAINER DESIGN WAS FOUND TO BE SAFE NUCLEARLY FOR SHIPMENT OF FOUR SAXTON 9 BY 9 ASSEMBLIES. CRITICALS WERE RUN WITH 5.7 PERCENT ENRICHED PELLETIZED UO₂ FUEL RODS.

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-12759 *CONTINUED*
CRITICALS WITH PELLETIZED PUO2--UO2 FUEL RODS ARE SCHEDULED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY

CRITICALITY SAFETY + PLUTONIUM + SHIPPING CONTAINER + URANIUM

3-12769 MECHAM WJ + JONKE AA
COMMERCIAL ASPECTS OF FUEL PROCESSING
15 PAGES, REACTOR FUEL PROCESSING, 9, PP. 1-15 (WINTER 1965-1966)

FUEL PROCESSING PLANS, VALUES IN SPENT FUEL FROM POWER REACTORS, SPENT-FUEL PROCESSING COSTS FOR ADVANCED CONVERTERS, ECONOMIC EVALUATION OF CLOSE-COUPLED FUEL PROCESSING, ECONOMICS OF IRRADIATED FUEL SHIPMENT, AND PATENTS CONCERNING PROCESSING ARE DISCUSSED.

ECONOMIC STUDY + TRANSPORTATION AND HANDLING

3-12773 JONKERS RA
THE CONSTRUCTION OF CONTAINERS FOR RADIOISOTOPES FOR GAMMA IRRADIATION
3 PAGES, ATOMENERGIC, 1(10), PP. 167-70 (OCTOBER 1959)

ABSTRACT OF THIS DUTCH DOCUMENT IS NOT AVAILABLE.

SHIPPING CONTAINER

3-12778 CONTAINERS UNDER FIRE. HARWELL RATIONALIZES RANGE OF CLASS B TRANSPORT CONTAINERS
2 PAGES, NUCLEAR ENGINEERING, 10, PP. 234-5 (JUNE 1965)

FIRE TESTS WERE CARRIED OUT ON CLASS B TRANSPORT CONTAINER. THE FIRE WAS PROVIDED BY 10,000 GALLONS OF JET FUEL AND BURNED FOR ONE HOUR AT 2000 C. A DISCUSSION OF THE REQUIREMENTS OF SHIELDING AND SHIELDING MATERIALS FOR IRRADIATED FUELS IS GIVEN WITH SPECIAL ATTENTION TO THERMAL SHIELDING.

FIRE + HEAT TRANSFER + SHIELDING + TEST, DESTRUCTIVE

3-12854 AINSWORTH ST
TRANSPORT OF IRRADIATED FUEL FROM NUCLEAR POWER STATIONS IN THE UNITED KINGDOM
7 PAGES, JOURNAL OF BRITISH NUCLEAR ENERGY SOCIETY, 4, PP. 299-306 (OCTOBER 1965)

THE PROBLEM OF TRANSPORTING FUEL FROM MAGNOX POWER STATIONS WITHIN THE UNITED KINGDOM IS DISCUSSED. THE CONTROLLING FEATURES OF THE METHODS OF TRANSPORT ARE SUMMARIZED, AND THE EQUIPMENT DEVELOPED TO ACHIEVE THE NECESSARY PERFORMANCE IS DESCRIBED.

EQUIPMENT DESIGN + TRANSPORTATION AND HANDLING + UNITED KINGDOM

3-12880 STONE LR + RADCLIFFE TJ + SOWER GW
RADIOACTIVE SOURCE HOLDER
REPUBLIC STEEL CORPORATION
U. S. PAT. 3,197,639 +. JULY 27, 1965

A RADIOACTIVE SOURCE HOLDER IS DESIGNED TO PROVIDE ADEQUATE SHIELDING AGAINST UNCONTROLLED RADIATION AND YET BE SUFFICIENTLY LIGHT AND CONVENIENT FOR INSTALLATION AT A SUBSTANTIAL HEIGHT AT THE EXTERIOR OF A BLAST FURNACE. THE HOLDER IS A LEAD-LINED CONTAINER EQUIPPED WITH A LEVER-OPERATED SHUTTER. WHEN THE SHUTTER IS OPEN, A NARROW RADIATION BEAM EMERGES FROM THE FRONT OF THE HOLDER AND PASSES THROUGH THE RELATED BEAM PORT. WHEN THE SHUTTER IS CLOSED, THE BEAM IS BLOCKED BY PB, AND THE HOLDER IS A SAFE STORAGE AND SHIPPING CONTAINER. THE HOLDER IS INTENDED AS PART OF A SYSTEM FOR DETECTING THE POSITION OF SLUCK WITHIN A BLAST FURNACE.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C., \$0.25 CY

CONTAINMENT, SOURCE + PATENT

3-12882 MONTGOMERY DW
DEVICE FOR THE STORAGE OF A HEAT EVOLVING MATERIAL
BABCOCK AND WILCOX COMPANY
U. S. PAT. 3,230,373 +. JANUARY 18, 1966

A SPENT FUEL STORAGE AND SHIPPING CASK INCLUDES A CYLINDRICAL STEEL PRESSURE VESSEL EMBEDDED IN A RECTANGULAR CASK OF RADIATION SHIELDING MATERIAL IN CONJUNCTION WITH AN EXTERIOR HEAT EXCHANGER FOR THE REMOVAL OF HEAT PRODUCED BY THE DECAY OF FISSION PRODUCTS IN THE ELEMENTS. A RADIATION SHIELDING LINING IS PROVIDED INSIDE THE PRESSURE VESSEL. THE CASK IS SUFFICIENTLY LARGE TO CONTAIN ENOUGH FUEL ELEMENTS TO LOWER THE SHIPPING COSTS BUT SMALL ENOUGH TO BE SHIPPED ON ANY STANDARD RAILROAD CAR.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C., \$0.25 CY

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-12882 *CONTINUED*
HEAT TRANSFER + PATENT + SHIPPING CONTAINER

3-12883 BONILLA CF + BROWN KP + BROWN SH
SHIPPING CONTAINER FOR SPENT NUCLEAR REACTOR FUEL ELEMENTS
NATIONAL LEAD COMPANY
U. S. PAT. 3,229,096 +. JANUARY 11, 1966

IN A SHIPPING CONTAINER FOR SPENT FUEL ELEMENTS, A NESTING ARRANGEMENT OF THE FUEL ELEMENTS PERMITS THE STORING OF MORE ELEMENTS IN A GIVEN SHIELDED SPACE TO REDUCE SHIPPING COSTS. THE ELEMENTS ARE EITHER GAS OR WATER COOLED WITHIN THE CONTAINER AND ARE SUPPORTED IN PROPER POSITION TO PREVENT CRITICALITY AND YET TO ENSURE PROPER COOLING. SPECIAL PROVISION IS MADE FOR STORING ELEMENTS THAT HAVE FAILED OR RUPTURED IN A CLOSED CONTAINER HAVING ITS OWN VENT AND PARTICULATE FILTER.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C., \$0.25 CY

CONTAINMENT DESIGN + HEAT TRANSFER + PATENT + SHIPPING CONTAINER

3-12892 CONTAINER FOR RADIOACTIVE MATERIAL
ABBOTT LABORATORIES
BRITISH PAT. 1,003,179 +. SEPTEMBER 2, 1965

A DEVICE FOR SHIPPING AND STORING RADIOACTIVE MATERIAL IS MADE UP OF A PRIMARY CONTAINER FOR CONTAINING THE RADIOACTIVE MATERIAL AND A SECONDARY SHIELDING CONTAINER. THE PRIMARY CONTAINER HAS A BODY PORTION AND A BASE PORTION HAVING AN OBLIQUE FLOOR AND AT LEAST TWO SIDE WALLS IN THE BASE PORTION. A SHOULDER PORTION IS DISPOSED ADJACENT TO THE INNER END OF EACH WALL AND IS SPACED AT AN EQUAL DISTANCE FROM THE TOP OF THE PRIMARY CONTAINER. THE PRIMARY CONTAINER HAS A NECK WITH MEANS TO RECEIVE A SCREW-THREADED CAP. THE SECONDARY CONTAINER COMPLETELY ENCLOSES THE PRIMARY CONTAINER AND HAS A SUBSTANTIALLY FLAT FLOOR AND AT LEAST TWO PROJECTIONS HAVING A SUPPORTING SURFACE.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C., 2, ENGLAND, \$0.49 CY

PATENT + SHIPPING CONTAINER + UNITED KINGDOM

3-12894 INOU K
METHOD FOR TRANSFERRING A SPECIMEN HOLDER INTO ITS CONTAINER, AND THE STRUCTURE OF THE CONTAINER
URAGA HEAVY IND., LTD.
JAPANESE PAT. 1964-23459 +. OCTOBER 21, 1964

THE METHOD AND CONTAINER PROPOSED ARE USED FOR TRANSFERRING A SPECIMEN HOLDER WITH AN IRRADIATED SPECIMEN INTO THE CONTAINER FROM THE REACTOR IRRADIATION HOLE. THE CONTAINER, ADEQUATELY SHIELDED, IS SUITABLE FOR TRANSPORTING THE IRRADIATED SPECIMEN TO THE LABORATORY. THE SPECIMEN HOLDER IS PLACED NEAR THE REACTOR CORE IN THE IRRADIATION HOLE, IT IS THEN ATTACHED TO THE END OF A LONG TUBE, WHICH CONNECTS THE HOLDER TO THE HOLE PLUG. WHEN REMOVING THIS HOLDER WITH AN IRRADIATED SPECIMEN AFTER IRRADIATION, THE DISCONNECTION OF THE HOLDER FROM THE TUBE AND THE CLOSING OF THE CONTAINER AFTER CONTAINMENT ARE DONE AT THE SAME TIME. THE CONTAINER FOR THIS PURPOSE CONSISTS OF A GEAR SYSTEM FOR CLOSING (OR OPENING) THE LID, TWO CUTTERS INSTALLED ON THE INNER SIDE OF THE LID, AND A DEVICE FOR WORKING THE TWO CUTTERS SIMULTANEOUSLY. THE ENTIRE TRANSPORT CONTAINER WITH SHIELDING IS DIVIDED INTO TWO PARTS PUT TOGETHER BY MEANS OF FEMALE AND MALE CONES.

AVAILABILITY - PHOTOCOPIES MAY BE OBTAINED FROM THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C., \$0.30 PER PAGE

JAPAN + PATENT + SHIPPING CONTAINER

3-12895 MUROTA K
NUCLEAR FUEL TRANSPORT CONTAINER
NIPPON ATOMIC IND. GROUP CO., LTD.
JAPANESE PAT. 1964-23458 +. OCTOBER 21, 1964

THE FUEL TRANSPORT CONTAINER PROPOSED FACILITATES HEAT REMOVAL FROM THE SPENT FUEL CONTAINED AND IS EASY TO HANDLE. THE ENTIRE TRANSPORT CONTAINER CONSISTS OF AN OUTER MASSIVE WALL, WHICH FORMS A CYLINDRICAL BODY, AND AN INNER SPACE FOR THE FUEL RODS. WHEN CONTAINED, THESE FUEL RODS ARE GROUPED INTO BUNDLES WITH SPACES BETWEEN THE RODS, IN EACH BUNDLE, THE RODS ARE SUPPORTED AT THE TOP AND BOTTOM BY PLATES. NEUTRON-ABSORBING RODS ARE PLACED AT REGULAR INTERVALS IN THE SPACES BETWEEN THE FUEL RODS. WATER IS INTRODUCED FOR COOLING THE FUEL RODS. THEN THE LID OF THE CONTAINER IS PLACED ON. THE HEAT CONVECTION, HENCE, HEAT REMOVAL IN THE TRANSPORT CONTAINER, IS GREATLY IMPROVED BY THE SPACES PRODUCED IN THE STRUCTURE.

AVAILABILITY - PHOTOCOPIES MAY BE OBTAINED FROM THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C., \$0.30 PER PAGE

HEAT TRANSFER + JAPAN + PATENT + SHIPPING CONTAINER

3-12937 GUIDE FOR DESIGN AND OPERATION OF SHIPPING CONTAINERS FOR IRRADIATED SOLID FUEL FROM NUCLEAR REACTORS
AMERICAN STANDARD ASSOCIATION, INC.

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-12937 *CONTINUED*
8 PAGES, DECEMBER 15, 1964

DESCRIBES RECOMMENDED PRACTICE IN THE DESIGN AND OPERATION OF CONTAINERS FOR OFF-PLANT SHIPMENT OF IRRADIATED SOLID FUEL FROM NUCLEAR REACTORS BY CUSTOMARY LAND TRANSPORTATION OR BY TRANSPORTATION INVOLVING BOTH LAND AND WATER VEHICLES IN ORDER TO PROVIDE A HIGH AND CONSISTENT DEGREE OF PROTECTION TO THE PUBLIC.

REGULATION, GENERAL

3-12949 LEAD FOR RADIATION SHIELDING
LEAD DEVELOPMENT ASSOCIATION
33 PAGES, 29 FIGURES, 19 ILLUSTRATIONS, 1 TABLE, PUBLISHED BY LEAD DEVELOPMENT ASSOCIATION, 1965

THIS COMPREHENSIVE PUBLICATION SUCCEEDS THE PREVIOUS FOUR BOOKLETS ISSUED SEPARATELY. GENERAL CONSIDERATIONS AFFECTING THE CHOICE OF MATERIAL ARE FIRST DISCUSSED AND BENEFITS DERIVED FROM THE USE OF LEAD ARE GIVEN. THE VARIOUS FORMS IN WHICH LEAD IS AVAILABLE FOR RADIOACTIVE SHIELDING ARE DESCRIBED TOGETHER WITH MECHANICAL AND PHYSICAL PROPERTIES OF THE METAL AND ITS ALLOYS. THE FABRICATION OF TRANSPORT, WORKING AND STORAGE CONTAINERS IS DISCUSSED IN RELATION TO DESIGN AND SAFETY CONSIDERATIONS WHILST A SECTION ON SPACE SHIELDING DESCRIBES THE USE OF LEAD SHEET AND LAMINATES. METHODS OF LOCAL SHIELDING ARE DESCRIBED SEPARATELY AND UNDER MISCELLANEOUS SHIELDING MATERIALS MENTION IS MADE OF THE THREE BASIC TYPES OF LEAD PLASTIC COMPOSITES.

AVAILABILITY - LEAD DEVELOPMENT ASSOCIATION, 34 BERKELEY SQUARE, LONDON W1, ENGLAND

EQUIPMENT DESIGN + LEAD + PROPERTY, PHYSICAL + SHIELDING

3-12950 NATIONAL FIRE CODES. VOLUME 9. OCCUPANCY STANDARDS AND PROCESS HAZARDS
NATIONAL FIRE PROTECTION ASSOCIATION
1 PAGE, NATIONAL FIRE CODES, 9, P. 683 (1965-66)

SELECTED NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS AND MANUALS ON OCCUPANCIES AND PROCESS HAZARDS RELATED TO MARINE, AVIATION, AND GROUND TRANSPORTATION AND INCLUDING SOME OCCUPANCY AND PROCESS HAZARDS ASSOCIATED WITH THESE THREE FORMS OF TRANSPORTATION ARE PRESENTED. SEPARATE ABSTRACTS WERE PREPARED ON THE SECTIONS ON HANDLING RADIOACTIVE MATERIALS AND FIRE PROTECTION PRACTICES FOR NUCLEAR REACTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

CODES AND STANDARDS + FIRE + TRANSPORTATION AND HANDLING

3-12955 APPLETON GJ + SERVANT JY
PACKAGING STANDARDS
1 PAGE, CHEMICAL ENGINEERING PROGRESS, SYMPOSIUM SERIES, 61(56), P. 50 (1965)

THE AGENCY REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS WERE FIRST PUBLISHED IN 1960. AT THIS TIME THE CONCEPT OF TWO TYPES OF PACKAGING, TYPE A AND TYPE B, WAS INTRODUCED WITH GENERAL DEFINITIONS IN TERMS OF NORMAL CONDITIONS OF TRANSPORT AND THE SO-CALLED MAXIMUM CREDIBLE ACCIDENT, RESPECTIVELY. DURING THE REVISION OF THE REGULATIONS IN 1963, IT WAS AGREED THAT MORE DETAILED PACKAGING DESIGN STANDARDS SHOULD BE PROVIDED TO FACILITATE THE INTERNATIONAL ACCEPTANCE OF PACKAGING. THIS PAPER REVIEWS THE ANALYSIS THAT WAS MADE OF THE NORMAL AND ACCIDENT TRANSPORT ENVIRONMENT TO SELECT A SERIES OF PHYSICAL AND MECHANICAL TESTS, AND DESCRIBES THESE TESTS.

REGULATION, GENERAL + REGULATION, IAEA + REGULATION, ICC + SHIPPING CONTAINER + TEST, PROOF + TRANSPORTATION AND HANDLING

3-12957 TERMAN AV
PROBLEMS IN RADIATION PROTECTION DURING STORING AND TRANSPORTING RADIOACTIVE ISOTOPES
135 PAGES, MOSCOW, PUBLISHING HOUSE MEDITSINA, 1964

A SYSTEMATIC SURVEY IS MADE OF PROTECTIVE MEASURES FOR STORING, AND TRANSPORTING RADIOISOTOPES. DESCRIPTIONS ARE GIVEN OF THE DESIGN AND CONSTRUCTION OF EQUIPMENT FOR HANDLING, STORING, AND TRANSPORTING RADIOACTIVE MATERIALS WITHIN THE BUILDING (PLANTS, HOSPITALS, OR LABORATORIES) AND IN TRANSPORT. EXPOSURE STANDARDS AND RADIATION PROTECTION REGULATIONS ARE DISCUSSED. MEASURES FOR PREVENTING ACCIDENTS DURING TRANSPORTATION ARE REVIEWED. EXTENSIVE REFERENCES ARE INCLUDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

CODES AND STANDARDS + EQUIPMENT DESIGN + RADIATION SAFETY AND CONTROL + TRANSPORTATION AND HANDLING + UNION OF SOVIET SOCIALIST REPUBLICS

3-12959 SAFETY STANDARDS FOR THE PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS
U. S. ATOMIC ENERGY COMMISSION
AUGUST 22, 1966, AEC MANUAL, CHAPTER 0529

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-12959 *CONTINUED*

THIS CHAPTER ESTABLISHES THE RESPONSIBILITIES AND STANDARDS TO BE USED IN GRANTING AEC APPROVAL TO CONTRACTORS FOR PACKAGING OF FISSILE MATERIALS AND LARGE QUANTITIES OF RADIOACTIVE MATERIALS. THE STANDARDS ARE IDENTICAL TO THOSE CONTAINED IN 10 CFR 71, PUBLISHED IN THE FEDERAL REGISTER, JULY 22, 1966.

REGULATION, AEC + TRANSPORTATION AND HANDLING

3-12962 GEORGE TC

REGULATIONS FOR TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES BY LAND AND WATER IN RAIL FREIGHT SERVICE AND BY MOTOR VEHICLE (HIGHWAY) AND WATER, INCLUDING SPECIFICATIONS FOR SHIPPING CONTAINERS. TARIFF NO. 19
INTERSTATE COMMERCE COMMISSION, NEW YORK
SEPTEMBER 5, 1966, ICC TARIFF NO. 19

PRESENTS REGULATIONS GOVERNING THE SHIPMENT OF DANGEROUS ARTICLES (RADIOACTIVE MATERIAL) IN INTERSTATE COMMERCE. MAIN PARAGRAPHS OF CONCERN ARE 73.391 THROUGH 73.396, AND 78.250.

REGULATION, ICC + TRANSPORTATION AND HANDLING

3-12970 TUGGLE KH

STATUTORY RESPONSIBILITIES OF THE ICC WHICH PERTAIN TO THE TRANSPORTATION OF RADIOACTIVE WASTE MATERIALS
INTERSTATE COMMERCE COMMISSION, WASHINGTON, D.C.
9 PAGES, PP. 2646-54 OF HEARINGS ON INDUSTRIAL RADIOACTIVE WASTE DISPOSAL, VOLUME 4

UNDER FEDERAL STATUTES KNOWN AS THE TRANSPORTATION OF EXPLOSIVES ACT AND SECTION 204 OF THE INTERSTATE COMMERCE ACT, THE COMMISSION HAS PRESCRIBED REGULATIONS GOVERNING THE SAFE TRANSPORTATION OF RADIOACTIVE MATERIALS IN INTERSTATE COMMERCE. THE REGULATIONS ARE APPLICABLE TO RAIL AND MOTOR CARRIERS AND TO SHIPPERS USING THOSE SERVICE AND THE SERVICES OF WATER CARRIERS.

REGULATION, ICC + TRANSPORTATION AND HANDLING

3-13632 INTERNATIONAL CONVENTIONS ON CIVIL LIABILITY FOR NUCLEAR DAMAGE, LEGAL SERIES NO. 4
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI-PUB-102 +. 252 PAGES, MAY 1966

THIS FOURTH VOLUME IS DEVOTED TO CIVIL LIABILITY FOR NUCLEAR DAMAGE WHICH MIGHT OCCUR IN THE COURSE OF THE OPERATION OF A NUCLEAR INSTALLATION OR A NUCLEAR SHIP OR DURING TRANSPORT OF NUCLEAR MATERIAL. THE VOLUME CONTAINS THE FOUR MULTI-LATERAL CONVENTIONS ON THIS SUBJECT WHICH SO FAR HAVE BEEN CONCLUDED. THEY WERE ADOPTED AT THE FOLLOWING INTERNATIONAL CONFERENCES - INTERNATIONAL CONFERENCE ON CIVIL LIABILITY FOR NUCLEAR DAMAGE, VIENNA 1963 (VIENNA CONVENTION) - DIPLOMATIC CONFERENCE ON MARITIME LAW, BRUSSELS 1962 (CONVENTION ON THE LIABILITY OF OPERATORS OF NUCLEAR SHIPS) DIPLOMATIC CONFERENCE FOR THE CONCLUSION OF A CONVENTION SUPPLEMENTARY TO THE PARIS CONVENTION ON THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY, BRUSSELS 1963.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA, \$5.00 COPY

*INSURANCE + *LIABILITY + ACCIDENT ANALYSIS + ADMINISTRATIVE CONTROLS AND PRACTICES + IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + LAW + REACTOR, MARITIME + REACTOR, POWER + TRANSPORTATION AND HANDLING

3-13634 TITLE 49. TRANSPORTATION AND RAILROADS. CHAPTER 1. INTERSTATE COMMERCE COMMISSION SUBCHAPTER A-GENERAL RULES AND REGULATIONS. PARTS 71-79 EXPLOSIVES AND OTHER DANGEROUS ARTICLES
INTERSTATE COMMERCE COMMISSION
122 PAGES, JANUARY 21, 1965, DOCKET NO. 3666

REVISED REACTIONS IN THE CODE OF FEDERAL REGULATIONS TITLE 49 PARTS 71-79 ARE GIVEN IN THE NOTICE OF PROPOSED RULE MAKING DOCKET NO. 3666 NOTICE NO. 66. THIS DOCUMENT DEALS WITH THE TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES, OF WHICH RADIOACTIVE MATERIALS IS ONE PART.

AVAILABILITY - INTERSTATE COMMERCE COMMISSION, WASHINGTON, D.C.

*REGULATION, AEC + SHIPPING CONTAINER + TRANSPORTATION AND HANDLING

3-13829 TRANSPORTATION OF RADIOACTIVE MATERIALS FILM AND LECTURE
ATOMIC ENERGY COMMISSION
6 PAGES, HEALTH AND SAFETY BULLETIN NO. 226, FEBRUARY 18, 1966

DESCRIBES THE SERIES OF LECTURE DEMONSTRATION MOTION PICTURES COVERING THE SUBJECTS OF PROBLEMS, ACCIDENTS, PRINCIPLES OF REGULATION, AND SHIPMENT OF FISSILE MATERIAL. THE TEXT ON THE PROBLEM OF TRANSPORTATION OF RADIOACTIVE MATERIALS IS GIVEN WHICH DEFINES AND CLARIFIES THE PROPERTIES AND ASPECTS OF RADIATION AND CONTAMINATION.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + RADIATION SAFETY AND CONTROL + REGULATION, AEC + TRANSPORTATION AND HANDLING

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-14064 SPALLER AE
STRUCTURAL ANALYSIS OF SHIPPING CASKS. VOLUME 2, RESISTANCE TO PUNCTURE
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1312 (VOL. 2) +. 58 PAGES, 40 FIGURES, 6 TABLES, SEPTEMBER 1966

A SMALL-SCALE MODEL OF A PROTOTYPE CASK WAS TESTED TO DETERMINE ITS PUNCTURE RESISTANCE, AND THE RESULTS WERE USED TO DEVELOP A TEST RIG SIMULATING ONE SIDE OF THIS MODEL. THE TEST RIG WAS THEN USED TO DEVELOP SCALE-MODEL PUNCTURE-RESISTANCE DATA FOR TWO MATERIALS- HOT-ROLLED STEEL, ASTM A245 GRADE A, AND TYPE 304L STAINLESS STEEL, ASTM A240. THE PUNCTURE-RESISTANCE DATA FROM THE SCALE-MODEL TESTS WERE EXTENDED TO APPLY TO FULL-SCALE CASKS, AND SEVERAL TESTS WERE CONDUCTED WITH A FULL-SCALE PROTOTYPE CASK. THE RESULTS OF THESE TESTS SUBSTANTIATED THE DATA EXTENDED FROM THE MODEL TESTS. TWO EMPIRICAL EQUATIONS ARE RECOMMENDED AS ALTERNATES TO THE PUNCTURE TESTS RECOMMENDED BY THE ATOMIC ENERGY COMMISSION. THEY ARE T EQUALS $(1.22 \times 10 \text{ TO THE MINUS } 3) W \text{ TO THE } 0.618\text{TH}$ FOR HOT-ROLLED STEEL, ASTM GRADE A OR ASTM A285 GRADE B, AND T EQUALS $(2.07 \times 10 \text{ TO THE MINUS } 5) W - (1.306 \times 10 \text{ TO THE MINUS } 10) W$ SQUARED FOR TYPE 304L STAINLESS STEEL, ASTM A240.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.75 MICROFICHE

ANALYTICAL MODEL + IMPACT SHOCK + STRUCTURAL INTEGRITY + TEST, DESTRUCTIVE + TEST, DROP

3-14407 WACHTELL GP + LANGHAAR JW
FIRE TEST AND THERMAL BEHAVIOR OF 15-TONE LEAD-SHIELDED CASK
SAVANNAH RIVER LABORATORY, Aiken, SOUTH CAROLINA
DP-1070 +. OCTOBER 1966

TO PROVIDE BASIC INFORMATION FOR MORE RELIABLE PREDICTION OF TEMPERATURES IN A SHIPPING CASK UNDER EXTERNAL FIRE CONDITIONS, A 15-TON LEAD-SHIELDED CASK WAS SUBJECTED TO A LARGE, OPEN-AIR PETROLEUM FIRE. RESULTS WERE CORRELATED BY MEANS OF ELECTRIC ANALOG COMPUTATION, USING VARIOUS ASSUMED VALUES FOR IMPORTANT PARAMETERS. THE RADIANT ABSORPTIVITY OF THE CASK WAS FOUND BOTH BY THIS METHOD AND BY HAND CALCULATIONS TO BE ABOUT 0.6, BASED ON AN EFFECTIVE FIRE TEMPERATURE OF 1800 F AND AN EMISSIVITY OF UNITY, UNITY BEING APPROPRIATE IN THIS CASE BECAUSE OF THE METHOD OF MEASURING FIRE TEMPERATURE. CONVECTION OF MOLTEN LEAD IN THE WALLS WAS FOUND TO BE SUCH THAT THE HORIZONTAL TEMPERATURE GRADIENT IN THE MOLTEN LEAD WAS NEGLIGIBLE. ON THE OTHER HAND, THE VERTICAL TEMPERATURE GRADIENT WAS ABOUT 8 F PER INCH OF HEIGHT, WITH SOME INDICATION OF A HIGHER GRADIENT IN UPWARD-FACING WALLS THAN IN SIDEWARD-FACING WALLS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*FIRE + HEAT TRANSFER EXPERIMENT + SHIPPING CONTAINER + THERMAL ANALYSIS

3-14468 MERCER BW + SCHMIDT WC
STORAGE OF LONG-LIVED FISSION PRODUCTS ON ALUMINO-SILICATE ZEOLITES
PACIFIC NORTHWEST LABORATORY + GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION
RL-SA-58 + CONF-660208-3 +. 12 PAGES, DECEMBER 3, 1965, FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON

AS A PART OF THE HANFORD WASTE MANAGEMENT PROGRAM THE LONG-LIVED RADIOISOTOPES CESIUM-137 AND STRONTIUM-90 WILL BE REMOVED FROM BOTH THE CURRENTLY GENERATED AND THE STORED HIGH-ACTIVITY WASTE AND PARTIALLY PURIFIED BY CHEMICAL PROCESSING. THESE SEMI-REFINED ISOTOPES COULD BE PACKAGED AND SAFELY STORED IN HIGH-INTEGRITY STAINLESS STEEL CONTAINERS ADSORBED ON ALUMINOSILICATE ION EXCHANGE ZEOLITES. THIS PAPER DESCRIBES THE TECHNOLOGY DEVELOPED TO PACKAGE LARGE QUANTITIES OF THESE RADIOISOTOPES SAFELY. THIS INCLUDES ADSORPTION OF THE ISOTOPES ON ALUMINOSILICATE ZEOLITES, DRYING THE ZEOLITES TO PREVENT EXCESSIVE PRESSURE AFTER A CONTAINER IS SEALED, SEALING THE CONTAINERS BY WELDING, AND ELUTION OF THE CONTAINERS TO RECOVER THE ISOTOPES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ION EXCHANGE + *WASTE MANAGEMENT + *WASTE STORAGE + CESIUM + HANFORD SITE + STRONTIUM

3-14470 MALLET AJ
PROTECTIVE PACKAGES FOR UF6 CONTAINERS
OAK RIDGE GASEOUS DIFFUSION PLANT
K-D-1926 + CONF-661011-2 +. 4 PAGES, SEPTEMBER 12, 1966, PRESENTED AT THE 1966 AEC - CONTRACTOR NUCLEAR MATERIALS MANAGEMENT MEETING, OCTOBER 3-5, 1966, BERKELEY, CALIFORNIA

THIS REPORT DESCRIBES BRIEFLY THE RESULTS OF THE DESIGN AND TESTING PROGRAM OF PACKAGES CONTAINING 5-, 8-, 12- AND 30-IN.-DIAM CYLINDERS USED FOR TRANSPORTING URANIUM HEXAFLUORIDE. SINCE INDIVIDUAL CONTAINER SHIPMENTS OF UF6 ARE VALUED TO SEVERAL HUNDRED THOUSAND DOLLARS, A PROTECTIVE PACKAGE WHICH CAN WITHSTAND SEVERE ACCIDENT AND FIRE DAMAGE HAS BEEN DESCRIBED BY THE AEC AS DESIRABLE AND NECESSARY. THE ORGDP DEVELOPMENT PROGRAM FOR SUCH PACKAGING FOLLOWED THE NORMAL ROUTINE OF DESIGN, CONSTRUCTION, TEST, REDESIGN, AND RETEST UNTIL A UNIT SUCCESSFULLY PASSED THE SEVERE TESTS OUTLINED IN AEC MANUAL CHAPTER 0529. CONCURRENT WITH THE PHYSICAL TESTING PROGRAM WERE THEORETICAL AND CRITICALITY EXPERIMENTAL STUDIES, WITH PARTICULAR EMPHASIS ON THE USE OF THE 30-IN. CYLINDER FOR BULK SHIPMENT OF UNMODERATED UF6. AS A RESULT, A SPECIAL PERMIT FROM THE ICC AND APPROVAL BY THE AEC HAVE BEEN OBTAINED FOR SHIPMENTS IN THE 30-IN. CYLINDER OF UF6 AT U235 ENRICHMENTS TO 4.5 PERCENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-14470 *CONTINUED*
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*EQUIPMENT DESIGN + *SHIPPING CONTAINER + *URANIUM HEXAFLUORIDE + ACCIDENT, CONSEQUENCES + FIRE +
TEST, DESTRUCTIVE + TEST, DROP

3-14471 STANDARD SHIPPING CONTAINER FOR 30-INCH-DIAMETER UF6 CYLINDERS. PARTS 1-5
OAK RIDGE GASEOUS DIFFUSION PLANT
K-D-1920 +. 34 PAGES, JULY 20, 1966

TWO DESIGNS WHICH APPEAR SUITABLE AS STANDARD PROTECTIVE PACKAGES FOR CLASS-II SHIPMENT OF
30-IN.-DIAM X 81-IN. CYLINDERS CONTAINING MODERATION-CONTROLLED URANIUM HEXAFLUORIDE ENRICHED
TO 4.5 PERCENT U-235 HAVE BEEN DEVELOPED AT THE OAK RIDGE GASEOUS DIFFUSION PLANT. A
PHENOLIC HIGH-TEMPERATURE FOAM PLASTIC WITH FIBERGLASS ADDITIVE IS USED AS A STRUCTURAL AND
FIRE-RESISTANT MATERIAL BETWEEN THE INNER AND OUTER CASINGS OF EACH UNIT. PROTOTYPES OF EACH
DESIGN HAVE SUCCESSFULLY PASSED THE ACCIDENT TEST CONDITIONS SPECIFIED IN AEC MANUAL CHAPTER
0529. THE ATTACHED FINAL DESIGNS INCORPORATE ALL IMPROVEMENTS WHICH, BASED ON PROTOTYPE TEST
DATA AND ENGINEERING EVALUATIONS, WERE CONSIDERED DESIRABLE WITH RESPECT TO IMPROVED
STRUCTURAL INTEGRITY, FIRE PROTECTION, AND SHIPPING CONVENIENCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*EQUIPMENT DESIGN + *SHIPPING CONTAINER + *URANIUM HEXAFLUORIDE + ACCIDENT, CONSEQUENCES + FIRE +
TEST, DESTRUCTIVE + TEST, DROP

3-14869 APPLETON G
SAFE TRANSPORT OF RADIOACTIVE MATERIALS
INTERNATIONAL ATOMIC ENERGY AGENCY
10 PAGES, INTERNATIONAL ATOMIC ENERGY AGENCY BULLETIN 8(4) PAGES 21-30 (DECEMBER 1966)

THIS ARTICLE WAS PREPARED FROM A LECTURE ON THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS
DELIVERED TO THE AGENCY STAFF BY GEORGE APPLETON OF THE IAEA. THE TOPICS COVERED INCLUDE
METHODS OF SAFETY CONTROL, MARKING AND LABELING, LARGE SOURCES AND FISSILE MATERIAL,
FULL-LOAD STOWAGE, DOCUMENTATION, AND THE ROLE OF THE CARRIER.

CONTAINMENT DESIGN + IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + REGULATION, IAEA +
TRANSPORTATION AND HANDLING

3-14870 SCHLAPP FW
STORAGE OF MODERATOR ELEMENTS IN HNPf MODERATOR STORAGE CELLS
ATOMICS INTERNATIONAL
NAA-SR-MEMO-12247 +. 7 PAGES, NOVEMBER 28, 1966

GROUNDWATER WAS ASSUMED TO CONTACT AND START DISSOLVING THE ACTIVATED STAINLESS STEEL PORTIONS
OF THE THREE IRRADIATED MODERATOR ELEMENTS NOW STORED IN THE HNPf MODERATOR-STORAGE CELLS.
THE SOLUBILITY AND DECOMPOSITION RATES OF THE METAL AND THE CONCENTRATION OF RADIOACTIVITY
RELEASABLE TO THE GROUNDWATER WERE ANALYZED. THE RESULTS SHOWED THAT INSIGNIFICANT
CONCENTRATIONS OF RADIOACTIVE MATERIALS CAN BE RELEASED, EVEN IF THE CONCRETE CELL STRUCTURE
AND THE STEEL LINERS ARE NEGLECTED IN CALCULATING THE DISSOLUTION AND DISPERSAL OF THE
MATERIAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*FISSION PRODUCT RELEASE, GENERAL + *RADIOACTIVITY, RELEASE + FUEL INTEGRITY + GROUND WATER, GENERAL +
HALLAM + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

3-14897 PROTECTIVE SHIPPING PACKAGES FOR 8- AND 12-INCH DIAMETER UF6 CYLINDERS
OAK RIDGE GASEOUS DIFFUSION PLANT, OAK RIDGE, TENN.
K-D-1930 +. 18 PAGES, SEPTEMBER 27, 1966

THE STANDARD PROTECTIVE ENCLOSURE DESIGNS FOR THE 8- AND 12-IN.-DIAM CYLINDERS ARE SIMILAR TO
THE DESIGN FOR THE 5-IN.-DIAM-CYLINDER PACKAGE. THE MODIFIED PHENOLIC FOAM PLASTIC DEVELOPED
AT THE OAK RIDGE GASEOUS DIFFUSION PLANT IS AGAIN USED AS A STRUCTURAL AND FIRE-RESISTANT
LINING. PROTOTYPE PACKAGES FOR 8- AND 12-IN. CYLINDERS AT NORMAL FILL WEIGHT HAVE MET THE
REQUIREMENTS OUTLINED IN AEC MANUAL CHAPTER 0529. THE FINAL DESIGNS INCLUDED IN THIS REPORT
INCORPORATE ALL IMPROVEMENTS WHICH, BASED ON PROTOTYPE TEST DATA AND ENGINEERING EVALUATIONS,
WERE CONSIDERED DESIRABLE FOR IMPROVED STRUCTURAL INTEGRITY, FIRE PROTECTION, AND SHIPPING
CONVENIENCE. PACKAGES SO DESIGNED WILL MEET CLASS-II SHIPPING-CONTAINER CRITERIA.

*SHIPPING CONTAINER + *URANIUM HEXAFLUORIDE + FIRE + STRUCTURAL INTEGRITY + TEST, DESTRUCTIVE

CATEGORY 4
AEROSPACE SAFETY

4-10519 DIX GP
FUTURE CONSIDERATIONS IN SPACE NUCLEAR SAFETY
U. S. ATOMIC ENERGY COMMISSION
19 PAGES, 9 FIGURES, TWELTH ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, DENVER, COLORADO, JUNE 21, 1966, ANS TRANSACTIONS, 9(1), PP. 155

PAPER IS CONCERNED WITH FOUR MAJOR CONSIDERATIONS IN THE FUTURE OF AEROSPACE SAFETY - SAFETY COSTS, STANDARDIZATION OF SAFETY APPROACHES, SAFETY INTEGRAL TO SYSTEM DEVELOPMENT, AND ADVANCED SAFETY RESEARCH AND TECHNOLOGY. IT PRESENTS BRIEF SURVEYS OF FUTURE SPACE-NUCLEAR SYSTEMS, FUTURE TRENDS IN SAFETY, SAFETY CRITERIA, AND POTENTIAL FUTURE INVESTIGATIONS.

*AEROSPACE SAFETY + *SAFETY PRINCIPLES AND PHILOSOPHY + CODES AND STANDARDS + DESIGN CRITERIA + ECONOMICS + REACTOR SAFETY SYSTEM + TESTING

4-11514 SOSKE PL
SNAP-10A FSM - 4 SYSTEM TEST
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-11814 +. 80 PAGES, 86 FIGURES, 8 TABLES, 5 REFERENCES, MARCH 25, 1966, CFSTI \$3.00 CY, \$0.75 MN

FSM-4 IS A NONNUCLEAR TEST SYSTEM DESIGNED TO PROVIDE PRE-FLIGHT QUALIFICATION FOR SNAP 10A. THE FSM-4 TEST SYSTEM DUPLICATED IN EVERY DETAIL THE SNAP 10A UNIT EXCEPT FOR THE NUCLEAR HEAT SOURCE, WHICH WAS SIMULATED BY ELECTRICAL HEATING. BEFORE THE FLIGHT SYSTEM COULD BE LAUNCHED, FSM-4 WAS REQUIRED TO DEMONSTRATE SUCCESSFUL PERFORMANCE IN SURVIVING THE STARTUP TEMPERATURE TRANSIENT. THE TESTING HAD FOUR OBJECTIVES - (1) SHOCK AND VIBRATION TESTING OF A NAK-LOADED SYSTEM (2) SIMULATED ORBITAL OPERATION BEFORE STARTUP (3) SIMULATED ORBITAL STARTUP SEQUENCE WITH EMPHASIS ON THE THERMAL TRANSIENT, AND (4) THERMAL-REFERENCE ENDURANCE TESTING. THE TESTS DEMONSTRATED THAT THE FLIGHT SYSTEM WOULD PRODUCE RATED POWER AFTER BEING SUBJECTED TO LAUNCH AND ORBITAL ENVIRONMENT. THE ENDURANCE TESTING INDICATED PROBLEM AREAS WHERE ADDITIONAL INSPECTION AND MODIFICATION ON THE FLIGHT SYSTEM WERE REQUIRED.

*AEROSPACE SAFETY + *SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + *TEST, PLANT RESPONSE + *TEST, PROOF + *TESTING

4-11515 WILLIS CA
RADIOLOGICAL ASPECTS OF REENTRY BURNUP OF SNAP REACTORS
ATOMIC INTERNATIONAL, CANOGA PARK
NAA-SR-11761 +. 36 PAGES, 1 FIGURE, 5 TABLES, 118 REFERENCES, MARCH 25, 1966, CFSTI \$2.00 CY, \$0.50 MN

REENTRY BURNUP OF SNAP REACTORS MAY PRODUCE LOW LEVELS OF WORLDWIDE FALLOUT. THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION HAS RECOMMENDED A POPULATION DOSE LIMIT OF 2 REMS IN 30 YR. THE FACTORS AFFECTING THE CHOICE OF A POPULATION-DOSE CRITERION ARE REVIEWED IN THIS REPORT. THESE FACTORS INCLUDE RADIOLOGICAL-SAFETY HISTORY AND TRADITION, RADIOBIOLOGICAL KNOWLEDGE, OTHER RADIATION CRITERIA, AND THE BIOLOGICAL SIGNIFICANCE OF CRITERIA DOSES. NO SAFETY JUSTIFICATION IS FOUND FOR REDUCTION OF THE ICRP LIMIT. THIS 2-REM-IN-30-YR DOSE IS WELL WITHIN THE RANGE OF VARIATION OF NATURAL BACKGROUND RADIATION. POPULATION SAFETY REQUIREMENTS ARE SATISFIED IF THE DOSE IS LESS THAN THE ICRP SPECIFICATION. MANY POSSIBLE SOURCES OF ARTIFICIAL, NONMEDICAL RADIATION COULD CONTRIBUTE TO THE POPULATION DOSE. FOR PLANNING PURPOSES, IT IS RECOMMENDED THAT ONE-EIGHTH THE POPULATION DOSE, 0.25 REM/30 YR, BE TAKEN AS THE ALLOWABLE DOSE FROM SNAP REACTOR APPLICATIONS.

*AEROSPACE SAFETY + *DOSE + *SNAP, GENERAL (SYSTEMS FOR NUCLEAR AUX. POWER) + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + FALLOUT + POPULATION EXPOSURE

4-12293 BILLINGHAM J + RUBBINS DE + EWING D
A METHOD OF EVALUATING RADIATION RISKS FOR MANNED SPACE FLIGHTS
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, AMES RESEARCH CENTER, MOFFETT FIELD, CALIFORNIA, MANNED SPACECRAFT CENTER, HOUSTON, TEXAS
CONF-660-212-6 + GMELIN-AED-CONF-66-016-6 +. 21 PAGES, 8 FIGURES, 1 TABLE, 15 REFERENCES, 1966, PRESENTED AT RADIATION RESEARCH SOCIETY FOURTEENTH ANNUAL MEETING, CORONADO, CALIFORNIA, FEBRUARY 13-16, 1966, SOURCE

PROBLEMS CONCERNING AN EVALUATION OF THE HAZARD FROM DOSES OF IONIZING RADIATION DURING MANNED SPACE FLIGHTS ARE DISCUSSED. A METHOD IS GIVEN FOR STATISTICALLY COMBINING SOLAR FLARE DATA WITH ASSESSMENTS OF THE LIKELIHOOD FOR BIOLOGICAL RESPONSES. THIS APPROACH IS AIMED AT SYNTHESIZING RADIOPHYSICAL AND RADIOBIOLOGICAL DATA SO THAT THE INTERFACES BETWEEN RADIATION, CREW SAFETY, AND MISSION SUCCESS CAN BE BETTER RELATED TO OTHER HAZARDS DURING MISSION PLANNING.

*AEROSPACE SAFETY + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + SAFETY STUDY

4-12294 STUDY OF THE CHEMICAL INTEGRITY OF RADIOISOTOPE CONTAINMENT MATERIALS IN LAUNCH ABORT ENVIRONMENTS. SUMMARY TECHNICAL REPORT, PHASE I
TRW SYSTEMS, REDONDO BEACH, CALIFORNIA
SC-DC-65-1918 +. 68 PAGES, 40 TABLES, 10 FIGURES, 69 REFERENCES, DECEMBER 1965, CFSTI \$3.00 CY, \$0.75 MN

THIS REPORT COVERS DETAILED SEARCH AND ANALYSIS OF THE AVAILABLE DATA FROM THE LITERATURE TO ESTABLISH QUANTITATIVELY WHAT IS KNOWN ABOUT THE HIGH TEMPERATURE CHEMICAL INTERACTION OF RADIOISOTOPE CONTAINMENT MATERIALS WITH LAUNCH PAD ABORT COMBUSTION GAS SPECIES. THE MATERIALS WHICH WERE CONSIDERED INCLUDED COBALT BASED ALLOYS, NICKEL BASED ALLOYS, STAINLESS STEELS, COATED AND UNCOATED REFRACTORY METALS, AND NOBLE METAL CLADDINGS. THE HIGH TEMPERATURE INTERACTION OF THESE MATERIALS WITH THE COMBUSTION GAS SPECIES N-2, N-2, CO, CO-2, NO, H2O, F-2, AND HF FORMS THE BASIS OF THIS REPORT.

CATEGORY 4
AEROSPACE SAFETY

4-12294 *CONTINUED*
*AEROSPACE SAFETY + *CHEMICAL REACTION + ACCIDENT ANALYSIS + ALLOY + COBALT + NICKEL + OXIDATION + STEEL, STAINLESS

4-13472 INOUYE FT
PROPERTIES OF LARGE 7079 ALUMINUM ALLOY FORGINGS IN A CRYOGENIC ENVIRONMENT
AEROJET-GENERAL CORP.
NASA-CR-513 +. 87 PAGES, 38 FIGURES, 16 TABLES, JULY 1966

LARGE 7079-T652 HAND-FORGINGS WERE EVALUATED FOR PUMP IMPELLER AND INDUCER APPLICATIONS IN LIQUID-OXYGEN/LIQUID-HYDROGEN ROCKET ENGINES. THE RESULTS OF MECHANICAL PROPERTY TESTS, REHEAT-TREATMENT EXPERIMENTS, AND MICROSTRUCTURAL STUDIES ARE PRESENTED. THE APPLICATION OF 7079 ALLOY IN A CRYOGENIC ENVIRONMENT IS DISCUSSED BASED UPON THE TEST RESULTS, AND RECOMMENDATIONS ARE MADE FOR METALLURGICAL ANALYSIS OF THE MORE PROMISING ALLOYS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY

*ALLOY + *ALUMINUM + *CRYOGENICS + FAILURE, EQUIPMENT + FAILURE, FATIGUE + HYDROGEN + OXYGEN

4-13549 FEELY HW + KATZMAN D + BISCAYE PE + PANACCIONE JB + FRENCH ER
FLIGHT DATA AND RESULTS OF RADIOCHEMICAL ANALYSES OF FILTER SAMPLES COLLECTED DURING 1965. THE THIRTEENTH PROGRESS REPORT ON PROJECT STARDUST
ISOTOPES, INC., WESTWOOD, NEW JERSEY
HASL-176 +. 88 PAGES, MAY 1, 1966

THIS IS THE FOURTH OF A SERIES OF REPORTS OF FLIGHT DATA AND OF RESULTS OF RADIOCHEMICAL ANALYSES OF STRATOSPHERIC AND TROPOSPHERIC AIR FILTER SAMPLES COLLECTED DURING PROJECT STARDUST. THE FIRST THREE REPORTS IN THIS SERIES CONTAINED DATA FOR SAMPLES COLLECTED DURING THE FIRST THREE AND ONE HALF YEARS OF THE PROJECT, JUNE 1961 TO DECEMBER 1964. THEY WERE PUBLISHED AS REPORTS HASL-153, HASL-168 AND HASL-169 BY THE HEALTH AND SAFETY LABORATORY OF THE USAEC. THE PRESENT REPORT CONTAINS FLIGHT DATA AND RESULTS OF RADIOCHEMICAL ANALYSIS OF AIR FILTER SAMPLES COLLECTED DURING JAN. TO DEC. 1965.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., 22151, \$3.00 CY, \$0.75 MN

*AIRBORNE RELEASE + *FALLOUT + *SAMPLING, HIGH ALTITUDE + *STRATOSPHERE + *TROPOSPHERE + ATMOSPHERIC CHEMISTRY + ATMOSPHERIC POLLUTION

4-13570 EFFECT OF NUCLEAR RADIATION ON MATERIALS AT CRYOGENIC TEMPERATURES. QUARTERLY REPORT NO. 3, JANUARY 21, 1966-APRIL 21, 1966
LOCKHEED NUCLEAR PRODUCTS, MARIETTA
NASA-CR-54976 + LAC-ER-8538 +. 94 PAGES, 24 FIGURES, 16 TABLES, MAY 1966

THE STUDIES INCLUDE THE EFFECTS OF (1) 10(18TH) NVT (E GREATER THAN 0.5 MEV) AT 30 TO 540 DEG. R ON TENSILE PROPERTIES OF ALUMINUM 1099-H14 FOLLOWING IRRADIATIONS UP TO 3 X 10(17TH) NVT, (2) ANNEALING FOLLOWING IRRADIATION AT 30 DEG. R TO 10(17TH) NVT ON TENSILE PROPERTIES OF ALUMINUM 1099, (3) IRRADIATION AT 30 DEG. R ON AXIAL, LOW-CYCLE FATIGUE PROPERTIES OF TITANIUM BASE ALLOYS, AND (4) TEMPERATURE (140 AND 540 DEG. R) ON TENSILE PROPERTIES OF TITANIUM 55A AND ALUMINUM 7178.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.75 MN

*ALLOY, + *CRYOGENICS + *FAILURE, FATIGUE + *IRRADIATION TESTING + *TENSILE PROPERTY + ALUMINUM + IN PILE LOOP + TITANIUM

4-13572 CADLE RD
PARTICLES IN THE ATMOSPHERE AND SPACE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
213 PAGES, FIGURES, TABLES, 59 REFERENCES, REINHOLD PUBLISHING CORP, NEW YORK, 1966

THIS BOOK, LIKE THE PRECEDING ONE I HAVE WRITTEN, ENTITLED, PARTICLE SIZE - THEORY AND INDUSTRIAL APPLICATIONS, IS INTENDED TO BE INTERMEDIATE IN SCOPE BETWEEN AN INTRODUCTION TO THE SUBJECT AND AN EXHAUSTIVE TREATISE. IT HAS BEEN WRITTEN ESPECIALLY FOR SCIENTISTS AND ENGINEERS WHO ARE NOT SPECIALISTS IN FINE-PARTICLE BEHAVIOR AND WISH TO LEARN MORE ABOUT THE NATURE OF PARTICLES IN OUR UNIVERSE AS A WHOLE. THIS BOOK IS INTENDED TO GATHER IN ONE VOLUME INFORMATION CONCERNING THE FINE PARTICLES IN OUR UNIVERSE, INFORMATION THAT FOR THE MOST PART HAS BEEN SCATTERED THROUGH A VOLUMINOUS LITERATURE COVERING SUCH SUBJECTS AS ATMOSPHERE, AIR POLLUTION, CLOUD PHYSICS, METEOROLOGY, RADIOACTIVE FALLOUT, AND SPACE SCIENCE.

*ATMOSPHERIC CHEMISTRY + *ATMOSPHERIC POLLUTION + *PARTICLE SIZE DISTRIBUTION + IONOSPHERE + MESOSPHERE + PARTICULATE + STRATOSPHERE + TROPOSPHERE

4-14363 BERG GE
FINAL SNAPSHOT PERFORMANCE REPORT
ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA
NAA-SR-11934 +. 289 PAGES, 81 FIGURES, 41 TABLES, 48 REFERENCES, AUGUST 15, 1966

CATEGORY 4
AEROSPACE SAFETY

4-14363 *CONTINUED*

PRESENTS A DETAILED EVALUATION OF THE OVERALL SYSTEM AND PERFORMANCE OF INDIVIDUAL COMPONENTS DURING ALL PHASES OF THE WORLD'S FIRST NUCLEAR-REACTOR SPACE-POWER-SYSTEM FLIGHT TEST. SPECIAL EMPHASIS IS PLACED ON THE EFFECT OF LAUNCH AND SPACE ENVIRONMENTS ON THE PERFORMANCE OF THE NUCLEAR THERMOELECTRIC SYSTEM. THE SYSTEM OPERATED ALMOST EXACTLY AS INTENDED. THE ONLY SIGNIFICANT DEVIATION OF SNAP 10A WAS THE MORE RAPID DECREASE IN CONVERTER RESISTANCE-TO-GROUND THAN EXPECTED, ATTRIBUTED TO POOR EXPERIMENTAL DATA FROM TESTS ON THE PROTOTYPE. THE AUTOMATIC STARTUP OF THE REACTOR WAS FLAWLESS.

AVAILABILITY - CLEARING HOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*DIRECT ENERGY CONVERSION DEVICES + *OPERATIONS REPORT, ANALYSIS +
*SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + OPERATING EXPERIENCE + SPACECRAFT

4-14457 DALBY WD
PODDLE THRUSTER AERODYNAMIC DROP TEST
SANDIA LABORATORY
SC-RR-65-609 +. 152 PAGES, APRIL 1966

TEN PODDLE THRUSTERS WERE DROPPED AT SANDIA CORPORATION TONOPAH TEST RANGE TO OBTAIN AERODYNAMIC DATA AND INFORMATION CONCERNING IMPACT AND CRATERING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*AEROSPACE SAFETY + *TEST, DROP + *TESTING + SAFETY ANALYSIS

4-14458 MARSHALL BW
AN EXPERIMENTAL STUDY OF THE EFFECT OF OXYGEN ON TANTALUM ABLATION IN A HYPERTHERMAL PLASMA TUNNEL
SANDIA LABORATORY
SC-RR-65-615 +. 56 PAGES, APRIL 1966

THIS REPORT DISCUSSES THE DATA OBTAINED FROM EXPOSING TANTALUM MODELS IN THE SIMULATED REENTRY ENVIRONMENT OF A HYPERTHERMAL ARC TUNNEL. THE RATE OF MASS REMOVAL WAS A FUNCTION OF THE OXYGEN PARTIAL PRESSURE IN THE 1800-2700 C RANGE. THE OXYGEN-TANTALUM RATIO WAS CLOSE TO THE COMPOSITION TAO, AND CALCULATED MASS-REMOVAL RATES BASED ON THIS COMPOSITION ARE COMPARED WITH THE MEASURED VALUES. ENGINEERING METHODS FOR CALCULATING TANTALUM REENTRY ABLATION ARE DEVELOPED AND PRESENTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*AEROSPACE SAFETY + *OXIDATION + *TANTALUM + REENTRY, ATMOSPHERIC

4-14459 SPAHR HR
A COMPARISON OF THE RESULTS OF THE SANDIA CORPORATION TTA TRAJECTORY PROGRAM AND THE ATOMICS INTERNATIONAL RESTORE TRAJECTORY PROGRAM
SANDIA CORPORATION
SC-RR-66-22 +. 60 PAGES, FEBRUARY 1966

THIS REPORT BRIEFLY DESCRIBES THE SANDIA CORPORATION TTA AND THE ATOMIC INTERNATIONAL RESTORE TRAJECTORY PROGRAMS. THE INITIAL CONDITIONS AND OBJECT CHARACTERISTICS USED IN THE TRAJECTORIES ARE DEFINED. THESE INITIAL CONDITIONS CORRESPOND TO A VERY SENSITIVE TRAJECTORY REPRESENTATIVE OF ORBITAL DECAY. THE STEPS TAKEN IN THE USE OF THE TTA TRAJECTORY PROGRAM TO OBTAIN THE SOLUTION TO THE EQUATIONS OF MOTION ARE ALSO PRESENTED. A COMPARISON OF THE RESULTS OF THE TWO TRAJECTORY PROGRAMS SHOWS VERY GOOD AGREEMENT. THE RELATIVELY SMALL DIFFERENCES BETWEEN THE TWO TRAJECTORIES ARE SHOWN TO BE AT LEAST AN ORDER OF MAGNITUDE LESS THAN THE VARIATIONS IN AN ACTUAL TRAJECTORY WHICH WOULD RESULT FROM THE ACCURACY WITH WHICH THE INPUT DATA WOULD BE KNOWN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*AEROSPACE SAFETY + REENTRY, ATMOSPHERIC + SAFETY ANALYSIS

4-14460 HAGE KD + BROWN PS + ARNASON G + BOWNE NE
PARTICLE FALLOUT AND DISPERSION IN THE ATMOSPHERE QUARTERLY REPORT NO. 3
THE TRAVELERS RESEARCH CENTER, INC.
SC-CR-66-2030 +. 70 PAGES, 8 TABLES, 18 FIGURES, APRIL 1966

THIS REPORT DESCRIBES THE PROGRESS ON THE DEVELOPMENT OF AN ATMOSPHERIC FALLOUT MODEL TO BE USED TO ESTIMATE PARTICULATE CONCENTRATIONS IN THE AIR AND ON THE EARTH'S SURFACE FOR PARTICLES RELEASED TO ALTITUDES AS HIGH AS 90 KM. THE PARTICLE-SIZE RANGE OF INTEREST IN THIS STUDY IS FROM 1 TO 100 MICRONS IN DIAMETER. THE MODEL IS BEING PROGRAMMED TO BE RUN ON THE CDC 3600 COMPUTER. DRAFT SPECIFICATIONS AND FLOW DIAGRAMS FOR THE COMPUTER PROGRAM ARE ALSO PRESENTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ATMOSPHERIC DIFFUSION + *FALLOUT + PARTICLE SIZE + PARTICULATE

CATEGORY 4
AEROSPACE SAFETY

4-14461 LEONARD JA + JOSEPH WW
CONTROLLED DEORBIT
SANDIA CORPORATION
SC-RR-65-472 +. 47 PAGES, MARCH 1966

THIS REPORT DISCUSSES CONTROLLED DE-ORBIT AS A MEANS OF DISPOSING OF ORBITING SNAP SATELLITES TO REDUCE RADIOLOGICAL HAZARDS. TWO TYPES OF CONTROLLED DE-ORBIT SYSTEMS ARE CONSIDERED - THE COMMAND-INITIATED RETRO-ROCKET SYSTEM AND THE COMMAND-DEPLOYABLE HIGH-DRAW DEVICE. AN EXAMPLE SITUATION OF DE-ORBIT FROM AN ECCENTRIC TRANSFER ORBIT, SIMILAR TO THAT FLOWN BY SNAP-10A, IS EXAMINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*AEROSPACE SAFETY + *REENTRY, ATMOSPHERIC + *SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) +
WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, GENERAL

CATEGORY 5
ACCIDENT ANALYSIS

5-00382 FARMER FR
SAFETY RESEARCH IN SUPPORT OF A POWER-REACTOR PROGRAM
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, AUTHORITY HEALTH AND SAFETY BRANCH
6 PAGES, AMERICAN NUCLEAR SOCIETY MEETING, JUNE, 1963, NUCLEAR NEWS-6(8) PAGES 7-12 (AUGUST 1963)

CHARACTERISTIC REACTOR SURFACES CAN ACCEPT DEPOSITED IODINE IN EXCESS OF THAT REQUIRED FOR THE ENTIRE IODINE INVENTORY OF TYPICAL POWER REACTORS. SUBSEQUENT RELEASE SHOWED AN ADDITIVE DEPOSITION, WITH NO EVIDENCE OF SURFACE SATURATION IN THE SECOND RELEASE, ALTHOUGH THERE WAS SOME RETARDATION OF THE DEPOSITION PROCESS. THE DEPOSITION HALF-LIFE OF IODINE IN TYPICAL CONTAINMENT SYSTEMS IS 40-700 MIN, DEPENDING PRIMARILY UPON THE VOLUME/SURFACE RATIO.

*ACCIDENT ANALYSIS + *BRITTLE FRACTURE + *DEPOSITION + ACCIDENT, LOSS OF PRESSURE + CONTAINMENT, GENERAL + REACTOR, GAS COOLED + UNITED KINGDOM

5-06838 EICHLER JB + GALLAHER EV + LIEBERMAN P + SINGER T
STUDIES OF REACTOR CONTAINMENT. PROGRESS REPORT, OCTOBER 1, 1964 - JULY 31, 1965
IIT RESEARCH INSTITUTE, CHICAGO
IITRI-T6042-13 + IITRI-518P21-13 +. 75 PAGES, FIGURES, 2 REFERENCES, JULY 1965, CFSTI \$3.00 CY, \$0.75 MN

PROGRESS ON THREE TASKS IS REPORTED. TASK NO. 1 - CRUSHABLE SHIELD ANALYSIS AND DESIGN. WORK COVERED (A) COMPLETION OF THE SWIMM CODE, (B) THE WRITING OF THE FINAL REPORT ON THE SWIMM CODE, AND (C) THE FORMULATION OF TENTATIVE SHIELD DESIGN TRENDS THROUGH RUNNING A SERIES OF COMPUTER RUNS. TASK NO. 2 - SHOCK IMPINGEMENT EXPERIMENTS. AT THIS TIME, GENERALIZED SOLUTIONS FOR LAYERED ELASTIC SHIELDS AND SPECIFIC SOLUTIONS FOR LAYERED ELASTIC-PLASTIC SHIELDS HAVE BEEN OBTAINED. TASK NO. 3 - COOLANT DECOMPRESSION EXPERIMENTS AND ANALYSIS. WORK PERFORMED ON THIS TASK DEALS WITH (A) ONE-DIMENSIONAL WATER SHOCK TUBE EXPERIMENTS AND ANALYSIS WITH VARIOUS AMOUNTS OF VAPOR PRESENT INITIALLY IN THE DRIVER SECTION, IN CONJUNCTION WITH VARIOUS ORIFICE SIZES, AND (B) THREE-DIMENSIONAL (DRIVEN SECTION) WATER SHOCK TUBE EXPERIMENTS, BOTH WITH AND WITHOUT VAPOR PRESENT INITIALLY IN THE DRIVER SECTION, WITH VARIOUS ORIFICE SIZES.

ACCIDENT, LOSS OF COOLANT + COMPUTER PROGRAM + CONTAINMENT ANALYSIS + CONTAINMENT DESIGN + CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT VESSEL LOADING + CONTAINMENT, SHOCK GENERATION AND PROTECTION + FAILURE, PIPE + MATERIAL + MISSILE GENERATION AND PROTECTION + STEEL

5-08812 BROOMFIELD GH
HYDROGEN EFFECTS IN AN IRRADIATED 1 PERCENT CR, ONE-HALF PERCENT MO PWR PRESSURE VESSEL STEEL
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4705 +. 13 PAGES, 12 FIGURES, 6 TABLES, 15 REFERENCES, SEPTEMBER 1964. UKAEA

AN INVESTIGATION HAS BEEN MADE OF THE EFFECT OF A HYDROGEN CONCENTRATION OF APPROXIMATELY 1.4 CC (NTP) PER 100 G STEEL ON (I) THE ROOM AND ELEVATED TEMPERATURE TENSILE PROPERTIES, (II) NOTCH STRENGTHENING AND BRITTLE FRACTURE CHARACTERISTICS, AND (III) DELAYED FRACTURE TENDENCIES, OF A 1 PERCENT CR, 1/2 PERCENT MO STEEL IN THE UNIRRADIATED AND IRRADIATED (1.0 TO 1.4 TIMES 10¹⁵ TH) FISSION NEUTRONS PER SQUARE CM. THE HYDROGEN EMBRITTLES THE STEEL AT ROOM TEMPERATURE AND TO A DIMINISHING DEGREE WITH INCREASING TEMPERATURE, BUT THE EMBRITTLING EFFECT IS NOT COMPLETELY ELIMINATED EVEN AT 250 C. THE DEGREE OF EMBRITTLMENT OF IRRADIATED STEEL DOES NOT DIFFER SIGNIFICANTLY FROM THAT OF UNIRRADIATED STEEL. IT IS CONCLUDED THAT AT ALL THE TEST TEMPERATURES THE EMBRITTLMENT IS DUE TO A PHYSICAL EFFECT OF THE HYDROGEN IN THE STEEL - HOWEVER, THE MECHANISMS OF THE EMBRITTLMENT AT ROOM TEMPERATURE AND 250 C DIFFER IN THAT THE ROOM TEMPERATURE EMBRITTLMENT IS ASSOCIATED WITH VOID FORMATION IN THE FERRITE WHILST THE 250 C EMBRITTLMENT IS APPARENTLY DUE TO CRACK FORMATION IN THE PEARLITE. LIMITED RESULTS SUGGEST THAT THE DUCTILE BRITTLE TRANSITION TEMPERATURES OF THE UNIRRADIATED AND IRRADIATED STEEL ARE RAISED BY HYDROGEN. HOWEVER, HYDROGEN HAS NO SIGNIFICANT EFFECT ON THE NOTCH STRENGTH, AND THE IRRADIATED STEEL IS NOT PRONE TO HYDROGEN INDUCED DELAYED FRACTURE.

*BRITTLE FRACTURE + *HYDROGEN + *STEEL + TEST, PROOF + TESTING

5-09520 GRASS G + KOTTOWSKI H + MILLIOT B
STUDY OF LIQUID METAL BOILING UNDER FORCED CONVECTION
EUROPEAN ATOMIC ENERGY COMMUNITY, ISPRA, ITALY
ANL-TRANS-257 +. 32 PAGES, OCTOBER, 1965, TO BE PUBLISHED IN NUKLEONIK, JCL, \$3.60 FS, \$1.16 MF

THIS WORK REPRESENTS AN INITIAL INVESTIGATION ON SAFETY PROBLEMS IN FAST REACTORS. A FORCED-CONVECTION BOILING-POTASSIUM LOOP WAS USED. A NEW MEASURING METHOD, TAKING ADVANTAGE OF DIRECT JOULE HEATING AND SIMULTANEOUS ANALYSIS OF THE VOLTAGE CHANGES WAS USED TO STUDY FLOW PATTERNS. FOR THE CONDITIONS OF THE TESTS, STEADY-STATE BOILING OCCURRED ONLY RARELY. BOILING WAS ABRUPT, LEADING TO THE SUDDEN PERIODICAL EMPTYING OF THE TEST SECTION, PRODUCING PRESSURE SHOCKS FOLLOWING VAPOR CONDENSATION. A BYPASS WAS INTRODUCED TO SIMULATE PARALLEL-CHANNEL FLOW AND LED TO MARKED DIFFERENCES IN THE BOILING BEHAVIOR. THE BOILING AND CONDENSATION PHENOMENA WERE INTERPRETED WITH THE USE OF THE NEW MEASURING TECHNIQUE. FURTHER STUDIES ARE REQUIRED TO ESTABLISH MECHANISMS AND CORRELATION.

*HEAT TRANSFER, BOILING + *METAL, LIQUID + *OUT OF PILE LOOPS AND EXPERIMENTS + POTASSIUM + REACTOR, FAST + REACTOR, LIQUID METAL COOLED

5-10429 BIJWAARD G + STAUB FW + ZUBER N
A PROGRAM OF TWO-PHASE FLOW INVESTIGATION. TENTH QUARTERLY REPORT, JULY-SEPTEMBER 1965
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-4950 + EURAEC-1526 +. 54 PAGES, OCTOBER 1, 1965, CFSTI, \$3.00 CY, \$0.50 MN

CATEGORY 5
ACCIDENT ANALYSIS

5-10429 *CONTINUED*

FURTHER PROGRESS REPORTS IN THIS SERIES WILL BE REFERRED TO THIS ABSTRACT. THE DESIGN, COST, EFFICIENCY AND RELIABILITY OF HIGH-POWER SYSTEMS WHICH ARE CHARACTERIZED BY THE PRESENCE OF TWO PHASES, DEPEND TO A LARGE EXTENT UPON THE UNDERSTANDING OF THE TWO-PHASE FLOW AND BOILING PROCESSES. EXPERIMENTS AND PRACTICE HAVE SHOWN THAT IN TWO-PHASE FLOW SYSTEMS STEADY-STATE OSCILLATIONS OF FLOW, OF VAPOR CONTENT, OF HEAT TRANSFER COEFFICIENT AND OF LOCAL PRESSURE CAN OCCUR EVEN WHEN THE INDEPENDENT PARAMETERS ARE KEPT CONSTANT. UNDER SOME CONDITIONS, NOT YET UNDERSTOOD, THE AMPLITUDES OF THESE OSCILLATIONS MAY INCREASE WITH TIME AND LEAD TO UNSTABLE OPERATION. THE OVERALL PURPOSE OF THE PROPOSED EXPERIMENTAL AND ANALYTICAL RESEARCH PROGRAM IS TWOFOLD. FIRST, TO GAIN AN UNDERSTANDING OF THE VARIOUS PHENOMENA WHICH LEAD TO THERMAL-HYDRAULIC OSCILLATIONS IN FORCED CONVECTION TWO-PHASE FLOW SYSTEMS WITH HEAT ADDITION. SECOND, TO OBTAIN EQUATIONS AND SPECIFICATIONS THAT CAN BE USED FOR PREDICTING THE INCEPTIONS OF THESE OSCILLATIONS AND INSTABILITIES AS FUNCTION OF INPUT PARAMETERS AND SYSTEM CHARACTERISTICS.

*FLOW STABILITY + *FLOW, TWO PHASE + *HEAT TRANSFER ANALYSIS + *HEAT TRANSFER EXPERIMENT +
*HEAT TRANSFER, BOILING + *HYDRODYNAMIC ANALYSIS + FUEL ELEMENT + HEAT TRANSFER

5-10451 TURNER JM + WALLIS GB

TWO-PHASE FLOW AND BOILING HEAT TRANSFER INTERIM REPORT, MAY 1965, THE SEPARATE-CYLINDERS MODEL OF TWO-PHASE FLOW
DARTMOUTH COLLEGE
NYO-3114-6 + EURAEC-1415 +. 69 PAGES, MAY 1965, CFSTI, \$3.00 CY, \$0.75 MN

REPORT IS CONCERNED WITH TWO-PHASE FLOW IN PIPES. GENERAL EQUATIONS ARE DEVELOPED APPLICABLE TO LAMINAR OR TURBULENT, VERTICAL OR HORIZONTAL FLOW. THE GENERAL EQUATIONS DESCRIBE TWO-PHASE PIPE FLOW IN TERMS OF SEVEN DIMENSIONLESS PARAMETERS. SEVERAL OF THE SAME GROUPS WERE USED INTUITIVELY BY WALLIS AND OTHER WORKERS. THE PRESENT WORK PROVIDES A RATIONALE FOR THEIR USE. THE SEPARATE-CYLINDERS MODEL OF TWO-PHASE FLOW IS DESCRIBED. THIS SIMPLE LUMPED-FLOW MODEL PROVIDES A THEORETICAL BASIS FOR THE MARTINELLI CORRELATION OF HORIZONTAL TWO-PHASE FLOW WHEN USED IN CONJUNCTION WITH THE GENERAL EQUATIONS.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TUBE + *FLOW, TWO PHASE + HYDRODYNAMIC ANALYSIS +
TURBULENCE, CONVECTIVE

5-10452 MARGOLIS SG + REDFIELD JA

HEAT TRANSFER ASPECTS OF THE LOSS OF COOLANT ACCIDENT
BETTIS ATOMIC POWER LABORATORY, WESTINGHOUSE ELECTRIC CORPORATION, PITTSBURGH
WAPD-T-1811 + CONF-650920-1 +. 7 PAGES, MARCH 1965, ASME-AICHE HEAT TRANSFER CONFERENCE, AUGUST 1965,
CFSTI, \$1.00 CY, \$0.50 MN

A SIMPLE MODEL FOR CALCULATING WHAT MIGHT OCCUR DURING A LOSS-OF-COOLANT ACCIDENT WAS PRESENTED. OUR ATTEMPT HAS BEEN TO IMBED EXPLICIT HEAT-TRANSFER CALCULATIONS IN AN OVERALL DESCRIPTION OF SYSTEM BEHAVIOR. BECAUSE OF THE LACK OF EXPERIMENTAL INFORMATION ON THE MECHANISMS OF TRANSIENT HEAT TRANSFER UNDER THE EXTREME CONDITIONS LIKELY TO BE ENCOUNTERED IN A LOSS-OF-COOLANT ACCIDENT, WE HAVE FELT THAT ONLY THE SIMPLEST CALCULATIONS ARE JUSTIFIED. THERE IS NO DOUBT THAT MORE COMPLICATED COMPUTATIONAL MODELS CAN AND WILL BE CONSTRUCTED. BUT FURTHER REAL PROGRESS IN THIS FIELD DEMANDS THAT THE EXPERIMENTALISTS TURN THEIR ATTENTION TO TRANSIENT HEAT TRANSFER UNDER CONDITIONS OF RAPIDLY FALLING PRESSURE, RAPIDLY RISING COOLANT QUALITY, AND VIOLENTLY UNSTEADY FLOW.

*ACCIDENT, LOSS OF COOLANT + *HEAT TRANSFER + *HEAT TRANSFER ANALYSIS + *LOFT (LOSS OF FLUID TEST) +
*TEMPERATURE TRANSIENT + ACCIDENT, LOSS OF PRESSURE + FUEL ELEMENT + REACTOR, PRESSURIZED WATER

5-10453 MOODY FJ

MAXIMUM TWO-PHASE VESSEL BLOWDOWN FROM PIPES
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-4827 +. 30 PAGES, REFERENCES, APRIL 20, 1965, CFSTI

A THEORETICAL MODEL IS PROPOSED FOR MAXIMUM TWO-PHASE FLOW FROM A CONSTANT-AREA ADIABATIC PIPE WITH FRICTION. GRAPHS ARE GIVEN FOR MAXIMUM STEAM-WATER FLOW RATE IN TERMS OF PIPE GEOMETRY AND ENTRANCE-STAGNATION PROPERTIES. THE PROPOSED MODEL IS USED TO OBTAIN THEORETICAL BLOWDOWN TRANSIENTS FROM SATURATED WATER SYSTEMS INITIALLY AT 1000, 1250, AND 2000 PSIA. ESTIMATED FLOW RATES AND BLOWDOWN TRANSIENTS ARE COMPARED WITH STEAM-WATER DATA. REASONABLE AGREEMENT IS SHOWN.

*ACCIDENT, LOSS OF COOLANT + *BLOWDOWN + *FLOW, TWO PHASE + ACCIDENT, LOSS OF PRESSURE + FLOW, TUBE +
HYDRODYNAMIC ANALYSIS

5-11228 HIGH-TEMPERATURE LIQUID-METAL TECHNOLOGY REVIEW. A BIMONTHLY TECHNICAL PROGRESS REVIEW. VOL. 4, NO. 2.

BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
BNL-991 +. 58 PAGES, APRIL 1966, CFSTI \$3.00 CY, \$0.75 MN

BROOKHAVEN NATIONAL LABORATORY BIMONTHLY REVIEW OF LIQUID-METAL TECHNOLOGY. THIS REPORT IS ONE OF A SERIES OF REPORTS ON THE FOLLOWING SUBJECTS - PHYSICAL PROPERTIES AND THERMODYNAMICS, FLUID DYNAMICS, HEAT TRANSFER, MATERIAL DEVELOPMENT AND CORROSION, INSTRUMENTATION COMPONENT DEVELOPMENT, SYSTEM STUDIES, CHEMISTRY AND CHEMICAL ANALYSIS, AND FABRICATION TECHNIQUES.

*METAL, LIQUID + CHEMICAL ANALYSIS + CORROSION + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER +
INSTRUMENTATION, GENERAL + MATERIAL + PROPERTY, PHYSICAL + THERMODYNAMICS

CATEGORY 5
ACCIDENT ANALYSIS

5-11750 SWAN AH + MASON EA
FRICTION FACTOR AND HEAT TRANSFER CORRELATION FOR IRRADIATED ORGANIC COOLANTS
MASS. INSTITUTE OF TECHNOLOGY
MIT-334-23 +. 165 PAGES, 43 FIGURES, 26 TABLES, 36 REFERENCES, SEPTEMBER 1965, CFSTI \$5.00 CY

HEAT-TRANSFER DATA AND FRICTION-FACTOR DATA WERE TAKEN ON SANTOWAX WR OVER THE REYNOLDS NUMBER RANGE OF 10,000 TO 100,000, AND IT WAS FOUND TO FIT THE USUAL CORRELATIONS, WITHIN AN UNCERTAINTY OF PLUS-OR-MINUS 10 PERCENT. A COMPARISON WAS MADE OF DATA FOR OTHER ORGANIC COOLANTS INCLUDING THAT FOR SANTOWAX OMP TO TRY AND DETERMINE WHY SOME OF THE DATA SHOW A REYNOLDS-NUMBER EXPONENT GREATER THAN 0.8. THE DITTUS-BOELTER TYPE OF EQUATION SUGGESTED BY MCADAMS, OR A COLBURN-TYPE, IS RECOMMENDED FOR CALCULATING HEAT-TRANSFER FACTORS OR FRICTION FACTORS FOR IRRADIATED ORGANIC COOLANTS.

*HEAT TRANSFER CORRELATION + *ORGANIC COOLANT + *PRESSURE DROP + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-11751 HEAT TRANSFER AND FLOW VISUALIZATION ON 1/2-INCH-DIAMETER CYLINDERS IN LAMINAR HYPERSONIC FLOW
RHODES AND BLOXSON, CANOGA PARK
SC-DC-65-1907 +. 56 PAGES, FIGURES, JANUARY 1966, CFSTI \$3.00 CY, \$0.50 MN

AEROHEATING RATES WERE MEASURED ON CYLINDERS WITH LENGTH-TO-DIAMETER RATIOS OF 1, 4.5, 8, AND 15, AND RATIOS OF CORNER RADII TO CYLINDER RADII OF 0, 0.2, 0.4, 0.6, 0.8, AND 1.0. ANGLES OF ATTACK RANGED FROM 0 TO 90 DEG. THE TEST FACILITY WAS THE RHODES AND BLOXSON 60-IN. HOT-SHOT TUNNEL. SHOCK-WAVE LOCATIONS WERE ALSO OBTAINED FROM LUMINOSITY PHOTOGRAPHS. TUNNEL CONDITIONS RESULTED IN HYPERSONIC LAMINAR CONTINUUM FLOW, WITH NEGLIGIBLE RADIANT HEATING.

*AEROSPACE SAFETY + *FLOW, HIGH SPEED + *FLOW, LAMINAR + *REENTRY, ATMOSPHERIC + BOUNDARY LAYER + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-11752 WICHNER RP + HOFFMAN HW
VAPOR-BUBBLE-GROWTH RATES IN SUPERHEATED LIQUID METALS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
ORNL-TM-1413 +. 37 PAGES, 9 FIGURES, 2 TABLES, 18 REFERENCES, JULY 1966, CFSTI \$2.00 CY, \$0.50 MN

THE GROWTH RATE OF A VAPOR BUBBLE IN A SUPERHEATED MOLTEN METAL WAS DERIVED UNDER THE ASSUMPTION THAT THE TEMPERATURE OF THE LIQUID REMAINS CONSTANT AT THE EQUILIBRIUM VALUE REQUIRED FOR AN ARBITRARY INITIAL BUBBLE SIZE. BUBBLE GROWTH RESULTS FROM THE DISTURBANCE OF THIS EQUILIBRIUM BY THE STOKES RISE AND IS LIMITED ONLY BY THE MASS INERTIA OF THE DISPLACED LIQUID. THE EFFECTS OF SURFACE TENSION AND VARIATION OF THE PRESSURE OF THE LIQUID AS THE BUBBLE RISES IN THE POOL WERE TAKEN INTO ACCOUNT. ACCORDINGLY, A SINGLE, DIMENSIONLESS PARAMETER WAS FOUND FOR SPECIFYING BOTH THE SUPERHEAT CONDITIONS AND THE VELOCITY OF THE RISING BUBBLE.

*HEAT TRANSFER, BOILING + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + METAL, LIQUID + POTASSIUM

5-11753 WILKIE D
HEAT TRANSFER FROM SURFACES ROUGHENED BY SQUARE RIBS AT A PITCH-TO-HEIGHT RATIO OF 7.2
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINNERS
TRG-REPORT-987 + JNPC-FEWP(65)/P.24 +. 21 PAGES, 8 FIGURES, 6 TABLES, 4 REFERENCES, APRIL 4, 1965, UKAEA

HEAT TRANSFER AND PRESSURE-DROP DATA ARE PRESENTED FOR SURFACES ROUGHENED BY SQUARE RIBS AT A PITCH-TO-HEIGHT RATIO OF 7.2, AND HEIGHT-TO-EQUIVALENT-DIAMETER RATIOS RANGING FROM 0.004 TO 0.104 OVER A RANGE OF REYNOLDS NUMBER FROM 90,000 TO 1,000,000. THE TESTS, WHICH WERE WITH AIR, PROVIDED AN ESTIMATE OF THE EFFECT OF TEMPERATURE RATIO ON FRICTION FACTOR. THE CONCLUSIONS FOLLOW - (1) THE ISOTHERMAL FRICTION FACTOR WAS INDEPENDENT OF REYNOLDS NUMBER. (2) THE FRICTION FACTOR FOR TESTS WITH HEAT APPLIED WAS ALMOST INDEPENDENT OF REYNOLDS NUMBER. (3) THE STANTON NUMBER WAS PROPORTIONAL TO REYNOLDS NUMBER TO THE MINUS 0.176 POWER TAKEN AS AN AVERAGE OVER ALL SURFACES AND REYNOLDS NUMBERS TESTED. (4) THE LOGARITHMS OF ALL THREE DEPENDENT VARIABLES WERE VERY NEARLY LINEAR FUNCTIONS OF THE RATIO OF RIB HEIGHT TO EQUIVALENT DIAMETER. (5) THE FRICTION FACTOR OF THE SMOOTH OUTER CHANNEL INCREASED WITH THE INCREASE IN THE FRICTION FACTOR OF THE INNER ROUGHENED CYLINDER. (6) THE INCREASE IN TEMPERATURE RATIO BETWEEN SURFACE AND GAS REDUCED THE FRICTION FACTOR.

*HEAT TRANSFER AUGMENTATION + FIN + HEAT TRANSFER + HEAT TRANSFER CORRELATION + SURFACE, GENERAL

5-11754 FAUSKE HK
WHAT'S NEW IN TWO-PHASE FLOW
ARGONNE NATIONAL LABORATORY, ARGONNE
11 PAGES, 12 FIGURES, 63 REFERENCES, POWER REACTOR TECHNOLOGY 9(1), PAGES 35-45, (WINTER 1966)

THIS ARTICLE IS A REVIEW OF SOME INTERESTING DEVELOPMENTS REPORTED AT THE SYMPOSIUM ON TWO-PHASE FLOW HELD AT EXETER, ENGLAND, JUNE 21-23, 1965. DISCUSSED WERE FLOW REGIMES, TWO-PHASE WAVE MECHANICS, VOID FRACTIONS AND HOLDUP, TWO-PHASE FLOW CHARACTERISTICS, BOILING HEAT TRANSFER, ENTRAINMENT, FLOODING, CRITICAL FLOW. ALSO, SOME DISCUSSION OF NUCLEAR REACTOR APPLICATION WAS INCLUDED.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TWO PHASE + *HEAT TRANSFER, BOILING + HEAT TRANSFER + HYDRODYNAMIC ANALYSIS

5-11906 RUBIN B + DANIEL RC + LYNAM L + MCCAULEY JE + MEIERAN HB

ACCESSION NUMBER 5-11750 TO 5-11906

CATEGORY 5
ACCIDENT ANALYSIS

5-11906 *CONTINUED*
IRRADIATION PERFORMANCE CAPABILITIES OF OXIDE FUEL RODS - X-1-U TEST OF TWO 100-INCH LONG HIGHLY RATED
ANNULAR ZR02 + UO2 FUEL RODS
WESTINGHOUSE ELECTRIC CORPORATION, BETTIS ATOMIC POWER LABORATORY, PITTSBURGH
WAPD-TM-574 +. 196 PAGES, 32 TABLES, 100 FIGURES, 18 REFERENCES, SEPTEMBER 1966, CFSTI \$6.00 CY

A 100-INCH-LONG FUEL ROD, CONTAINING ANNULAR PELLETS OF ZR02 PLUS 55.6 WT PERCENT UO2 SHEATHED
IN FREESTANDING ZIRCALOY 4, FAILED AFTER 10(21ST) FISSIONS ICC AT 685,000 BTU PER HR-FT SQ IN
AN NRX TEST LOOP AT ONE-THIRD DESIGN BURNUP. FAILURE WAS DUE TO LOCALIZED OXIDATION AND
SPALLING OF THE ZIRCALOY-4 DUE TO FLOW STARVATION AND SUBSEQUENT STEAM BLANKETING. CLADDING
DIMENSIONAL INSTABILITY AND HIGH-TEMPERATURE FUEL PLASTICITY ARE BELIEVED TO HAVE CAUSED FLOW
STARVATION. SEVERE INTERNAL SHEATH HYDRIDING OCCURRED AFTER THE FAILURE.

*FAILURE, CLADDING + *FAILURE, FUEL ELEMENT + *FUEL BURNUP + REACTOR, PRESSURIZED WATER + ZIRCALOY

5-11909 HERBST DA + TALBOY JH
DIFFERENTIAL CALORIMETER FOR IN-PILE GAMMA-RAY-HEATING MEASUREMENTS
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
6 PAGES, 6 FIGURES, 4 REFERENCES, NUCLEAR APPLICATIONS 2(5), PAGES 423-428 (OCTOBER 1966)

TWO CALORIMETERS WERE BUILT WHICH AGREE WITHIN PLUS-OR-MINUS 10 PERCENT OVER 0.003 TO 0.5
WATTS/GRAM OF SAMPLE. SIGNIFICANT IMPROVEMENTS WERE MADE BY CONTROLLING THE INSTRUMENT
ENVIRONMENT (AIR), THE TEMPERATURE, AND BY PREVENTING IT FROM TOUCHING THE ENCLOSING THIMBLE.
MEASUREMENTS MADE IN JUGGERNAUT AND CP-5 REPORTED.

*HEAT GENERATION, INTERNAL + *IN CORE MEASUREMENT + *INSTRUMENTATION, IN CORE

5-11913 SCHROCK VE + JOHNSON HA + GOPALAKRISHNAN A + LAVEZZO KE + CHO SM
TRANSIENT BOILING PHENOMENA. VOL II. EXPERIMENTAL RESULTS
UNIVERSITY OF CALIFORNIA, BERKELEY
SAN-1013(VOL.2) +. 60 PAGES, 102 FIGURES, 5 TABLES, MAY 1966, CFSTI \$4.00 CY, \$1.00 MN

THIS VOLUME IS A SUMMARY OF ALL THE EXPERIMENTAL TRANSIENT DATA COLLECTED DURING A PROGRAM TO
STUDY TRANSIENT-BOILING PHENOMENA IN POOL BOILING AND CHANNEL FLOW. ANALYSIS AND CORRELATION
OF THE DATA WILL BE REPORTED IN VOL. 1, WHICH HAS NOT YET BEEN ISSUED.

*HEAT TRANSFER, BOILING + HEAT TRANSFER + TEMPERATURE TRANSIENT + WATER, GENERAL

5-11914 SUD M + BERGLES AE + DOYLE EF + CLAWSON L + GOLDBERG P
INVESTIGATION OF BOILING FLOW REGIMES AND CRITICAL HEAT FLUX
DYNATECH CORPORATION, CAMBRIDGE, MASSACHUSETTS
NYO-3304-3 +. 60 PAGES, 21 FIGURES, 32 REFERENCES, MARCH 1, 1965, CFSTI \$4.00 CY

A PROGRAM TO INVESTIGATE THE MECHANISM OF THE CRITICAL-HEAT-FLUX CONDITION FROM THE STANDPOINT
OF FLOW REGIMES HAS BEEN INITIATED AT DYNATECH FOR THE USAEC. THIS REPORT COVERS THE WORK
DONE ON THIS INVESTIGATION IN THE FIRST YEAR. AVAILABLE DATA FOR ADIABATIC STEAM-WATER FLOW
WERE UTILIZED TO CONSTRUCT A FLOW-REGIME MAP FOR THE ANTICIPATED TEST CONDITIONS. AN
ANALYSIS INDICATED THAT THE TEST SECTION SHOULD BE FREE OF SYSTEM HYDRODYNAMIC INSTABILITY.
THE EXPERIMENTAL FACILITY WAS EXTENSIVELY MODIFIED SO THAT IT WOULD BE SUITABLE FOR OBTAINING
FLOW-REGIME AND CRITICAL-HEAT-FLUX INFORMATION. FLOW-REGIME DATA WERE OBTAINED FOR AN
8-FT-LONG, 0.4-INCH-DIAM HEATED TUBE AT 1000 PSIA OVER A RANGE OF FLOW RATES AND INLET
SUBCOOLINGS. BY MEANS OF AN ELECTRICAL RESISTANCE PROBE, THE FLOW REGIMES OF BUBBLY AND SLUG
FLOW WERE REASONABLY WELL DELINEATED. THESE DATA ARE COMPARED WITH THE ADIABATIC
PREDICTIONS. CRITICAL-HEAT-FLUX DATA WERE ALSO OBTAINED AND WERE FOUND TO BE IN AGREEMENT
WITH AVAILABLE DATA. FOR THE ENTIRE RANGE OF TEST CONDITIONS, THE FLOW WAS FOUND TO BE
STABLE, AS PREDICTED.

*CONVECTIVE BOILING + *DNB (DEPARTURE FROM NUCLEATE BOILING) + *HEAT TRANSFER, BOILING +
FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-11931 KELLER DL
PROGRESS RELATING TO CIVILIAN APPLICATIONS DURING JUNE 1966
BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO
BMT-1778 +. 23 PAGES, 5 TABLES, 5 REFERENCES, JULY 1, 1966, CFSTI \$2.00 CY, \$0.50 MN

THIS REPORT IS ONE OF A SERIES. PROGRAMS ARE - REACTOR MATERIALS AND COMPONENTS (IRRADIATION
EFFECTS ON TYPE 347 STAINLESS STEEL, GRAPHITE DENSIFICATION, CHROMIUM-RHENIUM ALLOYS,
EXPLOSIVE WELDING OF ZIRCALOY-ALUMINUM TUBING), STUDIES OF FUELS (DEVELOPMENT OF AARR FUEL
PLATES AND BeO-THO2-PUO2 FUELS, EFFECT OF HIGH BURNUP ON UO2-CEO2 AND UO2-ZR02 FUELS), PLUS
URANIUM-PLUTONIUM MONONITRIDE FUELS, COATED-PARTICLE FUELS AND CORROSION STUDIES OF THE
FLUORIDE-VOLATILITY PROCESS.

*RESEARCH CONTRACT + AARR (ARGONNE ADVANCED RESEARCH REACTOR) + CORROSION + FLUIDIZED BED + FUEL BURNUP +
FUEL ELEMENT + NITRIDE + PLUTONIUM + RADIATION EFFECT + RADIOCHEMICAL PROCESSING + STEEL, STAINLESS +
URANIUM + URANIUM DIOXIDE + WELDING

5-11989 CERAMICS RESEARCH AND DEVELOPMENT QUARTERLY REPORT. OCTOBER-DECEMBER 1965
BATTELLE-NORTHWEST, PACIFIC NORTHWEST LABORATORY
BNWL-269 +. 114 PAGES, 13 TABLES, 85 FIGURES, AUGUST 12, 1966

CATEGORY 5
ACCIDENT ANALYSIS

5-11989 *CONTINUED*

EXAMINATION OF RUPTURED ROD FROM PRTR INCIDENT OF SEPTEMBER 1965 BEGUN. BETA-PHASE ZIRCALOY INDICATES THAT CLADDING TEMPERATURE WAS NEAR BREAK AND WAS ABOVE 850 C. MOLTEN FUEL IN THE CENTERLINE HAD PENETRATED FROM THE 4 PERCENT PLUTONIUM OXIDE REGION THROUGH THE CENTERLINE OF THE 1 PERCENT REGION, THROUGH THE DEPLETED URANIUM DIOXIDE PELLET, THEN INTO THE GAS SPACE AT THE TOP OF THE ROD WHERE IT ATTACKED THE INCONEL SPRING. IN ANOTHER ROD, THE 1-PERCENT AND 4-PERCENT REGIONS HAD MIXED BEFORE IRRADIATION, AND LOCAL OVERHEATING HAD ALLOWED PARTIAL CLAD COLLAPSE. FLUX MONITORS INDICATE THAT POWER PEAKING DOES NOT ACCOUNT FOR EXCESSIVE TEMPERATURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

*FUEL MELTDOWN + *INCIDENT, ACTUAL, GENERAL + IN PILE LOOP + PRTR (PLUTONIUM RECYCLE TEST REACTOR) + REACTOR, AEC OWNED + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, TEST

5-12096 AMENDMENT 30 TO LACROSSE CONSTRUCTION AUTHORIZATION ADDITIONAL
ALLIS-CHALMERS COMPANY
ACNP-66572 +. 18 PAGES, 2 TABLES, OCTOBER 1966, DOCKET NO. 115-5, PDR

(1) RECORDS ADDITIONAL INFORMATION THAT WAS SUBMITTED TO ACRS SUBCOMMITTEE. (2) EFFECTS OF RECIRCULATION AND STEAM-LINE BREAKS FOR COMPLETE SPECTRUM OF BREAK AREAS, WITH FAILURE OF HIGH-PRESSURE CORE SPRAY. METHOD OF ANALYSIS GIVEN. WHERE REACTOR IS DEPRESSURIZED BELOW 100 PSIA WITHIN 4 MIN, THE FUEL AND CLADDING WILL NOT EXCEED 2500 F. FOR SMALLER BREAKS, WHERE DEPRESSURIZATION TIME IS GREATER THAN 4 MIN (BREAK AREA 6 TO 11 SQ. IN.), DETAILED CALCULATION SHOWED THAT THE CORE IS NOT UNCOVERED (BEFORE FEEDWATER OR LOW-PRESSURE INJECTION RECOVERS CORE) LONG ENOUGH FOR FUEL AND CLADDING TO REACH 2500 F. (3) BAFFLE PLATE SKIRT-HEIGHT BASIS - A 3-IN. SKIRT GIVES ADEQUATE HEAD (PREVENTS CORE-SPRAY-WATER RUNOFF) TO GIVE FULL 900-GPM FLOW AGAINST BACKPRESSURE OF RISING STEAM. (4) TWO EMERGENCY VENT VALVES ADDED TO SHUTDOWN CONDENSER WILL BE ADDED TO VENT AIR FROM THE REACTOR VESSEL IN CASE IT IS NECESSARY TO FLOOD THE REACTOR BUILDING TO REFLOOD THE CORE.

*ACRS (ADVISORY COMMITTEE ON REACTOR SAFEGUARDS) + ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + COOLING, SHUTDOWN + CORE COMPONENTS, MISCELLANEOUS + CORE SPRAY + LACROSSE + REACTOR, BOILING WATER

5-12097 SUPPLEMENTARY INFORMATION ON POST-ACCIDENT SAFEGUARDS PROVISIONS FOR THE LA CROSSE BOILING WATER REACTOR
ALLIS-CHALMERS COMPANY, BETHESDA, MARYLAND
ACNP-66564.1 +. 6 PAGES, 1 TABLES, 2 FIGURES, OCTOBER 1966, DOCKET NO. 115-5, PDR

(1) ADDITIONAL INFORMATION ON AMENDMENT 29 FOR DRL. (2) CONTROL ROD WILL NOT BUCKLE NOR SHEATH TEAR DURING A RECIRCULATION-LINE RUPTURE. TEST SHOWED THAT ROD DRIVES CAN WITHSTAND A 6000-LB FORCE WHEN BOTH HYDRAULIC AND ELECTRIC MOTORS ARE ON. (3) ONE OF TWO VALVE MOTORS FOR ALTERNATE CORE-SPRAY SYSTEM WILL BE CONNECTED TO PLANT STORAGE BATTERIES INSTEAD OF TO A-C EMERGENCY BUS. (4) A YEARLY TEST OF THE CHECK VALVES IN THE ALTERNATE CORE-SPRAY SYSTEM IS DESCRIBED. (5) AT YEARLY INTERVALS, THE CORE-SPRAY TUBES WILL BE TESTED (TO ENSURE THAT THEY ARE NOT BLOCKED) BY AN ADDED D-P CELL. CALCULATIONS GIVEN OF INCREASED DP WITH VARIOUS SPRAY TUBES BLOCKED. (6) 100 PERCENT RELEASE OF FISSION PRODUCTS MEANS 100 PERCENT OF GASES, 50 OF HALOGENS, 1 OF SOLIDS.

ACCIDENT, LOSS OF COOLANT + CONTROL ROD + CORE SPRAY + EMERGENCY POWER, ELECTRIC + LACROSSE + OPERATING LICENSE PROCESS + REACTOR, BOILING WATER + TEST, SYSTEM OPERABILITY

5-12147 HAUETER RL
BIG ROCK POINT REQUESTS AUTHORITY TO USE VIBRATORY COMPACTED UO₂ POWDER FUEL
CONSUMERS POWER COMPANY, JACKSON
19 PAGES, 3 FIGURES, 3 TABLES, JULY 29, 1966, DOCKET NO. 50-155, PDR

REQUESTS USE OF 85-PERCENT-THEORETICAL-DENSITY VIBRATION-COMPACTED FUEL IN ZIRCALOY-2 CLADDING IN PLACE OF 94-PERCENT-DENSITY PELLET FUEL IN STAINLESS CLADDING. REVIEWS EXPERIENCE OF HIGH-POWER-DENSITY PROGRAM AS APPLICABLE. MANY OTHER REACTORS HAVING SUCCESS. INTEGRAL KDT SHOWN TO BE 49 W/CM, INSTEAD OF PELLET 59 W/CM, BUT OFFSET BY GREATER CLADDING CONDUCTANCE (3000 VS 1000 FOR PELLETS) TO GIVE SAME 19 KW/FT FOR INCIPIENT MELTING. RECENT EXAMINATION SHOWS THAT CLADDING REMAINS APPRECIABLY DUCTILE WITH HIGH EXPOSURE, SO CLADDING WOULD COLLAPSE ON THE FUEL RATHER THAN BREAK. MENTIONS THE RIDGING OBSERVED WITH PELLET FUEL.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + BIG ROCK POINT + CLAD + OPERATING EXPERIENCE + REACTOR, BOILING WATER + STRESS + VIBRATION

5-12148 HAUETER RL
BIG ROCK POINT REQUESTS AUTHORITY TO USE VIBRATORY COMPACTED UO₂ POWDER FUEL
CONSUMERS POWER COMPANY, JACKSON
19 PAGES, 3 FIGURES, 3 TABLES, JULY 29, 1966, DOCKET NO. 50-255, PDR

IN A REQUEST TO CHANGE FROM PELLET FUEL TO VIBRATORY-COMPACTED FUEL, BIG ROCK POINT PEOPLE STATED THAT THE PROMISE THAT FUEL-CLADDING MECHANICAL INTERACTIONS CAN BE ELIMINATED COMPLETELY BY THE USE OF FREESTANDING CLADDING WITH A NOMINAL CLEARANCE BETWEEN THE PELLETS AND THE CLADDING IS NOT VALID. A SIGNIFICANT ASPECT OF RECENT MEASUREMENTS IS THAT CIRCUMFERENTIAL RIDGING OCCURS IN ALL PELLET FUEL RODS OF CURRENT DESIGNS, EVEN THOUGH THE CLADDING IS FREESTANDING WITH DIAMETRAL GAPS OF UP TO 0.013 IN. BETWEEN THE PELLETS AND THE CLADDING. MEASUREMENTS MADE ON VARIOUS TYPES OF FREESTANDING CLADDING, INCLUDING ZIRCALOY-2, STAINLESS STEEL, INCOLOY, AND INCONEL, SHOW RIDGING AT THE PELLET INTERFACES WHEN OPERATED AT

CATEGORY 5
ACCIDENT ANALYSIS

5-12148 *CONTINUED*

NOMINAL POWER LEVELS. RIDGING OF FREESTANDING, ZIRCALOY-2-CLAD FUEL RODS OPERATED FOR A SHORT TIME IN THE BIG ROCK POINT REACTOR HAS BEEN MEASURED. THE RIDGES ARE VISUALLY ACCENTUATED BY SELECTIVE CRUD DEPOSITION ON THE CLADDING SURFACE. THE MAGNITUDE OF THE RIDGING APPEARS TO BE A FUNCTION OF INITIAL COLD GAP AND FUEL ROD SPECIFIC POWER. RIDGES OF UP TO 0.001 IN. IN HEIGHT HAVE BEEN MEASURED IN 0.425 IN. OD, ZIRCALOY-2-CLAD FUEL RODS HAVING A WALL THICKNESS OF 0.030 IN., AN AS-FABRICATED PELLET-CLADDING GAP OF 0.007 IN., AND OPERATED AT A PEAK SURFACE HEAT FLUX OF UP TO 350,000 BTU/HR-SQ.FT.

*CLAD + *DAMAGE + *FUEL ELEMENT + *STRESS + BIG ROCK POINT + OPERATING EXPERIENCE + REACTOR, BOILING WATER + SURFACE FILM DEPOSIT

5-12177 AMENDMENT 2 TO BROWNS FERRY PRELIMINARY SAFETY ANALYSIS REPORT - EMERGENCY COOLING SYSTEMS
TENNESSEE VALLEY AUTHORITY
200 PAGES, FIGURES, TABLES, NOVEMBER 1966, PDR

AMENDMENT 2 CONSISTS OF (1) APPENDIX J, EMERGENCY COOLING SYSTEMS, AND (2) 7 PAGES CONTAINING CHANGES, SOME OF WHICH ARE MARKED. APPENDIX J DESCRIBES THE CONTAINMENT SPRAY COOLING SYSTEM, THE EMERGENCY CORE COOLING SYSTEMS (TWO HIGH-FLOW-RATE LOW-PRESSURE CORE-SPRAY SYSTEMS, TWO CORE-REFLOODING SYSTEMS (ONE HIGH PRESSURE AND ONE LOW PRESSURE) AUTOMATIC PRESSURE RELIEF VALVES TO ASSIST THE LOW-PRESSURE SYSTEMS, AND THE CONDENSATE PUMP SYSTEM, AND DESCRIBES THEIR INTEGRATED PERFORMANCE UNDER POSTULATED LOSS-OF-COOLANT ACCIDENTS. DESIGNER CONCLUDES, EVEN WITH NO EXTERNAL POWER SUPPLY, THAT CONTAINMENT CAN ACCOMMODATE SEVERAL ORDERS OF MAGNITUDE MORE THAN A 0.6 PERCENT METAL-WATER REACTION AND THAT THERE ARE AT LEAST TWO PROCESSES ADEQUATE FOR COOLING THE CORE FOR ANY SIZE OF BREAK.

*SAFETY ANALYSIS REPORT, PRELIMINARY + BROWNS FERRY + CONTAINMENT SPRAY + CONTAINMENT VESSEL LOADING + CORE REFLOODING SYSTEM + CORE SPRAY + REACTOR, BOILING WATER

5-12181 INCLINED FUEL CHANNEL NATURAL CONVECTION TEST LOOP
ARGONNE NATIONAL LABORATORY, ARGONNE
ANL-7255 +. 1 PAGE, SEPTEMBER 1966, PAGE 66 FROM REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, CFSTI \$4.00
CY

CONSTRUCTION IS COMPLETE ON THIS AARR LOOP WHICH WILL PROVIDE DATA ON THE NATURAL-CONVECTION COOLING PROPERTIES OF AN ELECTRICALLY HEATED .040 X 1.125 X 18 INCH FLOW CHANNEL AT HEAT FLUXES UP TO 125,000 BTU/HR-FT SQ, AT ANY ANGLE BETWEEN HORIZONTAL AND VERTICAL.

*CORE, PLATE TYPE + *DECAY HEAT + *FUEL STORAGE + *HEAT TRANSFER, NATURAL CONVECTION + *TESTING + AARR (ARGONNE ADVANCED RESEARCH REACTOR) + REACTOR, TEST

5-12205 APPENDIX V. 1 - DISCUSSION OF SIGNIFICANT TESTS
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
1 PAGE, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGE 1 OF APPENDIX V FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966, THROUGH AUGUST 15, 1966, PDR

REACTOR IS BACK TO FULL POWER FOLLOWING EVALUATION OF THE FLOW REDUCTION (DUE TO SPALLED SCALE TRAPPED ON FUEL ROD SPACERS) WHICH REDUCED THE MINIMUM BURNOUT RATIO AT 125 PERCENT POWER IN THE PEAK CHANNEL FROM 3.1 TO 2.9. AFTER AN APRIL SCRAM AND 3.5-DAY OUTAGE, A CHANGE IN CRITICAL CONTROL ROD POSITION (HALF THE ADDITIONAL ROD MOVEMENT NEEDED TO OVERCOME THE FLOW REDUCTION WAS NO LONGER NEEDED) INDICATED THAT SOME OF THE SPALLED SCALE HAD BEEN WASHED OUT. FLOW MEASUREMENTS OF 10.6 TIMES 10(6TH) POUNDS PER HOUR WERE BETWEEN NORMAL (11.3) AND LOWEST FLOW WITH SPALLED SCALE (9.6). IN JUNE, FLOW BEGAN A DOWNWARD TREND, REACHING 9.9 IN AUGUST.

*FLOW BLOCKAGE + *INCIDENT, ACTUAL, GENERAL + *SURFACE FILM DEPOSIT + HUMBOLDT BAY + REACTIVITY EFFECT, ANOMALOUS + REACTOR, BOILING WATER

5-12295 TECHNICAL SAFETY EVALUATION OF THE N.S. SAVANNAH. FOURTH SUPPLEMENT
EUROPEAN ATOMIC ENERGY COMMUNITY + BUREAU VERITAS + GERMANISCHER LLOYD
EUR-1621.E(VOL.3) +. 46 PAGES, APRIL 1966, DEP. MN

THE MAXIMUM POWER OUTPUT OF THE NS SAVANNAH NUCLEAR PLANT HAS BEEN RAISED FROM 69 MW TO 80 MW. MODIFICATIONS TO THE EMERGENCY COOLING PROVISIONS AND THE SCRAM SETTINGS, TOGETHER WITH THE ASSESSMENT OF THE HIGHER POWER LEVEL INFLUENCE ON THE TRANSIENT AND ACCIDENT BEHAVIOUR OF THE PLANT, SHOW THAT THERE IS NO SIGNIFICANT INCREASE OF POTENTIAL HAZARDS ASSOCIATED WITH 80 MW OPERATION. THE OPERATIONAL EXPERIENCE OF NS SAVANNAH HAS DEMONSTRATED THAT THE ACTIVE WASTES TO BE DISPOSED OF WERE WITHIN ACTIVITY LIMITS WELL BELOW THOSE ALLOWED. IT APPEARS THAT THE PORT OPERATING CRITERIA COULD BE RELAXED FOR NS SAVANNAH ON THE BASIS OF MODIFIED ASSUMPTIONS IN THE MCA FOR THIS SHIP.

*ACCIDENT ANALYSIS + *EURATOM + *N S SAVANNAH + *REACTOR, MARITIME + *SAFETY REVIEW (OPERATIONS, EXPERIMENTS)

5-12377 LAVIN Z + FEJER AA
INVESTIGATION OF SWIRLING FLOWS IN DUCTS
IIT RESEARCH INSTITUTE
ARL-66-0083 +. 236 PAGES, 52 FIGURES, 11 TABLES, 55 REFERENCES, MAY 1966, CFSTI

THIS WORK REPORTS ON THEORETICAL AND EXPERIMENTAL INVESTIGATIONS OF SWIRLING FLOWS IN CYLINDRICAL DUCTS. STEADY STATE SOLUTIONS WERE OBTAINED FOR LAMINAR INCOMPRESSIBLE SWIRLING

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ACCIDENT ANALYSIS

5-12377 *CONTINUED*

FLOW IN THE ENTRANCE REGION OF A STRAIGHT CIRCULAR DUCT OF UNIFORM CROSS SECTION BY SOLVING THE COMPLETE NAVIER STOKES EQUATIONS USING THE STREAM FUNCTION, THE ANGULAR MOMENTUM AND TANGENTIAL COMPONENT OF VORTICITY AS VARIABLES. THE ANALYSIS WAS ALSO ADAPTED TO THE SOLUTION OF UNSTEADY FLOWS AND AS AN EXAMPLE, AN IMPULSIVELY STARTED FLOW WAS TREATED. IN ADDITION, A METHOD WAS SUGGESTED FOR THE STUDY OF THE HYDRODYNAMIC STABILITY OF LAMINAR SWIRLING FLOWS. FINALLY IT WAS DEMONSTRATED THAT FOR THE FLOWS UNDER CONSIDERATION THE ANALYTICAL INCOMPRESSIBLE SOLUTIONS ARE ALSO REPRESENTATIVE OF THE CHARACTERISTICS OF SWIRLING COMPRESSIBLE FLOWS. IN THE EXPERIMENTAL PART OF THE INVESTIGATION, A SWIRLING FLOW OF AIR WAS OBSERVED IN A THIRTY-INCH LONG, THREE-INCH DIAMETER DUCT. THE STUDY COVERED A RANGE OF AXIAL MACH NUMBERS FROM 0.3 TO 2.0 AND SWIRL ANGLES FROM 0 TO 80. THE DUCT WAS INSTRUMENTED FOR STATIC PRESSURE MEASUREMENTS AND THE INTERIOR OF THE FLOW WAS PROBED BY MEANS OF 0.064-INCH OUTSIDE DIAMETER CYLINDRICAL PROBES. UNDER CERTAIN FLOW CONDITIONS A LUMINESCENT REGION WAS OBSERVED ALONG THE AXIS OF THE TUBE. THE LUMINESCENCE WAS IDENTIFIED AS A GLOW DISCHARGE WHICH WAS PRODUCED BY CONDENSED WATER DROPLETS IMPINGING ON THE DUCT WALL.

*FLOW, TUBE + *HYDRODYNAMIC ANALYSIS + FLOW STABILITY + FLOW THEORY AND EXPERIMENTS + FLOW, VORTEX + HEAT TRANSFER

5-12378 SHIRES GL + RILEY PJ
THE MEASUREMENT OF RADIAL VOIDAGE DISTRIBUTION IN TWO-PHASE FLOW BY ISOKINETIC SAMPLING
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH
AEEW-M-650 +. 52 PAGES, 17 FIGURES, 1 TABLE, 7 REFERENCES, 1966, BIS \$1.40 CY

IN THE STUDY OF TWO-PHASE FLOW THERE IS A NEED FOR AN INSTRUMENT WHICH WILL MEASURE THE DETAILED DISTRIBUTION OF THE PHASES AND THEIR LOCAL VELOCITIES. THIS REPORT DESCRIBES A PROBE THROUGH WHICH A TWO-PHASE SAMPLE IS WITHDRAWN AT SUCH A RATE THAT THE PRESSURE JUST INSIDE THE PROBE ORIFICE IS EQUAL TO THE LOCAL STATIC PRESSURE IN THE STREAM. THEORETICALLY, WHEN THE DENSITY OF THE GAS IS SMALL RELATIVE TO THAT OF THE LIQUID, THE SUPERFICIAL VELOCITY OF THE LIQUID ON ENTERING THE PROBE IS EQUAL TO THE LOCAL VALUE IN THE STREAM, I.E. THE PROBE SAMPLES ISOKINETICALLY IN TERMS OF SUPERFICIAL WATER VELOCITY, AND THE VOIDAGE OF THE SAMPLE IS EQUAL TO THE LOCAL VOIDAGE IN THE STREAM. BOTH CHARACTERISTICS HAVE BEEN CONFIRMED EXPERIMENTALLY IN AIR/WATER FLOWING UPWARDS IN A 1 IN. DIAMETER TUBE AT ATMOSPHERIC PRESSURE OVER A RANGE OF MEAN VOIDAGE FROM 0.1 TO 0.8. ALTHOUGH THEORETICALLY IT IS POSSIBLE TO DETERMINE VOIDAGE FROM IMPACT PRESSURE THIS ALTERNATIVE METHOD WAS FOUND TO BE UNSATISFACTORY BECAUSE OF ACCUMULATION OF ERRORS AND PROBE INTERFERENCE.

*FLOW, TWO PHASE + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER, BOILING + INSTRUMENTATION, FLOW + VOID COEFFICIENT

5-12379 JONES MC + NAGAMOTO TT + BRENNAN JA
HEAT TRANSFER TO A SUBLIMING SOLID-VAPOR MIXTURE OF HYDROGEN BELOW ITS TRIPLE POINT
NATIONAL BUREAU OF STANDARDS, DEPT OF COMMERCE
6 PAGES, 7 FIGURES, JULY 1966, A.I.C.H.E JOURNAL 12(4), PAGES 790-795

HEAT TRANSFER COEFFICIENTS HAVE BEEN MEASURED OVER A RANGE OF REYNOLDS NUMBERS FOR A SOLID-VAPOR MIXTURE OF PARAHYDROGEN DISCHARGING THROUGH A HEATED BRASS TUBE BELOW THE TRIPLE POINT PRESSURE. A CORRELATION IS GIVEN WHICH IS SHOWN BY A FORMAL ANALYSIS OF A SIMPLE MODEL TO ACCOUNT FOR MOST OF THE SYSTEM VARIABLES.

*HEAT TRANSFER EXPERIMENT + *HYDROGEN + *PHASE CHANGE + HEAT TRANSFER + HEAT TRANSFER CORRELATION

5-12380 ADAMS JA + MCFADDEN PW
SIMULTANEOUS HEAT AND MASS TRANSFER IN FREE CONVECTION WITH OPPOSING BODY FORCES
PURDUE UNIVERSITY
6 PAGES, 8 FIGURES, 2 TABLES, JULY 1966, A.I.C.H.E JOURNAL 12(4), PAGES 642-647

AN EXPERIMENTAL TECHNIQUE WHICH UTILIZED A MACH-ZEHNDER INTERFEROMETER WAS USED TO MEASURE LOCAL HEAT AND MASS TRANSFER COEFFICIENTS DURING SIMULTANEOUS HEAT AND MASS TRANSFER. THE EXPERIMENTAL MEDIUM WAS A VERTICAL, SUBLIMING SURFACE OF P-DI-CHLOROBENZENE. THE BODY FORCE CREATED BY THE HEAVY ORGANIC VAPOR IN THE BOUNDARY LAYER OPPOSED THE UPWARD THERMAL BODY FORCE CAUSED BY HEATING THE SURFACE. THE RESULTS INDICATED THAT THE HEAT AND MASS TRANSFER, UNDER THE INFLUENCE OF OPPOSING BODY FORCES OVER THE RANGE INVESTIGATED, WAS FROM 10 TO 15 PERCENT LOWER THAN THE VALUES PREDICTED BY PRESENT APPROXIMATE ANALYTICAL SOLUTIONS FOR A CONSTANT WALL HEAT FLUX BOUNDARY CONDITION.

*HEAT TRANSFER CORRELATION + *HEAT TRANSFER, NATURAL CONVECTION + *MASS TRANSFER + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-12381 MOECK EO + GARG SC + WIKHAMMER GA + STERN F + DEMPSTER RT
SWIFT DRYOUT DATA FOR A 19-ROD, 3.25 IN. DIAMETER BUNDLE COOLED BY STEAM/WATER FOG AT 515 PSIA
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
AECL-2586 +. 21 PAGES, 13 FIGURES, 2 TABLES, 30 REFERENCES, MAY 1966, AECL \$1.00 CY

DRYOUT HEAT FLUXES (A TERM USED TO DESCRIBE THE CRITICAL OR BURNOUT HEAT FLUX AT HIGH STEAM QUALITIES) WERE MEASURED FOR A 19-ROD BUNDLE UNDER THE FOLLOWING CONDITIONS - LENGTH OF HEATED BUNDLE 19.75 IN., LENGTH OF UNHEATED, UPSTREAM BUNDLE, 19.5 IN., MASS VELOCITY, (0.5 TO 1.4) X 10 TO THE .6 LB/HR-FT SQUARED, INLET QUALITY, 32 TO 70 PERCENT, OUTLET QUALITY, 38 TO 78 PERCENT, OUTLET PRESSURE 515 PSIA, DIAMETER OF HEATED ELEMENTS, 0.600 IN., DIAMETER OF PRESSURE TUBE, 3.25 IN. WITH REFERENCE TO ALIGNED BUNDLES HAVING NO STRIPPING RINGS AND NO AXIAL GAPS, THE BUNDLE POWER AT DRYOUT DECREASED BY UP TO 20 PERCENT WITH ANGULAR MISALIGNMENT BETWEEN BUNDLES, INCREASED BY UP TO 150 PERCENT WHEN THE LIQUID FILM WAS

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ACCIDENT ANALYSIS

5-12381 *CONTINUED*

STRIPPED OFF THE PRESSURE TUBE WALL, REMAINED UNCHANGED FOR COMBINED MISALIGNMENT AND STRIPPING RINGS, WAS THE SAME FOR CANDU END-PLATE AND FLAT-END GEOMETRIES, AND WAS UNAFFECTED BY AN AXIAL GAP BETWEEN THE BUNDLES.

*BURNOUT. HEAT FLUX + *FOG + *HEAT FLUX, DRYOUT + *HEAT TRANSFER, BOILING + CORE SPRAY + FLOW, AXIAL + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-13233 CONSOLIDATED EDISON REQUESTS DELETION OF INDIAN POINT I TECHNICAL SPECIFICATION PROVISION FOR A MINIMUM PRIMARY COOLANT FLOW FOR EACH PUMP
CONSOLIDATED EDISON COMPANY OF NEW YORK
3 PAGES, NOVEMBER 4, 1966, DOCKET NO. 50-3

CONSOLIDATED EDISON SUMMARIZES ANALYSIS PRESENTED TO ALLOW LOW FLOW TESTING (CHANGE 25) AND REASSERTS THAT, FOR THE LOWER CORE FLOW, THE DNB RATIO OF 2.0 WILL NOT BE EXCEEDED AT STEADY STATE AND THAT THE LOSS-OF-FLOW ACCIDENT RESULTS IN A DNB RATIO OF 1.33. THEY POINT OUT THAT PRIMARY FLOW IS NOT A LIMITING FACTOR IN ITSELF, BUT ONE OF THE FACTORS IN THE DNB RATIO.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ACCIDENT, LOSS OF FLOW + INDIAN POINT 1 + REACTOR, PRESSURIZED WATER

5-13384 ZEMANSKY MW + VAN NESS HC
BASIC ENGINEERING THERMODYNAMICS
NEW YORK UNIVERSITY + RENSSELAER POLYTECHNIC INSTITUTE
372 PAGES, FIGURES, TABLES, MCGRAW-HILL INC., 1966

IT HAS BEEN OUR PURPOSE TO PREPARE A TEXTBOOK FOR AN INITIAL, ONE-SEMESTER COURSE IN THERMODYNAMICS FOR ENGINEERS OF ANY DISCIPLINE. SUCH A COURSE MUST STRESS THE FUNDAMENTAL PRINCIPLES OF THERMODYNAMICS, BUT AT THE SAME TIME ITS SCOPE MUST SERVE TO PREPARE STUDENTS FOR A VARIETY OF SECOND COURSES IN WHICH THE PRINCIPLES ARE APPLIED TO DIFFERENT KINDS OF SYSTEMS. THUS, WHILE PAYING AMPLE ATTENTION TO SIMPLE FLUID SYSTEMS, WE HAVE ALSO INCLUDED CAREFUL TREATMENTS OF SOLID SYSTEMS UNDER STRESS, SURFACES, CELLS, AND ELECTRIC AND MAGNETIC SYSTEMS. SPECIALIZED APPLICATIONS, HOWEVER, ARE LEFT TO LATER COURSES. WE HAVE DRAWN VERY HEAVILY UPON THE BOOK, HEAT AND THERMODYNAMICS, BY ZEMANSKY.

AVAILABILITY - MCGRAW-HILL, \$9.50 CY

*THERMODYNAMICS + EQUATION OF STATE + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + THERMAL PROPERTY

5-13385 HIGH-TEMPERATURE LIQUID-METAL TECHNOLOGY REVIEW. A BIMONTHLY TECHNICAL PROGRESS REVIEW. VOL. 4 NO. 3
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
BNL-50003 +. 138 PAGES, 3 FIGURES, 2 TABLES, JUNE 1966

THE FOLLOWING TOPICS ARE COVERED - PHYSICAL PROPERTIES AND THERMODYNAMICS, FLUID DYNAMICS, HEAT TRANSFER, MATERIALS DEVELOPMENT AND CORROSION, INSTRUMENTATION, COMPONENT DEVELOPMENT, SYSTEMS STUDIES, CHEMISTRY AND CHEMICAL ANALYSIS, FABRICATION TECHNIQUES, SAFETY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA \$3.00 CY, \$0.50 MN

*METAL, LIQUID + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + INSTRUMENTATION, GENERAL + MATERIAL + THERMODYNAMICS

5-13386 WICHNER RP
THEORETICAL SLIP RATIOS IN ANNULAR TWO-PHASE FLOW
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1519 +. 25 PAGES, 11 FIGURES, MAY 9, 1966

AN EXPRESSION FOR THE SLIP RATIO (I.E., THE RATIO OF THE MEAN VAPOR VELOCITY TO THAT OF THE LIQUID) IN ANNULAR TWO-PHASE FLOW IS DEVELOPED UNDER THE ASSUMPTIONS OF LAMINAR FLOW IN THE LIQUID FILM AND NON-RIPPLING OF THE INTERFACIAL SURFACE. THE SOLUTION IS PRESENTED FOR UP, DOWN, AND ZERO-GRAVITY FLOW IN TERMS OF THE FOLLOWING THREE DIMENSIONLESS QUANTITIES - (1) THE VAPOR VOLUME FRACTION, (2) A PARAMETER, BETA, DEPENDING ON THE LIQUID AND VAPOR PHYSICAL PROPERTIES, TUBE RADIUS, AND FRICTION FACTOR OF THE VAPOR FLOW, AND (3) AN INTERFACIAL SHEAR STRESS PARAMETER. THE CRITICAL CONDITION FOR ZERO NET LIQUID UPFLOW IS SPECIFIED AS OCCURRING WHEN THE INTERFACIAL SHEAR STRESS PARAMETER IS EQUAL TO A DERIVED FUNCTION OF THE VOLUME FRACTION. LIQUID VELOCITY PROFILES AND VOLUMETRIC FLOW RATES ARE ALSO DERIVED. NUMERICAL VALUES OF THE SLIP RATIO FOR SATURATED WATER AT 212 F AND POTASSIUM AT 1850 ARE FOUND TO HAVE THE SAME TRENDS WITH QUALITY AS THE PREDICTION OF LOCKHART-MARTINELLI, AND ARE REMARKABLY CLOSE IN MAGNITUDE CONSIDERING THE SIMPLICITY OF THE MODEL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*FLOW, TWO PHASE + ANNULUS + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER, BOILING + HYDRAULIC ANALYSIS

5-13387 HULL DE

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5-13387 *CONTINUED*

PRECISE MEASUREMENT OF FLOW RATES WITH RADIOISOTOPES
CALIFORNIA RESEARCH CORP., RICHMOND

GMELIN-AED-CONF-64-033-21 + CONF-179-4 +. 14 PAGES, 1 FIGURE, 20 REFERENCES, PRESENTED AT AMERICAN
CHEMICAL SOCIETY 147TH NATIONAL MEETING, PHILADELPHIA, PA., APRIL 5-10, 1964

ACCURACY OF THE TOTAL-COUNT METHOD OF MEASURING FLOW RATES WITH RADIOTRACERS HAS HAD A PRACTICAL LIMIT OF ABOUT 1'. THIS LIMIT IS SET BY THE STATISTICS OF COUNTING TRACER QUANTITIES WHICH ARE FEASIBLE TO HANDLE, THE MAXIMUM COUNTING SPEED OF GEIGER TUBES, AND THEIR REPRODUCIBILITY. THE TOTAL-SAMPLE METHOD IS A VARIATION WHICH NOW PERMITS MORE ACCURATE MEASUREMENT OF SOME TYPES OF LIQUID STREAMS. THE ESSENTIAL FEATURES OF THIS METHOD ARE - (1) A SCINTILLATION COUNTER IS USED INSTEAD OF A GEIGER COUNTER, (2) A SAMPLE IS COLLECTED DURING THE INTERVAL IN WHICH ALL OF THE INFUSED TRACER PASSES THE SAMPLING POINT AND IS COUNTED AS LONG AS NECESSARY. THE FIRST CHANGE REMOVES THE LIMITATION ON COUNTING SPEED, THE SECOND ON COUNTING TIME. THE COMBINATION MAKES IT POSSIBLE TO RECORD UPWARD OF ONE MILLION COUNTS PER OBSERVATION WITH A POTENTIAL ACCURACY OF 0.1'. EXPERIMENTAL WORK WITH EQUIPMENT DESIGNED ALONG THESE LINES SHOWS THAT UNDER FAVORABLE CIRCUMSTANCES THIS DEGREE OF ACCURACY MAY BE ATTAINABLE.

*RADIOISOTOPE + *TRACER, RADIOACTIVE + FLOW THEORY AND EXPERIMENTS + FLOW, TUBE + INSTRUMENTATION, FLOW

5-13388 THURSTON RS

THERMAL-ACOUSTIC OSCILLATIONS INDUCED BY FORCED CONVECTION HEATING OF DENSE HYDROGEN
LOS ALAMOS SCIENTIFIC LAB.

LA-3543 +. 159 PAGES, FIGURES, TABLES, APRIL 1966

THE PURPOSE OF THIS INVESTIGATION WAS TO DETERMINE THE CONDITIONS AND MECHANISM OF THERMAL-ACOUSTIC OSCILLATIONS IN PARA-HYDROGEN. THERMAL-ACOUSTIC OSCILLATIONS ARE SELF-INDUCED OSCILLATIONS OF A FLUID THAT ARE CAUSED BY A COUPLING BETWEEN HEAT TRANSFER, PRESSURE, DENSITY, AND VELOCITY IN A SYSTEM WITH SPECIAL STEADY BOUNDARY CONDITIONS. THE SPECIAL BOUNDARY CONDITIONS ARE A DENSE PHASE OF THE FLUID AT THE INLET OF THE TEST SECTION AND A HEATED WALL OF THE TEST SECTION THAT PRODUCES A SUPERHEATED FILM ADJACENT TO IT. BELOW THE CRITICAL PRESSURE A DENSE PHASE IS THE LIQUID PHASE. ABOVE THE CRITICAL PRESSURE, THE TEMPERATURE OF A DENSE PHASE IS BELOW THE TEMPERATURE OF THE SPECIFIC HEAT MAXIMUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$5.00 CY, \$1.00 MN

FLOW THEORY AND EXPERIMENTS + FLUCTUATION + HEAT TRANSFER + HYDROGEN + THERMODYNAMICS + VIBRATION

5-13389 PITTS JH + VAN SANT JH + CORALLO RA
THE LONG JOHN THERMO-GASDYNAMIC RESEARCH FACILITY
LAWRENCE RADIATION LAB.

UCRL-14841 +. 31 PAGES, 16 FIGURES, 3 TABLES, 7 REFERENCES, APRIL 20, 1966

A RESEARCH FACILITY WAS DEVELOPED FOR EXPERIMENTAL STUDIES OF HEAT TRANSFER AND MOMENTUM TRANSFER TO GASES FLOWING INSIDE LONG CHANNELS. DESIGN SPECIFICATIONS AND OPERATING CAPACITIES AND CAPABILITIES ARE DESCRIBED FOR THE MAJOR COMPONENTS OF THE FLOW SYSTEM AND THE INSTRUMENTATION EQUIPMENT. THE FACILITY WAS DESIGNED SO THAT INVESTIGATIONS WITH FLOW CHANNELS OF VARIOUS LENGTHS AND SHAPES CAN BE CONDUCTED OVER A LARGE RANGE OF PRESSURES, TEMPERATURES, AND FLOW RATES. ACQUISITION OF FINAL RESULTS IS EXPEDITED BY AUTOMATIC RECORDING OF TEST DATA AND BY USING DIGITAL COMPUTERS FOR CALCULATING AND PLOTTING THE REQUIRED DATA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

FLOW THEORY AND EXPERIMENTS + FLOW, TUBE + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + PRESSURE DROP

5-13390 COUSINS LB

BIBLIOGRAPHY OF REPORTS ON TWO-PHASE HEAT TRANSFER ISSUED BY A.E.R.E., HARWELL
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R1B-150 +. 18 PAGES, MAY 1966

LISTS AND SUMMARISES THE REPORTS AND PUBLICATIONS ISSUED BY THE TWO-PHASE HEAT TRANSFER SECTION OF THE CHEMICAL ENGINEERING DIVISION AT A.E.R.E., HARWELL. REPORTS ARE DIVIDED INTO TWO MAIN SECTIONS - (1) BURNOUT AND HEAT TRANSFER STUDIES ON STEAM-WATER SYSTEMS. (2) HYDRODYNAMIC STUDIES ON AIR-WATER SYSTEMS. A LIST OF OTHER RELEVANT REPORTS ISSUED BY A.E.R.E. HARWELL IS GIVEN IN THE SUPPLEMENT.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVE, NEW YORK, N.Y. 10022 \$0.60 CY.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + *FLOW, TWO PHASE + BURNOUT HEAT FLUX + HEAT TRANSFER + HEAT TRANSFER, BOILING + PHASE CHANGE + WATER, GENERAL

5-13391 SCHROCK VE + JOHNSON HA + GOPALAKRISHNAN A + LAVEZZO KE + CHO SM
TRANSIENT BOILING PHENOMENA, VOL I
UNIVERSITY OF CALIFORNIA, BERKELEY
SAN-1013 (VOL I) +. 175 PAGES, 33 FIGURES, MAY 1966

THIS REPORT SUMMARIZES THE RESEARCH PERFORMED UNDER CONTRACT AT(11-1)-34, PROJECT 42, REFERRED TO AS THE REACTOR HEAT TRANSIENTS PROJECT. THE PROGRAM HAD AS A BROAD OBJECTIVE THE

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5-13391 *CONTINUED*

DEVELOPMENT OF SUFFICIENT UNDERSTANDING OF THE VARIOUS ASPECTS OF BOILING IN TRANSIENTLY HEATED SYSTEMS TO PERMIT ANALYSIS OF WATER REACTOR EXCURSIONS. THE RESEARCH HAS INCLUDED BOTH EXPERIMENTAL AND THEORETICAL APPROACHES. IN THE EXPERIMENTAL PROGRAM HEAT TRANSFER AND VOID WERE MEASURED ON A SURFACE SIMULATING A NUCLEAR REACTOR FUEL ELEMENT. ANALYTICAL STUDIES OF THE PROBLEM WERE CONDUCTED IN THREE DISTINCT AREAS - (A) TRANSIENT NON-BOILING HEAT TRANSFER TO STATIONARY AND FLOWING LIQUID, (B) NUCLEATION ON A HEATED SURFACE, AND (C) VOID GROWTH. THESE ANALYSES ARE SUCCESSFUL IN ADDING INSIGHT AND, WITH THE EXPERIMENTAL DATA, PROVIDE SOME BASIS FOR DESIGN CALCULATIONS. THE COMPLEXITY OF THE PROBLEM IS SO GREAT, HOWEVER, THAT VERY DETAILED AND ACCURATE PREDICTIONS ARE NOT YET POSSIBLE FOR ALL ASPECTS OF THE PROBLEM, PARTICULARLY THE VOID.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 CY

*CONVECTIVE BOILING + *FLOW THEORY AND EXPERIMENTS + *HEAT TRANSFER, BOILING + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + REACTOR TRANSIENT + TEMPERATURE TRANSIENT

5-13484 AEC LETTER ON EMERGENCY CORE COOLING SENT DECEMBER 8 TO CONSOLIDATED EDISON AND NORTHERN STATES POWER
CONSOLIDATED EDISON CO. OF NEW YORK, INC. + NORTHERN STATES POWER COMPANY
1 PAGE, DECEMBER 8, 1966, DOCKET NO. 50-247 AND 50-263, ATOMIC ENERGY CLEARING HOUSE 12(51), PAGE 7, (DECEMBER 19, 1966)

DRL REQUESTS TWO ANALYSES IN ADDITION TO PRESENT CONSIDERATION OF THE NEED FOR EMERGENCY CORE COOLING. (1) LOSS-OF-COOLANT ANALYSES FOR VARIOUS PIPE SIZES TO DEFINE THE LIMITING CONDITIONS, HEAT SINKS, AND EFFECTS ON REACTOR VESSEL INTEGRITY. (2) ANALYSES TO DETERMINE SYSTEM PERFORMANCE REQUIREMENTS TO PREVENT CORE MELTDOWN.

*EMERGENCY COOLING CONSIDERATIONS + INDIAN POINT 2 + MONTICELLO + REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER

5-13485 LOSS-OF-FLOW INCIDENT WITHOUT DAMAGE AT PLUM BROOK TESTING REACTOR, NOVEMBER 22, 1966
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D.C.
1 PAGE, DECEMBER 2, 1966, DOCKET NO. 50-30, ATOMIC ENERGY CLEARING HOUSE 12(51), PAGE 8, (DECEMBER 19, 1966)

AFTER 7 DAYS AT FULL POWER (60 MW-TH), THE CONTROL POWER BREAKER WAS ACCIDENTALLY OPENED, INTERRUPTING DC TO BOTH MAIN AND SHUTDOWN PUMP BREAKERS AND SCRAMING THE REACTOR. FLOW COASTDOWN LASTED 30 SEC, FORCED FLOW WAS RESTORED WITHIN AN ADDITIONAL 45 SEC. ALL COMPONENTS EXAMINED SHOWED NO THERMAL DAMAGE. DC CIRCUITS HAVE BEEN REWIRED TO PROVIDE SEPARATE BREAKERS AND POWER SOURCES FOR SHUTDOWN PUMPS.

*ACCIDENT, LOSS OF FLOW + *ACCIDENT, LOSS OF POWER + *FAILURE, MAINTENANCE ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + EMERGENCY POWER, ELECTRIC + PLUM BROOK + REACTOR, TEST

5-13532 N S SAVANNAH TECHNICAL SPECIFICATION CHANGE 8 - BURNOUT SAFETY FACTOR, AND OPERATION WITH STUCK RODS
FIRST ATOMIC SHIP TRANSPORT INC.
7 PAGES, 11 FIGURES, 2 TABLES, DECEMBER 5, 1966, DOCKET NO. 50-238

SAVANNAH REQUESTS THAT BURNOUT SAFETY FACTOR BE REDUCED TO 1.8 (REALLY 2.33 BY CONSERVATIVE APPROACH) AND THAT FIVE CRITERIA RELATING TO SHUTDOWN MARGIN BE ADDED. INCLUDED IS A PDQ STUDY ON POWER PEAKING, WITH 6 ROD CONFIGURATIONS. THE RESULT OF THE CHANGES IS TO PLACE THE LIMITING BURNOUT SAFETY FACTOR ON THE STUCK-ROD CONDITION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + BURNOUT HEAT FLUX + CONTROL ROD DRIVE + N S SAVANNAH + POWER DISTRIBUTION + REACTOR, PRESSURIZED WATER + SHUTDOWN MARGIN

5-13613 AMENDMENT 5 TO BROWNS FERRY CONSTRUCTION PERMIT APPLICATION - MISCELLANEOUS
TENNESSEE VALLEY AUTHORITY
39 PAGES, 8 TABLES, 11 FIGURES, NOVEMBER 25, 1966, DOCKET NO. 50-259 AND 50-260

REVISIONS MADE FOLLOWING A SEPTEMBER 22, 1966 MEETING WITH DRL APPEARS TO CONSIST OF (1) INCREASED RECREATIONAL POPULATION (2) OFF-GAS FILTER DESIGN TEMPERATURES OF 500 F, (3) HALVING THE FLOW RATE AND THYROID DOSE FOLLOWING A MAIN-STEAM-LINE RUPTURE, (4) HIGHER DRYWELL PRESSURE RESULTING FROM ONLY 1 OF 4 CONTAINMENT COOLING PUMPS OPERATING. ILLUSTRATIONS REVISED APPROPRIATELY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CHARCOAL + CONTAINMENT DESIGN + FILTER + POPULATION DISTRIBUTION + REACTOR, BOILING WATER

5-13643 LEE G + SUNDELL RE
APOLLO AFTERBODY HEAT TRANSFER AND PRESSURE WITH AND WITHOUT ABLATION AT MACH NUMBER OF 5.8 TO 8.3
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NASA-TN-D-3620 +. 44 PAGES, SEPTEMBER 1966

CATEGORY 5
ACCIDENT ANALYSIS

5-13643 *CONTINUED*

ABLATION-TYPE HEAT SHIELDS, COMMONLY USED FOR THE THERMAL PROTECTION OF THE STAGNATION REGION OF SPACECRAFT, INJECT GASES INTO THE STREAM. THE QUESTION OF HOW ABLATION PRODUCTS AFFECT THE DOWNSTREAM PORTION OF THE SPACECRAFT HAS BEEN CONSIDERED FOR SIMPLE SHAPES, SUCH AS FLAT PLATES, WEDGES, CONES, AND HEMISPHERE CYLINDERS, AND THE RESULTS INDICATE THAT THE UPSTREAM INJECTION OF GASES CAN SIGNIFICANTLY CHANGE PRESSURES AND HEAT TRANSFER. FOR MORE COMPLICATED SHAPES, VERY LITTLE INFORMATION IS AVAILABLE ABOUT EFFECTS OF INJECTION OF ABLATION PRODUCTS. FOR A CONFIGURATION LIKE THE APOLLO, THE SITUATION IS FURTHER COMPLICATED BY THE FACT THAT THE DOWNSTREAM FLOW CAN BE EITHER ATTACHED AND SEPARATED FLOWS, THE INFLUENCE OF ABLATED GASES IS ALSO LIKELY TO BE DIFFERENT. IN THIS REPORT, AN EXPERIMENTAL INVESTIGATION OF THE HEAT TRANSFER AND PRESSURES TO THE AFTERBODY OF AN APOLLO MODEL WITH AN ABLATING TEFLON NOSE CAP IS PRESENTED AND COMPARED WITH APPROXIMATE THEORIES DEVELOPED HEREIN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 COPY

ABLATION + BOUNDARY LAYER + FLOW THEORY AND EXPERIMENTS + FLOW, HIGH SPEED + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + REENTRY, ATMOSPHERIC

5-13644 RESEARCH AND DEVELOPMENT REPORT 198. ANALYSIS DATA CORRELATION AND OPTIMIZATION OF THE VAPOR REHEAT LIQUID-LIQUID HEAT EXCHANGE PROCESS
RESEARCH TRIANGLE INSTITUTE, DURHAM, NORTH CAROLINA
61 PAGES, SEPTEMBER 1966

THE BEHAVIOR OF LIQUID-LIQUID SPRAY TOWERS WAS STUDIED TO DETERMINE THE EFFECTS OF OIL AND WATER-PHASE MIXING ON THE HEAT-TRANSFER EFFICIENCY. IT IS SHOWN THAT THE RESISTANCE TO HEAT FLOW TO INDIVIDUAL OIL DROPLETS CONTRIBUTES A NEGLIGIBLY SMALL COMPONENT TO THE OVERALL RESISTANCE IN COMPARISON TO THE LARGE DECREASE IN THE EFFECTIVE THERMAL DRIVING FORCE CAUSED BY FLUID MIXING. EXPERIMENTAL VALUES FOR PECLET NUMBERS FOR BOTH OIL AND WATER PHASES IN 3- AND 6-INCH-DIAM SPRAY TOWERS OF THE ELGIN TYPE HAVE BEEN OBTAINED. THE PROCEDURE IS BASED ON A RADIOISOTOPE TRACING TECHNIQUE WHEREIN THE TRANSIENT RESPONSE TO SMALL AMOUNTS OF THE RADIOTRACER INJECTED INTO THE OIL OR WATER-PHASE INLETS CAN BE FITTED NUMERICALLY TO APPROPRIATE FORMULAS DERIVED FROM SOLUTIONS OF THE DIFFERENTIAL EQUATIONS REPRESENTING THE AXIAL MIXING PHENOMENON. THESE FORMULAS ARE MORE GENERAL THAN HAVE BEEN PRESENTED IN THE LITERATURE TO DATE AND DO NOT DEPEND UPON A SPECIAL INLET SIGNAL FORM.

AVAILABILITY - U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402, \$0.50

*FLOW, TWO PHASE + *HEAT EXCHANGER + *HEAT TRANSFER CORRELATION + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + SPRAY, GENERAL

5-13693 KUDRYAVTSEV YV
UNSTEADY STATE HEAT TRANSFER
160 PAGES, 46 FIGURES, 8 TABLES, 37 REFERENCES, 1966

THE AUTHORS PRESENT NEW METHODS WHICH THEY HAVE DEVELOPED AND WHICH ARE FREE FROM THE LIMITATIONS OF THE FORMER METHODS OF INVESTIGATING BOUNDARY CONDITIONS OF HEATING OR COOLING. PROBLEMS IN WHICH THE HEAT TRANSFER SURFACE IS SUBJECT TO PHASE CONVERSIONS, CHEMICAL REACTIONS AND MECHANICAL DESTRUCTION ARE ALSO DISCUSSED. A QUANTITATIVE EXPERIMENTAL STUDY OF THE UNSTEADY THERMAL STATE USING ELECTRON BEAM HEATING IS DESCRIBED. THIS IS THE ONLY KNOWN METHOD OF FORCIBLY INTRODUCING A PREDETERMINED HEAT FLOW THROUGH A SPECIMEN SURFACE. THE PRACTICAL IMPOSSIBILITY OF FULFILLING THE REQUIREMENTS OF THE THEORY OF SIMILARITY WITH REGARD TO BOUNDARY CONDITIONS DURING UNSTEADY STATE HEAT TRANSFER IS POINTED OUT, AND A NEW EXPRESSION IS GIVEN TO FULFILL THESE REQUIREMENTS.

AVAILABILITY - ILIFFE BOOKS, LTD, DORSET HOUSE STAMFORD STREET, LONDON, S.E.1, ENGLAND, \$5.60 CY

*HEAT TRANSFER + *TEMPERATURE TRANSIENT + HEAT CONDUCTION + HEAT TRANSFER ANALYSIS + HEAT TRANSFER EXPERIMENT + HEAT TRANSFER, CONVECTION + PHASE CHANGE

5-13694 SANDERS JP
ORNL VERSION OF THEME 1 CODE - A THERMAL HYDRAULIC CODE FOR ANALYSIS OF THE HOT CHANNEL IN A FUEL BUNDLE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4015 +. 45 PAGES, 1 FIGURE, 1 TABLE, NOVEMBER 1966

THIS CODE WAS ORIGINALLY WRITTEN IN A FORM OF FORTRAN FOR THE IBM 7070 BY COMBUSTION ENGINEERING, INC., FOR USE IN THE HWOCR DESIGN STUDY. IT HAS BEEN CONVERTED TO FORTRAN IV FOR USE WITH THE IBM 7090 AT ORNL. THE CODE IS DESIGNED TO STUDY THE EFFECT OF THE DESIGN PARAMETERS ON THE THERMAL AND HYDRAULIC CONDITIONS FOR AXIAL FLOW WITH INTERSUBCHANNEL MIXING IN FUEL BUNDLES. THE PROGRAM ESSENTIALLY EXAMINES THE CONDITIONS IN THE HOT SUBCHANNEL AND REPRESENTS THE REMAINDER OF THE FLOW CHANNEL BY ITS THERMAL AND HYDRAULIC EQUIVALENTS. AFTER SPECIFYING THE MAJOR REACTOR CHARACTERISTICS, ONE OF THREE OPTIONS MAY BE SELECTED TO SEARCH FOR ACCEPTABLE VALUES OF CERTAIN PARAMETERS WITHIN THE DESIGN LIMITATIONS. THESE ARE (1) THE ORIFICING FACTOR, (2) THE CHANNEL AVERAGE VELOCITY, AND (3) THE REACTOR TEMPERATURE CHANGE. ALL THESE OPTIONS SELECT THE CORRESPONDING NUMBER OF TOTAL REACTOR FLOW CHANNELS. IN A FOURTH OPTION, THE NUMBER OF FLOW CHANNELS IS SPECIFIED, AND THE RESULTANT THERMAL CONDITIONS ARE CALCULATED. MIXING IS REPRESENTED BY A MIXING FACTOR THAT GIVES THE RATIO OF THE DIFFERENCES IN THE TEMPERATURE CHANGE WITHOUT MIXING AND WITH MIXING TO THE DIFFERENCES WITHOUT MIXING AND WITH COMPLETE MIXING. THERMAL CONDITIONS ARE CALCULATED AT THOSE POINTS PRESELECTED BY THE INPUT FLUX INFORMATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 CY, \$0.65 MF

CATEGORY 5
ACCIDENT ANALYSIS

5-13694 *CONTINUED*

*COMPUTER PROGRAM + *COMPUTER, DIGITAL + *HEAT TRANSFER, CONVECTION + *HOT SPOT + HEAT TRANSFER +
HEAT TRANSFER ANALYSIS

5-13695 MORRISON DL + GENCO JM + GIESEKE JA + RITZMAN RL + WALTERS CT + WOOTON RO
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR
ACCIDENT. QUARTERLY PROGRESS REPORT, JULY-SEPTEMBER 1966
BATTTELLE MEMORIAL INSTITUTE
BMI-1777 +. 28 PAGES, 4 FIGURES, 35 REFERENCES, OCTOBER 1, 1966

THE FOLLOWING AREAS OF A REACTOR ACCIDENT ARE PRESENTED - COOLANT SHUTDOWN, HEAT TRANSFER AND
THERMODYNAMICS, FISSION-PRODUCT CHEMISTRY, AND AEROSOL AND PARTICLE DYNAMICS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 CY, \$0.50 MV.

*ACCIDENT ANALYSIS + *ACCIDENT, CONSEQUENCES + *FISSION PRODUCT TRANSPORT + ACCIDENT, GENERAL +
AEROSOL PROPERTIES + FISSION PRODUCT RELEASE, GENERAL + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER +
THERMODYNAMICS

5-13696 ANDERSEN R + MOYER CB
STUDY OF A PROPOSED HEAT TRANSFER EXPERIMENT WITH A MULTIROD ELEMENT, DOR DESIGN STUDY
DANISH ATOMIC ENERGY COMMISSION, RISØE. RESEARCH ESTABLISHMENT
RISO-124 +. 140 PAGES, 1 TABLE, 7 FIGURES, DECEMBER 1964

THE REPORT DESCRIBES VARIOUS CONSIDERATIONS PERTINENT TO THE DESIGN OF EXPERIMENTS TO OBTAIN
HEAT TRANSFER INFORMATION ABOUT THE DOR 19-ROD BUNDLE FUEL ELEMENT. A COMPARISON OF ANALYSES
AND DATA AVAILABLE IN THE LITERATURE SHOWS THAT THE LUMPED PARAMETER OR FINITE DIFFERENCE
TYPE OF ANALYSIS SUCH AS THAT DESCRIBED BY KATTCHEE AND REYNOLDS CAN YIELD FAIRLY ACCURATE
PREDICTIONS OF CANNING TEMPERATURES. APPLIED TO TYPICAL DOR CASES, THE ANALYSIS PREDICTS
PERIPHERAL CANNING TEMPERATURE VARIATIONS OF APPROXIMATELY 5 C ABOUT THE MEAN PROVIDED THAT
THE FUEL RODS ARE PROPERLY ALIGNED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM,
WISCONSIN 54669

FUEL ELEMENT + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-13697 SHOTKIN LM
THE FLOW OF BOILING WATER IN HEATED PIPES
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
12 PAGES, 11 FIGURES, 1 TABLES, 29 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING 26(3), PAGES 293-304
(NOVEMBER 1966)

A SPATIAL-AVERAGED MODEL OF A BOILING HYDRAULIC CHANNEL IS PRESENTED. LINEARIZED ANALYTICAL
RESULTS ARE COMPARED, WITH REASONABLY GOOD AGREEMENT, WITH SEVERAL TRANSFER FUNCTIONS
MEASURED BY ZIVI, WRIGHT ET AL. IN A BOILING LOOP AT ATMOSPHERIC PRESSURE USING BOTH NATURAL
AND FORCED CIRCULATION. THE NECESSITY OF APPLYING A HEAT SOURCE CORRECTION TO THE
EXPERIMENTAL DATA IS DISCUSSED, AND THE ROLE THAT THE DYNAMIC PRESSURE PLAYS IS PRESENTED.
THE PHYSICAL MECHANISM CAUSING THE EXPERIMENTALLY OBSERVED HYDRAULIC INSTABILITY IS SHOWN TO
BE AN INTERACTION BETWEEN THE TRANSIENT FLOW AND FRICTION PRESSURE DROP IN THE TWO-PHASE
REGION. THE EXPERIMENTALLY OBSERVED INCREASE IN UNSTABLE OSCILLATION FREQUENCY WITH INVERSE
BOILING LENGTH IS ALSO SHOWN ANALYTICALLY. THE POSITION OF THE BOILING BOUNDARY IN THE
CHANNEL IS SHOWN TO BE IMPORTANT IN STABILITY CONSIDERATIONS. BY COMPARING ANALYTICAL
RESULTS WITH EXPERIMENTAL DATA OF WISSLER ET AL. AND BECKER ET AL., IT IS CONCLUDED THAT THE
LFAST-STABLE SITUATION OF THE BOILING BOUNDARY IS DIRECTLY RELATED TO THE DEGREE OF
SUBCOOLING. THE EXISTENCE OF THIS CRUCIAL POSITION IS USED TO EXPLAIN THE INFLUENCE OF
SUBCOOLING ON STABILITY.

*FLOW STABILITY + *FLOW, TWO PHASE + FLOW, TUBE + HEAT TRANSFER + HEAT TRANSFER, BOILING

5-13698 HSU CJ
LAMINAR HEAT TRANSFER IN A HEXAGONAL CHANNEL WITH INTERNAL HEAT GENERATION AND UNEQUALLY HEATED SIDES
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
14 PAGES, 9 FIGURES, 6 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING 26(3) PAGES 305-318 (NOVEMBER 1966)

THE HEAT TRANSFER CHARACTERISTICS FOR THE CASE OF LAMINAR FLOW THROUGH A HEXAGONAL CHANNEL
HAVE BEEN DETERMINED FOR THE FOLLOWING CONDITIONS - THE UNIFORM HEAT FLUX ON ANY ONE SIDE OF
THE HEXAGON IS IDENTICAL TO THAT ON THE OPPOSITE SIDE, AND MAY BE EQUAL TO OR DIFFERENT THAN
THOSE ON THE TWO ADJACENT SIDES - BOTH THE VELOCITY AND TEMPERATURE PROFILES ARE FULLY
ESTABLISHED - THE HEAT TRANSFER FROM THE WALLS MAY OR MAY NOT BE ACCOMPANIED BY SIMULTANEOUS
INTERNAL HEAT GENERATION IN THE FLOWING FLUID. FUNDAMENTAL TEMPERATURE SOLUTIONS AND
EQUATIONS ARE PRESENTED WHICH MAY BE USED TO PREDICT THE TEMPERATURE FIELD, OR TO CALCULATE
THE DIFFERENCE BETWEEN LOCAL WALL TEMPERATURE AND THE BULK FLUID TEMPERATURE FOR A VARIETY OF
CASES. METHODS OF PREDICTING THE VARIATION OF LOCAL WALL TEMPERATURE ARE ILLUSTRATED FOR
SEVERAL TYPICAL CASES, INCLUDING THE CASE OF UNIFORMLY DISTRIBUTED WALL HEAT FLUX. FOR THE
LATTER CASE, IT WAS FOUND THAT APPRECIABLE TEMPERATURE VARIATION EXISTS ALONG THE PERIPHERY
OF THE HEXAGON. THE CIRCUMFERENTIAL VARIATION OF THE LOCAL AND THE MEAN NUSSLETT NUMBER ARE
ALSO REPORTED, WITH AND WITHOUT INTERNAL HEAT GENERATION.

*FLOW, LAMINAR + *HEAT CONDUCTION + *HEAT GENERATION, INTERNAL + *HEAT TRANSFER, CONVECTION +
HEAT TRANSFER + HEAT TRANSFER ANALYSIS

CATEGORY 5
ACCIDENT ANALYSIS

5-13699 ROWE DS + MCFERON DE
MAXIMUM TEMPERATURES IN A FLAT-PLATE FUEL ELEMENT WITH FUEL-CLAD BONDING DEFECTS
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON + UNIVERSITY OF WASHINGTON, SEATTLE
10 PAGES, 14 FIGURES, 1 TABLE, 8 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING 26(3) PAGES 319-328 (NOVEMBER 1966)

THIS PAPER PRESENTS A MATHEMATICAL MODEL THAT DESCRIBES THE HEAT TRANSFER IN A DEFECTIVELY BONDED FLAT-PLATE FUEL ELEMENT. THE BOND DEFECT IS ASSUMED TO EXIST ONLY ON ONE SIDE OF THE FUEL PLATE AND TO BE EITHER A CIRCULAR SPOT OR INFINITE STRIP IN SHAPE. DETAILS OF THE GENERAL SOLUTION TO THE HEAT CONDUCTION EQUATION FOR THE MATHEMATICAL MODEL ARE SHOWN FOR THE STRIP-TYPE DEFECT. FOR A PARTICULAR TYPE OF DEFECT, THE TEMPERATURE DISTRIBUTION IS DEPENDENT UPON THREE DIMENSIONLESS PARAMETERS THAT INCLUDE THE EFFECTS OF DEFECT SIZE AND THE HEAT TRANSFER PROPERTIES OF THE DEFECTIVE FUEL ELEMENT. DATA ARE PROVIDED IN TERMS OF THE THREE DIMENSIONLESS PARAMETERS THAT PERMIT RAPID ESTIMATES OF FUEL TEMPERATURES IN FUEL PLATES WITH STRIP AND SPOT DEFECTS. THESE DEFECTS ARE ASSUMED TO BE STEP REDUCTIONS IN THE NORMAL FUEL-BOUNDARY CONDUCTANCE. DEFECT SIZES ON THE ORDER OF A COUPLE OF FUEL THICKNESSES CAN CAUSE SIGNIFICANT LOCAL INCREASES IN THE FUEL TEMPERATURE AND FUEL-SURFACE HEAT FLUX.

*CLAD + *FAILURE, CLADDING + *FUEL ELEMENT + *HEAT CONDUCTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + INCIDENT, ACTUAL, GENERAL + PRTR (PLUTONIUM RECYCLE TEST REACTOR)

5-13700 HIMMELSLAU DM + BISCHOFF KB
MASS TRANSFER -- ANNUAL REVIEW
UNIVERSITY OF TEXAS
10 PAGES, 28 TABLES, 272 REFERENCES, INDUSTRIAL AND ENGINEERING CHEMISTRY 58(12) PAGES 32-41 (DECEMBER 1966)

THIS IS THE ANNUAL REVIEW OF MASS TRANSFER SPECIAL INTEREST TABLES, WITH BRIEF DESCRIPTIONS OF THE NATURE AND SCOPE OF THE WORK COVERED IN THE LITERATURE DURING THE PAST YEAR, HIGHLIGHT THE REVIEW. IT COVERS THE PERIOD IMMEDIATELY FOLLOWING THAT COVERED BY THE LAST ANNUAL REVIEW (IND. ENG. CHEM. 57(54)(1965)) AND IS IN ESSENTIALLY THE SAME FORMAT TO PROVIDE CONTINUITY. ALTHOUGH THE REVIEW IS RELATIVELY COMPLETE FOR CHEMICAL ENGINEERING INTERESTS, IT IS BY NO MEANS EXHAUSTIVE. A FEW SELECTED PAPERS ARE DISCUSSED, BUT THE BULK OF THE REVIEW CONSISTS OF SPECIAL-INTEREST TABLES WITH BRIEF DESCRIPTIONS OF THE NATURE AND SCOPE OF THE REPORTED WORK. THE FOLLOWING TOPICS ARE REVIEWED - MOLECULAR DIFFUSION, TURBULENT DIFFUSION, TURBULENT DIFFUSION AND DISPERSION, CHEMICAL REACTOR APPLICATIONS, GENERAL MIXING PROCESSES, GENERAL POPULATION BALANCES, AGE DISTRIBUTION FUNCTION APPLICATIONS, MIXING IN STIRRED TANKS AND FLUIDIZED BEDS, INTERPHASE MASS TRANSFER, SIMULTANEOUS HEAT AND MASS TRANSFER, INTERFACIAL PHENOMENA, PORE DIFFUSION IN SOLIDS, AND OTHER MISCELLANEOUS TOPICS.

FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + MASS TRANSFER + PARTICLE SIZE + PARTICLE SIZE DISTRIBUTION + PARTICULATE

5-13701 FERRELL JK + STAHEL EP
HEAT TRANSFER -- ANNUAL REVIEW
NORTH CAROLINA STATE UNIVERSITY
12 PAGES, 10 FIGURES, 724 REFERENCES, INDUSTRIAL AND ENGINEERING CHEMISTRY 58(12) PAGES 42-54 (DECEMBER 1966)

THIS IS AN ANNUAL REVUE OF THE HEAT TRANSFER LITERATURE. AS IN PAST YEARS THIS REVIEW COVERS THE YEAR PRECEDING MARCH 1966. THE MAJOR CONFERENCE OF THE YEAR WAS THE EIGHTH A.I.C.H.E.-A.S.M.E. JOINT HEAT TRANSFER CONFERENCE HELD IN LOS ANGELES IN AUGUST 1965. WE HAVE ALSO INCLUDED THE PAPERS PRESENTED AT THE THIRD INTERNATIONAL HEAT TRANSFER CONFERENCE HELD IN CHICAGO IN AUGUST 1966. THIS CONFERENCE WAS THE LARGEST TO DATE WITH 177 PAPERS BEING PRESENTED AND PUBLISHED IN THE PROCEEDINGS. THE REFERENCES FOR THIS REVIEW WERE SELECTED AS BEING OF GREATEST USE TO THE CHEMICAL PROCESS INDUSTRY. THE FOLLOWING SUBJECTS ARE REVIEWED - THERMAL PROPERTIES AND MEASUREMENTS, HEAT TRANSFER IN EQUIPMENT, CONDUCTION HEAT TRANSFER, CONVECTION, HIGH VELOCITY HEAT TRANSFER, RADIATION HEAT TRANSFER, BOILING HEAT TRANSFER WITH CHEMICAL REACTION, AND COUPLED TRANSPORT PROPERTIES.

CHEMICAL REACTION + CONDENSATION + FLOW, HIGH SPEED + FLOW, LAMINAR + FLOW, TURBULENT + HEAT CONDUCTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER EXPERIMENT + HEAT TRANSFER, BOILING + HEAT TRANSFER, CONVECTION + HEAT TRANSFER, RADIANT

5-13702 SINGER RM
EXPERIMENT ON WATER EXPULSION FOLLOWING RAPID TRANSIENT HEATING
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
4 PAGES, 1 FIGURE, ANS TRANSACTIONS 9(2), PAGE 550, 1966 WINTER MEETING, PITTSBURGH, PENNSYLVANIA, OCTOBER 30 - NOVEMBER 3, 1966

IN THE INVESTIGATION OF THE EXPULSION OF WATER FROM SIMULATED REACTOR CHANNELS CAUSED BY RAPID TRANSIENT HEATING, SEVERAL INTERESTING RESULTS HAVE BEEN OBTAINED. THE EXPERIMENTAL APPARATUS CONSISTED OF A THIN-WALL (0.005 IN. WALL X 0.750 IN. DIAM) STAINLESS-STEEL TUBE WITH AN OUTER CONCENTRIC QUARTZ PIPE (ANNULAR SPACING OF 0.125 IN.). THE ANNULAR SYSTEM WAS CLOSED AT THE BOTTOM AND OPEN TO THE ATMOSPHERE AT THE TOP. WATER WAS CONTAINED IN THE ANNULUS, AND THE INNER STEEL TUBE WAS HEATED OVER A 10-IN. LENGTH. THE PRESSURE OF THE WATER NEAR THE HEATED SURFACE WAS MEASURED AS WELL AS THE WATER TEMPERATURE - HIGH SPEED MOTION PICTURES WERE TAKEN OF THE HEATED SURFACE AND THE LIQUID-VAPOR INTERFACE. OBSERVATION OF THE HIGH-SPEED (2000 TO 6000 FRAMES PER SECOND) FILM REVEALED THE BEHAVIOR OF THE WATER DURING THESE HEATING TRANSIENTS. THE FIRST SMALL PRESSURE PULSE CORRESPONDS TO THE SUDDEN GROWTH OF VAPOR BUBBLES WHICH ACCELERATES THE WATER AWAY FROM THE HEATED SURFACE. FOR HIGHLY SUBCOOLED WATER, THE VAPOR RECONDENSES CAUSING A PARTIAL VACUUM AND THE WATER FALLS BACK TO THE STILL HOT TEST SECTION AFTER AN UPWARD MOTION OF LESS THAN 1 CENTIMETER, AND VIOLENTLY RE-VAPORIZES, CAUSING ANOTHER PRESSURE PULSE - THE LIQUID AGAIN IS ACCELERATED UPWARD AND THE

CATEGORY 5
ACCIDENT ANALYSIS

5-13702 *CONTINUED*

VAPOR RECONDENSES, RESULTING IN A PARTIAL VACUUM, PULLING BACK THE LIQUID. THIS CYCLE REPEATS UNTIL THE HEATED SURFACE HAS SUFFICIENTLY COOLED SO AS TO NOT FURTHER VAPORIZE THE WATER. THE INITIAL PRESSURE PULSES WHICH ACCELERATE THE LIQUID INCREASE IN MAGNITUDE WITH INCREASED ENERGY GENERATION RATE AND INITIAL WATER TEMPERATURE AS DO THE EXPULSION VELOCITIES. THE SECONDARY PULSES CAUSED BY THE COLLAPSING OF THE VOIDS INCREASE GENERALLY WITH INCREASING ENERGY GENERATION RATE AND INCREASE, REACH A MAXIMUM, AND DECREASE WITH INITIAL WATER TEMPERATURE.

*BLOWDOWN + FLOW STABILITY + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + TEMPERATURE TRANSIENT

5-13703 BUMP TR

COOLANT MIXING IN FUEL SUBASSEMBLIES
ARGONNE NATIONAL LABORATORY

4 PAGES, 1 TABLE, 8 REFERENCES, ANS TRANSACTIONS 9(2), PAGE 571, 1966 WINTER MEETING, PITTSBURGH, PENNSYLVANIA, OCTOBER 30 - NOVEMBER 3, 1966

THIS PAPER DISCUSSES THREE TOPICS RELATED TO THE TITLE - (1) A PHOTOMETRIC METHOD OF EVALUATING MIXING, (2) A METHOD OF CORRELATING MIXING DATA, AND (3) EFFECTS OF MIXING ON EBR-II-1 COOLANT TEMPERATURES.

*FLOW, CROSS + FLOW THEORY AND EXPERIMENTS + FUEL ELEMENT + HEAT TRANSFER

5-13704 WALTERS CT + RAINES GE

HEAT TRANSFER ANALYSES IN LOSS-OF-COOLANT ACCIDENTS
BATTELLE MEMORIAL INSTITUTE

27 PAGES, 2 TABLES, 6 FIGURES, 32 REFERENCES, ANS TRANSACTIONS 9(2), PAGE 555, 1966 WINTER MEETING, PITTSBURGH, PENNSYLVANIA, OCTOBER 30 - NOVEMBER 3, 1966

A COMPUTER PROGRAM WAS WRITTEN FOR THE COMPREHENSIVE ANALYSIS OF CORE-PRESSURE VESSEL HEAT TRANSFER DURING A LOSS-OF-COOLANT ACCIDENT. THE PROGRAM, NURLOC, IS BASED UPON A GENERALIZED PROCEDURE FOR NUMERICALLY SOLVING THE TWO-DIMENSIONAL HEAT-CONDUCTION EQUATION OVER SEVERAL CONNECTED REGIONS, WITH VARIOUS COMPLICATING FACTORS SPECIFIC TO THIS APPLICATION. A VARIABLE-INTERVAL RECTANGULAR MESH IS SUPERIMPOSED UPON THE PROBLEM GEOMETRY, WHICH IS ASSUMED TO BE AXISYMMETRIC. WITH THE EXPLICIT FORM, THE TEMPERATURE AT EACH MESH POINT IS CALCULATED IN TERMS OF THE TEMPERATURES AT A TIME EARLIER BY A SMALL FINITE TIME INCREMENT. BOUNDARY CONDITIONS AND HEAT GENERATION RATES ARE SET BY MODELS WHICH CHARACTERIZE VARIOUS COMPLEX CHEMICAL AND PHYSICAL PROCESSES WHICH CAN OCCUR DURING AN ACCIDENT. THE APPLICABILITY OF THE MODEL IS DEMONSTRATED USING LOFT REACTOR CHARACTERISTICS.

*ACCIDENT, LOSS OF COOLANT + *TEMPERATURE TRANSIENT + BLOWDOWN + FLOW THEORY AND EXPERIMENTS + HEAT CONDUCTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-13705 FENECH H + GUERON HM

THE SYNTHESIS METHOD OF UNCERTAINTY ANALYSIS IN NUCLEAR REACTOR THERMAL DESIGN
MASSACHUSETTS INSTITUTE OF TECHNOLOGY + COMMISSARIAT A L'ENERGIE ATOMIQUE, FRANCE

23 PAGES, 6 TABLES, 2 FIGURES, 13 REFERENCES, ANS TRANSACTIONS 9(2), PAGE 563. 1966 WINTER MEETING, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966

THE DIFFERENCE BETWEEN THE MAXIMUM ACCEPTABLE VALUE AND THE MAXIMUM DESIGN VALUE OF THE PARAMETERS IS AN IMPORTANT ELEMENT INFLUENCING THE LEVEL OF POWER AT WHICH THE REACTOR IS TO OPERATE, AND HENCE ITS ECONOMICS. IT IS THEREFORE IMPORTANT TO DETERMINE THIS DIFFERENCE PRECISELY - UNNECESSARY CAUTIOUSNESS AND LACK OF PRUDENCE CARRY THEIR OBVIOUS PENALTIES IN THE COST OF THE ENERGY PRODUCED AND IN THE RELIABILITY OF THE SYSTEM. OUR PURPOSE IN THIS PAPER IS TO CRITICALLY REVIEW THE METHODS THROUGH WHICH THIS PROBLEM HAS BEEN APPROACHED AND TO PROPOSE A NEW ONE, THE SYNTHESIS METHOD, WHICH WE FEEL TO BE MORE PRACTICAL AND RATIONAL THAN THOSE NOW IN USE. WE SHALL ILLUSTRATE THESE VARIOUS METHODS IN THEIR APPLICATION TO ONE SPECIFIC CASE.

*HOT SPOT + *STATISTICAL ANALYSIS + HEAT TRANSFER

5-13706 GOLDSTEIN ME + YANG WJ + CLARK JA

BOUNDARY LAYER ANALYSIS OF TWO-PHASE (LIQUID-GAS) FLOW OVER A CIRCULAR CYLINDER AND OSCILLATING FLAT PLATE
MICHIGAN UNIVERSITY, ANN ARBOR

ARL-66-0010, PT. IV +. 336 PAGES, 27 FIGURES, JANUARY 1966

AN ANALYSIS IS CARRIED OUT OF A TWO PHASE (GAS/LIQUID) FLOW OVER A CIRCULAR CYLINDER AND OVER AN OSCILLATING FLAT PLATE. THE FLOW IS ASSUMED TWO DIMENSIONAL AND GRAVITY, VAPORIZATION OF THE LIQUID PHASE, AND COMPRESSIBILITY ARE IGNORED. THE LIQUID IS ASSUMED TO BE IN THE FORM OF SMALL DROPS FAR UPSTREAM FROM THE BODY. THE LIQUID FILM WHICH FORMS ON THE SURFACE OF THE BODY DUE TO DROP IMPINGEMENT IS ANALYZED EXTENSIVELY. IN THE CASE OF THE CYLINDER THE ANALYSIS IS STARTED FROM THE FULL INCOMPRESSIBLE NAVIER-STOKES AND ENERGY EQUATIONS IN THE FILM WHICH ARE SIMPLIFIED BY USING DIMENSIONAL ARGUMENTS. THE ORDER OF MAGNITUDE OF THE PHYSICAL PROPERTIES OF THE FLUIDS IS TAKEN TO BE THOSE OF AIR/WATER MIXTURES. THE SOLUTIONS ARE USED TO CALCULATE VELOCITY AND TEMPERATURE PROFILES IN THE FILM AND ALSO SUCH PHYSICAL QUANTITIES AS LOCAL FILM THICKNESS, LOCAL NUSSELT NUMBER, AND LOCAL SKIN FRICTION. THE ANALYSIS SHOWS THAT IN GENERAL THERE IS A SIGNIFICANT INCREASE IN HEAT TRANSFER AS WELL AS SKIN FRICTION OVER WHAT WOULD BE OBTAINED FROM A SINGLE COMPONENT GAS FLOW. IN THE CASE OF THE FLAT PLATE ONLY A VERY SMALL PERMANENT CHANGE IN THE HEAT TRANSFER WAS FOUND DUE TO THE OSCILLATIONS. IN THE CASE OF THE CYLINDER, A PEAKING IN THE HEAT TRANSFER, FILM THICKNESS, AND SKIN FRICTION WAS FOUND WITH RESPECT TO THE PARAMETER E-2 (THE PRODUCT OF THE VOLUME

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5-13706 *CONTINUED*

FRACTION OF THE LIQUID IN THE FREE STREAM, SQUARED, AND THE DIAMETER REYNOLDS NUMBER BASED ON LIQUID PROPERTIES). THE PEAKING OCCURS AT A VALUE OF THIS PARAMETER OF ABOUT UNITY. THE THEORETICAL PREDICTION COMPARES FAVORABLY WITH THE EXPERIMENTAL RESULTS OF ACRIVOS ET AL. (ARL-64-116).

AVAILABILITY - DEFENSE DOCUMENTATION CENTER, CAMERON STATION, ALEXANDRIA, VIRGINIA

*BOUNDARY LAYER + FLOW THEORY AND EXPERIMENTS + FLOW, TWO PHASE + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-13707 SMITH W + HAMMITT FG

NATURAL CONVECTION IN A RECTANGULAR CAVITY WITH INTERNAL HEAT GENERATION
UNIVERSITY OF MICHIGAN, ANN ARBOR

15 PAGES, 2 TABLES, 16 FIGURES, 9 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING 25(4) PAGES 328-342 (AUGUST 1966)

APPLICATIONS TO NUCLEAR REACTORS HAVE REVIVED INTEREST IN NATURAL CONVECTION. A RECTANGULAR CLOSED CAVITY WITH INTERNAL HEAT GENERATION AND WALL-COOLING ROUGHLY SIMULATING A CHANNEL OF AN INTERNALLY-COOLED HOMOGENEOUS REACTOR CORE HAS BEEN STUDIED THEORETICALLY AND EXPERIMENTALLY. THE BASIC EQUATIONS OF CONTINUITY, NAVIER-STOKES, AND A MODIFIED ENERGY RELATION INCLUDING A VOLUMETRIC HEAT SOURCE ARE NORMALIZED TO SHOW THE DEPENDENCE ON THE FOLLOWING NONDIMENSIONAL PARAMETERS - (I) NUSSELT NUMBER BASED ON WIDTH - (II) PRANDTL NUMBER, AND (III) PRODUCT OF RAYLEIGH NUMBER BASED ON WIDTH AND ASPECT RATIO, A/B , OF THE CAVITY. THE COMPLEXITY OF THESE EQUATIONS ALLOWS ONLY NUMERICAL SOLUTIONS, WHICH ARE OBTAINED FOLLOWING A MODIFIED SQUIRES METHOD CONSISTING IN ASSUMING TEMPERATURE AND VELOCITY PROFILES. THESE ARE SUBSTITUTED INTO THE NONDIMENSIONAL EQUATIONS, AND INTEGRATED ACROSS THE CAVITY, RESULTING IN A STILL COMPLEX SYSTEM OF DIFFERENTIAL EQUATIONS IN WHICH THE DEPENDENT VARIABLES AND UNKNOWN FUNCTIONS ARE THE THICKNESS, VELOCITY, AND TEMPERATURE OF THE RISING CORE OF FLUID. THE COEFFICIENTS IN THE EQUATIONS ARE FUNCTIONS OF THE CORE THICKNESS, MORE OR LESS COMPLICATED ACCORDING TO THE VELOCITY AND TEMPERATURE PROFILES ASSUMED. TWO CASES ARE CONSIDERED - A SIMPLIFIED TEMPERATURE PROFILE, AS USED BY LIGHTHILL - AND A MORE SOPHISTICATED PROFILE WITH A POSITIVE MAXIMUM. BOTH VELOCITY PROFILES ARE LIGHTHILLS. THE PARALLEL EXPERIMENTAL STUDY CONFIRMS THE EXISTENCE OF A POSITIVE MAXIMUM IN THE TEMPERATURE PROFILE, PREVIOUSLY NOT REPORTED. INTRODUCTION OF THIS INNOVATION IN THE THEORETICAL TREATMENT LEADS TO EXCELLENT AGREEMENT WITH EXPERIMENTAL RESULTS. SEMIQUANTITATIVE EXPERIMENTAL DATA ON THE VELOCITY FIELD ALSO INDICATE THE EXISTENCE OF A POSITIVE MAXIMUM IN THE VELOCITY PROFILE UNTIL NOW NOT REPORTED.

*HEAT GENERATION, INTERNAL + *HEAT TRANSFER, CONVECTION + *HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-13708 DWYER OE

ANALYTICAL STUDY OF HEAT TRANSFER TO LIQUID METALS FLOWING IN-LINE THROUGH CLOSELY PACKED ROD BUNDLES
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK

16 PAGES, 3 TABLES, 18 FIGURES, 18 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING 25(4) PAGES 343-358 (AUGUST 1966)

CIRCUMFERENTIAL VARIATIONS OF TEMPERATURE AND LOCAL HEAT TRANSFER COEFFICIENTS WERE OBTAINED FOR SODIUM FLOWING IN-LINE THROUGH A STAGGERED ROD BUNDLE. THE CONDITIONS OF THE STUDY WERE - TURBULENT FLOW, UNIFORM HEAT FLUX FROM THE SURFACES OF ALL RODS, AND FULLY DEVELOPED VELOCITY AND TEMPERATURE PROFILES. THE RODS WERE SPACED IN AN EQUILATERAL TRIANGULAR ARRAY, AND THE PITCH-DIAMETER (P/D) RATIO WAS VARIED DOWN TO 1.10. IT WAS SHOWN THAT THE ANNULUS MODEL IS SATISFACTORY FOR ESTIMATING AVERAGE HEAT TRANSFER COEFFICIENTS FOR P/D RATIOS DOWN TO ABOUT 1.3, BUT BELOW THIS, IT GIVES INCREASINGLY HIGH RESULTS, E.G., AT P/D EQUALS 1.10, AN ANNULUS-MODEL COEFFICIENT CAN BE HIGH BY ABOUT A FACTOR OF 2. IT WAS FOUND THAT CIRCUMFERENTIAL TEMPERATURE VARIATIONS ARE NOT LARGE, E.G., AT P/D EQUALS 1.10, THIS VARIATION IS ABOUT TWICE THE AVERAGE TEMPERATURE DROP FROM THE ROD SURFACE TO FLOWING METAL.

*FUEL ELEMENT + FLOW, AXIAL + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + METAL, LIQUID

5-13884 PHYSICS DEPARTMENT PROGRESS REPORT, FEBRUARY - MAY, 1966

LAWRENCE RADIATION LABORATORY

UCRL-50001-66-1 +. 79 PAGES, FIGURES, TABLES, REFERENCES, MAY 1966

OF POSSIBLE SAFETY INTEREST ARE THE COMPILATION OF SHOCK WAVE DATA (PAGE 51), AND THE EXPERIMENTAL DETERMINATION OF THE COMPRESSIBILITY OF ATOMIC SHELLS (PAGE 51). BOTH ITEMS RELATE TO THE EQUATION-OF-STATE AT HIGH PRESSURE WHICH IS USED IN COMPILATIONS OF HYPOTHETICAL VERY LARGE EXPLOSIONS OF FAST REACTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY

*EQUATION OF STATE

5-14389 CORDES OL

COMPARISON OF FISSION PRODUCT RELEASE FROM THE DESTRUCTIVE TESTS OF TWO SNAP 10A/2 REACTORS

PHILLIPS PETROLEUM COMPANY

12 PAGES, 19 FIGURES, 1 TABLE, 7 REFERENCES, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

TWO SNAP 10A/2 REACTORS WERE, BY DELIBERATE EXCURSIONS OF NEARLY \$4-5, TO DEMONSTRATE PUBLIC SAFETY, ONE IN AIR AND ONE IN WATER. 96 PERCENT OF THE NOBLE GASES AND 100 PERCENT OF THE

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5-14389 *CONTINUED*

HALOGENS, TELLURIUM AND SOLIDS WERE RETAINED IN THE WATER-IMMERSION TEST, BECAUSE THE QUENCHING OF THE LOW-TEMPERATURE BULK WATER CAUSED GAS ATOMS TO BE TRAPPED IN THE FUEL MATRIX. COMPLETE RETENTION OF IODINE WAS DUE EITHER TO SORPTION IN WATER, OR COMBUSTION WITH THE FUEL-ELEMENT HYDROGEN. IN THE AIR TEST, 45 PERCENT OF THE TELLURIUM WAS RELEASED, DEMONSTRATING THAT TELLURIUM SHOULD BE CLASSED AS A SOLID ONLY WHEN THE REACTOR CORE STAYS IMMersed IN WATER. THESE TESTS INDICATE THAT THE EXPENSIVE INTEGRAL-REACTOR-DESTRUCTION EXPERIMENTS YIELD BETTER DATA THAN SCALING UP CONSERVATIVELY SMALL CAPSULE DATA.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, 1967

*FISSION GAS RELEASE + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT RETENTION + ACCIDENT ANALYSIS + ACCIDENT, REACTIVITY + FISSION PRODUCT, IODINE + NOBLE GAS + REACTOR, SPACE + SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + TELLURIUM

5-14412 RUBIN BF

EXAMINATION OF A FAILED ROD OPERATING WITH MOLTEN UO₂-ZRO₂-CAO FUEL
BETTIS ATOMIC POWER LABORATORY
WAPD-TM-593 +. 75 PAGES, 6 TABLES, 47 FIGURES, 11 REFERENCES, DECEMBER 1966

A FUEL ROD CONTAINING DISHED-END PELLETS OF ZRO₂ PLUS 6.1 W/O CAO PLUS 33.2 W/O UO₂ RUPTURED AFTER 4.3 EFPD (30 HOURS) OPERATION IN THE ETR L-12 LOOP, AT 1.4 X 10 TO THE 6TH BTJ/HR-FT². THE ROD OPERATED AT FULL POWER FOR 25 MIN AFTER FAILURE TOOK PLACE. THE ROD WAS TO OPERATE WITH 50 PERCENT OF THE FUEL VOLUME WAS MOLTEN, EXTENDING WITHIN 31 MILS OF THE PELLET O.D. DURING A SHUTDOWN, FUEL SHIFTED DOWN TO THE AXIAL FLUX MINIMUM, THE REGION OF FAILURE, THEN MOLTEN FUEL PENETRATED A RADIAL CRACK WITHIN THE PELLET AND MELTED THROUGH THE TUBING. THE FUEL REACTED WITH STEAM, AND THE FUEL-SHEATH CONTACT CONDUCTANCE WAS REDUCED TO 1/6TH, WHEREUPON THE FUEL BECAME LOCALLY MOLTEN NEARLY TO THE PELLET OUTER DIAM. INTENSIVE CLAD HYDRIDING TOOK PLACE FROM RADIOLYTIC DECOMPOSITION IN THE BOTTOM OF THE FUEL STACK, RESULTING IN A LONGITUDINAL CLAD RUPTURE ALONG THE BOTTOM SEVEN PELLETS. IT IS CONCLUDED THAT OPERATION WITH SIGNIFICANT AMOUNTS OF MOLTEN ZRO₂-CAO-UO₂ FUEL MAY LEAD TO TUBING BURN-THROUGHS AND ROD FAILURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*CENTERLINE MELTING + *FAILURE, CLADDING + *FAILURE, FUEL ELEMENT + *URANIUM DIOXIDE + EMBRITTLEMENT + ETR (ENGINEERING TEST REACTOR) + HEAT CONDUCTANCE, FUEL TO CLAD + HYDROGEN + IN PILE LOOP + REACTOR, TEST

5-14448 REDFIELD JA + MARGOLIS SG

TOPS. A FORTRAN PROGRAM FOR THE TRANSIENT THERMODYNAMICS OF PRESSURIZERS
BETTIS ATOMIC POWER LAB.
WAPD-TM-545 +. 38 PAGES, REFERENCES, DECEMBER 1965

THE TOPS PROGRAM IS A DIGITAL SIMULATION OF PRESSURIZER DYNAMICS BASED ON A RIGOROUS APPLICATION OF THE FIRST LAW OF THERMODYNAMICS AND PHENOMOLOGICAL HEAT- AND MASS-TRANSFER LAWS WITH EMPIRICALLY DETERMINED COEFFICIENTS. THIS WORK IS AN EXTENSION OF THE INITIAL MODEL DEVELOPMENT DONE WITH ANALOG COMPUTER STUDIES. THE PROGRAM IS USEFUL IN STUDYING THE THERMODYNAMIC PATHS OF PRESSURIZER TRANSIENTS, AND IS CONVENIENT TO USE AS A DESIGN TOOL. A COMPARISON WITH EXPERIMENTAL DATA IS INCLUDED IN THIS REPORT IN ORDER TO DEMONSTRATE THE VALIDITY OF THIS ANALYSIS METHOD. IN THE TOPS REPRESENTATION OF THE PRESSURIZER, NO A PRIORI ASSUMPTIONS ARE MADE CONCERNING THE PARTICULAR THERMODYNAMIC PROCESS FOLLOWED DURING INSURGE OR OUTSURGES. THIS CONTRASTS WITH MOST CURRENTLY USED MODELS, IN WHICH SOME PREDETERMINED PROCESS (ISENTROPIC COMPRESSION, SATURATION LINE, ETC.) IS BUILT INTO THE MODEL. IN THE REPRESENTATION USED HERE, THE PROGRAM ITSELF DETERMINES THE THERMODYNAMIC PROCESS AT EACH INSTANT OF THE TRANSIENT. IN ADDITION, IT IS POSSIBLE TO SIMULATE THE SPECIAL CASES OF ISENTROPIC AND SATURATION LINE PATHS BY APPROPRIATE SELECTION OF THE HEAT - AND MASS-TRANSFER COEFFICIENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*FLUCTUATION + *PRESSURIZER + *THERMODYNAMICS + FLOW THEORY AND EXPERIMENTS + PRESSURE, INTERNAL

5-14449 BYERS CH + JUDSON KC

CONVECTIVE TRANSFER PROCESSES IN LAMINAR GAS-LIQUID CHANNEL FLOW.
LAWRENCE RADIATION LAB.
UCRL-16535 +. 267 PAGES, TABLES, REFERENCES, MAY 20, 1966

INTERPHASE MASS TRANSFER WAS STUDIED EXPERIMENTALLY AND THEORETICALLY FOR CASES WHERE RESISTANCE TO MASS TRANSFER IS CONFINED TO THE GAS PHASE AND WHERE CONTROL IS DISTRIBUTED BETWEEN PHASES. A HORIZONTAL, RECTANGULAR CHANNEL OF HIGH ASPECT RATIO WAS BUILT. THE GAS AND LIQUID PHASES, WHICH MOVE IN STRATIFIED LAMINAR FLOW, ARE CONTACTED IN AN 18-IN.-LONG TEST SECTION. THE EXIT STREAMS ARE ANALYZED IN A GAS-LIQUID CHROMATOGRAPH. A NUMERICAL SOLUTION WAS PERFORMED OF THE LAMINAR TRANSPORT EQUATION FOR A PARABOLIC VELOCITY PROFILE WITH A COCURRENTLY MOVING BOUNDARY. EXPERIMENTS IN WHICH PURE ETHANOL WAS EVAPORATED INTO TWO GASES, CO₂ AND OXYGEN, SHOWED AGREEMENT WITH THIS THEORY WITHIN THE ESTIMATED EXPERIMENTAL ERROR OF 10%.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*MASS TRANSFER + FILM, LIQUID + FLOW, LAMINAR + FLOW, TWO PHASE + HEAT TRANSFER

CATEGORY 5
ACCIDENT ANALYSIS

5-14451 KIRBY GJ
NEW CORRELATION OF NON-UNIFORMLY HEATED ROUND TUBE BURNOUT DATA.
ATOMIC ENERGY ESTABLISHMENT, WINFRITH
AEEW-R-500 +. 46 PAGES, FIGURES, REFERENCES, JULY 1966

A NEW CORRELATION OF NONUNIFORMLY HEATED ROUND-TUBE BURNOUT DATA IS PRESENTED. THIS FITS THE AVAILABLE DATA BETTER THAN ANY PREVIOUSLY PUBLISHED CORRELATION - THE ROOT-MEAN-SQUARE DEVIATION BEING 5.7% FOR ALL DATA AT 1000 PSIA, AND THE WORST FIT BEING TO DATA AT 2000 PSIA WHERE THE R.M.S. ERROR IS 6.6%. THE CORRELATION IS USED TO INVESTIGATE THE EFFECT OF FLUX-PROFILE CHANGES, AND NO SIGNIFICANT INCREASE IN BURNOUT POWER IS OBTAINED BY MODIFYING THE PRESENT CHOPPED-COSINE DISTRIBUTION.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVENUE, NEW YORK, N.Y. 10022, \$1.40 COPY

*BURNOUT HEAT FLUX + *HEAT TRANSFER CORRELATION + FLOW, TUBE + HEAT TRANSFER

5-14453 JAIN KC + MILLER D + PETRICK + BANKOFF SG
SELF-SUSTAINED HYDRODYNAMIC OSCILLATIONS IN A NATURAL-CIRCULATION BOILING WATER LOOP
ARGONNE NATIONAL LABORATORY + NORTHWESTERN UNIVERSITY
20 PAGES, 19 FIGURES, 3 TABLES, 22 REFERENCES, NUCLEAR ENGINEERING AND DESIGN 4(3), PAGES 233-252, (OCTOBER 1966)

MEASUREMENTS ARE GIVEN OF FLOW AND PRESSURE OSCILLATIONS OVER A RANGE OF STEADY POWER INPUTS TO A NATURAL-CIRCULATION BOILING WATER LOOP FOR SEVERAL RISER AND TEST-SECTION GEOMETRIES AND OVER A PRESSURE RANGE OF 200-1000 PSIA. IN SOME CASES THE INCEPTION THRESHOLD IS QUITE SHARP, BUT IN OTHERS THE OSCILLATIONS GROW MONOTONICALLY. THE EFFECTS OF SYSTEM PARAMETERS ARE DISCUSSED, AND THE RESULTS ARE COMPARED WITH EXISTING THEORY.

*FLOW STABILITY + *FLOW, TWO PHASE + FLOW THEORY AND EXPERIMENTS + FLUCTUATION + HEAT TRANSFER + HEAT TRANSFER, BOILING

5-14454 NIJSING R + EIFLER W
HEAT TRANSFER CALCULATIONS OF ORGANIC COOLED SEVEN-ROD CLUSTER FUEL ELEMENTS
EURATOM, ISPRA, ITALY
23 PAGES, 19 FIGURES, 3 TABLES, 6 REFERENCES, NUCLEAR ENGINEERING AND DESIGN 4(3), PAGES 253-275, (OCTOBER 1966)

A DESCRIPTION IS GIVEN OF CALCULATION METHODS USED TO ESTABLISH THE THERMAL PERFORMANCE OF 7-ROD CLUSTER FUEL ELEMENTS. IN EVALUATING THE EFFECTS OF ASYMMETRIC NEUTRON-FLUX DISTRIBUTION AND FLUX PEAKING, ACCOUNT WAS TAKEN OF CONDUCTION PHENOMENA IN FUEL AND CLADDING. DETAILED CONSIDERATION WAS GIVEN TO THE PROCESS OF COOLANT MIXING BETWEEN SUBCHANNELS. THE CALCULATION PROCEDURE (PROGRAMMED FOR THE IBM 7090 COMPUTER) ENABLES THE FUEL-ELEMENT POWER TO BE CALCULATED WHEN THE MAXIMUM ALLOWABLE VALUES OF OUTLET COOLANT TEMPERATURE AND OF THE CLADDING TEMPERATURE ARE SPECIFIED AND WHEN A CERTAIN INPUT INFORMATION IS GIVEN CONCERNING DIMENSIONS, FLUID FLOW, AND HEAT TRANSFER. NUMERICAL EXAMPLES ARE DISCUSSED.

*ORGANIC COOLANT + FUEL ELEMENT + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-14455 MIN K + CHAO BT
PARTICLE TRANSPORT AND HEAT TRANSFER IN GAS-SOLID SUSPENSION FLOW UNDER THE INFLUENCE OF AN ELECTRIC FIELD
LOWELL TECHNOLOGICAL INSTITUTE, LOWELL + UNIVERSITY OF ILLINOIS, URBANA
13 PAGES, 10 FIGURES, NUCLEAR SCIENCE AND ENGINEERING 26(4), PAGES 534-546, (DEC. 1966)

AN EXPERIMENTAL INVESTIGATION DEMONSTRATED THE FEASIBILITY OF IMPROVING WALL-TO-FLUID HEAT TRANSFER IN SOLID-GAS SUSPENSION FLOW IN WHICH THE SOLID PARTICLES WERE ELECTRICALLY CHARGED AND WERE ACTED UPON BY FORCES DUE TO A FLUCTUATING ELECTRIC FIELD, NORMAL TO THE FLOW STREAM. THE SUSPENSION, CONSISTING OF 30-MICRON GLASS BEADS IN AIR, FLOWED VERTICALLY DOWNWARD IN A RECTANGULAR HEAT-TRANSFER CHANNEL. THE FLOW REYNOLDS NUMBER RANGED FROM 1460 TO 10-KV PEAK-TO-PEAK WAS APPLIED ACROSS THE HALF-CHANNEL WIDTH OF 0.635 CM. AT THE FREQUENCY OF 7.7 CYCLES/SEC AND THE LOADING RATIO OF UNITY, THE RATE OF HEAT TRANSFER INCREASED BY APPROXIMATELY 30 TO 60%, DEPENDING ON THE REYNOLDS NUMBER. IT WAS SHOWN THAT THE INCREASE IN HEAT TRANSFER CAN BE LARGELY ACCOUNTED FOR BY THE HEAT CONVEYED BY THE PARTICLES FROM THE HEATED WALL TO THE FLOW STREAM. UNDER CERTAIN SIMPLIFYING ASSUMPTIONS, THE INCREASE IN HEAT FLUX WAS EXPRESSED IN TERMS OF THE PARTICLE INFLUX AT THE WALL AND THE DEGREE OF ACCOMMODATION OF THE PARTICLES TO THE WALL AND FLUID BULK TEMPERATURES. THE PRINCIPAL SIMPLIFYING FEATURE OF THE SYSTEM WAS THE DOMINANT INFLUENCE OF THE APPLIED FIELD ON THE PARTICLE TRANSPORT BEHAVIOR.

*HEAT TRANSFER AUGMENTATION + ELECTROSTATIC CHARGE + FLOW THEORY AND EXPERIMENTS + FLUIDIZED BED + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + PARTICULATE

5-14497 TRANSITION BOILING HEAT TRANSFER PROGRAM. FIFTEENTH QUARTERLY PROGRESS REPORT
GENERAL ELECTRIC COMPANY, SAN JOSE
GEAP-5278 + EURAEC-1739 +. 18 PAGES, OCTOBER 1, 1966

A SUMMARY OF WORK DONE DURING THIS QUARTER FOLLOWS - A NEW TEST SECTION WAS DESIGNED TO OBTAIN FILM-BOILING HEAT-TRANSFER MEASUREMENTS FOR FLOW INSIDE A HEATED TUBE. TWO TYPES OF PROBES FOR MEASUREMENT OF THE STEAM-PHASE SUPERHEAT LEVEL WILL BE USED WITH THE TEST SECTION - A TEMPERATURE PROBE UTILIZING SEPARATION OF THE MOISTURE FROM THE STEAM, AND A PITOT TUBE FROM WHICH THE STEAM TEMPERATURE CAN BE INFERRED. FABRICATION OF TEST ASSEMBLY WAS STARTED.

CATEGORY 5
ACCIDENT ANALYSIS

5-14497 *CONTINUED*

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*FLOW, TUBE + *HEAT TRANSFER, BOILING + FILM, GENERAL + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-14594 QUESTION G-1C. PARAMETER STUDY OF ISOLATION VALVE DELAY TIME CONSEQUENCES
TENNESSEE VALLEY AUTHORITY
5 PAGES, 1 FIGURE, PAGES G.1.4 TO G.1.8 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

VALVE-CLOSURE TIME IS ADJUSTED BETWEEN 3-10 SEC BY ORIFICES. DETAILED CALCULATIONS SHOW THAT CORE WOULD BE ONLY PARTIALLY UNCOVERED IF VALVE CLOSED AFTER 10 SEC. EFFECTS OF WATER FLASHING TO STEAM AND DISRUPTING RECIRCULATION FLOW PUMPS WAS CONSIDERED. FUEL CLAD WILL NOT EXCEED SATURATION TEMPERATURE BY 15 F, SO THE CONSEQUENCES ARE UNCHANGED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT ANALYSIS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + REACTOR, BOILING WATER

5-14596 QUESTION G-1E. TESTING OF ISOLATION VALVES WITH SIMULATED ACCIDENT CONDITIONS
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES G.1.11 TO G.1.13 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1967, DOCKET NO. 50-259/260

MANUFACTURERS TESTS WILL BE DONE IN NONFLOWING SYSTEMS. VALVE DISK AND SEAT ARE SUCH THAT STEAM FLOW TENDS TO CLOSE THE VALVE. SINCE THERE ARE FOUR STEAM LINES TO THE TURBINE, A VALVE CAN BE TESTED DURING NORMAL OPERATION AND THE CLOSURE TIME DETERMINED. LEAK RATE OF CLOSED VALVE CAN BE DETERMINED WITH THE PLANT SHUT DOWN.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + REACTOR, BOILING WATER + SYSTEM OPERABILITY IN ACCIDENT CONDITIONS + TEST, SYSTEM OPERABILITY

5-14598 QUESTION G-3. OUTLINE CALCULATIONAL MODEL AND ASSUMPTIONS SUPPORTING MINIMUM CRITICAL HEAT FLUX RATIO GREATER THAN 1 DURING LOSS OF FLOW ACCIDENT
TENNESSEE VALLEY AUTHORITY
PAGE G.3.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

PRELIMINARY COAST-DOWN ANALYSIS SHOWED A MINIMUM CRITICAL HEAT FLUX RATIO (MCHF) OF 1.3 AFTER A LOSS OF ELECTRICITY TO THE PUMP MOTORS. THE PRESENT MODEL IS BEING ENLARGED TO MORE COMPLETELY SIMULATE THE RECIRCULATION LOOP OF A JET-PUMP BWR. FINAL PUMP-PERFORMANCE DATA WILL NOT BE READY FOR SIX MONTHS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF FLOW + BROWNS FERRY + REACTOR, BOILING WATER

5-14599 QUESTION G-4. CRITERION 17--MODEL, ASSUMPTIONS AND RESULTS OF METAL WATER REACTION FOLLOWING A LOSS-OF-COOLANT ACCIDENT WITHOUT CORE COOLING SYSTEMS
TENNESSEE VALLEY AUTHORITY
22 PAGES, 1 FIGURE, 14 REFERENCES, PAGES G.4.1 TO 22 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

DISCUSSION OF FUEL-ELEMENT-CLADDING TEMPERATURE, ENERGY RELEASE TO THE CONTAINMENT IN A STANDARDIZED FIGURE-OF-MERIT APPROACH, AND HYDROGEN EVOLUTION. REFUTES ANL-SUGGESTED ZIRCONIA-CRUCIBLE EFFECT BY NOTING THAT THE 9' VOLUME CHANGE AT 2201 F HAS PREVENTED DELIBERATE ATTEMPTS TO MAKE ZIRCONIA CRUCIBLES (UNLESS SIGNIFICANT AMOUNTS OF ADDITIVES ARE PRESENT). THIS CRACKING WOULD ALSO ALLOW LEAKAGE OF MOLTEN DROPS. BWR EXPERIENCE SHOWS HYDROGEN RELEASED AT 0.04 CU.FT/MIN-MWTH. THIS RATIO FOR THE SHUT-DOWN REACTOR SHOWS THAT RADIOLYTIC HYDROGEN IS ONLY 3% THAT PRODUCED BY METAL-WATER REACTIONS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF COOLANT + BROWNS FERRY + CONTAINMENT DESIGN + FAILURE, CLADDING + HYDROGEN + METAL WATER REACTION + RADIOLYTIC GAS + REACTOR, BOILING WATER

5-14600 QUESTION G-5. INTERNAL GAS PRESSURE EFFECTS ON CLAD
TENNESSEE VALLEY AUTHORITY
PAGE G.5.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GAS PLENUM MAY BE LONGER THAN 16 INCHES, DEPENDING ON STRESS CALCULATIONS. GRAPH SHOWS THAT A

CATEGORY 5
ACCIDENT ANALYSIS

5-14600 *CONTINUED*

FUEL-ELEMENT END-OF-LIFE PRIMARY MEMBRANE CLADDING STRESS IS 17 KSI (800 F AT 18.5 KW/FT) AND 24.3 KSI AT TRANSIENT OVERPOWER FUEL DAMAGE LIMIT OF 28 KW/FT (950 F).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CLAD + FUEL ELEMENT + PRESSURE, INTERNAL + REACTOR, BOILING WATER + STRESS ANALYSIS

5-14602 QUESTION G-7. HOW MUCH FUEL MELTING OCCURS FOLLOWING REACTIVITY ACCIDENTS
TENNESSEE VALLEY AUTHORITY

3 PAGES, PAGES G.7.1 TO G.7.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GOOD BACKGROUND DISCUSSION. ROD-DROPOUT ACCIDENTS (THOROUGHLY REPORTED IN UNCERTAINTY ANALYSIS IN DRESDEN 3 AMENDMENT 3) IS STUDIED TO ENSURE PRIMARY-SYSTEM INTEGRITY, AND SOME FUEL MELTING AND CLADDING-STRAIN RUPTURE ACCEPTED. ROD-WITHDRAWAL ACCIDENT FROM THE COLD CONDITION GIVES A PEAK FUEL TEMPERATURE OF 2500 F, WELL BELOW CLAD-FAILURE THRESHOLD OF 3900 F. ROD-WITHDRAWAL ACCIDENT AT POWER IS ASSUMED TO BE VERY SLOW. INCIPIENT MELTING AT 22 KW/FT AND GROSS MELTING AT 28 KW/FT OCCURS. THE MAXIMUM TRANSIENT HEAT FLUX IS ONLY 16% ABOVE STEADY-STATE VALUE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD DROPOUT + ACCIDENT, CONTROL ROD WITHDRAWAL + BROWNS FERRY + CENTERLINE MELTING + REACTOR, BOILING WATER + SAFETY PRINCIPLES AND PHILOSOPHY

5-14603 QUESTION G-8. DOES INCREASED POWER CHANGE ROD DROPOUT ACCIDENT CONCLUSION. DO LOW WORTH RODS GIVE HIGHER ENTHALPY INCREASES BECAUSE THEY ARE NEAR FLUX PEAKS.

TENNESSEE VALLEY AUTHORITY

3 PAGES, 1 FIGURE, PAGES G.8.1 TO G.8.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GRAPH OF FUEL-CENTERLINE ENTHALPY VS DELTA K OF NEARBY CONTROL FOR INITIAL AND FOR EXCURSION INCREMENT SHOWS THAT THE SUM (FINAL ENTHALPY) IS APPROXIMATELY CONSTANT (220-210 CAL/G) UP TO 0.04 DELTA K. EVEN THOUGH THE BASE INITIAL ENTHALPY IS 20 CAL/G HIGHER FOR BROWNS FERRY, THIS IS AT ZERO DELTA K. NEAR PROMPT CRITICALITY, THE DIFFERENCE FROM DRESDEN 2 IS ONLY 5 CAL/G, AND THE RESULTANT 220 IS WELL BELOW THE 280-CAL/G FULLY MOLTEN CONDITION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD DROPOUT + BROWNS FERRY + CENTERLINE MELTING + PERFORMANCE LIMIT + REACTOR, BOILING WATER

5-14609 QUESTION H-3. WILL USE OF STEAM DRIVEN FEEDWATER PUMPS BE UNEFFECTIVE IN LOSS-OF-COOLANT ACCIDENT

TENNESSEE VALLEY AUTHORITY

PAGE H.3.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

TURBINE-DRIVEN PUMPS WOULD BE ISOLATED (DUE TO STEAM-SUPPLY LOSS) FOLLOWING LOSS-OF-COOLANT ACCIDENT. ONCE REACTOR PRESSURE DECAYS TO 300 PSI, THE CONDENSATE PUMPS WILL BE ABLE TO DISCHARGE TO REACTOR.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF COOLANT + BROWNS FERRY + CORE REFLOODING SYSTEM + REACTOR, BOILING WATER

5-14614 QUESTION H-8. DESIGN BASES AND SETPOINTS OF PRIMARY PRESSURE RELIEF VALVES

TENNESSEE VALLEY AUTHORITY

PAGE H.8.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

RELIEF VALVES SIZED TO PREVENT SAFETY VALVE DISCHARGE TO DRY-WELL UPON A REACTOR ISOLATION. CAPACITY IS 60% STEAM FLOW, SETTING IS 80 PSI ABOVE OPERATING PRESSURE. SAFETY VALVES (150% STEAM FLOW, SET LINEARLY BETWEEN 1210 AND 1250 PSIG) WILL KEEP PEAK VESSEL PRESSURE WITHIN ASME CODE LIMITS UPON ISOLATION, NO SCRAMS, NO RELIEF VALVE ACTION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF LOAD + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + DESIGN CRITERIA + REACTOR, BOILING WATER + VALVE

5-14743 PATHFINDER - POWER DISTRIBUTION AND REACTIVITY
NORTHERN STATES POWER COMPANY

NSP-6603 +. 6 PAGES, 4 TABLES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH

CATEGORY 5
ACCIDENT ANALYSIS

5-14743 *CONTINUED*
REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 6, 19-23, JANUARY 9, 1967, DOCKET NO. 50-130

XENON-FOLLOW TESTS AT 40 AND 60 PERCENT VERIFY CALCULATIONS. XENON BUILDUP DECREASES SUPERHEATER POWER FRACTION ON RESTART. VOID REACTIVITY APPEARED TO BE OVERESTIMATED AT 20 PERCENT POWER. NEW ESTIMATES FIT WELL AT 40 PERCENT. HOWEVER, AT 40 PERCENT POWER, THE CORE REACTIVITY LOSS APPEARS TO BE 0.2 PERCENT DELTA K LESS THAN PREDICTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*POWER DISTRIBUTION + *REACTIVITY EFFECT, ANOMALOUS + *XENON + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTIVITY EFFECT + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

5-14746 PATHFINDER - RECIRCULATION FLOW RATE TESTS
NORTHERN STATES POWER COMPANY
NSP-6603 +. 6 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 27, 31-35, JANUARY 9, 1967, DOCKET NO. 50-130

FLOW-CHANGE RESULTS AT LOW POWER WERE AS PREDICTED. THE SAME FLOW CHANGE AT HIGHER POWER PRODUCES A LARGER EFFECT BECAUSE THERE ARE MORE VOIDS TO BE AFFECTED. DURING THE RECIRCULATION-FLOW-CHANGE TEST AT 40 PERCENT POWER WITH THE GANGED-VALVE CHANGED FROM 100 PERCENT OPEN TO 45 PERCENT OPEN, THE FINAL VALVE POSITION WAS INCREASED TO 60 PERCENT OPEN WHEN IT BECAME APPARENT THAT THE POWER/FLOW SCRAM WOULD OCCUR. HEAT BALANCES GAVE 73.3 MWTH (100 PERCENT VALVE OPEN) AND 60.8 MWTH AT 60 PERCENT OPEN. ****SINGLE-PUMP TRIPS ATTEMPTED, TWO WERE SCRAMMED OUT ON HIGH STEAM TEMPERATURE. BECAUSE REVERSE FLOW THROUGH THE PARTIALLY OPEN DISCHARGE VALVES IS GREATER THAN CALCULATED, THE RATE OF FLOW INCREASES AS THE VALVE CLOSES APPROACHES THE TECH.-SPEC. LIMIT (455 GPM, 2.8 CENTS/SEC). TESTS CAN BE RUN FROM THE 60-PERCENT-OPEN POSITION, BUT A PUMP-TRIP SCRAM HAS BEEN TEMPORARILY ADDED PENDING FUTURE TESTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*FLOW, RECIRCULATION + *PUMP + *TEST, PLANT RESPONSE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

5-14823 QUESTION 1A - PERCENTAGE OF FUEL RODS AT MCHF RATIOS LESS THAN 1 FOR HIGH POWER OPERATIONS. TENNESSEE VALLEY AUTHORITY
3 PAGES, 2 FIGURES, PAGES 1-3, BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

AT 124' POWER, ALL RODS ARE ABOVE A 1.0 MAXIMUM CRITICAL HEAT FLUX RATIO. AT 130', 2.8' ARE BELOW. AT 140', 5.7' ARE BELOW. INITIAL CORE EXCESS REACTIVITY WITH EQUILIBRIUM XENON IS INSUFFICIENT TO ALLOW STEADY-STATE OPERATION ABOVE 130'. TWO FIGURES PROVIDE PERCENT OF FUEL RODS VS MCHF RATIO FOR 130 AND 140' POWER.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + BURNOUT HEAT FLUX + REACTOR, BOILING WATER

5-14824 QUESTION 1B - DISCUSS METHODS OF ANALYZING POWER DISTRIBUTION AND UNCERTAINTIES
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES 4-5 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

POWER DISTRIBUTION USED RESULT FROM CALCULATIONS AND MEASUREMENTS, VERIFIED BY (E.G.) GARIGLIANO REACTOR TESTS. VARIOUS MARGINS ARE INCLUDED IN ANALYSIS (E.G., 0.2 PSI PRESSURE LOSS AT INLET TO LIMITING CHANNEL ALLOWANCE FOR GREATER COOLANT PATH LENGTH, NO CREDIT TUBES FOR FUEL-ROD SPACERS INCREASING THE CRITICAL HEAT FLUX). UNCERTAINTIES ARE TREATED BY STATISTICAL ANALYSIS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + HEAT TRANSFER ANALYSIS + POWER DISTRIBUTION + REACTOR, BOILING WATER

5-14825 QUESTION 1C - ACTUAL AND CRITICAL HEAT FLUXES ALONG THE LIMITING CHANNEL
TENNESSEE VALLEY AUTHORITY
2 PAGES, 1 FIGURE, PAGES 6-7 OF BROWNS FERRY AMENDMENT 4, NOV. 1966, DOCKET NO. 50-259/260

FIGURE SHOWS THAT SURFACE HEAT FLUX PEAKS AT 450,000 BTU/HR/SQ. FT AND 47' HEIGHT. CRITICAL HEAT FLUX REMAINS 980,000 UNTIL QUALITY EXCEEDS 6' AT 43' HEIGHT, AND THEN DROPS TO 425,000 AT EXIT WHERE SURFACE HEAT FLUX IS 50,000 (POWER LEVEL UNSPECIFIED).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + BURNOUT HEAT FLUX + HGT CHANNEL + REACTOR, BOILING WATER

5-14826 QUESTION 1D - PROVIDE A RESUME OF ACTUAL EXPERIENCE IN LIMITING AXIAL AND RADIAL POWER PEAKING

CATEGORY 5
ACCIDENT ANALYSIS

5-14826 *CONTINUED*
TENNESSEE VALLEY AUTHORITY
PAGE 8 OF BROWNS FERRY, AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

DRESDEN 1, GARIGLIANO, HUMBOLDT BAY, AND BIG ROCK POINT OPERATING CYCLES DEMONSTRATED GROSS POWER PEAKING FACTORS LESS THAN 2.1. APPENDIX G (FIG. G2) IS TAKEN FROM GARIGLIANO PERFORMANCE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ADMINISTRATIVE CONTROLS AND PRACTICES + BROWNS FERRY + CONTROL ROD PROGRAM + POWER DISTRIBUTION + REACTOR, BOILING WATER

5-14827 QUESTION 1E - SPECIFY MASS FLOW RATE APPROPRIATE IN APED-5286 CORRELATION
TENNESSEE VALLEY AUTHORITY
PAGE 9 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

THE DATA USED IN OBTAINING THE LIMIT LINES RANGE FROM 0.2 TO 1.6 X 10⁶ (6TH) LB/HR-SQ FT. AT BROWNS FERRY THE FLOW WILL BE BETWEEN 0.2 AND 1.3 X 10⁶ (6TH).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + HEAT TRANSFER CORRELATION + REACTOR, BOILING WATER

5-14828 QUESTION 1F - SPECIFY MCHF RATIO AND POWER LEVEL
TENNESSEE VALLEY AUTHORITY
PAGE 10 OF BROWNS FERRY, AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

FOR THE 2H POWER-DISTRIBUTION CURVE IN FIGURE G-3 OF AMENDMENT 1, WITHOUT INITIAL COMPENSATION, THE MCHF RATIO WOULD BE 1.55 AT 100' WITH A RELATIVE ASSEMBLY POWER OF 1.40. AT 118' POWER, THE MCHF RATIO WOULD BE UNITY.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + BURNOUT HEAT FLUX + POWER DISTRIBUTION + REACTOR, BOILING WATER

5-14829 QUESTION 2 - PROVIDE SUMMARY REPORT OF PERFORMANCE TESTING TO CONFIRM THERMAL DESIGN BASIS. PROVIDE STARTUP TEST PROGRAM OBJECTIVES.
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES 11-12 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

ANSWER STATES NAMES OF REACTORS WHERE 8 VARIOUS TESTS HAVE BEEN PERFORMED. (EG. 4 HIGH POWER DENSITY--BIG ROCK POINT) STARTUP TEST PROGRAM WILL INCLUDE VARIOUS TESTS AS IN PRESENT PLANT STARTUP.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + HEAT TRANSFER ANALYSIS + REACTOR STARTUP TESTING + REACTOR, BOILING WATER + TEST, PLANT RESPONSE

5-14837 EXTENDED LOSS OF COOLANT ANALYSIS EXTENDED TO SEVERAL BREAK SIZES
CONNECTICUT YANKEE ATOMIC POWER COMPANY
17 PAGES, 14 FIGURES, PAGES B-1 TO B-17 FROM CONNECTICUT YANKEE ATOMIC POWER COMPANY, AMENDMENT 11 TO LICENSE APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

LOSS-OF-COOLANT ANALYSIS WAS EXTENDED TO CONSIDER VARIOUS BREAK SIZES, AMOUNTS OF COOLING WATER AVAILABLE, TRIP DELAY TIME, AND STEAM HEAT-TRANSFER COEFFICIENT. FOR THE LARGEST PIPE RUPTURE, THE CORE IS UNCOVERED IN 6 SEC AND RE-COVERED IN 170 SEC, AND CLAD MELTING IS 13' WITH ONLY ONE DELUGE PUMP OPERATING AND LESS THAN 5' WITH 3 SYSTEMS OPERATING. EFFECTS OF TRIP DELAY TIME, HEAT-TRANSFER COEFFICIENT, AND BLOWDOWN RATE ARE INSIGNIFICANT.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF COOLANT + CORE REFLOODING SYSTEM + HADDAM NECK + REACTOR, PRESSURIZED WATER

5-14840 DETAILS OF ROD EJECTION ANALYSIS
CONNECTICUT YANKEE ATOMIC POWER COMPANY
19 PAGES, 14 FIGURES, 5 REFERENCES, PAGES D-1 TO D-19 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

PARAMETER STUDIES ARE REPORTED FOR 1,2. INITIAL POWER LEVEL, ZERO OR 1880 MWTH, AND ROD WORTH. (FUEL-ELEMENT ENTHALPY RISE IS LESS THAN 200 BTU/LB FOR MOST ROD-PLUS-MODERATOR REACTIVITY ADDITIONS. MODERATOR ADDITIONS STRONGLY AFFECT THIS, WITH 200 BEING REACHED AT 1' RODS PLUS 1.5' MODERATOR AT 1880 MWTH. WORSE CASE IS AT POWER, BUT ROD WORTH IS THEN MINIMIZED BY CHEMICAL SHIM.) 3. DOPPLER WEIGHTING FACTOR (A FACTOR OF 1.2 INSTEAD OF THE 1.6 USED WOULD INCREASE ENTHALPY BY 40 IN WORST CASE). 4. MODERATOR REACTIVITY INSERTION

CATEGORY 5
ACCIDENT ANALYSIS

5-14840 *CONTINUED*

(STRONGLY DEPENDENT ON WORTH OF EJECTED ROD.) 5. SCRAM DELAY TIME (DELAY TIME OF 1.5 SEC RATHER THAN 1 SEC WOULD ADD 20 BTU/LB IN WORST CASE). SAMPLE CALCULATION SHOWS A 0.7' EJECTION AT 1880 MWTH WOULD GIVE A MAXIMUM OF 3' FUEL DISPERSION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT ANALYSIS + ACCIDENT, CONTROL ROD EJECTION + FUEL MELTDOWN + MODERATOR COEFFICIENT + REACTOR, PRESSURIZED WATER + SAFETY ANALYSIS

5-14841 CORE THERMAL/HYDRAULIC STUDY FOR INTERMEDIATE STEADY STATE POWERS AND ROD WITHDRAWAL ACCIDENT CONNECTICUT YANKEE ATOMIC POWER COMPANY
11 PAGES, 8 FIGURES, PAGES E-1 TO E-11 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION, DOCKET NO. 50-213, OCTOBER 6, 1966

SENSITIVITY OF VARIOUS ASSUMPTIONS AND PARAMETERS TESTED. FOR VARIOUS POWER LEVELS, THE NUMBER OF FUEL RODS STATISTICALLY IN DNB ARE GIVEN FOR NORMAL CONDITIONS (ONE ROD AT 2000 MWTH), VARIATIONS IN POWER DISTRIBUTION (0.3 RODS AT ΔH 30' HIGHER), COOLANT FLOW RATE (0.024 RODS WITH 20' LESS FLOW), CORRELATION ERROR (0.94 RODS WITH 30' ERROR). FOR THE WORST REACTIVITY WITHDRAWAL ACCIDENT (AT 3×10 TO THE MINUS 5TH) ΔK /SEC BETWEEN ACTIONS OF TWO DIFFERENT TRIP CIRCUITS, 6 RODS CAN BE IN DNB.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD WITHDRAWAL + DNB (DEPARTURE FROM NUCLEATE BOILING) + HEAT TRANSFER CORRELATION + POWER DISTRIBUTION + REACTOR, PRESSURIZED WATER

5-14852 SMITH RJ

REACTOR SAFETY - A LITERATURE SEARCH
DIVISION OF TECHNICAL INFORMATION

TID-3525 (REV. 5, SUPPL. 2) +. 64 PAGES, 671 REFERENCES, AUGUST 1965

A TOTAL OF 671 REFERENCES TO UNCLASSIFIED REPORTS IS PRESENTED ON REACTOR SYSTEMS, MATERIALS, AND OPERATION DESIGNED TO PROVIDE MAXIMUM SAFETY FOR THE REACTOR, REACTOR PERSONNEL, AND ENVIRONS. INFORMATION IS INCLUDED CONCERNING INCIDENTS AND CONDITIONS OF OPERATION CONSIDERED HAZARDOUS. AUTHOR, REACTOR, AND REPORT-NUMBER-AVAILABILITY INDEXES ARE PROVIDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT ANALYSIS + *ACCIDENT, GENERAL + *BIBLIOGRAPHY + *CONTAINMENT, GENERAL + *OPERATIONS REPORT, GENERAL + *PERSONNEL PROTECTIVE DEVICE

5-14917 DICKERMAN CE + ROBINSON LE + BLUMENTHAL B + STEWART R
BEHAVIOR OF TH-20 WT/PERCENT U FAST-REACTOR FUEL UNDER TRANSIENT HEATING TO FAILURE
ARGONNE NATIONAL LABORATORY
10 PAGES, 10 FIGURES, 2 TABLES, 17 REFERENCES, NUCLEAR APPLICATIONS 3(1) PAGES 9-17 (JANUARY 1967)

SODIUM-BONDED TH-20 WT % U EBR II FUEL ELEMENTS WERE STUDIED IN TRANSIENT MELTDOWN EXPERIMENTS RANGING UP TO COMPLETE SAMPLE MELTDOWN, CONDUCTED IN TREAT. THE HIGH-MELTING THORIUM MATRIX SUPPORTED THE FUEL DURING TRANSIENT HEATING AT TEMPERATURES SIGNIFICANTLY BEYOND THE SOLIDUS. BECAUSE THE FUEL WAS STILL RELATIVELY INTACT AT THE TEMPERATURES OF CLADDING FAILURE, INTERNAL PRESSURE WAS NOT EFFECTIVE IN EJECTING FUEL UPON FAILURE. THE DOMINANT MECHANISM OF FUEL MOVEMENT WAS GRAVITY.

*FUEL MELTDOWN + *TEMPERATURE TRANSIENT + *TREAT (TRANSIENT TEST REACTOR FACILITY) + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

5-14919 ONGMANN HD

NUCLEAR SUPERHEAT PROJECT. FINAL REPORT
GENERAL ELECTRIC COMPANY, SAN JOSE

GEAP-5087 +. 104 PAGES, 15 TABLES, 14 FIGURES, DECEMBER 1965

PRESENTS TASK STATEMENTS AND SUMMARIES OF TOPICAL REPORTS ISSUED. TASKS INCLUDED (A) ADMINISTRATION, (B) SADE LOOP FUEL IRRADIATION, (C) TESTS OF CLAD RADIATION-DAMAGE, (D) CRITICAL EXPERIMENTS, (E) COOLANT CHEMISTRY, (F) HEAT TRANSFER, INCLUDING ONCE-THROUGH BOILING, (G) STEAM SEPARATORS AND DRYERS, (H) ESAD-LOOP FUEL IRRADIATION IN VBWR, (J) MIXED-SPECTRUM SAFETY STUDIES, AND (K) MIXED-SPECTRUM CRITICAL EXPERIMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*RESEARCH AND DEVELOPMENT PROGRAM + CLAD + COOLANT CHEMISTRY + CORROSION + CRITICALITY EXPERIMENT + FAILURE, FUEL ELEMENT + HEAT TRANSFER, BOILING + IRRADIATION TESTING + RADIATION DAMAGE + REACTOR, SUPERHEAT + SAFETY STUDY

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-09541 BARAN W + MEYER K
EFFECT OF DELAYED NEUTRONS ON THE STABILITY OF A NUCLEAR POWER REACTOR
RESEARCH INSTITUTE FOR ADVANCED STUDIES, BALTIMORE, MARYLAND
6 PAGES, 1 FIGURE, NUCLEAR SCIENCE AND ENGINEERING, 24(4), PP. 356-361 (APRIL 1966)

AN EXAMPLE IS GIVEN TO SHOW THAT STABILITY WITHOUT DELAYED NEUTRONS DOES NOT IMPLY STABILITY WITH DELAYED NEUTRONS. A NEW CRITERION FOR STABILITY IN THE LARGE IS DERIVED. AN EXAMPLE IS GIVEN THAT SHOWS THAT THE NEW CRITERION PREDICTS STABILITY IN SOME CASES WHEN THE OLDER ONE FAILS.

*DELAYED NEUTRON + *REACTOR STABILITY + *THEORETICAL INVESTIGATION + REACTOR, POWER

6-10503 VOLLMER H + ANDERSON AJ
DEVELOPMENT OF A DYNAMICS MODEL FOR HEAVY WATER BOILING REACTORS AND ITS APPLICATION TO THE HBWR
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY. OECD HALDEN REAKTOR PROSJEKT
HPR-54 +. 143 PAGES, DECEMBER 1964, DEP.MN

PROBLEM - IMPROVE THE UNDERSTANDING OF THE DYNAMIC BEHAVIOR OF A HEAVY-WATER BOILING REACTOR.
APPROACH - (1) IMPROVE AND EXTEND THE DYNAMIC MODELS FOR LIGHT-WATER BOILING REACTORS, (2) DEVELOP A GENERAL MODEL FOR THIS TYPE OF REACTOR, (3) APPLY THE MODEL TO SPECIAL CASE OF THE HBWR USING THE SECOND FUEL LOADING. RESULTS - (1) THE STUDY INDICATED THAT THE HBWR WILL HAVE SELF-SUSTAINED OSCILLATIONS UNDER SOME CONDITIONS, (2) THE MODEL WAS VERIFIED WITH SEVERAL EXPERIMENTS.

*REACTOR DYNAMICS + *REACTOR STABILITY + ANALYTICAL MODEL + COMPUTER PROGRAM + MATHEMATICAL STUDY + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

6-11331 COMPENDIUM OF UNUSUAL REACTOR AND CRITICALITY INCIDENTS AND EXPERIMENTS
DIVISION OF OPERATIONAL SAFETY, USAEC
60 PAGES, 66 REFERENCES, 1965, SOURCE

VERY BRIEF SUMMARIES OF 90 INCIDENTS AT VARIOUS REACTORS AND PROCESS PLANTS, BEGINNING IN 1945. NO FIXED REPORTING CRITERIA.

*INCIDENT COMPILATION + FAILURE, GENERAL + REACTOR, AEC OWNED

6-11370 REACTOR SAFETY - REACTOR KINETICS - TREAT
ARGONNE NATIONAL LABORATORY
ANL-7245 +. 2 PAGES, PAGES 72-74 FROM REACTOR DEVELOPMENT PROGRAM, PROGRESS REPORT, JULY 1966, CFSTI \$3.00 CY

IN TREAT, A SAMPLE CONSISTING OF THREE ZIRCALOY-CLAD UO₂ FUEL RODS WAS IRRADIATED WHILE SUSPENDED IN A STEAM ENVIRONMENT ABOVE A POOL OF WATER. A FLAT-TOP TYPE OF TRANSIENT WAS USED TO SIMULATE A LOSS-OF-COOLANT INCIDENT. BEFORE THE SAMPLE FELL INTO THE WATER BECAUSE OF THE MELTING, A METAL-WATER REACTION HAD BEEN IN PROGRESS.

*TREAT (TRANSIENT TEST REACTOR FACILITY) + METAL WATER REACTION + ZIRCONIUM

6-11371 MATERIALS BEHAVIOR, EQUATION OF STATE, AND ENERGY TRANSFER
ARGONNE NATIONAL LABORATORY
ANL-7245 +. 9 PAGES, 5 FIGURES, PAGES 64-72 OF REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JULY 1966, CFSTI \$3.00 CY

COOLANT (WATER) EXPULSION STUDIES SHOW CONVERSION INTO MECHANICAL ENERGY TO BE VERY INEFFICIENT. PROGRESS REPORT ON SODIUM-SUPERHEAT EXPERIMENT, SODIUM-EXPULSION EXPERIMENT, CRITICAL-FLOW STUDIES, COMPUTER PROGRAM ON ENERGY ABSORPTION BY BURSTING OF PRESSURE VESSEL. EXPERIMENTS AND ANALYSIS ON HEAT TRANSFER FROM METAL SPHERE BEING SWISHED THROUGH WATER, AND PREPARATION OF SIMILAR EXPERIMENTS IN SODIUM.

FAILURE, PRESSURE VESSEL + HEAT TRANSFER ANALYSIS + HEAT TRANSFER EXPERIMENT + SODIUM + WATER, GENERAL

6-11372 MELTDOWN EXPERIMENT WITH TREAT MARK-II INTEGRAL SODIUM LOOP
ARGONNE NATIONAL LABORATORY
ANL-7245 +. 4 PAGES, PAGES 61-65 FROM REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JULY 1966, CFSTI \$3.00 CY

IN THE HIGH-SPECIFIC-ENERGY-INPUT MELTDOWN EXPERIMENT PERFORMED WITH A 6 PERCENT ENRICHED EBR-II MARK I PIN IN FLOWING SODIUM IN A TREAT INTEGRAL SODIUM LOOP, CLADDING FAILURE OCCURRED DUE TO THERMAL STRESS, AND EXTREME COOLANT-VAPORIZATION RATES OCCURRED WHEN THE COOLANT RETURNED TO THE FAILED SECTION AFTER THE PIN WAS ESSENTIALLY INSULATED AND EXPOSED TO PEAK POWER. INCLUDES CALCULATIONS ON THERMAL STRESS, LOOP STRESS DUE TO INTERNAL PRESSURE, AND PENETRATION OF CLADDING DUE TO EUTECTIC FORMATION. RESULTS OF INSPECTION OF A SAMPLE.

*EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS) + FAILURE, CLADDING + TREAT (TRANSIENT TEST REACTOR FACILITY)

6-11373 NUCLEAR SAFETY - REACTOR KINETICS - IRRADIATED FAST OXIDE FUEL PINS
ARGONNE NATIONAL LABORATORY
ANL-7245 +. 1 PAGE, 1 TABLE, PAGE 60 FROM REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JULY 1966, CFSTI,

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-11373 *CONTINUED*
\$3.00 CY

PROGRESS REPORT ON FOUR PREIRRADIATED EBR-II FUEL PINS EXPOSED IN TREAT. CALCULATION OF TRANSIENT TEMPERATURES.

*EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS) + *TREAT (TRANSIENT TEST REACTOR FACILITY) + THERMAL ANALYSIS

6-11511 RANDES J
ACCIDENT AND SELF-REGULATION STUDIES OF PULSED FAST REACTORS
EURATOM, ISPRA, ITALY
16 PAGES, 5 FIGURES, 1 TABLE, 7 REFERENCES, JOURNAL OF NUCLEAR ENERGY PARTS 20(9), PAGES 713-728, SEPTEMBER 1966

FORTTRAN PROGRAMME FOR PULSED-FAST-REACTOR KINETICS. COMPETITION FOR DOMINANCE BETWEEN A PROMPT POSITIVE DOPPLER AND DELAYED AXIAL THERMAL-FUEL-EXPANSION EFFECT. EXCITATION OF ELASTIC WAVES IN THE FUEL SLUGS. THE REACTOR, SIMILAR TO THE PROPOSED EURATOM SYSTEM SORA, POSSESSES A STRONG NET NEGATIVE FEEDBACK, BUT SUCH FEEDBACK DOES NOT APPRECIABLY RAISE THE REACTIVITY PULSE AMPLITUDES RESPONSIBLE FOR SERIOUS DAMAGE. SYSTEMS SIMILAR TO THE SORA REACTOR MUST BE DESIGNED SO THAT POSSIBLE DRIFTS ARE BELOW 2 PERCENT DELTA-K/SEC. FROM THE SAFETY VIEWPOINT, A CERAMIC IS AS GOOD AS METALLIC FUEL.

COMPUTER, DIGITAL + DESTRUCTIVE TRANSIENT + DOPPLER EFFECT + EURATOM + EXPANSION REACTIVITY EFFECT + REACTOR, FAST + REACTOR, FAST BURST + REACTOR, PULSED + THERMAL MECHANICAL EFFECT

6-11512 MURRAY HS + SCHULTZ DG + WEAVER LE
STABILITY OF COUPLED CORE REACTORS BY THE SECOND METHOD OF LIAPUNOV
UNIVERSITY OF ARIZONA, TUCSON
6 PAGES, 3 FIGURES, 4 REFERENCES, JOURNAL OF NUCLEAR ENERGY PARTS 20(9), PAGES 729-734, SEPTEMBER 1966

IN THIS STUDY, THE SECOND METHOD OF LIAPUNOV IS EMPLOYED IN THE NONLINEAR-STABILITY ANALYSIS OF A COUPLED-CORE REACTOR. TO ENSURE CONSERVATIVE RESULTS, THE TIME DELAY DUE TO THE TRANSPORT OF NEUTRONS BETWEEN CORES IS INCORPORATED DIRECTLY INTO THE SECOND METHOD. THIS, IN EFFECT, AVOIDS THE USE OF SERIES APPROXIMATIONS FOR THE TIME DELAY, WHICH MAY LEAD TO NONCONSERVATIVE RESULTS. REGIONS OF STABILITY ARE DETERMINED AS FUNCTIONS OF THE COUPLING COEFFICIENT, INTRINSIC REACTIVITY CONTRIBUTION, AND DELAY TIME.

COUPLED CORES + REACTOR STABILITY

6-11516 CAPPEL HH
SGR TEMPERATURE TRANSIENTS
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-MEMO-11458 +. 56 PAGES, TABLES, JUNE 16, 1965, CFSTI \$3.00 CY, \$0.50 MN

DESCRIBES THE ANALYTICAL METHODS AND RESULTS OF A DESIGN STUDY OF THE TEMPERATURE TRANSIENTS (RESULTING FROM A MISMATCH OF POWER AND FLOW) FOR A 200-MW(E) SODIUM-GRAPHITE REACTOR. TWO DIGITAL COMPUTER CODES WERE DEVELOPED - ONE FOR THE PRIMARY SYSTEM, THE OTHER FOR THE LOW-PRESSURE SYSTEM OF THE PRIMARY LOOP. THE SEVERITY OF THE TRANSIENTS IS ATTRIBUTED TO THE SPECIFIC ROD POWER AND THE FUEL-CHANNEL-COOLANT TRANSPORT TIME.

*TEMPERATURE TRANSIENT + ACCIDENT, HYPOTHETICAL + COMPUTER PROGRAM + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

6-11517 PACILIO N
DETERMINATION OF REACTOR KINETIC PARAMETERS BY STATISTICAL ANALYSIS OF PROMPT NEUTRON DISTRIBUTION
COMITATO NAZIONALE PER L ENERGIA NUCLEARE, ROME
RI-FI-65-49 +. 40 PAGES, FIGURES, DECEMBER 1965, DEP. MN, IN ITALIAN

FORMALISM AND PROPERTY OF THE NEGATIVE BINOMIAL DISTRIBUTION (NBD) MOMENTS AND GENERATING FUNCTIONS OF THE NBD, COMPARISON WITH THE POISSON DISTRIBUTION, CORRECT VALUES AND MEASURED VALUES, PRECISION OF A MEASUREMENT OF THE RELATIVE VARIANCE CORRELATED WITH NBD. THE NBD AND THE EFFECTS OF SUBTRACTION OF THE SERIES OF COUNTS, THE DEAD-TIME OF THE MEASURING SYSTEM, THEORETICAL CORRECTION FACTORS TO THE EXPERIMENTAL DATA AND THEIR PROPERTIES, THE CORRELATED RELATIVE VARIANCE OF AN NBD AS INFORMATION ON THE KINETIC PARAMETERS OF A NUCLEAR REACTOR. DISTRIBUTION OF COUNTS OF A NEUTRON SOURCE IN A NUCLEAR REACTOR, THE GENERATING FUNCTION OF THE COUNTING PROCESS, AND THE GENERATING FUNCTION OF THE NBD. SIGNIFICANCE OF ANY APPROXIMATION INTRODUCED, METHODS OF MEASUREMENT OF THE ROSSI ALPHA AND THE ASYMPTOTIC VARIANCE IN EXPERIMENT BY MOGLINER AND ZOLOTUKHIN.

*NOISE ANALYSIS + ITALY + ROSSI ALPHA

6-11518 HANNUM WH
STATUS OF FAST REACTOR PHYSICS DESIGN
LOS ALAMOS SCIENTIFIC LAB., LOS ALAMOS
LA-DC-7739 + CONF-660308-2 +. 21 PAGES, FROM AMERICAN NUCLEAR SOCIETY, PLUTONIUM INFORMATION MEETING, WASHINGTON, D.C., 1965, CFSTI \$1.00 CY, \$0.50 MN

SAFETY-ORIENTED REMARKS ARE ON PAGES 5 TO 8. FUEL AND CLAD EXPANSION GIVE NEGATIVE REACTIVITY EFFECT BUT IS SOMETIMES SMALL OR DELAYED. VOID AND FLOODING COEFFICIENTS FOR VARIOUS COOLANTS. DOPPLER EFFECT MOSTLY IN THE SOFT-SPECTRUM SYSTEM. TABLES OF NEEDED CROSS-SECTION

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-11518 *CONTINUED*
MEASUREMENTS, FAST-REACTOR CODES, PLUTONIUM CRITICAL FACILITY, AND FEATURES OF FAST-REACTOR EXPERIMENT.

*REACTOR, FAST + DOPPLER COEFFICIENT + FUEL EXPANSION COEFFICIENT + VOID COEFFICIENT

6-11519 NIMS JB + THIE JA + SMITH RR + KLINKMAN AE + NICHOLSON RB
FAST REACTOR STABILITY AND SAFETY
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC. + ARGONNE NATIONAL LABORATORY + UNIVERSITY OF WISCONSIN
ANS-100 +. 12 PAGES, 3 FIGURES, 22 REFERENCES, PAGES 213-224 OF AMERICAN NUCLEAR SOCIETY, NATIONAL
TOPICAL MEETING ON FAST REACTOR TECHNOLOGY, DETROIT, MICHIGAN, APRIL 26-28, 1965

DOPPLER, SODIUM, AND FUEL EXPANSION COEFFICIENTS. OPERATIONAL STABILITY, PLAUSIBLE
REACTIVITY-INSERTION ACCIDENTS, DEFICIENT-HEAT-REMOVAL ACCIDENT, MAXIMUM HYPOTHETICAL
ACCIDENT.

ACCIDENT ANALYSIS + ACCIDENT, CONTROL ROD WITHDRAWAL + ACCIDENT, FUEL SLUMP + ACCIDENT, LOSS OF COOLANT +
ACCIDENT, LOSS OF FLOW + ACCIDENT, MAXIMUM CREDIBLE (MCA) + DOPPLER COEFFICIENT +
EXPANSION REACTIVITY EFFECT + REACTOR STABILITY + REACTOR, FAST + REACTOR, LARGE + SODIUM COEFFICIENT +
SPACE DEPENDENT DYNAMICS

6-11520 SMITH DC + ROWLANDS JL
THE CALCULATION OF REACTIVITY AND TEMPERATURE CHANGES FOLLOWING A DISTURBANCE IN REACTOR CONDITIONS.
UKAEA, WINFRIETH
ANS-100 +. 19 PAGES, 8 FIGURES, 9 TABLES, 41 REFERENCES, PAGES 194-212 OF AMERICAN NUCLEAR SOCIETY,
NATIONAL TOPICAL MEETING ON FAST REACTOR TECHNOLOGY, DETROIT, MICHIGAN, APRIL 26-28, 1965

CALCULATIONS OF SMALL REACTIVITY CHANGES BY USE OF MULTIGROUP METHODS. UNCERTAINTIES IN
DOPPLER-COEFFICIENT AND SODIUM-COEFFICIENT CALCULATIONS, PLUS INTERRELATIONS BETWEEN COOLANT
DENSITY AND DOPPLER EFFECTS. RANGE OF TEMPERATURE COEFFICIENTS FOR KINETIC STUDIES.
APPROXIMATE METHODS FOR USE IN TRANSIENT STUDIES, AND APPLICATIONS TO POSTULATED ACCIDENTS.
EXPERIMENTAL DIFFICULTIES IN EVALUATING REACTIVITY COEFFICIENTS.

ACCIDENT ANALYSIS + ACCIDENT, CONTROL ROD WITHDRAWAL + ACCIDENT, LOSS OF FLOW + ACCIDENT, REACTIVITY +
ACCIDENT, REFUELING + COMPUTER, DIGITAL + DOPPLER COEFFICIENT + REACTOR, FAST + REACTOR, LARGE +
SODIUM COEFFICIENT

6-11648 DEBBAGE AG
FORCED CIRCULATION BOILING INVESTIGATIONS IN AN INSTRUMENTED FUEL ASSEMBLY AT HBWR
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-35 (VOL. I) +. 43 PAGES, 4 TABLES, 21 FIGURES, 21 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE
INSTRUMENTATION AT HBWR, SECTION 5, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM
ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

FORCED-CIRCULATION BOILING EXPERIMENTS WERE MADE WITH THE FOURTH INSTRUMENTED FUEL ASSEMBLY AT
HBWR. THE METHOD DEVELOPED WAS TO CONTINUOUSLY VARY THE BOILING BOUNDARY ALONG THE CHANNEL
LENGTH, WITH CONTINUOUS COMPUTER CALCULATION AND RECORDING OF THE VARYING PARAMETERS. THE
CONTROLLED PARAMETERS WERE CHANNEL POWER AND INLET VELOCITY, WITH THE PRINCIPAL COMPUTED
VALUES BEING EXIT STEAM QUALITY, VOID FRACTION, AND SLIP RATIO.

*HEAT TRANSFER + *MATHEMATICAL STUDY + HBWR (HALDEN BOILING WATER REACTOR) + REACTOR, BOILING WATER +
REACTOR, HEAVY WATER

6-11934 GILLEY LW + HOLLAND LB + POSTON JW + WARD DR
OPERATIONAL PROBLEMS WITH THE HEALTH PHYSICS RESEARCH REACTOR
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3973 (VOL. I) +. 2 PAGES, SEPTEMBER 1966, PAGES 11-12 OF NEUTRON PHYSICS DIVISION ANNUAL PROGRESS
REPORT FOR PERIOD ENDING MAY 31, 1966, CFSTI \$3.00 CY, \$0.75 MN

THE BURST SIZE VARIED BY 40 PERCENT FROM THE AVERAGE, WHICH WAS TRACED TO POOR DAMPING OF THE
SHOCK ABSORBER OF THE BURST ROD, WHICH IN TURN CAUSED OSCILLATION OF THE SAFETY BLOCKS AND
ASSOCIATED PARTS. THE BOLTS HOLDING THE CORE TOGETHER ALSO MIGHT NOT HAVE BEEN TIGHT ENOUGH
AND THE PARAMETERS INFLUENCING BURST SIZE CAN BE MEASURED ONLY WITH LIMITED ACCURACY.
REMEDIAL ACTION FOR THE ABOVE.

HPRR (HEALTH PHYSICS RESEARCH REACTOR) + OPERATING EXPERIENCE + REACTOR, FAST BURST

6-11935 JOHNSON EB + WEBSTER JW + MIHALCZO JT + KISTNER G + THOMAS JT + REEDY RK + RAFFETY SJ
CRITICAL EXPERIMENTS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3973 (VOL. I) +. 12 PAGES, 28 REFERENCES, 10 FIGURES, 8 TABLES, PAGES 14-25, NEUTRON PHYSICS DIVISION
ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1966, SEPTEMBER 1966, CFSTI \$3.00 CY, \$0.75 MN

CRITICALITY OF SPHERE OF URANYL FLUORIDE SOLUTION AND OF URANIUM CYLINDRICAL ANNULI.
FLIGHT-TIME EFFECTS IN COUPLED SUBCRITICAL URANIUM METAL CYLINDERS. SORA CRITICAL
EXPERIMENTS. ESTIMATING CRITICALITY OF LARGE ARRAYS OF URANIUM. CRITICALITY OF LATTICES
HIRE FUEL ELEMENTS. SAFE HANDLING OF HFIR FUEL ELEMENTS.

*COUPLED CORES + *CRITICALITY EXPERIMENT + HFIR (HIGH FLUX ISOTOPE REACTOR) + REACTOR, AIRCRAFT +
REACTOR, FAST BURST

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-11995 SMITH DC + ROWLANDS JL
THE CALCULATION OF REACTIVITY AND TEMPERATURE CHANGES FOLLOWING A DISTURBANCE IN REACTOR CONDITIONS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH
ANS-100 +. 18 PAGES, 8 FIGURES, 9 TABLES, 41 REFERENCES, PAGES 194-211 OF FAST REACTOR TECHNOLOGY,
AMERICAN NUCLEAR SOCIETY NATIONAL TOPICAL MEETING, DETROIT, MICH., APRIL 26-28, 1965

REVIEWS METHODS FOR CALCULATION OF DOPPLER AND COOLANT COEFFICIENTS AND MAKES A SUBJECTIVE
ESTIMATE OF THE RANGE OF VALUES WHICH MAY COVER PRESENT CALCULATIONS. EXAMINES IMPORTANCE
(TO REACTOR SAFETY) OF THESE ERRORS AND SHOWS THAT CALCULATIONS OF THE INITIAL STAGES OF A
REACTIVITY OR FLOW-LOSS ACCIDENT MAY BE CARRIED OUT ADEQUATELY DESPITE THE COMPARATIVELY WIDE
RANGE OF POSSIBLE VALUES.

*DOPPLER COEFFICIENT + *SODIUM COEFFICIENT + COMPUTER PROGRAM + DOUNREAY (UK) + REACTOR, FAST

6-11996 NIMS JB + THIE JA + SMITH RR + KLINKMAN AE + NICHOLSON RB
FAST REACTOR STABILITY AND SAFETY
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT + ARGONNE NATIONAL LABORATORY, IDAHO FALLS + UNIVERSITY
OF WISCONSIN, MADISON
ANS-100 +. 12 PAGES, 3 FIGURES, 22 REFERENCES, DOCKET NO. 50-19, PAGES 194-211 OF FAST REACTOR
TECHNOLOGY, AMERICAN NUCLEAR SOCIETY NATIONAL TOPICAL MEETING, DETROIT, MICHIGAN, APRIL 26-28, 1965

BROAD REVIEW OF CURRENT STATUS OF STABILITY AND SAFETY OF FAST REACTORS IN AREAS OF
OPERATIONAL (REACTIVITY) STABILITY, HYPOTHETICAL ACCIDENT ANALYSIS, AND LOSS-OF-FLOW
ACCIDENTS. COMPARES 1000-MW(E) DESIGN STUDIES WITH PRESENT REACTORS. SUGGESTS THAT CERTAIN
STANDARD (BETHE-TAIT) MODELS ARE NO LONGER APPLICABLE AND THAT SHAPE CHANGES TO MINIMIZE THE
SODIUM COEFFICIENT MAY BE AN UNSALABLE LUXURY.

*ACCIDENT, HYPOTHETICAL + *ACCIDENT, LOSS OF FLOW + *REACTOR STABILITY + BETHE TAIT + FERMI +
REACTOR, FAST + REACTOR, LIQUID METAL COOLED

6-12124 YEE S
SNAP CRITICAL ASSEMBLY-4B PHASE III WATER IMMERSION EXPERIMENTS
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-9871 +. 113 PAGES, 58 FIGURES, 14 TABLES, DECEMBER 1, 1964, CFSTI \$2.25 CY

THE PHASE III SNAP CRITICAL ASSEMBLY--4B (SCA-4B) EXPERIMENTS WHICH WERE CONDUCTED AS ONE OF
THE PROJECTS IN THE SNAP AEROSPACE SAFETY PROGRAM ARE DESCRIBED. THESE EXPERIMENTS
DEMONSTRATE CONCLUSIVELY THE EFFECTIVENESS OF (1) A VOID-POISON SLEEVE (SHIPPING SLEEVE) IN
MAINTAINING A BARE CORE SUBCRITICAL WHEN IT IS INTERNALLY FLOODED AND FULLY REFLECTED WITH
WATER AND (2) VOID-POISON FILLER BLOCKS IN MAINTAINING A BERYLLIUM-REFLECTED CORE SUBCRITICAL
WHEN IT IS SUBMERGED IN BUT NOT INTERNALLY FLOODED WITH WATER. EXPERIMENTAL DATA WERE ALSO
PROVIDED IN SUPPORT OF THE SUBSEQUENT SNAPTRAN 10A/2-3 DESTRUCTION EXPERIMENT.

*CRITICAL ASSEMBLY FACILITY + *HYDRAULIC EFFECT + *HYDRAULIC EXPERIMENT +
*SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + *SNAP 8 (SYSTEMS FOR NUCLEAR AUXILIARY POWER) +
POISON, BURNABLE + REACTOR, SPACE + WATER, GENERAL

6-12258 KAUFMAN SF
FABRICATION DEVELOPMENT OF BORON CARBIDE AND BORON CARBIDE + SILICON CARBIDE MIXTURES FOR POSSIBLE
APPLICATION AS LUMPED BURNABLE POISONS IN PWR-2
WESTINGHOUSE ELECTRIC CORPORATION, BETTIS ATOMIC POWER LABORATORY, PITTSBURGH
WAPD-244 +. 43 PAGES, 39 FIGURES, 24 TABLES, 13 REFERENCES, JANUARY 1964, CFSTI \$1.00 CY

WAFERS HAVING DENSITIES GREATER THAN 99 PERCENT THEORETICAL WERE PRODUCED FROM B4C AND SIC
POWDER MIXTURES RANGING FROM 0 TO 80 VOL. PERCENT SIC. THE EFFECTS OF STARTING POWDER PURITY
AND SIZE, BLENDING AND HOT PRESSING VARIABLES, VOLUME FRACTION OF SIC UPON DENSITY, AND
MICROSTRUCTURE ARE PRESENTED. THE EFFECT OF DENSITY, B4C PARTICLE SIZE AND VOLUME FRACTION
UPON THE CORROSION BEHAVIOR IN 680 F WATER IS GIVEN. FACTORS AFFECTING THE PREPARATION OF
HOT-PRESSED B4C CONTAINING BORON ENRICHED OR DEPLETED IN THE ISOTOPE B-10 ARE ALSO DISCUSSED.

*POISON, BURNABLE + *REACTOR, PRESSURIZED WATER + BORON + CARBIDE + COPPER + CORROSION + FABRICATION +
FUEL ELEMENT + SILICON

6-12261 COWAN CL
MEASUREMENT OF THE LIVERMORE POOL-TYPE REACTOR (LPTR) TRANSFER FUNCTION USING REACTOR OSCILLATION
TECHNIQUES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-12476 +. 23 PAGES, 10 FIGURES, 6 REFERENCES, MARCH 30, 1965, CFSTI \$2.00 CY, \$0.50 MV

THE TRANSFER FUNCTION OF THE LIVERMORE POOL TYPE REACTOR WAS MEASURED WITH THE AID OF A PILE
OSCILLATOR MECHANISM. A DESCRIPTION OF THE OSCILLATOR CONSTRUCTION IS PRESENTED AND THE
EXPERIMENTAL TRANSFER-FUNCTION CURVES FOR PHASE LAG AND AMPLITUDE ARE INDICATED. THE BREAK
FREQUENCY OF THE TRANSFER FUNCTION WAS DETERMINED FROM THE MEASURED CURVES AND THE RATIO OF
THE EFFECTIVE DELAYED NEUTRON FRACTION TO THE EFFECTIVE NEUTRON LIFETIME WAS FOUND TO BE 88
(PLUS-OR-MINUS 4) RECIPROCAL SECONDS. THE TRANSFER FUNCTION WAS MEASURED WITH BOTH BARE AND
CADMIUM-COVERED DETECTORS. THE FREQUENCY-RESPONSE MEASUREMENTS WERE FOUND TO BE IDENTICAL
FOR BOTH DETECTORS.

*REACTOR, POOL TYPE + *TRANSFER FUNCTION + IN CORE MEASUREMENT + OSCILLATOR, REACTIVITY

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-12314 BENFENATI I
INTEGRATED DOSE AND NEUTRON SPECTRA RESULTING FROM A CRITICALITY INCIDENT
EUROCHEMIC
NP-16216 +. 13 PAGES, 5 FIGURES, 16 REFERENCES, JUNE 1966, CFSTI \$1.00, \$0.50 MN

BASICALLY, SHIELDING STUDY RESULTS OF AN ASSUMED 10-TO-THE-17TH FISSIONS CRITICALITY ACCIDENT IN THE EUROCHEMIC PLANT, REVISED FROM EARLIER WORK. FORTY-FIVE CM OF STANDARD CONCRETE REDUCES DOSE TO 25 REMS WITH EVACUATION.

*ACCIDENT, CRITICALITY + *SHIELDING + EUROCHEMIC + RADIOCHEMICAL PROCESSING

6-12352 FURET J
SAFETY PERIOD DURING THE START-UP OF NUCLEAR REACTORS
CENTRE D ETUDES NUCLEAIRES DE SACLAY
ORNL-TR-292 + CEA-R-2411 +. 30 PAGES, 21 FIGURES, 6 REFERENCES, MARCH 1964, JCL \$3.60 FS, \$1.13 MF

THE PURPOSE OF THIS STUDY IS TO COMPLETE THE ANALYSIS OF PROBLEMS ASSOCIATED WITH A NEUTRON TRANSIENT, IN ORDER TO SHOW HOW THE REACTIVITY LIBERATION RATE IN THE SUBCRITICAL STATE CAN BE INCREASED AND STILL BE COMPATIBLE WITH RAPID STARTUP (PROVIDED THAT MEASUREMENTS OF THE POWER OR NEUTRON FLUX CAN BE MADE WITH A GOOD DEGREE OF PRECISION OVER RELATIVELY SHORT INTERVALS). ANOTHER OBJECTIVE IS TO PROPOSE SAFETY APPARATUSES WHICH MAY LIMIT THE POWER GENERATION RATE DURING STARTUP OF REACTORS.

*CONTROL SYSTEM + *MEASUREMENT, SUBCRITICALITY + *REACTOR STARTUP TESTING + FLUX DISTRIBUTION + MEASUREMENT, REACTIVITY + PERIOD METER + REACTOR SAFETY SYSTEM

6-13235 CORE B MEASUREMENTS REQUIRE REVISION TO INDIAN POINT I ROD WITHDRAWAL ACCIDENT
CONSOLIDATED EDISON
5 PAGES, SEPTEMBER 14, 1966, DOCKET NO. 50-3

CORE B PHYSICS TESTS SHOWED THE MAXIMUM SINGLE-ROD WORTH WAS 3.8 PERCENT REACTIVITY (WITH ALL OTHER RODS INSERTED), WHILE LESS THAN 2 PERCENT WITHDRAWN IN NORMAL SEQUENCE. THEY REQUEST THAT THE TECH. SPEC. PARAGRAPH RELATING TO MAXIMUM SINGLE-ROD WORTH BE CHANGED FOR CLARITY. THE HOT STARTUP ACCIDENT WAS RECOMPUTED TO SHOW THAT POWER REACHES 1090 PERCENT, BUT (WITH OVERPOWER SCRAM) HEAT FLUX DOES NOT EXCEED 52 PERCENT, FUEL DOES NOT EXCEED 950 F, NOR WATER EXCEED 460 F.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*ACCIDENT ANALYSIS + *ACCIDENT, CONTROL ROD WITHDRAWAL + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + INDIAN POINT 1 + REACTOR, PRESSURIZED WATER + TEST, PHYSICS

6-13323 FLOCK WL
NUCLEAR SUPERHEAT PROJECT TWENTY-SECOND QUARTERLY REPORT. NOVEMBER 1964 - JANUARY 1965
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-4790 +. 92 PAGES, FEBRUARY 1965, CFSTI \$5.00 CY

ADDITIONAL MEASUREMENTS WITH THE DOPPLER FURNACES TO EVALUATE PERTURBATIONS CREATED BY STRUCTURAL COMPONENTS OF THE FURNACES AND THE IMPORTANCE OF SELF-SHIELDING OF THE FOILS. THE MEASUREMENT OF THE FLOODING-POISONING EFFECT WAS EXTENDED TO 16 BUNDLES. CALCULATIONS ON THE WORTH OF MATERIALS IN THE FAST CORE HAVE BEEN MADE AND COMPARED TO MEASURED VALUES FOR INCONEL AND STAINLESS STEEL. A TWO-DIMENSIONAL, 4-ENERGY GROUP, R-Z GEOMETRY, PDQ CALCULATION MATCHING THE PRESENT MSCA CRITICAL LOADING WAS MADE.

*MSSR (MIXED SPECTRUM SUPERHEAT REACTOR) + COMPUTER, DIGITAL + DANGER COEFFICIENT + DOPPLER COEFFICIENT + FLOODING, SUPERHEATER + INCONEL + STEEL, STAINLESS

6-13373 REISCH F
STABILITY ANALYSIS OF A SAMPLED-DATA CONTROLLED NUCLEAR REACTOR SYSTEM
AB ATOMENERGI, STOCKHOLM
7 PAGES, 10 FIGURES, NOVEMBER 1966, NUCLEAR SCIENCE AND ENGINEERING 26(3), PAGES 378-384

IN A DIGITAL-COMPUTER-CONTROLLED SYSTEM, SEVERAL VARIABLES CAN BE MONITORED ALMOST SIMULTANEOUSLY, AND THE SYSTEM CAN BE CONTROLLED ACCORDING TO THE MOST CRITICAL ONE. STABILITY OF SUCH A SAMPLED-DATA CONTROL SYSTEM MAY BE HANDLED BY TRANSFORM. DIGITAL COMPUTER PROGRAM FOR THIS IS DEVELOPED.

COMPUTER, DIGITAL + REACTOR CONTROL

6-13374 BABALA D
ON THE THEORY OF ROSSI-ALPHA EXPERIMENT IN REACTOR NOISE STUDIES
INSTITUTT FOR ATOMENERGI
2 PAGES, 1 FIGURE, NUCLEAR SCIENCE AND ENGINEERING 26(3), PAGES 418-419 (NOVEMBER 1966)

ATTEMPTS TO EXPLAIN DIFFERENCES BETWEEN EXPERIMENT AND THEORY ON ROSSI ALPHA.

*ROSSI ALPHA + NORWAY

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-13375 PLAZA H + KOHLER WH
COUPLED-REACTORS KINETICS EQUATIONS
TEXAS A AND M UNIVERSITY
4 PAGES, NUCLEAR SCIENCE AND ENGINEERING 26(3), PAGES 418-422 (NOVEMBER 1966)

IN THIS NOTE, THE COUPLED-REACTORS KINETICS EQUATIONS HAVE BEEN DERIVED WITHIN THE FRAME OF NEUTRON TRANSPORT THEORY. THE CONCEPT OF SURFACE COUPLING IS USED TO ACCOUNT FOR THE NEUTRONIC INTERACTION BETWEEN REACTORS. EQUATION (13) CONSTITUTES AN EXACT FORMULATION OF THE COUPLED CORES KINETICS AND IS SUITED TO DESCRIBE LESS GENERAL CASES. FOR LARGE REACTORS, WITH A HIGH DEGREE OF HETEROGENEITY, THIS FORMULATION PROPERLY REDUCES TO WHAT MAY BE CALLED THE TIME-DEPENDENT REGION OR ZONE-COUPLING TECHNIQUE.

*COUPLED CORES + *REACTOR DYNAMICS

6-13376 CHERNICK J
A REVIEW - NAVAL REACTORS PHYSICS HANDBOOK VOLUME I, SELECTED BASIC TECHNIQUES
BROOKHAVEN NATIONAL LABORATORY
2 PAGES, NUCLEAR SCIENCE AND ENGINEERING 26, PAGES 428-429, A REVIEW OF A BOOK EDITED BY A. RADKOWSKY, PUBLISHER, USAEC

MENTIONS THAT THE HANDBOOK CONTAINS A CHAPTER ON REACTOR KINETICS.

REACTOR DYNAMICS

6-13381 DITTMAN GL
SINGLE PULSE TIME-OPTIMAL SOLUTION OF THE REACTOR SHUTDOWN PROBLEM
LAWRENCE RADIATION LABORATORY
UCRL-12261 +. 38 PAGES, 1 TABLE, REFERENCES, DECEMBER 16, 1964, CFSTI \$3.00 CY

THE WORK PRESENTED HERE REPRESENTS TIME-INDEPENDENT XENON AND IODINE VARIATIONS IN A NORMALIZED PHASE PLANE. THIS REPRESENTATION GRAPHICALLY ILLUSTRATES THE ENTIRE RANGE OF THE XENON AND IODINE VALUES FOR EITHER A SCRAM SHUTDOWN OR FULL-POWER EXCURSION. FROM A QUALITATIVE CONSIDERATION OF THE PHASE PLANE CURVES, NECESSARY AND SUFFICIENT GENERAL CRITERIA FOR THE OPTIMUM SHUTDOWN OF A REACTOR ARE FORMULATED. IN ADDITION, A SINGLE-PULSE SHUTDOWN PROCEDURE IS GENERATED THAT HAS BEEN PROVEN TO BE THE OPTIMUM SHUTDOWN FOR REACTORS WITH SUFFICIENT EXCESS REACTIVITY. A DIGITAL PROGRAM HAS BEEN WRITTEN THAT CALCULATES AND PLOTS ALL THE EQUATIONS OF INTEREST, DETERMINES THE OPTIMUM ONE-PULSE SHUTDOWN, AND GENERATES MINIMUM-TIME ONE-PULSE SHUTDOWNS AS A FUNCTION OF REACTIVITY BURNOUT.

*REACTOR DYNAMICS + *XENON + COMPUTER PROGRAM + COMPUTER, DIGITAL + IODINE + MATHEMATICAL STUDY

6-13383 CLARK HK
INTERACTION OF FISSILE UNITS. A COMPUTER CODE- INTERACT
SAVANNAH RIVER LABORATORY
DP-1031 +. 59 PAGES, 7 TABLES, 9 REFERENCES, JUNE 1966

A FORTRAN CODE WHICH COMPUTES THE K-EFFECTIVE FOR A GROUP OF FISSILE UNITS SURROUNDED BY A REFLECTOR AND THE SPACING BETWEEN UNITS REQUIRED TO MAKE K-EFFECTIVE UNITY. THE CODE MAY BE USED WITH CONFIDENCE FOR NUCLEAR SAFETY APPLICATIONS. IN ADDITION TO THE DIMENSIONS AND SPACINGS OF UNITS AND REFLECTORS, THE REQUIRED INPUT INCLUDES THE MATERIAL BUCKLING, THE BARE EXTRAPOLATION DISTANCE, THE MIGRATION AREA OF THE FISSILE UNITS, AND THE ALBEDO OF THE REFLECTOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.75 MN.

*COUPLED CORES + *CRITICALITY SAFETY

6-13393 ERGEN WK
TRANSIENTS IN LARGE REACTORS
OAK RIDGE NATIONAL LABORATORY
5 PAGES, 1 TABLE, 2 FIGURES, 10 REFERENCES, NUCLEAR SAFETY 8(1) PAGES 30-34 (FALL 1966)

FOR SUPERPROMPT-CRITICAL EXCURSIONS IN LARGE REACTORS CONSIDERATION OF THE SPACE DEPENDENCE OF TRANSIENTS YIELDS APPRECIABLY DIFFERENT VALUES OF ENERGY DENSITY THAN THE POINT REACTOR MODEL. TECHNIQUES FOR CONSERVING COMPUTING-MACHINE TIME IN SPACE-DEPENDENT CALCULATIONS ARE DISCUSSED IN THIS PAPER. ANALYTICAL SOLUTIONS, IN TERMS OF ELLIPTIC FUNCTIONS, ARE PRESENTED FOR CERTAIN TYPICAL CASES.

*EXCURSION, LARGE + *SPACE DEPENDENT DYNAMICS

6-13404 DAWSON FG
PHYSICS DESIGN ASPECTS OF PLUTONIUM RECYCLE
PACIFIC NORTHWEST LABORATORY, RICHLAND
BNWL-232 +. 34 PAGES, 11 FIGURES, 14 TABLES, 40 REFERENCES, MAY 1966

OF SAFETY INTEREST IS THE DISCUSSION OF THE DELAYED NEUTRONS AND OF MODERATOR TEMPERATURE COEFFICIENT, MODERATOR VOID COEFFICIENT, AND DOPPLER COEFFICIENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-13404 *CONTINUED*
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$2.00 CY, \$0.50 MN.

*PLUTONIUM + *REACTOR, THERMAL + DELAYED NEUTRON + DOPPLER COEFFICIENT + MODERATOR COEFFICIENT + VOID COEFFICIENT

6-13405 JUDGE FD + DAITCH PB
TIME-DEPENDENT NEUTRON FLUX IN PULSED MULTIPLYING ASSEMBLIES
RENSSELAER POLYTECHNIC INSTITUTE, TROY, NEW YORK
15 PAGES, 4 FIGURES, 4 TABLES, NUCLEAR SCIENCE AND ENGINEERING 26(4), PAGES 472-486, (1966)

VARIATIONAL METHOD USED TO REDUCE THE GENERAL TIME-DEPENDENT BOLTZMANN EQUATION TO A MULTIGROUP FORM. RELATION BETWEEN ENERGY AND SPACE TRANSIENTS IN PULSED MULTIPLYING AND PULSED MODERATING SYSTEMS. NELKIN BUCKLING EXPANSION SOLUTION FOR THE FOURIER TRANSFORMED TRANSPORT EQUATION FOR 1 V ABSORPTION IS EXTENDED TO INCLUDE NON-1/V ABSORPTION AND FISSION. SPACE AND TIME DEPENDENCE OF THE NEUTRON FLUX IN PULSED MULTIPLYING SYSTEMS IS DESCRIBED AND APPLIED TO THE ANALYSIS OF RECENT PULSED SPECTRA MEASUREMENTS. SPATIAL ASYMMETRIES IN THE FLUX COULD EXIST AFTER THE FLUX DISTRIBUTION APPEARS ASYMPTOTIC.

*PULSED NEUTRON TECHNIQUE + *SPACE DEPENDENT DYNAMICS

6-13406 OSBORN RK + NIETO JM
DETECTOR EFFECTS ON THE STATISTICS OF NEUTRON FLUCTUATIONS
UNIVERSITY OF MICHIGAN, ANN ARBOR
6 PAGES, NUCLEAR SCIENCE AND ENGINEERING 26(4), PAGES 511-516, (1966)

PROBLEM FORMULATED IN A GENERAL WAY. AS ILLUSTRATION, EXPRESSIONS ARE OBTAINED FOR THE POWER SPECTRAL DENSITY AND THE CROSS POWER SPECTRAL DENSITY ASSUMING GAS-FILLED BF₃ IONIZATION CHAMBERS AS DETECTORS. RESULTS SHOW THE ANTICIPATED BREAK FREQUENCIES ON CHAMBER PARAMETERS SUCH AS DENSITY, TEMPERATURE, AND BIAS VOLTAGE IS QUALITATIVELY REVEALED.

*NOISE ANALYSIS

6-13407 OTT K
QUASISTATIC TREATMENT OF SPATIAL PHENOMENA IN REACTOR DYNAMICS
ARGONNF NATIONAL LABORATORY
2 PAGES, 2 FIGURES, NUCLEAR SCIENCE AND ENGINEERING 26(4), PAGES 563-564, (1966)

AN IMPROVED QUASISTATIC MODEL IS PROPOSED (ADIABATIC) WHICH SHOULD GIVE RELIABLE RESULTS IN ALL CASES OF PRACTICAL INTEREST.

*SPACE DEPENDENT DYNAMICS + COMPUTER, DIGITAL + DELAYED NEUTRON

6-13594 PRINCE BE
PERIOD MEASUREMENTS ON THE MOLTEN SALT REACTOR EXPERIMENT DURING FUEL CIRCULATION -- THEORY AND EXPERIMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1626 +. 36 PAGES, 8 FIGURES, 1 TABLE, 10 REFERENCES, OCTOBER 1966

FOR THE MSRE, A THEORY OF PERIOD DEPENDENCE ON FUEL CIRCULATION. THE RESULTING IN-HOUR-TYPE EQUATION IS EVALUATED BY MACHINE COMPUTATION. THE CALCULATED REACTIVITY DIFFERENCE BETWEEN THE NONCIRCULATING AND THE CIRCULATING FUEL STATES IS IN CLOSE AGREEMENT WITH MSRE ROD-CALIBRATION EXPERIMENTS. ROD-BUMP PERIOD MEASUREMENTS MADE WITH FUEL CIRCULATING CONVERTED TO DIFFERENTIAL ROD WORTH AND COMPARED FAVORABLY WITH SIMILAR ROD SENSITIVITY MEASUREMENTS MADE WITH THE FUEL STATIONARY. SUGGESTIONS FOR A MORE RIGID TEST OF THE THEORETICAL MODEL FOR THE EFFECTS OF CIRCULATION ON THE DELAYED NEUTRON KINETICS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 COPY, \$0.50 MICRONEGATIVE

*MSRE (MOLTEN SALT REACTOR EXPERIMENT) + *SPACE DEPENDENT DYNAMICS + COMPUTER, DIGITAL + DELAYED NEUTRON + REACTOR, MOLTEN SALT

6-13816 PALMER JA
A KINETIC ANALYSIS OF THE AIR FORCE NUCLEAR ENGINEERING TEST REACTOR
AIR FORCE INSTITUTE OF TECH., WRIGHT-PATTERSON AFB, OHIO
AD-621124 + GNE-65-16 +. 205 PAGES, FIGURES, TABLES, AUGUST 1965

NEUTRON KINETICS WERE DESCRIBED USING THE SPACE INDEPENDENT KINETICS EQUATIONS WITH SIX DELAYED GROUPS. THERMAL KINETICS WERE OBTAINED BY BREAKING THE REACTOR COOLING SYSTEM INTO A SERIES OF BLOCKS AND WRITING A HEAT BALANCE EQUATION FOR EACH. REACTIVITY FEEDBACK WAS BASED ON AN EFFECTIVE VOID VOLUME DUE TO MODERATOR DENSITY CHANGE, CORE EXPANSION, AND STEAM FORMATION. A DIGITAL COMPUTER CODE WAS CONSTRUCTED TO SOLVE THE RESULTING SET OF DIFFERENTIAL EQUATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.50 CY, \$1.25 MN.

REACTOR DYNAMICS + REACTOR, TEST

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-13817 MORRELL RP
SEFOR BETA/1 MEASUREMENTS BY NOISE ANALYSIS TECHNIQUES
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS
ID0-17210 +. 50 PAGES, 26 FIGURES, 3 TABLES, AUGUST 1966

THE OBJECTIVE OF THIS STUDY WAS TO EVALUATE CROSS-POWER SPECTRUM TECHNIQUES AS APPLIED TO BETA/1 MEASUREMENTS ON THE ZPR-III MOCK-UP OF THE SEFOR CORE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*SEFOR (SOUTHWEST EXP. FAST OXIDE REACTOR) + ROSSI ALPHA + ZPR 3 (ANL ZERO POWER EXPERIMENT)

6-13868 YASINSKY JB
THE SOLUTION OF THE SPACE-TIME NEUTRON GROUP DIFFUSION EQUATIONS BY A TIME-DISCONTINUOUS SYNTHESIS METHOD
BETTS ATOMIC POWER LABORATORY
25 PAGES, 4 TABLES, 4 FIGURES, 8 REFERENCES, OCTOBER 1966, ANS TRANSACTIONS 9(2), PAGE 456 (1966) WINTER MEETING PITTSBURGH, PENNSYLVANIA, OCTOBER 30 THROUGH NOVEMBER 3, 1966

VARIATIONAL PRINCIPLE, WHICH HAS AS ITS STATIONARY CONDITIONS THE DIRECT AND ADJOINT TIME-DEPENDENT GROUP DIFFUSION EQUATIONS, MODIFIED TO ADMIT TIME-DISCONTINUOUS APPROXIMATING FUNCTIONS. THIS EXTENDED PRINCIPLE IS USED FOR A SYNTHESIS APPROXIMATION FOR THE TIME-DEPENDENT GROUP DIFFUSION EQUATIONS WHICH PERMITS USE OF DIFFERENT SETS OF TRIAL FUNCTIONS AT DIFFERENT TIMES DURING A TRANSIENT ANALYSIS. THE NECESSARY EQUATIONS DERIVED TWO NUMERICAL EXAMPLES. THESE EXAMPLES SHOW THAT THE TIME-DISCONTINUOUS SYNTHESIS METHOD CAN CONSTRUCT ACCURATE SPACE-TIME NEUTRON FLUXES, WHICH VARY SMOOTHLY IN TIME, FROM SPATIAL TRIAL FUNCTIONS WHICH ARE DISCONTINUOUS IN TIME. THESE EXAMPLES ALSO DISPLAY THE POTENTIAL OF THE NEW TIME SYNTHESIS FOR YIELDING COMPUTATIONALLY CHEAPER SOLUTIONS.

*REACTOR DYNAMICS

6-13869 MEENAN P + HETRICK D
STABILITY OF THE TWO-TEMPERATURE REACTOR MODEL WITH DELAYED NEUTRONS
UNIVERSITY OF ARIZONA
6 PAGES, 2 FIGURES, 4 REFERENCES, JUNE 1966, ANS TRANSACTIONS 9(2) PAGE 458 (1966) WINTER MEETING PITTSBURGH, PENNSYLVANIA, OCTOBER 30 THROUGH NOVEMBER 3, 1966

THE PROMPT-JUMP APPROXIMATION HAS BEEN APPLIED TO THE TWO-TEMPERATURE REACTOR MODEL, YIELDING LINEAR STABILITY REGIONS IN REACTIVITY-COEFFICIENT PARAMETER SPACE INCLUDING THE EXPLICIT BOUNDARY BETWEEN STABLE AND UNSTABLE PORTIONS OF THE CONDITIONALLY STABLE REGION.

*REACTOR DYNAMICS

6-13870 BECKER M + HOGUE DC + RUBIN HH
THE INFLUENCE OF COOLANT PASS ARRANGEMENT ON NUCLEAR PLANT DYNAMICS
GENERAL ELECTRIC COMPANY, KNOLLS ATOMIC POWER LABORATORY, SCHENECTADY, NEW YORK
24 PAGES, 6 FIGURES, 4 REFERENCES, ANS TRANSACTIONS 9(2) PAGE 458 (1966) WINTER MEETING PITTSBURGH, PENNSYLVANIA OCTOBER 30-NOVEMBER 3, 1966, AMERICAN NUCLEAR SOCIETY

CONSIDERS PLANT AS A WHOLE WITH CONSTANT STEAM FLOW OR ANOTHER ATTEMPT AT DRAWING CONSTANT POWER. SUCH CLOSED SYSTEM MAY BE MORE OR LESS STABLE THAN OPEN SYSTEMS. EXTENSIVE SERIES OF TRANSIENTS WITH TEMPERATURE COEFFICIENTS OF DIFFERENT SIZES. TEMPERATURE VARIATION OF SPECIFIC HEAT OF WATER MAY DESTABILIZE.

*REACTOR DYNAMICS + *REACTOR STABILITY

6-13884 PHYSICS DEPARTMENT PROGRESS REPORT, FEBRUARY - MAY, 1966
LAWRENCE RADIATION LABORATORY
UCRL-50001-66-1 +. 79 PAGES, FIGURES, TABLES, REFERENCES, MAY 1966

OF POSSIBLE SAFETY INTEREST ARE THE COMPILATION OF SHOCK WAVE DATA (PAGE 51), AND THE EXPERIMENTAL DETERMINATION OF THE COMPRESSIBILITY OF ATOMIC SHELLS (PAGE 51). BOTH ITEMS RELATE TO THE EQUATION-OF-STATE AT HIGH PRESSURE WHICH IS USED IN COMPILATIONS OF HYPOTHETICAL VERY LARGE EXPLOSIONS OF FAST REACTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY

*EQUATION OF STATE

6-13900 THOMPSON TJ + KAPLAN I + CLIKEMAN FM + DRISCOLL MJ
HEAVY WATER LATTICE PROJECT ANNUAL REPORT
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASSACHUSETTS
MIT-2344-4 + MITNE-65 +. 165 PAGES, 51 FIGURES, 32 TABLES, 4 REFERENCES, SEPTEMBER 1965, CFSTI \$5.00 CY, \$1.00 MN

AN EXPERIMENTAL AND THEORETICAL PROGRAM ON THE PHYSICS OF HEAVY-WATER MODERATED, PARTIALLY ENRICHED LATTICES, CONDUCTED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. EXPERIMENTAL METHODS ALLOW RESEARCH ON BUCKLING, FAST FISSION, RESONANCE CAPTURE, AND THERMAL CAPTURE. IN THE PAST YEAR, MEASUREMENTS HAVE BEEN MADE ON LATTICES OF 0.25-INCH RODS CONTAINING 1.143

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-13900 *CONTINUED*
PERCENT ENRICHED FUEL AND ON 0.75-INCH RODS CONTAINING 0.947 PERCENT ENRICHED FUEL. RESEARCH IS ALSO UNDER WAY IN THE AREAS OF SINGLE-ROD MEASUREMENTS, TWO-REGION-LATTICE STUDIES, STUDIES OF LATTICES WITH ADDED NEUTRON ABSORBERS, FAST-NEUTRON DISTRIBUTION MEASUREMENTS, MINIATURE LATTICE WORK, AND PULSED-NEUTRON METHODS.

*RESEARCH CONTRACT + BUCKLING + FLUX DISTRIBUTION + REACTOR, HEAVY WATER

6-14414 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
PATHFINDER ATOMIC POWER PLANT. BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-65599 +. 79 PAGES, 30 TABLES, 22 FIGURES, 11 REFERENCES, AUGUST 31, 1966 DOCKET NO. 50-130

REACTIVITY WORTHS OF FUEL AND CONTROL RODS OBTAINED BETWEEN INITIAL-SLAB CORE AND FULL-CORE LOADING. REVIEWS COMPLEX CORE-MATERIAL ARRANGEMENT AND RESULTANT CHANGES TO INTRICATE CALCULATIONAL TREATMENT BASED ON SLAB-CORE TESTS. (A SYNTHESIS OF RZ AND XY USED FOR SUPERHEATER AND UPPER/LOWER BOILER DIFFERENCES INSTEAD OF A 3D CODE).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + ANALYTICAL MODEL + COMPARISON, THEORY AND EXPERIENCE + CONTROL ROD WORTH + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SHUTDOWN MARGIN

6-14417 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
CORE COUPLING TESTS
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-65599 +. 3 PAGES, 1 FIGURE, PATHFINDER ATOMIC POWER PLANT, BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS, PAGES 3-16 - 3-18, AUGUST 31, 1966, DOCKET NO. 50-130

INITIAL TEST 302 HAD SUPERHEATER UNFUELED, BUT WITH MODERATOR AND CONTROL RODS IN, PREVENTING COUPLING ACROSS THE SUPERHEATER. CALCULATIONS FOR AN UNBALANCED ROD PATTERN INDICATED AN 8-SECOND LAG BETWEEN DIFFERENT INSTRUMENTS RESPONDING. MEASUREMENTS SHOWED A TIME LAG OF SEVERAL SECONDS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + COUPLED CORES + FLUX TILT + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

6-14418 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
SHUTDOWN MARGIN PROBLEM
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-65599 +. 2 PAGES, PATHFINDER ATOMIC POWER PLANT, BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS, PAGES 7.1 - 7.2, AUGUST 31, 1966, DOCKET NO. 50-130

CALCULATIONS APPEAR TO OVER PREDICT (BY ONE TENTH) INDIVIDUAL REACTIVITY ADDITIONS BY FUEL CHANGE, CONTROL ROD POSITION, SHIMS ETC. HOWEVER, COMBINATIONS OF TWO CHANGES HAVE BEEN PREDICTED ACCURATELY. VARIOUS ATTEMPTS WERE UNSUCCESSFUL IN INCREASING K EFFECTIVE WHILE MAINTAINING SHUTDOWN MARGIN (ONE ROD STUCK OUT) ABOVE 0.3 PERCENT. THE FINAL LOADING GIVES AN AVAILABLE EXCESS REACTIVITY OF 9.8 PERCENT, WHILE 9.7 PERCENT IS ESTIMATED NEEDED FOR FULL POWER WITH EQUILIBRIUM XENON AND SAMARIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + PATHFINDER + REACTIVITY, EXCESS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SHUTDOWN MARGIN

6-14601 QUESTION G-6. JUSTIFY SELFPOINT OF NEUTRON LEVEL SCRAM AT INCIPIENT CENTERLINE MELTING TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.6.1 TO G.6.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

THE INITIAL SETTING OF 120' WAS CHOSEN ON THE EXPECTATION THAT FINAL DESIGN ANALYSIS WOULD SHOW THAT THIS WAS ADEQUATE. APPENDIX G ATTEMPTED TO DISTINGUISH BETWEEN CENTERLINE MELTING AT 22 KW/FT AND DAMAGE AT 28 KW/FT. A LOAD-REJECTION TRANSIENT PRODUCING A 150-180' NEUTRON FLUX TRANSIENT IS OF SUCH SHORT DURATION THAT THE HEAT FLUX OVERSHOOT IS ONLY 1'. A SLOW INCREASE WOULD BE STOPPED BY A 108' ROD BLOCK OR BY A HIGH-PRESSURE SCRAM WELL BEFORE 120' POWER. THE OBSERVED FREQUENCY IS 2 IN EVERY 10 REACTOR-YEARS FOR LARGE-BWR TRANSIENTS TO THE 110' LEVEL.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CENTERLINE MELTING + INSTRUMENTATION, POWER RANGE + OPERATING LIMITS/TECHNICAL SPECIFICATIONS + PERFORMANCE LIMIT + REACTOR SAFETY SYSTEM + REACTOR TRANSIENT + REACTOR, BOILING WATER

6-14602 QUESTION G-7. HOW MUCH FUEL MELTING OCCURS FOLLOWING REACTIVITY ACCIDENTS

ACCESSION NUMBER 6-13900 TO 6-14602

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-14602 *CONTINUED*
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES G.7.1 TO G.7.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GOOD BACKGROUND DISCUSSION. ROD-DROPOUT ACCIDENTS (THOROUGHLY REPORTED IN UNCERTAINTY ANALYSIS IN DRESDEN 3 AMENDMENT 3) IS STUDIED TO ENSURE PRIMARY-SYSTEM INTEGRITY, AND SOME FUEL MELTING AND CLADDING-STRAIN RUPTURE ACCEPTED. ROD-WITHDRAWAL ACCIDENT FROM THE COLD CONDITION GIVES A PEAK FUEL TEMPERATURE OF 2500 F, WELL BELOW CLAD-FAILURE THRESHOLD OF 3900 F. ROD-WITHDRAWAL ACCIDENT AT POWER IS ASSUMED TO BE VERY SLOW. INCIPIENT MELTING AT 22 KW/FT AND GROSS MELTING AT 28 KW/FT OCCURS. THE MAXIMUM TRANSIENT HEAT FLUX IS ONLY 16' ABOVE STEADY-STATE VALUE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD DROPOUT + ACCIDENT, CONTROL ROD WITHDRAWAL + BROWNS FERRY + CENTERLINE MELTING + REACTOR, BOILING WATER + SAFETY PRINCIPLES AND PHILOSOPHY

6-14603 QUESTION G-8. DOES INCREASED POWER CHANGE ROD DROPOUT ACCIDENT CONCLUSION. DO LOW WORTH RODS GIVE HIGHER ENTHALPY INCREASES BECAUSE THEY ARE NEAR FLUX PEAKS.
TENNESSEE VALLEY AUTHORITY
3 PAGES, 1 FIGURE, PAGES G.8.1 TO G.8.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GRAPH OF FUEL-CENTERLINE ENTHALPY VS DELTA K OF NEARBY CONTROL FOR INITIAL AND FOR EXCURSION INCREMENT SHOWS THAT THE SUM (FINAL ENTHALPY) IS APPROXIMATELY CONSTANT (220-210 CAL/G) UP TO 0.04 DELTA K. EVEN THOUGH THE BASE INITIAL ENTHALPY IS 20 CAL/G HIGHER FOR BROWNS FERRY, THIS IS AT ZERO DELTA K. NEAR PROMPT CRITICALITY, THE DIFFERENCE FROM DRESDEN 2 IS ONLY 5 CAL/G, AND THE RESULTANT 220 IS WELL BELOW THE 280-CAL/G FULLY MOLTEN CONDITION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD DROPOUT + BROWNS FERRY + CENTERLINE MELTING + PERFORMANCE LIMIT + REACTOR, BOILING WATER

6-14604 QUESTION G-9. GIVE PLUTONIUM ISOTOPIC INVENTORY AT BURNUP, AND EFFECTS ON DESIGN BASES ACCIDENTS
TENNESSEE VALLEY AUTHORITY
2 PAGES, 1 TABLE, PAGES G.9.1 TO G.9.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

PU-239 EFFECT ON DELAYED NEUTRON FRACTION ACCOUNTED FOR. DRESDEN-3 AMENDMENT 3 SUMMARIZED EXCURSION-ANALYSIS UNCERTAINTIES AND SHOWED THAT THE BETA-EFFECT REACTIVITY FEEDBACK UNCERTAINTY CANCELED THE INPUT UNCERTAINTY. PU-240 EFFECT ON DOPPLER COEFFICIENT IS USUALLY NEGLECTED. TABLE SHOWS THAT PU-240 WOULD MAKE DOPPLER COEFFICIENT A FACTOR OF 0.226 MORE NEGATIVE AFTER 25,000 MWD/METRIC TON.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + DELAYED NEUTRON + DOPPLER COEFFICIENT + FUEL BURNUP + PLUTONIUM + REACTOR, BOILING WATER

6-14616 QUESTION I-1. DISCUSS REACTOR STABILITY IN LIGHT OF INCREASED EXIT QUALITY AND OTHER DIFFERENCES FROM DRESDEN-II-CLASS REACTORS
TENNESSEE VALLEY AUTHORITY
5 PAGES, 1 FIGURE, PAGES I.1.1 TO I.1.5 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

A STABILITY PARAMETER STUDY SET 8 DESIGN-GUIDE VALUES OF WHICH ONLY THE VALUE FOR THE EXIT QUALITY IS EXCEEDED AT BROWNS FERRY. HOWEVER, GAIN AND PHASE MARGINS ARE GREATER THAN REQUIRED (13 DB AND 55 DEG). THE EFFECT OF NINE ITEMS ON STABILITY IS DISCUSSED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + DESIGN CRITERIA + REACTOR STABILITY + REACTOR, BOILING WATER

6-14617 QUESTION I-2. EVALUATE OFF-NORMAL CONDITIONS ON REACTOR STABILITY
TENNESSEE VALLEY AUTHORITY
2 PAGES, 1 FIGURE, PAGES I.2.1 AND 2.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

AN OFF-NORMAL EVENT WILL EITHER CAUSE A SCRAM OR THE REACTOR WILL SETTLE TO A NEW OPERATING CONDITION. PRELIMINARY ANALOG ANALYSIS OF A 10-PSI REACTOR-PRESSURE SETPOINT CHANGE SHOWS A MOMENTARY NEUTRON FLUX INCREASE TO 109' IN 4 SEC, AN INCREASE TO 103' IN SURFACE HEAT FLUX, AND 9' DROPS IN STEAM FLOW AND PRESSURE, FOLLOWED BY PEAKS TO 105'.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-14617 *CONTINUED*
REACTOR STABILITY + REACTOR, BOILING WATER

6-14618 QUESTION 1-3. DISCUSS XENON OSCILLATION AND IDENTIFY LIMITING MODE
TENNESSEE VALLEY AUTHORITY
3 PAGES, 2 FIGURES, PAGES 1.3.1 TO 1.3.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC
QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

L/D RATIO MAKES BROWNS FERRY MOST SUSCEPTIBLE TO AZIMUTHAL MODE. MODAL EXPANSION TECHNIQUES
SHOW MARGIN TO INSTABILITY ADEQUATE BY A FACTOR OF 2-4 IN POWER COEFFICIENT. EFFECT OF GROSS
POWER FLATTENING WAS CONSIDERED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
POWER COEFFICIENT + POWER DISTRIBUTION + REACTOR, BOILING WATER + XENON OSCILLATION

6-14745 PATHFINDER RESPONSE TO SYSTEM CHANGES IN THE 10 TO 40 PERCENT POWER RANGE
NORTHERN STATES POWER COMPANY
NSP-6603 +. 25 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES
17-41, JANUARY 9, 1967, DOCKET NO. 50-130

MAJOR STEPS WERE 20 PERCENT AND 40 PERCENT (76 MWTH) POWER, WITH SHORT TESTS AT INTERMEDIATE
POWER LEVELS. TESTS INCLUDED SETPOINT CHANGES TO PRESSURE, FEEDWATER FLOW AND TEMP.,
CONTROL-ROD POSITION, AND RECIRCULATION FLOW. INSTRUMENT RESPONSE AND DATA AT EQUILIBRIUM
STATES NOTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATIONS SUMMARY FOR AEC + *TEST, PLANT RESPONSE + PATHFINDER + REACTOR STABILITY +
REACTOR, BOILING WATER + REACTOR, SUPERHEAT

6-14757 SINGH RS
PHYSICS ASPECTS OF LARGE THORIUM FUELED FAST REACTORS.
ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA
AEET-229 +. 12 PAGES, 1965

THE REACTIVITY COEFFICIENTS DUE TO SODIUM LOSS AND DOPPLER EFFECTS ARE NEGATIVE EVEN IN A CORE
VOLUME AS LARGE AS 15,000 LITERS. (FOR A 15,000 LITER, THORIUM U-233-FUELED, SODIUM COOLED
FAST REACTOR). REACTIVITY COEFFICIENTS EVALUATED FOR THE CLEAN CORE AS WELL AS FOR THE CORE
WITH EQUILIBRIUM COMPOSITION USING METALLIC AND CARBIDE FUELS. INTERFERENCE INTERACTION
BETWEEN THE RESONANCES OF PU-239 AND TH-232 ON THE DOPPLER EFFECT AND SODIUM-VOID
COEFFICIENTS IN TH-PU-239 FUELED FAST REACTORS INVESTIGATED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM,
WISCONSIN 54669

*INDIA + *REACTOR, FAST + *THORIUM + DOPPLER EFFECT + PLUTONIUM + REACTOR, DESALINATION +
SODIUM COEFFICIENT

6-14840 DETAILS OF ROD EJECTION ANALYSIS
CONNECTICUT YANKEE ATOMIC POWER COMPANY
19 PAGES, 14 FIGURES, 5 REFERENCES, PAGES D-1 TO D-19 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT
11 TO LICENSE APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

PARAMETER STUDIES ARE REPORTED FOR 1.2. INITIAL POWER LEVEL, ZERO OR 1880 MWTH, AND ROD
WORTH. (FUEL-ELEMENT ENTHALPY RISE IS LESS THAN 200 BTU/LB FOR MOST ROD-PLUS-MODERATOR
REACTIVITY ADDITIONS. MODERATOR ADDITIONS STRONGLY AFFECT THIS, WITH 200 BEING REACHED AT 1'
RODS PLUS 1.5' MODERATOR AT 1880 MWTH. WORSE CASE IS AT POWER, BUT ROD WORTH IS THEN
MINIMIZED BY CHEMICAL SHIM.) 3. DOPPLER WEIGHTING FACTOR (A FACTOR OF 1.2 INSTEAD OF THE
1.6 USED WOULD INCREASE ENTHALPY BY 40 IN WORST CASE). 4. MODERATOR REACTIVITY INSERTION
(STRONGLY DEPENDENT ON WORTH OF EJECTED ROD.) 5. SCRAM DELAY TIME (DELAY TIME OF 1.5 SEC
RATHER THAN 1 SEC WOULD ADD 20 BTU/LB IN WORST CASE). SAMPLE CALCULATION SHOWS A 0.7'
EJECTION AT 1880 MWTH WOULD GIVE A MAXIMUM OF 3' FUEL DISPERSION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT ANALYSIS +
ACCIDENT, CONTROL ROD EJECTION + FUEL MELTDOWN + MODERATOR COEFFICIENT + REACTOR, PRESSURIZED WATER +
SAFETY ANALYSIS

6-14841 CORE THERMAL/HYDRAULIC STUDY FOR INTERMEDIATE STEADY STATE POWERS AND ROD WITHDRAWAL ACCIDENT
CONNECTICUT YANKEE ATOMIC POWER COMPANY
11 PAGES, 8 FIGURES, PAGES E-1 TO E-11 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE
APPLICATION, DOCKET NO. 50-213, OCTOBER 6, 1966

SENSITIVITY OF VARIOUS ASSUMPTIONS AND PARAMETERS TESTED. FOR VARIOUS POWER LEVELS, THE
NUMBER OF FUEL RODS STATISTICALLY IN DNB ARE GIVEN FOR NORMAL CONDITIONS (ONE ROD AT 2000
MWTH), VARIATIONS IN POWER DISTRIBUTION (0.3 RODS AT ΔH 30' HIGHER), COOLANT FLOW RATE

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-14841 *CONTINUED*
(0.024 RODS WITH 20% LESS FLOW), CORRELATION ERROR (0.94 RODS WITH 30% ERROR). FOR THE WORST REACTIVITY WITHDRAWAL ACCIDENT (AT 3×10^{-5} TO THE MINUS 5TH) DELTA K/SEC BETWEEN ACTIONS OF TWO DIFFERENT TRIP CIRCUITS), 6 RODS CAN BE IN DNB.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD WITHDRAWAL + DNB (DEPARTURE FROM NUCLEATE BOILING) + HEAT TRANSFER CORRELATION + POWER DISTRIBUTION + REACTOR, PRESSURIZED WATER

6-14855 ARGONNE NATIONAL LABORATORY. REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT.
ARGONNE NATIONAL LABORATORY
ANL-7286 +. 84 PAGES, 23 FIGURES, 23 TABLES, JANUARY 26, 1967

ARGONNE NATIONAL LABORATORY PROGRESS REPORT FOR DEC. 1966. THIS REPORT IS ONE OF A SERIES OF REPORTS ON THE FOLLOWING TOPICS - IRRADIATION OF FUEL PINS, TREAT MELTDOWN TEST, INTEGRAL SODIUM LOOP, FAST REACTOR SAFETY CONTAINMENT, EQUATION OF STATE OF REFRACTORIES SUCH AS UO₂, METAL-WATER REACTIONS, AND PLUTONIUM VOLATILITY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

CONTAINMENT DESIGN + EQUATION OF STATE + FUEL MELTDOWN + METAL WATER REACTION + PLUTONIUM + REACTOR DYNAMICS + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, TEST + SODIUM + TREAT (TRANSIENT TEST REACTOR FACILITY) + URANIUM OXIDE

6-14917 DICKERMAN CE + ROBINSON LE + BLUMENTHAL B + STEWART R
BEHAVIOR OF TH-20 WT/PERCENT U FAST-REACTOR FUEL UNDER TRANSIENT HEATING TO FAILURE
ARGONNE NATIONAL LABORATORY
10 PAGES, 10 FIGURES, 2 TABLES, 17 REFERENCES, NUCLEAR APPLICATIONS 3(1) PAGES 9-17 (JANUARY 1967)

SODIUM-BONDED TH-20 W1 + U EBR II FUEL ELEMENTS WERE STUDIED IN TRANSIENT MELTDOWN EXPERIMENTS RANGING UP TO COMPLETE SAMPLE MELTDOWN, CONDUCTED IN TREAT. THE HIGH-MELTING THORIUM MATRIX SUPPORTED THE FUEL DURING TRANSIENT HEATING AT TEMPERATURES SIGNIFICANTLY BEYOND THE SOLIDUS. BECAUSE THE FUEL WAS STILL RELATIVELY INTACT AT THE TEMPERATURES OF CLADDING FAILURE, INTERNAL PRESSURE WAS NOT EFFECTIVE IN EJECTING FUEL UPON FAILURE. THE DOMINANT MECHANISM OF FUEL MOVEMENT WAS GRAVITY.

*FUEL MELTDOWN + *TEMPERATURE TRANSIENT + *TREAT (TRANSIENT TEST REACTOR FACILITY) + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-00552 PRADOS JW + SCOTT JL
MODELS FOR FISSION GAS RELEASE FROM COATED FUEL PARTICLES
OAK RIDGE NATIONAL LABORATORY
ORNL-3421 +. 60 PAGES, 4 FIGURES, JUNE 1963, CFSTI, \$1.50 CY

MATHEMATICAL RELATIONS ARE PRESENTED FOR ESTIMATING THE RELEASE FRACTIONS OF GASEOUS FISSION PRODUCTS FROM COATED FUEL PARTICLES AND FUEL ELEMENTS CONTAINING THEM. THE RELATIONS ARE BASED ON SIMPLIFIED MODELS OF THE RELEASE PROCESS, WITH PARTICULAR EMPHASIS ON THE FOLLOWING MECHANISMS - (A) RECOIL, (B) DIFFUSION FROM FUEL, (C) DIFFUSION THROUGH PARTICLE COATING, AND (D) DIFFUSION THROUGH FUEL-ELEMENT MATRIX. THE CHARACTERISTICS OF FISSION GAS RELEASE BY THESE MECHANISMS, ACTING SINGLY AND IN COMBINATION, ARE CONSIDERED, AND THE APPLICATION OF THE THEORETICAL RELATIONS TO EXPERIMENT PLANNING AND INTERPRETATION IS DISCUSSED. SPECIAL ATTENTION IS GIVEN TO METHODS FOR ANALYSIS OF DATA FOR CONTINUOUS, IN-PILE (SWEEP CAPSULE) RELEASE EXPERIMENTS AND NEUTRON-ACTIVATION RELEASE EXPERIMENTS.

COATED PARTICLE + DIFFUSION + FISSION GAS RELEASE + FISSION RECOIL + IN PILE LOOP + IRRADIATION TESTING

7-08820 SHILLING AW
THE THEORETICAL KINETICS OF FISSION GAS RELEASE DURING POST-IRRADIATION ANNEALING ALLOWING FOR THE EFFECTS OF FISSION GAS DEPLETION DURING IRRADIATION AND DURING PREVIOUS ANNEALS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINDSCALE
TRG REPORT 777(W) +. 54 PAGES, 17 FIGURES, 2 TABLES, 15 REFERENCES, JULY 1, 1964, UKAEA

EXPRESSIONS FOR THE FRACTIONAL RELEASE DURING POST-IRRADIATION ANNEALING ARE DERIVED TAKING INTO ACCOUNT THE EFFECTS OF THE DEPLETION OF FISSION GASES DURING IRRADIATION. THE BOOTH MODEL IS ASSUMED TO APPLY FOR ALL CONDITIONS. THE INTERPRETATION OF POST-IRRADIATION ANNEALING EXPERIMENTS ON FUEL WHICH HAS BEEN IRRADIATED AT HIGH TEMPERATURES IS DISCUSSED. EXPRESSIONS FOR THE FRACTIONAL RELEASE DURING SECOND AND SUCCESSIVE POST-IRRADIATION ANNEALS ARE ALSO DERIVED. IT IS CONCLUDED THAT FOR THE MEASUREMENT OF THE ACTIVATION ENERGY BY SUCCESSIVE ANNEALS, SUCCESSIVE INCREASES IN TEMPERATURE ARE PREFERRED. A SHORT TREATMENT OF THE EFFECT OF FURNACE TEMPERATURE RISE TIME ON THE SUBSEQUENT DIFFUSIONAL RELEASE IS INCLUDED.

*FISSION GAS RELEASE + *RELEASE RATE

7-10348 MITCHELL RI
DEVELOPMENT OF A TRACER SYSTEM FOR IN-PLACE FILTER EVALUATION. FINAL REPORT, OCTOBER 1, 1962 - JUNE 30, 1965
BATTELLE MEMORIAL INSTITUTE
BMT-X-346 +. 29 PAGES, JUNE 30, 1965, CFSTI, \$2.00 CY, \$0.50 MN

A TRACER SYSTEM COMPOSED OF AN AEROSOL GENERATOR AND A HIGH-VOLUME SAMPLER WAS DEVELOPED TO ENABLE THE DETERMINATION OF HOLES OR TEARS IN ABSOLUTE-FILTER MEDIA. THE GENERATOR CONSISTS OF AN AEROSOL CAN CONTAINING A HIGHLY FLUORESCENT OIL-SOLUBLE TRACER AND A FLUORINATED HYDROCARBON. DEFECTS IN ABSOLUTE FILTERS CAN BE DETECTED BY CHALLENGING THEM WITH THE FLUORESCENT AEROSOL AND SAMPLING THE EFFLUENT FROM THE FILTER WITH A LARGE-AREA HIGH-VOLUME SAMPLER CONTAINING A LOW-PRESSURE-DROP FILTER MEDIA. THE FLUORESCENT TRACER PENETRATES THE DEFECTS IN THE ABSOLUTE FILTER AND IS DEPOSITED ON THE SAMPLING-FILTER, AND THE AREA OF THE STAIN IS PROPORTIONAL TO THE SIZE OF THE DEFECT. IT IS ALSO POSSIBLE TO DETECT THESE DEFECTS IN THE ABSOLUTE FILTER BY THE USE OF A BLACK LIGHT, THUS ELIMINATING THE NEED OF SAMPLING THE EFFLUENT FROM THE FILTER.

*AEROSOL + *FILTER + *FILTER, DAMAGED + *TEST, FILTER + AIR CLEANING + ANALYTICAL TECHNIQUE, GENERAL

7-10524 NOBLE GAS RECOVERY STUDY MARITIME NUCLEAR SHIP SAVANNAH. FINAL REPORT
AIR REDUCTION COMPANY, INC., NEW YORK
60 PAGES, FIGURES, APRIL 5, 1965, SOURCE

THIS REPORT PRESENTS THE RESULTS OF A STUDY PERFORMED BY AIR REDUCTION FOR THE ATOMIC ENERGY COMMISSION UNDER TODD SHIPYARDS JOB NO. 2736 TO DETERMINE THE FEASIBILITY OF RECOVERING RADIOACTIVE PURGE GAS FROM THE NUCLEAR REACTOR CONTAINMENT COMPARTMENT ON THE SAVANNAH. THE PROCESSES STUDIED INCORPORATED SUCH TECHNIQUES AS ADSORPTION OF NOBLE GASES BY A LIQUID, BY A SOLID, OR SEPARATION FROM AIR BY CRYOGENICS TECHNIQUES.

*CONTAINMENT DESIGN + *CRYOGENICS + *DESIGN CRITERIA + *NOBLE GAS + *SYSTEM DESCRIPTION + AIR CLEANING + ARGON + CONTAINMENT FILTERING SYSTEM + CONTAINMENT, MULTIPLE + KRYPTON + SEPARATOR + XENON

7-11834 COLLINS DA + MCINTOSH AE + TAYLOR R + YUILIE WD
EXPERIMENTS RELATING TO THE CONTROL OF FISSION-PRODUCT RELEASE FROM ADVANCED GAS-COOLED REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINDSCALE
27 PAGES, 8 FIGURES, 7 TABLES, 11 REFERENCES, JOURNAL OF NUCLEAR ENERGY 20(2), PAGES 97-122 (FEBRUARY 1966)

IT HAS BEEN SHOWN THAT IODINE RELEASED FROM IRRADIATED AGR FUEL ELEMENTS, MAY BE PRESENT IN THREE FORMS - ELEMENTAL IODINE VAPOUR, IODINE CARRIED ON SOLID PARTICLES, AND VAPOUR COMPOUNDS OF IODINE, PRINCIPALLY METHYL IODIDE. OTHER FISSION PRODUCTS, SPECIFICALLY TELLURIUM, CAESIUM, BARIUM/LANTHANUM, STRONTIUM AND RUTHENIUM ARE PRESENT ENTIRELY AS SOLID PARTICLES. THE RELATIVE AMOUNTS OF THE THREE FORMS OF IODINE DEPEND ON SUCH FACTORS AS THE FUEL-ELEMENT TEMPERATURE AND IRRADIATION LEVEL, THE GAS COMPOSITION AND TEMPERATURE AND THE SORPTION/DESORPTION HISTORY OF THE IODINE ON SURFACES. METHYL IODIDE CAN COMPRISE AN APPRECIABLE PERCENTAGE OF THE TOTAL IODINE RELEASED. A TRAPPING SYSTEM CONSISTING OF A COMBINATION HIGH-EFFICIENCY FILTERS AND ACTIVATED CARBON BEDS CAN PROVIDE ADEQUATE PROTECTION AGAINST THE ESCAPE OF THE RELEASED FISSION PRODUCTS (APART FROM THE RARE GASES) PROVIDED THAT THE CAPACITY OF THE CARBON FOR METHYL IODIDE IS NOT EXCEEDED. A COCONUT-SHELL-BASED CARBON

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-11834 *CONTINUED*

(TYPE SC II), CHOSEN FOR ITS PERFORMANCE AGAINST ELEMENTAL IODINE WILL RETAIN METHYL IODIDE WITH HIGH EFFICIENCY ONLY UP TO A LOADING OF ABOUT 5 G/TE CARBON AT 100 C AND MUCH LESS AT ROOM TEMPERATURE. AN ALTERNATIVE COAL-BASED CARBON (TYPE 207 B) HAS EXCELLENT PERFORMANCE IN RELATIVELY DRY GAS UP TO A LOADING OF ABOUT 500 G/TE CARBON BOTH AT ROOM TEMPERATURE AND AT 100 C. THE PERFORMANCE OF SCALED-DOWN TRAPPING PLANTS CONTAINING EACH OF THESE TYPES OF CARBON HAS BEEN DEMONSTRATED AGAINST THE FISSION PRODUCTS RELEASED FROM OVERHEATED AGR FUEL SPECIMENS IN LABORATORY-SCALE EXPERIMENTS.

*FILTER, EFFICIENCY OF + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT, IODINE + ADSORPTION + AGR (ADVANCED GASCOOLED REACTOR, WINDSCALE, UK) + BARIUM + CESIUM + CHARCOAL + FILTER CHARACTERISTICS + FISSION GAS RELEASE + REACTOR, GAS COOLED + RUTHENIUM + STRONTIUM + TELLURIUM

7-12113 DAVIS RE + WILLIAMS JM

THE EFFICIENCY OF WHATMAN TYPE ACG/B FILTER PAPERS FOR METHYL IODIDE RETENTION IN AIR
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH
AEEW-M-568 +. 10 PAGES, 3 FIGURES, 2 TABLES, 6 REFERENCES, NOVEMBER 1965, BIS \$0.50 CY

EXPERIMENTS ARE DESCRIBED IN WHICH CHARCOAL IMPREGNATED GLASS FIBRE FILTER PAPERS TYPE ACG/B WERE EXPOSED TO METHYL IODIDE VAPOUR AND THE PENETRATION DETERMINED FOR IODIDE LOADINGS RANGING FROM 2 TIMES 10 (MINUS 7TH) TO 2 TIMES 10 (MINUS 1) MICROGRAMS PER SQ. CM OF FILTER AREA. AIR WAS SUBSEQUENTLY PASSED THROUGH THE FILTERS, AND AT INTERVALS THE AMOUNT OF METHYL IODIDE REMAINING ON THEM WAS DETERMINED. PENETRATIONS DURING LOADING VARIED FROM 30 PERCENT TO 80 PERCENT, BUT AFTER 10 MINUTES ELUTION ALL FILTERS RETAINED LESS THAN 5 PERCENT OF THE METHYL IODIDE ORIGINALLY PRESENT.

*CHARCOAL + *FILTER EFFICIENCY + *FILTER, GLASS + *FISSION PRODUCT RETENTION + *ORGANIC IODIDE + FISSION PRODUCT, IODINE + HUMIDITY + IODINE

7-12219 YUKHIM IY

SAFETY ENGINEERING IN WORKING WITH BERYLLIUM
MOSCOW INSTITUTE OF STEEL AND ALLOYS
JPRS-27980 + IT-64-51996 +. 7 PAGES, DECEMBER 24, 1964, CFSTI \$1.00 CY

THE SAFETY MEASURES USED WHEN HANDLING BERYLLIUM AND ITS COMPOUNDS, ESPECIALLY THE SOLUBLE ONES (FLUORIDES, OXYFLUORIDES, CHLORIDES, SULFIDES, ACETATES, ETC.), ARE DETERMINED BY THEIR TOXICITY. ALTHOUGH THE SOLUBLE COMPOUNDS OF BERYLLIUM ARE MORE TOXIC, ONE MUST NOT UNDERESTIMATE THE DANGER PRESENTED BY BERYLLIUM AND ITS INSOLUBLE COMPOUNDS AFTER PENETRATING INTO THE RESPIRATORY ORGANS IN THE FORM OF FINELY DISPERSED AEROSOLS. THE MAXIMUM PERMISSIBLE CONCENTRATION OF BERYLLIUM AND ITS COMPOUNDS HAS BEEN SET IN THE USSR AT 0.001 MG/CU. METER.

*BERYLLIUM + *CHEMICAL TOXICITY + *SAFETY PRINCIPLES AND PHILOSOPHY + AEROSOL + OXIDE + SAFETY REVIEW (OPERATIONS, EXPERIMENTS)

7-13308 SEHMEI GA

APPLICATION AND PERFORMANCE OF A SPINNING DISC AEROSOL GENERATOR
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-235-3 +. 3 PAGES, 1 FIGURE, 1 TABLE, MAY 1966, PAGES 51-53 OF PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. VOL. 3. EARTH SCIENCES. CFSTI \$3.00 CY, \$0.75 MN

A SPINNING DISC AEROSOL GENERATOR WAS APPLIED IN STUDIES OF THE TURBULENT DEPOSITION OF MONODISPERSE PARTICLES. URANINE AND METHYLENE BLUE SOLUTIONS WERE USED AS THE MATERIAL TO GENERATE PARTICLES FROM 1 TO 10 MICRONS. OBSERVATIONS REGARDING THE CALIBRATION AND USE OF THIS INSTRUMENT ARE REPORTED. THE RELATIVE HUMIDITY OF THE SWEEP AIR IS AN IMPORTANT FACTOR IN DETERMINING THE FINAL MOISTURE CONTENT OF THE PARTICLES GENERATED AND IT MATERIALLY INFLUENCES THE PHYSICAL QUALITY OF THE PARTICLES. THE SPINNING DISC GENERATOR CONTINUED TO PROVE ITS WORTH AS A VALUABLE TOOL IN THE STUDY OF BEHAVIOR OF PARTICLES IN THE 1 TO 10 MICRONS SIZE RANGE.

*AEROSOL PRODUCTION + *PARTICLE SIZE + *PARTICLE SIZE DISTRIBUTION + AEROSOL + AEROSOL PROPERTIES + HUMIDITY + WATER VAPOR

7-13309 SEHMEI GA

SUBISOKINETIC SAMPLING OF PARTICLES IN AN AIR STREAM
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-235-3 +. 6 PAGES, 3 FIGURES, MAY 1966, PAGES 53-58 OF PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. VOL. 3. EARTH SCIENCES. CFSTI \$3.00 CY, \$0.75 MN

THE ERRORS ASSOCIATED WITH SAMPLING AT FILTER FACE VELOCITIES MUCH BELOW THE CARRYING STREAM VELOCITY (SUBISOKINETIC) WERE FURTHER STUDIED. FOR RELATIVELY HIGH APPROACH VELOCITIES AND WHEN THE FILTER FACE VELOCITY IS ONLY A FRACTION OF ISOKINETIC, LARGER PARTICLES ARE COLLECTED PRIMARILY BY IMPACTION. SHOULD THE AIR CONCENTRATION BE COMPUTED FROM COLLECTED PARTICLES AND FLOW VOLUME THROUGH THE FILTER, THE INDICATED AIR CONCENTRATIONS WILL BE MUCH HIGHER THAN THE ACTUAL CONCENTRATION. A RELATIONSHIP WAS ESTABLISHED WHICH PERMITS REASONABLE ESTIMATES OF CORRECTIONS AS A FUNCTION OF SUBISOKINETIC FLOW AND THE APPROACH VELOCITY. THE RELATIONSHIP IS BASED UPON IMPACTION DATA OBTAINED FOR THE FILTER. DATA ARE SHOWN FOR AIR VELOCITIES FROM 2.7 TO 30 MPH AND PARTICLE SIZES FROM 4 TO 21 MICRONS.

*ERROR ANALYSIS + *PARTICLE SIZE DISTRIBUTION + *SAMPLING + AEROSOL + AEROSOL PROPERTIES + FILTER + FILTER IMPACTION + FLOW DISTRIBUTION + FLOW, HIGH SPEED + FLOW, TUBE + PARTICLE SIZE

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13310 SEHMEL GA
ERRORS IN SAMPLING WITH NOZZLES DESIGNED TO ACHIEVE ISOKINETIC FLOW
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-235-3 +. 2 PAGES, 1 FIGURE, MAY 1966, PAGES 58-59 OF PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. VOL. 3. EARTH SCIENCES. CFSTI \$3.00 CY \$0.75 MN

NOZZLES WERE USED TO OBTAIN ISOKINETIC SAMPLES OF ZNS PARTICLES AT AIR VELOCITIES FROM 5.4 TO 30 MI/HR. PARTICLE DEPOSITION ON THE NOZZLE WALLS WAS MEASURED AND IS REPORTED AS THE FRACTION DEPOSITED OF THOSE ENTERING THE NOZZLE. THE DEPOSITION INCREASED WITH PARTICLE SIZE AND VELOCITY UP TO 70 PERCENT.

*DEPOSITION + *ERROR ANALYSIS + *PARTICLE SIZE DISTRIBUTION + *SAMPLING + AEROSOL + FLOW, HIGH SPEED + FLOW, TUBE + NOZZLE + PARTICLE SIZE

7-13311 SEHMEL GA
PARTICLE DEPOSITION AND RE-ENTRAINMENT IN LONG VERTICAL CONDUITS
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-235-3 +. 5 PAGES, 2 FIGURES, MAY 1966, PAGES 60-64 OF PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. VOL. 3. EARTH SCIENCES. CFSTI \$3.00 CY \$0.75 MN

THE DEPOSITION OF 1- TO 10 MICRON DIAM PARTICLES WAS MEASURED IN VC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. 50-FT LONG ALUMINUM TUBES OF 0.52, 1.15, AND 2.81 IN. I.D. URANINE-METHYLENE BLUE PARTICLES OF NARROW SIZE RANGE GENERATED WITH A SPINNING DISC AEROSOL GENERATOR WERE USED. SIGNIFICANT DIFFERENCES FROM EARLIER DEPOSITION DATA ARE BELIEVED TO BE DUE TO THE BETTER RESOLUTION ACHIEVED WITH THE NEARLY MONODISPERSE PARTICLES FROM THE SPINNING DISC. THE SIGNIFICANTLY LOWER DENSITY OF THE URANINE-METHYLENE BLUE PARTICLES THAN OF PARTICLES USED PREVIOUSLY MAY ALSO CONTRIBUTE TO THE APPARENT DIFFERENCE. THE DEPOSITION RATIO, K/V, IS SHOWN TO BE A MORE COMPLEX FUNCTION OF THE REDUCED STOPPING DISTANCE, THAN FORMERLY INDICATED. FLOW CONDITIONS WHICH RESULT IN SIGNIFICANT RE-ENTRAINMENT WERE IDENTIFIED AND SHOWN TO BE CONSISTENT WITH A CONCLUSION THAT EDDY FLUCTUATIONS PENETRATE DEEPLY INTO THE LAMINAR SUBLAYER.

*DEPOSITION + *DISPERSION + *ERROR ANALYSIS + FLOW, TUBE + PARTICLE SIZE

7-13312 SCHWENDIMAN LC
AN I-131 GENERATOR FOR FIELD RELEASE STUDIES
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-235-3 +. 4 PAGES, 1 FIGURE, 1 TABLE, MAY 1966, PAGES 64-67 OF PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. VOL. 3. EARTH SCIENCES. CFSTI \$3.00 CY, \$0.75 MN

STUDIES OF ATMOSPHERIC DISPERSION AND DEPOSITION OF I-131 REQUIRE A SOURCE WHICH GIVES A STEADY EVOLUTION OF THE VAPOR FORM OF THE ISOTOPE OVER A SELECTED PERIOD OF TIME. THE OXIDATION OF IODIDE ION IN ACIDIFIED NANOD WAS CHOSEN AS A SUITABLE REACTION TO LIBERATE IODINE IN THE DESIRED FORM. STEADY EVOLUTION WAS OBTAINED BY METERING IODIDE CARRIER AND THE TRACER I-131 AT A FIXED KNOWN RATE INTO AN EXCESS OF THE OXIDIZING AGENT WHICH WAS CONTINUOUSLY SPARGED WITH N₂ OR AIR. THE SPARGING GAS FLOW RATE WAS SELECTED SO THAT THE I-131 WAS RELEASED AT A RATE DETERMINED EFFECTIVELY BY THE TRANSFER OF THE CARRIER AND TRACER TO THE REACTION VESSEL. ALTHOUGH TRACER LEVEL RUNS WERE SUCCESSFULLY COMPLETED ON A LABORATORY SCALE, A FIRST ATTEMPT IN A FIELD DISPERSION STUDY RESULTED IN A PARTIAL RELEASE, WHICH WAS TRACED PRIMARILY TO PLATING OF THE HIGH LEVEL SPIKE DURING THE WAITING PERIOD ONTO THE STAINLESS STEEL WALLS OF THE RESERVOIR. A SECOND RUN WITH AN ALL-GLASS RESERVOIR WAS SUCCESSFUL.

*AEROSOL PRODUCTION + *AIRBORNE RELEASE + *IODINE + AEROSOL, RADIOACTIVE + FISSION PRODUCT, IODINE + PARTICLE, RADIOACTIVE + RADIOACTIVITY, RELEASE + TRACER, RADIOACTIVE

7-13365 POSTMA AK
RELEASE OF NOBLE GASES FROM AQUEOUS SOLUTION
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-235-3 +. 2 PAGES, MAY 1966, PAGES 68-69 OF PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1965 IN THE PHYSICAL SCIENCES. VOL. 3. EARTH SCIENCES. CFSTI \$3.00 CY, \$0.75 MN

RELEASE RATE OF A DISSOLVED NOBLE GAS FROM A POOL OF WATER IS EFFECTIVELY GOVERNED BY THE TRANSPORT RATE THROUGH THE LIQUID FILM ADJACENT TO THE AIR-WATER INTERFACE. A THEORETICAL STUDY WHICH MADE USE OF THE LIMITED AVAILABLE DATA SHOWED THAT A HALF-TIME OF RELEASE MAY VARY FROM ABOUT 7 TO OVER 1000 HR FOR A POOL 5 FT DEEP. BETTER DEFINITION OF LIQUID FILM TRANSPORT COEFFICIENTS THROUGH EXPERIMENTAL STUDIES IS REQUIRED TO BETTER DEFINE THE RELEASE RATE.

*FISSION GAS RELEASE + *NOBLE GAS + *SURFACE WATER, DISPOSAL MEDIA + *WATER, GENERAL + FISSION PRODUCT TRANSPORT + FISSION PRODUCT, AIRBORNE + KRYPTON + XENON

7-13443 FREDERICKSON RL
ADDITIONAL LABORATORY PROGRESS IN REDUCING STACK RELEASES OF IODINE
ARRATT LABORATORIES, NORTH CHICAGO, ILLINOIS
2 PAGES, ATOMIC ENERGY COMMISSION REPORT 12(50), PAGES 18-19 (DECEMBER 12, 1966)

THE ROOF OF THE BUILDING WAS MADE A RESTRICTED AREA, AND AIR SAMPLERS ON THE ROOF HAVE NOT SHOWN ABOVE MPC YET. THE ABSOLUTE FILTER OF THE F-11 SYSTEM WAS REPLACED WITH A HALF-INCH, AND LATER, A ONE-INCH CHARCOAL FILTER. WHILE THE RELEASE LAST MAY WAS 38,000 TIMES THE MPC, TODAY THE SAME RELEASE WOULD ONLY BE 22 TIMES BECAUSE OF A FACTOR-OF-TWENTY BETTER FILTRATION AND A FACTOR OF 90 BY THE ZONING CHANGE.

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13443 *CONTINUED*
*FISSION PRODUCT, IODINE + *SOURCE, CONTINUOUS + CHARCOAL + FILTER

7-13471 DEYE RW
DISPERSED CERAMIC FUELS AND THE ADVANCED GAS-COOLED REACTOR
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, SPRINGFIELDS
TRG-REPORT-1210 +. 6 PAGES, JANUARY 5, 1966

THE TREND IN FUEL-ELEMENT DESIGN TO MORE GENEROUS CONDITIONS OF TEMPERATURE, RATING AND BURNUP CAN LEAD ULTIMATELY TO A LIMIT FOR DEVELOPMENT OF METAL-CLAD FUELS. ONE WAY OF OVERCOMING THIS LIMIT IN AN A.G.R. SYSTEM (CO₂ COOLED, GRAPHITE MODERATED) WITHOUT MAKING ANY MAJOR CONCEPTUAL CHANGES TO THE DESIGN, IS THE ADOPTION OF AN ALL-CERAMIC FISSION PRODUCT RETAINING FUEL. THE RESULTS OF A STUDY TO SELECT AND ECONOMICALLY ASSESS SUCH A FUEL, NAMELY, A URANIUM CARBIDE COATED WITH PYROLYTIC CARBON, WITH THESE COATED SPHERES DISPERSED IN A MATRIX OF SILICON CARBIDE, ARE BRIEFLY REVIEWED. THE FOUR STAGES IN THE FABRICATION ROUTE LEADING TO THE DEVELOPMENT AND PRODUCTION OF A SUITABLE FUEL PIN ARE SUMMARIZED. THE PHYSICAL AND MECHANICAL PROPERTIES TOGETHER WITH THE IRRADIATION TRIALS OF FUEL PINS ARE MENTIONED TO INDICATE THAT THE CONDITIONS REQUIRED BY THE ECONOMIC ASSESSMENTS ARE FEASIBLE.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVE., NEW YORK, N.Y. 10022, \$0.30 COPY

*FUEL ELEMENT + AGR (ADVANCED GASCOOLED REACTOR, WINDSCALE, UK) + COATED PARTICLE + FUEL BURNUP + IRRADIATION TESTING + PYROLYTIC + REACTOR, GAS COOLED + URANIUM CARBIDE

7-13473 GREGOR HP
RESEARCH AND DEVELOPMENT REPORT NO. 193. MEMBRANE PHENOMENA
POLYTECHNIC INSTITUTE OF BROOKLYN
93 PAGES, 34 FIGURES, 10 TABLES, 55 REFERENCES, MAY 1966

IN GENERAL, MOST OF THE PUBLISHED WORK HAS BEEN UPON DIFFERENT KINDS OF MEMBRANES EXAMINED BY ONE OR AT BEST A FEW CHARACTERIZATION PROCEDURES. ACCORDINGLY, THE FIRST AIM OF THIS STUDY HAS BEEN TO CORRELATE THE STRUCTURE OF GIVEN ION-EXCHANGE MEMBRANES WITH THEIR FUNCTIONAL PROPERTIES, WITH THE AIM OF DEVELOPING A GENERAL MECHANISTIC THEORY OF MEMBRANE PHENOMENA. WHEN WE CAN SUCCESSFULLY CORRELATE FUNCTION WITH STRUCTURE, WE CAN, IN A DIRECT AND EFFICIENT MANNER, PROCEED TO TAILOR-MAKE AN IMPROVED MEMBRANE OR A MEMBRANE FOR A PARTICULAR APPLICATION. ONE FUNCTIONAL PROPERTY OF ION-EXCHANGE MEMBRANE SYSTEMS HAS DESERVED SPECIAL ATTENTION. THIS IS THE SO-CALLED POLARIZATION OR WATER-HYDROLYSIS PHENOMENON WHICH OCCURS WHEN ION-EXCHANGE MEMBRANES ARE USED IN ELECTRODIALYTIC APPARATUS. WHEN A MORE FUNDAMENTAL UNDERSTANDING OF POLARIZATION IS OBTAINED, ONE CAN THEN PROCEED TO DESIGN MEMBRANES WHICH WOULD SHOW A MINIMAL POLARIZATION, OR TO DEVISE PROCESSES TO MINIMIZE OR ELIMINATE IT.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402, \$0.50 COPY

*ION EXCHANGE + *RESIN + *WATER TREATMENT + ELECTROSTATIC CHARGE + MATHEMATICAL STUDY + OCEAN AND SEA

7-13474 KSANDA CF + LAUMETS E + HOGAN MA
GAMMA-RAY ENERGY PSEUDOSPECTRA FOR U-235 FISSION PRODUCTS AND FOR VARIOUS TIMES AFTER FISSION
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO
AD-628982 + USNRDL-TR-942 +. 95 PAGES, FIGURES, 21 TABLES, 6 REFERENCES, DECEMBER 18, 1965

THE GAMMA-RAY ENERGY SPECTRUM OF U-235 FISSION PRODUCTS FOLLOWING A NUCLEAR EXPLOSION IS MADE UP OF HUNDREDS OF DIFFERENT PHOTON ENERGIES WHOSE RELATIVE CONTRIBUTIONS TO THE SPECTRUM CHANGE WITH TIME AFTER FISSION. GAMMA-RADIATION ATTENUATION AND SHIELDING CALCULATIONS CAN BE GREATLY SIMPLIFIED BY THE USE OF PSEUDOSPECTRA THAT CLOSELY APPROXIMATE THE ATTENUATION OBTAINED WITH THE TRUE SPECTRA. A TECHNIQUE FOR COMPUTING PSEUDOSPECTRA WEIGHTING FRACTIONS TO OBTAIN SUCH SIMPLIFIED SPECTRA COMPOSED OF ONLY 5 REPRESENTATIVE PHOTON ENERGIES IS DESCRIBED. PSEUDOSPECTRA WEIGHTING FRACTIONS AND PSEUDOSPECTRA FOR AIR AND IRON ATTENUATION ARE PRESENTED. A FLOW CHART AND AN IBM-704 COMPUTER PROGRAM OF THE TECHNIQUE ARE ALSO PRESENTED, ALONG WITH THE INPUT DATA AND EXAMPLES OF THE PRINTED OUTPUT VALUES. THROUGHOUT THE TIME RANGE CONSIDERED (FROM 1.7 SEC TO 301 DAYS AFTER FISSION), THE MAXIMUM ATTENUATION ERROR IS LESS THAN PLUS-OR-MINUS 5%. THE TECHNIQUE IS VALID FOR RESOLVING ALMOST ANY SPECTRAL ATTENUATION DATA INTO FIVE OR FEWER ENERGY COMPONENTS AND MAY BE USED TO SOLVE PROBLEMS INVOLVING FIVE SIMULTANEOUS EQUATIONS IN FIVE UNKNOWN WITH PRESCRIBED CONSTRAINTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.75 MICROFICHE

*COMPUTER PROGRAM + *GAMMA + *NUCLEAR DETONATION + *SPECTROMETRY, GAMMA + FISSION PRODUCT ACTIVITY, GROSS

7-13475 BAROCH CJ + HOFFMANN JP + WILLIAMSON HE + PASHOS TJ
COMPARATIVE PERFORMANCE OF ZIRCALOY AND STAINLESS STEEL CLAD FUEL RODS OPERATED TO 10,000 MWD/T IN THE VBWR
GENERAL ELECTRIC COMPANY, PLEASANTON
GEAP-4849 +. 225 PAGES, FIGURES, 23 TABLES, 39 REFERENCES, APRIL 1966

TEST ASSEMBLIES OF FUEL RODS CLAD WITH ZIRCALOY-2, ZIRCALOY-4, AND TYPE 304 STAINLESS STEEL WERE IRRADIATED IN THE VBWR IN ORDER TO DETERMINE THE COMPARATIVE PERFORMANCE CHARACTERISTICS OF EACH TYPE OF CLADDING UNDER HIGH SPECIFIC POWERS AND AT HIGH HEAT FLUXES. THESE FUEL RODS WERE MADE BY TYPICAL COMMERCIAL PROCESSES. THE FUEL RODS CONTAINED 95-PERCENT-DENSE UO₂ PELLETS IN SELF-SUPPORTING TUBES. IRRADIATION TEST EXPERIENCES AND THE RESULTS OF POSTIRRADIATION EXAMINATIONS PERFORMED ARE PRESENTED IN THIS REPORT. THE FAILURES IN BOTH THE ANNEALED AND COLD-WORKED TYPE-304 STAINLESS STEEL WERE VERY SIMILAR TO THOSE OBSERVED IN THE HIGH-POWER-DENSITY PROGRAM. THE CRACKING CONSISTENTLY OCCURRED IN THE PEAK HEAT-FLUX

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13475 *CONTINUED*

ZONE. THE COLD-WORKED CLADDING CRACKED PRIMARILY IN A LONGITUDINAL DIRECTION AND THE ANNEALED CLADDING CRACKED PREDOMINANTLY IN THE CIRCUMFERENTIAL DIRECTION, USUALLY AT THE PELLET INTERFACES. METALLOGRAPH REVEALED THAT THE FAILURES WERE PRIMARILY INTERGRANULAR, WITH ONLY MINOR TRANSGRANULAR CRACKING. THE CAUSE OF THE CRACKING IS UNKNOWN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 COPY, \$2.00 MICROFICHE

*FUEL ELEMENT + *FUEL EXPANSION COEFFICIENT + *STEEL, STAINLESS + *TENSILE PROPERTY + *ZIRCALOY + FISSIION GAS RELEASE + FISSIION PRODUCT TRANSPORT + FUEL BURNUP + URANIUM OXIDE

7-13476 HOFFMANN JP + COPLIN OH
THE RELEASE OF FISSION GASES FROM URANIUM DIOXIDE PELLET FUEL OPERATED AT HIGH TEMPERATURES.
GENERAL ELECTRIC COMPANY, SAN JOSE
GEAP-4596 +. 28 PAGES, 3 FIGURES, TABLES, 13 REFERENCES, SEPTEMBER 1964

PELLETED UO₂ FUEL RODS, OF COMPARABLE DESIGNS AND FABRICATION HISTORIES, WERE IRRADIATED AT PEAK SURFACE HEAT FLUXES RANGING FROM 63 TO 440 W/CM SQUARED (200,000 - 1,400,000 BTU/H-FT SQUARED). THE VALUES OF AVERAGE BURNUP FOR THE DIFFERENT RODS TESTED RANGED FROM 0.03 TO 3 X 10(20TH) FISSIONS/CC OF UO₂ (100 - 11,000 MWD/TJ). AFTER IRRADIATION THE FREE FISSION GASES CONTAINED IN EACH ROD WERE COLLECTED AND THE QUANTITY OF RELEASED GAS WAS RELATED TO A CALCULATED VALUE OF THE GAS AS A FUNCTION OF THE VOLUMETRIC AVERAGE TEMPERATURE OF THE RESPECTIVE FUEL RODS AT THE PEAK POWER EXPERIENCED DURING THEIR PERIODS OF REACTOR EXPOSURE. IT WAS FOUND THAT PERCENT RELEASE GRADUALLY INCREASED WITH TEMPERATURE, AND THAT 50 TO 60% OF GENERATED FISSION GASES ESCAPED TO THE FREE VOLUME OF FUEL ROD WHEN EXPOSED AT HEAT FLUXES HIGH ENOUGH TO PRODUCE GROSS MELTING OF UO₂ IN THE CENTER OF THE FUEL COLUMN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 COPY, \$1.00 MICROFICHE

FISSION GAS RELEASE + FISSIION PRODUCT TRANSPORT + FISSIION PRODUCT, VOLATILE + FUEL BURNUP + URANIUM OXIDE

7-13478 MUHLBAIER DR
PROGRESS REPORT OCTOBER 1964 - JANUARY 1966. NONDESTRUCTIVE TEST OF CARBON BEDS FOR REACTOR CONFINEMENT
SAVANNAH RIVER LABORATORY
DP-1053 +. 30 PAGES, 12 FIGURES, 5 TABLES, 6 REFERENCES, JUNE 1966

A NONDESTRUCTIVE IN-PLACE TEST FOR DETECTING LEAKS IN A BANK OF INSTALLED CARBON BEDS WITH FREON-112 TRACER WAS DEVELOPED BY THE SAVANNAH RIVER LABORATORY AND DEMONSTRATED IN THE REACTOR-CONFINEMENT FACILITIES AT THE SAVANNAH RIVER PLANT. LEAKAGE FLOW (FLOW THAT BYPASSES THE CARBON) OF 0.01% OF THE TOTAL AIR FLOW THROUGH THE BEDS IS DETECTED READILY. INSTALLED CARBON BEDS WITH ABOUT 2 YEARS OF EXPOSURE TO EXHAUST AIR FLOW IN THE CONFINEMENT SYSTEM WERE EVALUATED SUCCESSFULLY WITH THE TEST. STANDARDIZATION OF THE TEST IS IN PROGRESS FOR GENERAL APPLICATION TO IN-PLACE TESTING OF CARBON BEDS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL/SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 COPY, \$0.50 MICROFICHE

*FILTER + *TEST, FILTER SYSTEM + CHARCOAL + CONTAINMENT FILTERING SYSTEM + OPERATING EXPERIENCE

7-13479 DURANT WS
PERFORMANCE OF THE ACTIVATED CARBON BEDS IN SRP REACTOR CONFINEMENT FACILITIES
SAVANNAH RIVER LABORATORY
DP-1028 +. 27 PAGES, 4 FIGURES, 2 TABLES, JANUARY 1966

BED EFFICIENCIES FOR ELEMENTAL IODINE EXCEEDS 99.9% AFTER 2 YEARS OF CONTINUOUS SERVICE. BOTH CADMIUM-PLATED AND PAINTED MILD-STEEL FRAMES CORRODED FROM NO₂ AND SO₂, SO STAINLESS STEEL IS NOW USED. SIMILAR, NONUSED FRAMES IN STANDBY HWCTR DO NOT SHOW CORROSION. TEN TIMES THE IODINE, CHLORINE, AND SULPHUR WERE FOUND IN OLD BEDS. RADIOLYTIC DECOMPOSITION OF ATMOSPHERIC NITROGEN FORMS NO₂, WHICH IS REDUCED TO NO BY CARBON IN BED TO LOSE ADSORPTION SITES. IN-LINE FREON-112 TESTING IS USED DURING OPERATION. INCLUDES LATEST REVISED SPECIFICATIONS (DECEMBER 1965).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 COPY, \$0.50 MICROFICHE

*CONTAINMENT FILTERING SYSTEM + *FILTER + *OPERATING EXPERIENCE + CHARCOAL + SAVANNAH RIVER PLANT + TEST, FILTER SYSTEM

7-13480 ROHRMANN CA + MERRILL ET
FORMATION OF SELECTED FISSION PRODUCTS IN POWER REACTORS
PACIFIC NORTHWEST LABORATORY
BNWL-244 +. 47 PAGES, 1 FIGURE, 3 TABLES, MAY 1966

WITH AN INCREASING CIVILIAN POWER-REACTOR ECONOMY AND PRESENT INTEREST IN THE LARGE SCALE USE OF CERTAIN ISOTOPIES, IT IS NOW PERTINENT TO REVIEW THE POTENTIAL AVAILABILITY, FORMATION, AND COMPOSITION OF SUCH MATERIALS. SUCH INTERESTS RELATE NOT ONLY TO THE UNIQUE PROPERTIES AND POTENTIAL USES FOR THESE MATERIALS, BUT ALSO TO THE REALISTIC POSSIBILITY OF VALUE AND CREDIT TO THE FUEL USER AS WELL AS THE FUEL PROCESSOR. DATA IN THIS REPORT SHOW THE PRODUCTION OF THE VARIOUS FISSION PRODUCT ISOTOPIES AS A FUNCTION OF FUEL EXPOSURE FOR SPECIFIC REACTOR CONDITIONS. LARGE-SCALE USES ARE ASSUMED ONLY FOR THOSE ISOTOPIES THAT ARE STABLE OR THAT

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13480 *CONTINUED*

HAVE REASONABLY LONG HALF-LIVES (OF ABOUT A YEAR OR MORE), AND ALSO HAVE HIGH FISSION YIELD. TABLE I LISTS TYPICAL ISOTOPES AND THE POTENTIAL LARGE SCALE USES. THESE ARE VERY LIKELY THE ONLY FISSION PRODUCTS THAT CAN BE SERIOUSLY CONSIDERED IN VIEW OF SATISFACTORY YIELDS, AVAILABILITY, AND USEFUL PROPERTIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 COPY

*COMPUTER PROGRAM + *RADIOISOTOPE + HEAT GENERATION, INTERNAL + RECOVERY FACTOR + RECOVERY PROCESS

7-13481 BURGESS MP + GARVIN RG + SCOTTEN WC
PERFORMANCE OF SIEVE TRAYS UNDER GS HEAVY WATER PROCESS CONDITIONS. PART I, LOW PRESSURE OPERATIONS
SAVANNAH RIVER LABORATORY
DP-1025 +. 81 PAGES, 38 FIGURES, 2 TABLES, 3 REFERENCES, JUNE 1966

CAPACITY AND ENTRAINMENT OF SIEVE TRAYS WERE MEASURED UNDER GS PROCESS CONDITIONS IN A 6-1/2-FT-DIAMETER TOWER. BLOWER CAPACITY LIMITED GAS FLOW TO A MAXIMUM F-FACTOR OF 1.7 AT 225-230 PSIG OPERATING PRESSURE. TESTS WILL BE RESUMED WITH THE INCREASED BLOWER CAPACITY AVAILABLE AT 270-275 PSIG. THE MAXIMUM FLUID-HANDLING CAPACITY OF SIEVE TRAYS UNDER GS PROCESS CONDITIONS ENTERS INTO COMPARISONS OF FUTURE POWER COSTS FOR VARIOUS TYPES OF NUCLEAR REACTORS THROUGH ITS EFFECT ON THE PROJECTED COST OF HEAVY WATER. WITH OUR CURRENT TECHNOLOGY, THIS PROJECTED COST SHOULD BE BASED ON THE GS PROCESS APPLIED TO MODERN PLANTS EQUIPPED WITH SIEVE TRAYS LIKE THOSE USED TO REPLACE CORRODED BUBBLE-CAP TRAYS AT THE AEC'S DANA PLANT. PROCTOR AND THAYER PREPARED A FLOW-SHEET AND ESTIMATED INVESTMENT AND OPERATING COSTS FOR A MODERN GS PLANT, BASING THEIR ESTIMATE OF CAPACITY ON THAT OBTAINED WITH SIEVE TRAYS AT DANA. THROUGHPUT AT DANA WAS LIMITED BY PUMPING CAPACITY BUT THE LESS EXPENSIVE SIEVE TRAYS PERMITTED GREATER FLOWS WITH BETTER TRAY EFFICIENCY THAN THE PLANT'S BUBBLE-CAP TRAYS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY

*DEUTERIUM + *HEAVY WATER + RECOVERY PROCESS

7-13540 SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING MARCH 31, 1966. GAS-COOLED REACTOR PROGRAM
OAK RIDGE NATIONAL LABORATORY
ORNL-3951 +. 226 PAGES, FIGURES, TABLES, JULY 1966

ADVANCED GAS-COOLED REACTOR PROGRAM - FUELED-GRAPHITE DEVELOPMENT, INVESTIGATIONS OF FUELED-GRAPHITE SYSTEMS, STUDIES FOR AVR - GERMAN PEBBLE-BED REACTOR, INVESTIGATIONS OF MODERATOR MATERIALS, STUDIES FOR ADVANCED SYSTEMS, FAST REACTOR DEVELOPMENT, AND HIGH-TEMPERATURE GAS-COOLED REACTOR NUCLEAR SAFETY PROGRAM. PART 2. EXPERIMENTAL GAS-COOLED REACTOR PROGRAM - COMPONENT DEVELOPMENT AND TESTING AND IRRADIATION TESTING OF COMPONENTS AND MATERIALS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 COPY, \$1.25 MICROFICHE

*COATED PARTICLE + *FUEL BURNUP + *FUEL INTEGRITY + *IN PILE EXPERIMENT + *IRRADIATION TESTING + *REACTOR, GAS COOLED + *REACTOR, PEBBLE BED + CARBIDE + ENGINEERED SAFEGUARD + FISSION PRODUCT TRANSPORT + FISSION RECOIL + MODERATOR + PYROLYTIC + REACTOR, FAST + SAFETY STUDY + SOL-GEL PROCESS + THERMODYNAMICS

7-13542 ALLEMANN RT + MOORE RL + UPSON UL
ELECTROSTATIC BUBBLE SCRUBBER
CANADIAN PAT. NO. 715868 +. 20 PAGES, 3 FIGURES, AUGUST 17, 1965

THE INVENTION RELATES TO A NOVEL METHOD OF REMOVING FINE ENTRAINED DUST PARTICLES FROM A GAS STREAM, MORE PARTICULARLY, TO A METHOD OF REMOVING SUCH PARTICLES UNDER ONE MICRON IN SIZE IN AN ENVIRONMENT OF SUBATMOSPHERIC PRESSURE, AND TO AN APPARATUS FOR CARRYING IT OUT. ACCORDING TO THE INVENTION A PARTICLE-LADEN GASEOUS STREAM IS LED THROUGH A FIELD OF ELECTRICAL DISCHARGE, WHEREUPON THE PARTICLES ENTRAINED IN THE STREAM BECOME INDIVIDUALLY CHARGED, AND THEREAFTER THE STREAM IS LED THROUGH SMALL OPENINGS IN A VESSEL CONTAINING A CONDUCTIVE LIQUID AT A DIFFERENT ELECTRICAL POTENTIAL FROM THAT OF THE PARTICLES. THE CONDUCTIVE LIQUID, MEANWHILE, MAY BE RECIRCULATED IN AND OUT OF THE VESSEL THROUGH A LIQUID CIRCUIT CONTAINING A SEPARATING MEANS FOR REMOVING THE DISSOLVED OR SUSPENDED MATTER FROM THE GAS STREAM. BECAUSE OF THE SEPARATING ACTION WHICH TAKES PLACE ON THE SURFACE OF THE BUBBLES, WE HAVE NAMED THE DEVICE OF OUR INVENTION THE ELECTROSTATIC BUBBLE SCRUBBER.

AVAILABILITY - U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C., \$0.30 A PAGE

*ELECTROSTATIC PRECIPITATION + *ENGINEERED SAFEGUARD + *LIQUID SCRUBBER + *SCRUBBER + DECONTAMINATION + FILTER SYSTEM

7-13549 FEELY HW + KATZMAN D + BISCAYE PE + PANACCIONE JB + FRENCH ER
FLIGHT DATA AND RESULTS OF RADIOCHEMICAL ANALYSES OF FILTER SAMPLES COLLECTED DURING 1965. THE THIRTEENTH PROGRESS REPORT ON PROJECT STARDUST
ISOTOPES, INC., WESTWOOD, NEW JERSEY
HASL-176 +. 88 PAGES, MAY 1, 1966

THIS IS THE FOURTH OF A SERIES OF REPORTS OF FLIGHT DATA AND OF RESULTS OF RADIOCHEMICAL ANALYSES OF STRATOSPHERIC AND TROPOSPHERIC AIR FILTER SAMPLES COLLECTED DURING PROJECT

ACCESSION NUMBER 7-13480 TO 7-13549

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13549 *CONTINUED*

STARDUST. THE FIRST THREE REPORTS IN THIS SERIES CONTAINED DATA FOR SAMPLES COLLECTED DURING THE FIRST THREE AND ONE HALF YEARS OF THE PROJECT, JUNE 1961 TO DECEMBER 1964. THEY WERE PUBLISHED AS REPORTS HASL-153, HASL-168 AND HASL-169 BY THE HEALTH AND SAFETY LABORATORY OF THE USAEC. THE PRESENT REPORT CONTAINS FLIGHT DATA AND RESULTS OF RADIOCHEMICAL ANALYSIS OF AIR FILTER SAMPLES COLLECTED DURING JAN. TO DEC. 1965.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., 22151, \$3.00 CY, \$0.75 MN

*AIRBORNE RELEASE + *FALLOUT + *SAMPLING, HIGH ALTITUDE + *STRATOSPHERE + *TROPOSPHERE +
ATMOSPHERIC CHEMISTRY + ATMOSPHERIC POLLUTION

7-13550 WINSCHKE WE + DAVIS MW
INSOLUBILIZATION OF FISSION PRODUCTS
CANADIAN PAT. 720,046 +. 20 PAGES, 5 TABLES, OCTOBER 1965

THE INVENTION RELATES TO NUCLEAR REACTOR WASTE DISPOSAL (MORE PARTICULARLY TO THE DEHYDRATION, INSOLUBILIZATION AND SOLIDIFICATION OF AQUEOUS NUCLEAR REACTOR WASTE SOLUTIONS CONTAINING LONG-LIVED RADIOISOTOPES IN SUCH A WAY AS TO MAKE THE RESULTING SOLIDS SUITABLE FOR STORAGE FOR AN INDEFINITE PERIOD) AND TO A NOVEL APPARATUS FOR CARRYING IT OUT. IN ACCORDANCE WITH THE PRESENT INVENTION, FISSION-PRODUCT SPECIES, ESPECIALLY THOSE PRESENT IN AQUEOUS SOLUTION AND SLURRY FORMS, ARE INSOLUBILIZED BY INCORPORATING THE SAME IN A MENSTRUUM OF MOLTEN SULFUR, THEREBY PROMOTING DEHYDRATION AND PROGRESSIVE CONVERSION OF THE SPECIES TO SUBSTANTIALLY INSOLUBLE FORMS, AND THEREAFTER COOLING THE MENSTRUUM TO SOLIDIFY SAME, THEREBY ENCAPSULATING THE RESULTING SPECIES WITHIN A SOLID WATER-REPELLENT MATRIX WHICH IS VIRTUALLY IMMUNE TO DEGRADATION BY THERMAL RADIATION OF THE SPECIES.

AVAILABILITY - PHOTOCOPIES MAY BE OBTAINED FROM THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C. (30 CENTS PER PAGE)

*SULFUR + *WASTE DISPOSAL, SOLID + *WASTE STORAGE + *WASTE TREATMENT, GENERAL + WASTE TREATMENT, LIQUID +
WASTE TREATMENT, SOLID

7-13568 DIFFUSION OF RARE GASES IN SOLIDS. QUARTERLY REPORT NO. 22, OCTOBER-DECEMBER 1965
HAHN-MEITNER-INSTITUT FUER KERNFORSCHUNG, BERLIN
EURAC-1573 + EUR-2806 +. 5 PAGES, JANUARY 1966

THE DIFFUSION OF KR-88 WAS MEASURED ON UO₂ AND UC SINGLE CRYSTALS AT IRRADIATION DOSES OF 5X10 TO THE 13TH NVT. IN THE CASE OF UO₂, NO DIFFERENCE WAS OBSERVED IN COMPARISON WITH XE-133 MEASUREMENTS AT 2 TO 10X10 TO THE 16TH NVT. UC SHOWED SLIGHTLY HIGHER D VALUES. IN U-DOPED CAF₂ THE FOLLOWING VALUES WERE FOUND FOR THE DIFFUSION OF ARGON, KRYPTON, AND XENON IN THE 900-1200 C RANGE - AR-41.37, D EQUALS 1.5X10 TO THE 8TH EXP - 4.0/KT KR-88, D EQUALS 7.6X10 TO THE 8TH EXP - 4.4/KT XE-133, D EQUALS 1.1X10 TO THE 8TH EXP - 4.5/KT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 COPY, \$0.50 MICROFICHE

*DIFFUSION + *NOBLE GAS + ARGON + KRYPTON + RUBIDIUM + URANIUM CARBIDE + URANIUM OXIDE + XENON

7-13571 LAURITZEN TA + NOVAK PE + DAVIES JH
EXPERIMENTAL STUDIES OF PLUTONIUM AND FISSION PRODUCT REDISTRIBUTION IN FAST REACTOR FUELS
GENERAL ELECTRIC CO., SAN JOSE
GEAP-4466 +. 17 PAGES, REFERENCES, MARCH 1966

AN ATTEMPT IS MADE TO CLARIFY THE BEHAVIOR OF MIXED-OXIDE FUELS WITH REGARD TO PLUTONIUM AND FISSION PRODUCT REDISTRIBUTION AND TO ASSESS BOTH THEIR MAGNITUDE AND CONSEQUENCES ON THE OPERATION OF FAST REACTOR SYSTEMS. THE PLUTONIUM AND FISSION PRODUCT REDISTRIBUTION IN MIXED-OXIDE FUEL OPERATED ABOVE THE MELTING POINT REDUCES THE DOPPLER SHUTDOWN REACTIVITY BY 4 PERCENT OR LESS. THE SELECTION OF A PUO₂-UO₂ MIXTURE AS THE REFERENCE FUEL FOR THE FAST CERAMIC REACTOR HAS PROMPTED A NUMBER OF INVESTIGATIONS INTO THE BEHAVIOR OF SUCH FUEL UNDER BOTH NORMAL AND EXTREME OPERATING CONDITIONS. OF PARTICULAR INTEREST IN THE DESIGN AND OPERATION OF FAST REACTORS IS THE MAINTENANCE OF ADEQUATE FUEL HOMOGENEITY AND THE INTEGRITY OF THE FUEL ASSEMBLY. THE INTEREST IN FUEL HOMOGENEITY STEMS PRIMARILY FROM THE POSSIBLE EFFECT OF A PLUTONIUM REDISTRIBUTION ON THE DOPPLER SHUTDOWN REACTIVITY OF THE SYSTEM. SEPARATION OF PLUTONIUM FROM URANIUM IN MIXED OXIDES REDUCES THE RATE OF TEMPERATURE RISE IN U-238 RELATIVE TO THE CASE OF COMPLETE HOMOGENEITY AND THEREBY REDUCES THE PROMPTNESS OF THE NEGATIVE DOPPLER COEFFICIENT, A BASIC ELEMENT IN THE MECHANICS OF REACTOR SHUTDOWN. FISSION PRODUCT CONCENTRATION GRADIENTS DO NOT MATERIALLY INFLUENCE THE DOPPLER PHYSICS OF A FAST REACTOR SYSTEM BECAUSE OF THE RELATIVELY SMALL AMOUNT OF HEAT LIBERATED BY NEUTRON CAPTURE IN FISSION PRODUCTS. HOWEVER, IT HAS BEEN HYPOTHESIZED THAT THE CONCENTRATIONS OF CHEMICALLY REACTIVE SPECIES SUCH AS CESIUM AND IODINE NEAR THE FUEL-CLADDING INTERFACE AND THEIR DIFFUSION INTO THE CLADDING MAY BE PARTIALLY RESPONSIBLE FOR THE STRUCTURAL CHANGES SOMETIMES OBSERVED AT AND ADJACENT TO THE INNER SURFACE OF THE CLADDING. AN UNDERSTANDING OF THE MIGRATION BEHAVIOR OF FISSION PRODUCTS IS, THEREFORE, SIGNIFICANT IN INTERPRETING THE BEHAVIOR OF STRUCTURALLY SOUND FUEL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN.

7-13572 CADLE RD
PARTICLES IN THE ATMOSPHERE AND SPACE

ACCESSION NUMBER 7-13549 TO 7-13572

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13572 *CONTINUED*
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
213 PAGES, FIGURES, TABLES, 59 REFERENCES, REINHOLD PUBLISHING CORP, NEW YORK, 1966

THIS BOOK, LIKE THE PRECEDING ONE I HAVE WRITTEN, ENTITLED, PARTICLE SIZE - THEORY AND INDUSTRIAL APPLICATIONS, IS INTENDED TO BE INTERMEDIATE IN SCOPE BETWEEN AN INTRODUCTION TO THE SUBJECT AND AN EXHAUSTIVE TREATISE. IT HAS BEEN WRITTEN ESPECIALLY FOR SCIENTISTS AND ENGINEERS WHO ARE NOT SPECIALISTS IN FINE-PARTICLE BEHAVIOR AND WISH TO LEARN MORE ABOUT THE NATURE OF PARTICLES IN OUR UNIVERSE AS A WHOLE. THIS BOOK IS INTENDED TO GATHER IN ONE VOLUME INFORMATION CONCERNING THE FINE PARTICLES IN OUR UNIVERSE, INFORMATION THAT FOR THE MOST PART HAS BEEN SCATTERED THROUGH A VOLUMINOUS LITERATURE COVERING SUCH SUBJECTS AS ASTRONOMY, AIR POLLUTION, CLOUD PHYSICS, METEOROLOGY, RADIOACTIVE FALLOUT, AND SPACE SCIENCE.

*ATMOSPHERIC CHEMISTRY + *ATMOSPHERIC POLLUTION + *PARTICLE SIZE DISTRIBUTION + IONOSPHERE + MESOSPHERE + PARTICULATE + STRATOSPHERE + TROPOSPHERE

7-13583 MORRISON DL + BERRY DA + BERRY WE + GENCO JM
FISSION-PRODUCT DEPOSITION AND ITS ENHANCEMENT UNDER REACTOR ACCIDENT CONDITIONS. QUARTERLY PROGRESS REPORT, APRIL - JUNE, 1966
BATTTELLE MEMORIAL INSTITUTE, COLUMBUS
BMT-X-10173 + EURAEC-1708 +. 36 PAGES, 15 FIGURES, 8 TABLES, 2 REFERENCES, JULY 1, 1966

THIS IS A QUARTERLY PROGRESS REPORT. THE PRESENT PROGRAM, HAS BEEN UNDERTAKEN IN THE PURSUIT OF TWO MAJOR OBJECTIVES- (1) THE PERFORMANCE OF EXPERIMENTAL AND ANALYTICAL WORK DIRECTED TOWARD OBTAINING DEFINITIVE INFORMATION ON THE CHEMICAL AND PHYSICAL PROCESSES WHICH EFFECT IODINE TRANSPORT AND DEPOSITION, AND (2) THE DEVELOPMENT OF PRACTICAL COATINGS WHICH WOULD RETAIN SIGNIFICANT FRACTIONS OF FISSION-PRODUCT IODINE RELEASED IN THE EVENT OF A SERIOUS ACCIDENT IN A WATER-COOLED REACTOR. FUNDAMENTAL EXPERIMENTAL STUDIES WILL BE PERFORMED FOR BOTH CONTAINMENT- AND PRIMARY-SYSTEM SURFACES TO DETERMINE THE KINETIC BEHAVIOR OF IODINE AND ITS FISSION-PRODUCT PRECURSORS DURING REACTION AND DEPOSITION UNDER CONDITIONS POSTULATED FOR SERIOUS REACTOR ACCIDENTS. THE VARIABLES TO BE STUDIED ARE IODINE FORM AND CONCENTRATION, CONDENSATION RATE, TYPE OF SURFACE, ATMOSPHERE, GAS FLOW RATE, TEMPERATURE, PRESSURE, AND THE INFLUENCE OF THE FISSION-PRODUCT PRECURSOR OF IODINE, TELLURIUM. ANALYTICAL STUDIES ON SURFACE REACTIONS AND DEPOSITION, GAS-PHASE MASS TRANSPORT, AND HOMOGENEOUS GAS-PHASE REACTIONS WILL BE PERFORMED IN SUPPORT OF THE EXPERIMENTAL PROGRAM. TO DEVELOP A SURFACE COATING CAPABLE OF RETAINING IODINE RELEASED IN AN ACCIDENT, POLYMER FILMS THAT HAVE A POTENTIAL OF REACTING WITH IODINE, HI, AND ALKYL IODIDES WILL BE CONSIDERED, AS WELL AS REACTIVE PIGMENTS IN EITHER CONVENTIONAL COATINGS OR IN A TYPE THAT HAS A PROPENSITY TO REACT WITH FISSION PRODUCTS. THE COATINGS WHICH ARE DEVELOPED WILL BE EVALUATED FOR THEIR ABSORPTIVE EFFECTIVENESS, AND THE OPTIMUM METHOD OF APPLICATION OF THE COATING WILL BE DETERMINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN.

*CHEMICAL KINETICS + *COATING, SURFACE + *CONTAINMENT PAINT + *DEPOSITION + *FISSION PRODUCT, IODINE + CONTAINMENT RESEARCH AND DEVELOPMENT + FISSION PRODUCT RELEASE, GENERAL + FISSION PRODUCT TRANSPORT + IODINE + ORGANIC IODIDE + STEEL, STAINLESS + ZIRCALOY

7-13584 MORRISON DL + BERRY DA + GENCO JM + BERRY WE + ROSENBERG HS + CREMEANS GE
FISSION-PRODUCT DEPOSITION AND ITS ENHANCEMENT UNDER REACTOR ACCIDENT CONDITIONS. QUARTERLY PROGRESS REPORT FOR JULY-SEPTEMBER, 1966
BATTTELLE MEMORIAL INSTITUTE, COLUMBUS
BMT-X-10179 +. 37 PAGES, 16 FIGURES, 11 TABLES, 6 REFERENCES, OCTOBER 1, 1966

THE PRESENT PROGRAM WAS UNDERTAKEN IN THE PURSUIT OF TWO MAJOR OBJECTIVES - (1) THE PERFORMANCE OF EXPERIMENTAL AND ANALYTICAL WORK DIRECTED TOWARD OBTAINING DEFINITIVE INFORMATION ON THE CHEMICAL AND PHYSICAL PROCESSES WHICH AFFECT THE IODINE TRANSPORT AND DEPOSITION, AND (2) THE DEVELOPMENT OF PRACTICAL COATINGS WHICH WOULD RETAIN SIGNIFICANT FRACTIONS OF FISSION PRODUCT IODINE RELEASE IN THE EVENT OF A SERIOUS ACCIDENT IN A WATER-COOLED REACTOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA.

*CONTAINMENT PAINT + *DEPOSITION + *FISSION PRODUCT, IODINE + IODINE

7-13586 NOTLEY MJ + MACEWAN JR
THE EFFECT OF UO₂ DENSITY OF FISSION PRODUCT GAS RELEASE AND SHEATH EXPANSION
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO, CANADA
6 PAGES, 2 TABLES, 4 FIGURES, 13 REFERENCES, NUCLEAR APPLICATIONS 2(2), PAGES 117-122 (APRIL 1966)

THE EFFECT OF UO₂ DENSITY ON FISSION PRODUCT GAS RELEASE AND SHEATH EXPANSION HAS BEEN DETERMINED IN AN IRRADIATION EXPERIMENT IN WHICH THE PERFORMANCE OF FUEL ELEMENTS WITH DENSITIES BETWEEN 10.42 AND 10.74 G/CM³ WAS COMPARED AT INTEGRAL OF LAMBDA D(THETA) VALUES OF 39 AND 42 W/CM. DIAMETRAL SHEATH STRAIN WAS LESS FOR THE LOWER DENSITY ELEMENTS, BUT FISSION PRODUCT GAS RELEASE AND THE EXTENT OF GRAIN GROWTH WERE GREATER AS THE DENSITY DECREASED. A CORRELATION BETWEEN THE EXTENT OF GRAIN GROWTH IN THE UO₂ AND THE FRACTIONAL GAS RELEASE WAS FOUND TO EXIST IN THIS TEST AND TO APPLY TO A LARGE NUMBER OF OTHER IRRADIATIONS - IT IS SUGGESTED THAT THIS RELATIONSHIP MAY BE CAUSAL AND THAT THE FRACTIONAL GAS RELEASE IS NOT SOLELY A FUNCTION OF TEMPERATURE.

*DIFFUSION + *FISSION GAS RELEASE + *FUEL INTEGRITY + *PROPERTY, PHYSICAL + FISSION PRODUCT TRANSPORT + FUEL ELEMENT + IRRADIATION TESTING + NOBLE GAS + THERMAL PROPERTY + URANIUM DIOXIDE + XENON

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13587 WHAPHAM AD
ELECTRON MICROSCOPE OBSERVATION OF THE FISSION-GAS BUBBLE DISTRIBUTION IN UO₂
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL, BERKSHIRE, ENGLAND
8 PAGES, 10 FIGURES, 16 REFERENCES, NUCLEAR APPLICATIONS 2(2), PAGES 123-130 (APRIL 1966)

THE STRUCTURE OF POST-IRRADIATION ANNEALED UO₂ HAS BEEN EXAMINED BY TRANSMISSION ELECTRON MICROSCOPY TO TRY TO UNDERSTAND THE BEHAVIOR AND RELEASE OF FISSION GAS. AT A DOSE OF 2.2×10 TO THE 19TH FISSIONS/CC, 5×10 TO THE 15TH SMALL GAS BUBBLES/CC ARE OBSERVED IN THE MATERIAL. THESE PRECIPITATE AT 1100 C AND APPEAR TO GROW FROM 25 TO 100 ANGSTROM DIAM AT 1500 C BY DIFFUSION OF GAS ATOMS FROM THE MATRIX. GRAIN-BOUNDARY MIGRATION SWEEPS UP THESE BUBBLES AT BETWEEN 1800 AND 2000 C. RE-SOLUTION OF FISSION-GAS BUBBLES UP TO 300 ANGSTROM DIAM HAS BEEN DEMONSTRATED ON RE-IRRADIATION. AT A DOSE OF 1.6×10 TO THE 20TH FISSIONS/CC, BUBBLES APPEAR TO GROW BY COALESCENCE AND BY DISLOCATION SWEEPING. PRECIPITATES, BELIEVED TO BE SOLID FISSION PRODUCTS, ARE OBSERVED. IT IS CONCLUDED THAT, IN A FUEL ELEMENT IN WHICH A HIGH-TEMPERATURE GRADIENT EXISTS, THE GAS RELEASE BELOW 1800 C WILL BE CONTROLLED BY THE MIGRATION OF BUBBLES TO GRAIN BOUNDARIES AND BY THE DEGREE OF LINKING UP BETWEEN THE GAS-FILLED Voids PRODUCED AT GRAIN BOUNDARIES. AT TEMPERATURES ABOVE 1800 C, LARGE GAS-FILLED Voids PRODUCED AT GRAIN BOUNDARIES WOULD BE EXPECTED TO MIGRATE UP THE TEMPERATURE GRADIENT BY THE VAPOR-TRANSFER MECHANISM, CONTINUING THE PROCESS OF SWEEPING UP MOST OF THE GAS STARTED BY THE INITIAL GROWN-IN POROSITY.

*DIFFUSION + *ELECTRON MICROSCOPY + FISSION GAS RELEASE + FISSION PRODUCT TRANSPORT + FUEL ELEMENT + IRRADIATION TESTING + URANIUM DIOXIDE

7-13588 MATZKE H
DIFFUSION IN DOPED UO₂
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO, CANADA
7 PAGES, 4 TABLES, 11 FIGURES, 16 REFERENCES, NUCLEAR APPLICATIONS 2(2) PAGES 131-137 (APRIL 1966)

UO₂, BOTH PURE AND DOPED WITH TRI-, QUADRI-, AND PENTA-VALENT IONS, HAS BEEN LABELLED WITH RARE GAS BY MEANS OF ION BOMBARDMENT AND REACTOR IRRADIATION. THE GAS RELEASE AT LOW GAS CONCENTRATIONS OCCURRED BY A MECHANISM LITTLE OR NOT DEPENDENT ON SELF-DIFFUSION OF EITHER OXYGEN OR URANIUM. AT HIGH GAS CONCENTRATIONS, RETARDED RELEASE OF GAS OCCURRED. THIS WAS SHOWN BY TRANSMISSION ELECTRON MICROSCOPY TO COINCIDE WITH FORMATION AND ANNEALING OF RADIATION-INDUCED BUBBLES AND DISLOCATION LOOPS.

*DIFFUSION + *ELECTRON MICROSCOPY + *FISSION GAS RELEASE + *XENON + FISSION PRODUCT TRANSPORT + IRRADIATION TESTING + NOBLE GAS + RADIATION EFFECT + URANIUM DIOXIDE

7-13589 SOULHIER R
FISSION-GAS RELEASE FROM UO₂ DURING IRRADIATION UP TO 2000 C
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
4 PAGES, 2 FIGURES, 2 TABLES, 7 REFERENCES, NUCLEAR APPLICATIONS 2(2) PAGES 138-141 (APRIL 1966)

THE FISSION-GAS RELEASE FROM UO₂ SAMPLES WAS STUDIED DURING IRRADIATION IN THE TEMPERATURE RANGE 150 TO 2000 C. BOTH SINTERED UO₂ AND SINGLE CRYSTALS WERE STUDIED. BELOW 600 C, RECOIL AND KNOCK-OUT ARE THE MECHANISMS OF RELEASE. BETWEEN 800 AND 2000 C, EXCLUDING THE EVAPORATIONAL ESCAPE ABOVE 1800 C, THE FRACTIONAL RELEASE FOLLOWS AN ARRHENIUS LAW WHERE ACTIVATION ENERGY DECREASES WITH INCREASING DENSITY. THE FRACTIONAL RELEASE WAS FOUND TO BE INDEPENDENT OF NEUTRON FLUX.

*FISSION GAS RELEASE + *URANIUM DIOXIDE + *XENON + FISSION PRODUCT TRANSPORT + FISSION RECOIL + IRRADIATION TESTING + NOBLE GAS + RADIATION EFFECT

7-13590 CARROLL RM + SISMAN N
FISSION-GAS RELEASE DURING FISSIONING IN UO₂
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
9 PAGES, 11 FIGURES, 10 REFERENCES, NUCLEAR APPLICATIONS 2(2) PAGES 142-150 (APRIL 1966)

THE RESULTS OF IN-PILE TESTS ON UO₂ SPECIMENS OF FINE-GRAIN AND SINGLE-CRYSTAL STRUCTURE LED TO THE FORMATION OF A DEFECT-TRAP THEORY TO DESCRIBE FISSION-GAS RELEASE. THE THEORY, WHICH APPLIES ONLY WHEN THE UO₂ TEMPERATURE IS BELOW THE GRAIN GROWTH REGION (1600 C), IS DESCRIBED, AND CONFIRMING EXPERIMENTS ARE CITED. EXPERIMENTAL RESULTS ARE GIVEN TO SUPPORT THE CONTENTION THAT A KNOCK-OUT MECHANISM ACCOUNTS FOR THE MAJORITY OF THE FISSION-GAS RELEASE AT UO₂ TEMPERATURES UNDER 600 C. AN OSCILLATING EXPERIMENTAL TECHNIQUE DEVELOPED TO EVALUATE THE DEFECT-TRAP THEORY IS DESCRIBED, AND THE INITIAL RESULTS ARE INTERPRETED IN TERMS OF THE THEORY.

*ANALYTICAL MODEL + *FISSION GAS RELEASE + *IRRADIATION TESTING + *RADIATION DAMAGE + *URANIUM DIOXIDE + FISSION PRODUCT TRANSPORT + FISSION RECOIL + IN PILE EXPERIMENT + RADIATION EFFECT

7-13591 MACEWANN JR + MOREL PA
MIGRATION OF XENON THROUGH A UO₂ MATRIX CONTAINING TRAPPING SITES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO, CANADA
13 PAGES, 11 FIGURES, 2 TABLES, 32 REFERENCES, NUCLEAR APPLICATIONS 2(2) PAGES 158-170 (APRIL 1966)

RECENT DEVELOPMENTS CONCERNING THE MECHANISM FOR VOLUME DIFFUSION OF XENON IN UO₂ AND THE DEFECTS OBSERVED IN IRRADIATED UO₂ BY ELECTRON MICROSCOPY ARE REVIEWED WITH DETAILED REFERENCE TO RECENT RESULTS OBTAINED AT CHALK RIVER NUCLEAR LABORATORY. AN EARLIER INTERPRETATION FOR XENON DIFFUSION IN A MATRIX CONTAINING PRE-EXISTING AND IRRADIATION INDUCED TRAPPING SITES IS EXTENDED.

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13591 *CONTINUED*

*DIFFUSION + *ELECTRON MICROSCOPY + *FISSION GAS RELEASE + *IRRADIATION TESTING + *NOBLE GAS +
FISSION PRODUCT TRANSPORT + FUEL INTEGRITY + PARTICLE SIZE + RADIATION EFFECT + URANIUM DIOXIDE + XENON

7-13592 LEWIS WB

ENGINEERING FOR THE FISSION GAS IN UO₂ FUEL
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO, CANADA
11 PAGES, 16 FIGURES, 1 TABLE, 23 REFERENCES, NUCLEAR APPLICATIONS 2(2), PAGES 171-181 (APRIL 1966)

FUEL MAY BE DESIGNED FOR FISSION GAS CONTAINMENT WITHIN THE FUEL CLAD OR FOR VENTING, ALSO TO SURVIVE POSSIBLE RUPTURES OF THE CLAD. FISSION GAS BEHAVIOR VARIES WIDELY WITH THE UO₂ STARTING MATERIAL AND, LIKE THE BAKING OF BREAD, WITH ITS IRRADIATION HISTORY OF TIME AND TEMPERATURE. BELOW 1000 C, MOST GAS REMAINS TRAPPED - BETWEEN 1000 AND 1800 C, MOST GAS BECOME TRAPPED AT SOME TIME IN SMALL CLOSED PORES. EXPANSION OF THE PORES CAUSES SWELLING. ESCAPE FROM THE PORES IS BY CRACKING OR BY RADIATION-INDUCED REABSORPTION. FUEL RODS ARE COMMONLY DESIGNED WITH A PLENUM TO COLLECT GAS, BUT THE HIGH DENSITY OF PORES AND PLASTICITY OF THE OXIDE DELAYS PREVENTS MUCH OF THE GAS FROM REACHING THE PLENUM. FOR IRRADIATIONS UP TO 12000 MWD/T, SATISFACTORY DESIGNS HAVE BEEN ACHIEVED WITHOUT A PLENUM. ABOVE 1800 C, MOST GAS ESCAPES, BUT THE PROCESS OF ESCAPE IS NOT WELL ESTABLISHED AND REQUIRES CONSIDERATION IN EACH CASE BY THE DESIGN ENGINEER. AVAILABLE KNOWLEDGE MOST RELEVANT TO DESIGN IS BRIEFLY REVIEWED AND ILLUSTRATED IN PHOTOGRAPHS AND GRAPHS.

*FISSION GAS RELEASE + *FUEL BURNUP + *FUEL ELEMENT + *FUEL INTEGRITY + *IRRADIATION TESTING +
CENTERLINE MELTING + FAILURE, FUEL ELEMENT + FISSION PRODUCT TRANSPORT + PROPERTY, PHYSICAL +
RADIATION EFFECT + URANIUM DIOXIDE

7-13593 PEREZ RB

A DYNAMIC METHOD FOR IN-PILE FISSION-GAS RELEASE STUDIES
UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA
7 PAGES, 2 FIGURES, 3 REFERENCES, NUCLEAR APPLICATIONS 2(2) PAGES 151-157 (APRIL 1966)

A DYNAMIC METHOD TO STUDY THE RELEASE OF FISSION GASES FROM FUEL SPECIMENS DURING IRRADIATION IS PRESENTED. THE MAIN PURPOSE OF THE WORK IS TO SHOW HOW A DYNAMIC METHOD CAN DISCRIMINATE BETWEEN DIFFUSION AND DIFFUSION-TRAPPING PROCESSES BY OBSERVING THE DIFFERENT BEHAVIOR OF THE RELEASE RATE TRANSFER FUNCTION, WITH RESPECT TO NEUTRON FLUX OSCILLATIONS, FOR THE TWO MODELS.

*ANALYTICAL MODEL + *DIFFUSION + *FISSION GAS RELEASE + *THEORETICAL INVESTIGATION +
FISSION PRODUCT TRANSPORT + MATHEMATICAL STUDY + NOBLE GAS + URANIUM DIOXIDE

7-13607 VENERUS ER + OZISIK MN

THEORETICAL INVESTIGATIONS OF FISSION PRODUCT DEPOSITION FROM FLOWING GAS STREAMS
NORTH CAROLINA STATE UNIVERSITY
19 PAGES, 5 FIGURES, 2 TABLES, NUCLEAR SCIENCE AND ENGINEERING 26(1), PAGES 122-130, (SEPTEMBER 1966)

DEPOSITION OF FISSION PRODUCTS FROM AN ISOTHERMAL LAMINAR GAS STREAM TO THE SURFACES OF A CIRCULAR TUBE IS THEORETICALLY INVESTIGATED FOR A SOURCE RELEASING A RADIOACTIVE PRECURSOR INTO THE GAS STREAM AT A UNIFORM RATE AT THE ORIGIN. A SLUG VELOCITY PROFILE IS ASSUMED. IN SOLVING THE PARTIAL DIFFERENTIAL EQUATIONS OF THE PROBLEM, TWO DIFFERENT MODELS ARE EXAMINED AS BOUNDARY CONDITIONS TO COUPLE THE PROBLEM, TWO DIFFERENT MODELS ARE EXAMINED AS BOUNDARY CONDITIONS TO COUPLE EQUATIONS. THE FIRST MODEL, WHICH IS REFERRED TO AS THE RESISTANCE MODEL, IS APPLICABLE WHEN THE SURFACE CONCENTRATION OF THE DEPOSITED PRECURSOR IS SMALL OR APPLICABLE WHEN THE SURFACE IS NEGLIGIBLE. IT IS EQUIVALENT TO ASSUMING A FICTITIOUS UNKNOWN RESISTANCE TO MASS TRANSFER AT THE WALL SURFACE. THE BOUNDARY VALUE PROBLEM OF MASS TRANSFER BASED ON THE RESISTANCE MODEL HAS BEEN SOLVED FOR THE TRANSIENT CONDITIONS AND ANALYTICAL RELATIONS ARE DERIVED FOR THE CONCENTRATION OF FISSION PRODUCTS IN THE GAS STREAM AND ON THE TUBE SURFACE. IN THE SECOND MODEL, WHICH IS REFERRED TO AS THE TRANSPORT MODEL, A MORE DETAILED ACCOUNT IS TAKEN OF THE ACTUAL PHYSICAL TRANSPORT PROCESS IN THE IMMEDIATE VICINITY OF THE CONDUIT SURFACE.

*ANALYTICAL MODEL + *DEPOSITION + *FISSION PRODUCT, VOLATILE + *FLOW, TUBE + *THEORETICAL INVESTIGATION +
DIFFUSION CHANNEL + FILTER SYSTEM + FISSION PRODUCT TRANSPORT + MATHEMATICAL STUDY +
PARTICLE, RADIOACTIVE + RADIOISOTOPE + STACK + SURFACE CONTAMINATION

7-13629 BLACK DE + LAKEY LT + LEGLER BM

CONTAMINATION DECONTAMINATION EXPERIMENT IN THE ICPP
IDAHO NUCLEAR CORPORATION
9 PAGES, 9 FIGURES, 1966, PRESENTED AT THE 152ND NATIONAL MEETING OF THE AMERICAN CHEMICAL SOCIETY, NEW YORK CITY, NEW YORK, SEPTEMBER 12-16, 1966

THE CONTAMINATION-DECONTAMINATION EXPERIMENT AT THE IDAHO CHEMICAL PROCESSING PLANT PROVIDES MIXTURES OF HIGH-LEVEL, SHORT-COOLED FISSION PRODUCTS FOR DEVELOPMENT STUDIES ON PROTECTIVE COATINGS, DECONTAMINATION TECHNIQUES, SAMPLING DEVICES, AND ANALYTICAL METHODS. THE MIXTURES ARE BEING PRODUCED BY MELTING A FRESHLY IRRADIATED MINIATURE FUEL PIN WITH AN INDUCTION FURNACE. TWO TESTS HAVE BEEN MADE INVOLVING KILOCURIE QUANTITIES OF FISSION PRODUCTS RELEASED FROM ZIRCONIUM-CLAD UO₂ FUEL PINS MELTED IN A STEAM ATMOSPHERE. OPERATION OF THE EXPERIMENTAL SYSTEM HAS BEEN SATISFACTORY AND HAS STARTED US WELL ON THE WAY TO ACCOMPLISHING OUR OBJECTIVES.

AVAILABILITY - D. E. BLACK, IDAHO NUCLEAR CORPORATION, IDAHO FALLS, IDAHO

*CONTAINMENT, FUEL REPROCESSING + *CONTAMINATION + *DECONTAMINATION + *LOFT (LOSS OF FLUID TEST) +
*SAMPLING + CHEMICAL REACTION + CLAD + COATING, SURFACE + FUEL ELEMENT + FUEL MELTDOWN + URANIUM DIOXIDE +

ACCESSION NUMBER 7-13591 TO 7-13629

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13629 *CONTINUED*
ZIRCONIUM

7-13638 MCQUILKIN FR + CUNEO DR + PRADOS JW + LONG EL + COOBS JH
AN IRRADIATION TEST OF AVR PRODUCTION FUEL SPHERES IN THE OAK RIDGE RESEARCH REACTOR
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1512 +. 65 PAGES, FIGURES, TABLES, JUNE 1966

INJECTION-MOLDED SPHERES WITH MACHINED ATJ UNFUELED GRAPHITE SHELLS SUCCESSFULLY MET THE IRRADIATION PERFORMANCE REQUIREMENTS FOR AVR FUEL. IN PARTICULAR - (1) THERMAL ANALYSES SHOWED THAT THE HEAT TRANSFER BETWEEN FUELED CORES AND UNFUELED SHELLS WAS SATISFACTORY, AND NOT DECREASED BY IRRADIATION, (2) DIMENSIONAL AND WEIGHT CHANGES DURING IRRADIATION WERE ACCEPTABLY SMALL, (3) NO FAILURES OF FUEL-PARTICLE COATINGS WERE FOUND FOR BURNUPS IN THE RANGE OF 7 ATOM PERCENT, AND (4) MIGRATION OF SOLID FISSION PRODUCTS OUT OF THE SPHERES WAS QUITE LOW, AS WAS FISSION-GAS RELEASE DURING IRRADIATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.75 MICROFICHE

*COATED PARTICLE + *FAILURE, COATED PARTICLE + *FUEL BURNUP + *IN PILE EXPERIMENT + *IRRADIATION TESTING + DIFFUSION + FISSION GAS RELEASE + FISSION PRODUCT TRANSPORT + FUEL ELEMENT + FUEL INTEGRITY + RADIATION DAMAGE + RADIATION EFFECT + REACTOR, PEBBLE BED + THERMAL PROPERTY

7-13648 KOVACH JL + GREEN JE
EVALUATION OF THE IGNITION TEMPERATURE OF ACTIVATED CHARCOALS IN DRY AIR
BARNÉBEY-CHENEY CO
6 PAGES, 7 FIGURES, 33 PAGES, NUCLEAR SAFETY 8(1), PAGES 41-46, (FALL 1966)

ACTIVATED-CHARCOAL PROPERTIES THAT INFLUENCE THE IGNITION TEMPERATURE IN DRY AIR WERE EVALUATED IN DETAIL, AND A METHOD AND EQUIPMENT FOR CHARCOAL IGNITION-TEMPERATURE MEASUREMENT ARE DESCRIBED. A THEORETICAL EXPLANATION BASED ON THE EXPERIMENTAL DATA IS GIVEN FOR THE CONTRIBUTING EFFECTS OF CHARCOAL SURFACE AREA, ASH CONTENT, PARTICLE SIZE, AND BED DEPTH AT VARIOUS AIR VELOCITIES. METHODS FOR INCREASING THE IGNITION TEMPERATURE OF ACTIVATED CHARCOALS ARE DISCUSSED. CAREFUL SELECTION OF THE CHARCOAL FOR A REACTOR CONTAINMENT APPLICATION IS NEEDED TO MINIMIZE THE FIRE HAZARD. THE IGNITION TEMPERATURES OF ACTIVATED CHARCOALS DEPEND MAINLY ON THE SURFACE AREA AND THE TYPE OF IMPURITIES PRESENT. PARTICLE SIZE, AIR VELOCITY, AND NON-OXIDIZING CATALYST IMPURITIES HAVE LESS INFLUENCE ON THE IGNITION TEMPERATURE. THE IMPREGNATION OF CHARCOAL WITH IODINE DOES NOT LOWER THE IGNITION TEMPERATURE. ON THE BASIS OF CURRENT RESULTS, APPARENTLY THE DANGER OF FIRE IN REACTOR CONTAINMENT SYSTEMS CAN BE GREATLY MINIMIZED BY PROPER CHARCOAL SELECTION.

*CHARCOAL + *FILTER + *FIRE + *IGNITION + CARBON + FILTER, BED + FILTER, TRAP + OXIDATION + PARTICLE SIZE + SURFACE TO VOLUME RATIO + TEST, FILTER + THERMAL PROPERTY

7-13651 JOHNSON JS
HYPERFILTRATION STUDIES IV SALT REJECTION BY DYNAMICALLY FORMED HYDROUS OXIDE MEMBRANES
OAK RIDGE NATIONAL LAB.
8 PAGES, 1 FIGURE, 2 TABLES, 12 REFERENCES, 1965

IN A CANVASS OF MATERIALS FOR POSSIBLE USEFULNESS AS SALT FILTERS IN THE HYPERFILTRATION (REVERSE OSMOSIS) PROCESS FOR DESALINATION, HYDROUS OXIDES AND BASIC SALTS DESERVE CONSIDERATION. THESE MATERIALS ARE KNOWN TO HAVE ION-EXCHANGE PROPERTIES, AND ION-EXCHANGE MEMBRANES AND POROUS BODIES ARE KNOWN TO REJECT SALT FROM SOLUTIONS FORCED THROUGH THEM BY PRESSURE. IT IS NOT OBVIOUS, HOWEVER, HOW TO PREPARE A HYDROUS OXIDE LAYER SUITABLE FOR HYPERFILTRATION. IN ORDER TO REJECT, IT MUST BE COMPACT ENOUGH FOR INTIMATE CONTACT WITH FEED. AT THE SAME TIME, IT MUST BE THIN ENOUGH TO ALLOW FAST PERMEATION (AS THE ACTIVE LAYER OF PRESENTLY PRODUCED CELLULOSE ACETATE MEMBRANES DOES). WE HAVE FOUND THAT MEMBRANES CAN BE DYNAMICALLY CREATED BY EXPOSING A POROUS BODY MOUNTED IN A HYPERFILTRATION APPARATUS TO A SOLUTION CONTAINING AS ADDITIVE A COLLOIDAL DISPERSION OF A HYDROUS OXIDE. A HYPERFILTRATION APPARATUS CONSISTS OF A MEMBRANE AND SUPPORT IN CONTACT WITH A PRESSURIZED FEED SOLUTION. THE SOLUTION IS CIRCULATED PAST THE MEMBRANE TO DECREASE AT THE MEMBRANE-SOLUTION INTERFACE THE SALT BUILDUP RESULTING FROM REJECTION OF SOLUTE FROM THE SOLUTION PERMEATING THE MEMBRANE. IN THIS STUDY, THE EQUIPMENT DIFFERED FROM THAT PREVIOUSLY DESCRIBED IN THAT A LARGE VOLUME OF SOLUTION WAS PRESSURIZED, AND CIRCULATION WAS EFFECTED WITH A SEPARATE PUMP OPERATING AT PRESSURE.

AVAILABILITY- J. S. JOHNSON, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

*ION EXCHANGE + *POROUS DIFFUSION + *POROUS MEDIA + *SALT + *WATER TREATMENT + FILTER, GLASS + FILTER, LIQUID + OCEAN AND SEA + WATER, GENERAL

7-13652 KRAUS KA + PHILLIPS HO + MARCHNIEWSKY AE + SHOR AJ
HYPERFILTRATION STUDIES VI SALT REJECTION BY DYNAMICALLY FORMED POLYELECTROLYTE MEMBRANES
OAK RIDGE NATIONAL LABORATORY
9 PAGES, 2 FIGURES, 1965

SALT-FILTERING LAYERS CAN BE FORMED ON POROUS BODIES BY CIRCULATING BY THEM PRESSURIZED SOLUTIONS CONTAINING SMALL CONCENTRATIONS OF ORGANIC POLYELECTROLYTES. THESE FILMS REJECT SUBSTANTIAL FRACTIONS OF SOLUTE FROM DILUTE SOLUTIONS, FREQUENTLY WITH HIGH TRANSMISSION RATES THROUGH THE MEMBRANES (E.G., 100 TO 200 GPD/FT SQUARED UNDER 35 ATM. PRESSURE). POSSIBILITIES OF APPLICATIONS IN REVERSE OSMOSIS PROCESSES ARE DISCUSSED BRIEFLY.

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13652 *CONTINUED*
AVAILABILITY - J. S. JOHNSON, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENN.

*ION EXCHANGE + *POROUS DIFFUSION + *POROUS MEDIA + *SALT + *WATER TREATMENT + FILTER, GLASS +
FILTER, LIQUID + OCEAN AND SEA + WATER, GENERAL

7-13653 KRAUS KA + MARCINKOWSKY AE + SHOR AJ + JOHNSON JS
SALT REJECTION BY A POROUS GLASS
OAK RIDGE NATIONAL LABORATORY
2 PAGES, 1 TABLE, SCIENCE 151(3707), PAGES 194-195, (JANUARY 14, 1966)

POROUS GLASS PARTLY FILTERS DISSOLVED SALT FROM AQUEOUS SOLUTIONS PASSED THROUGH IT UNDER
PRESSURE. REJECTION OF SALT CAN BE INCREASED BY INCREASE IN THE PH OF THE SOLUTION OR BY
ADDITION OF TH(IV). THE FILTRATION SEEMS TO ACCORD WITH A MECHANISM OF SALT EXCLUSION
CHARACTERISTIC OF ION EXCHANGERS.

*ION EXCHANGE + *POROUS DIFFUSION + *POROUS MEDIA + *SALT + *WATER TREATMENT + FILTER, GLASS +
FILTER, LIQUID + OCEAN AND SEA + THORIUM + WATER, GENERAL

7-13677 KOTRAPPA P + JAUHRI GS + DUA SK
UNIT FOR TESTING HIGH-EFFICIENCY FILTERS
ATOMIC ENRGY ESTABLISHMENT, TROMBAY, INDIA
AEET-202 +. 23 PAGES, 1965

A UNIT WHICH USES SODIUM-24 AS A TRACER HAS BEEN DEVELOPED TO TEST HIGH-EFFICIENCY VENTILATION
FILTERS USED IN RADIOACTIVE INSTALLATIONS. THE TEST AEROSOLS CONSIST OF 0.2-MICROM MMD
PARTICLES PRODUCED BY AN AEROSOL GENERATOR WHICH USES 5 PERCENT ACTIVATED SODIUM CHLORIDE
SOLUTION. THE METHOD OF TESTING CONSISTS IN ISOKINETIC SAMPLING OF AIR FOR RADIOACTIVITY UP
STREAM AND DOWN STREAM OF THE TEST FILTER, USING INLINE SAMPLERS. A STUDY OF VARIATION OF
PENETRATION WITH VELOCITY INDICATED NO APPRECIABLE CHANGE WHEN THE FACE VELOCITY WAS VARIED
FROM 20 FPM TO 275. DETAILED EVALUATION OF THE METHOD FOR REPRODUCIBILITY, SENSITIVITY AND
ASSOCIATED HAZARDS HAS BEEN MADE. THE POSSIBLE IMPROVEMENTS (THE DEVELOPMENT WORK UNDER
PROGRESS) ARE ALSO SUGGESTED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM,
WISCONSIN 54669

*ANALYTICAL TECHNIQUE, CALIBRATION + *INSTRUMENTATION, AIR SAMPLING + *TEST, FILTER SYSTEM +
*TRACER, RADIOACTIVE + AEROSOL + AIR CLEANING + FILTER + FILTER EFFICIENCY + FILTER, HIGH EFFICIENCY +
INDIA + INSTRUMENTATION, GENERAL + SODIUM + TEST, FILTER

7-13680 PASCERI RE + FRIEDLANDER SK
MEASUREMENTS OF THE PARTICLE SIZE DISTRIBUTION OF THE ATMOSPHERIC AEROSOL - II. EXPERIMENTAL RESULTS AND
DISCUSSION
THE JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND
8 PAGES, 2 TABLES, 14 FIGURES, 11 REFERENCES, JOURNAL OF THE ATMOSPHERIC SCIENCES 22(5) PAGES 577-584
(SEPTEMBER 1965)

DISTRIBUTION DATA OBTAINED BY SAMPLING THE BALTIMORE AEROSOL WITH A CASCADE IMPACTOR ARE
REPORTED FOR THE RANGE BETWEEN 0.4 AND 20 MICRONS RADIUS. DATA FOR THE RANGE BETWEEN 70 Å
AND 0.1 MICRON IN RADIUS WERE OBTAINED IN TWO RUNS WITH THE ROTATING DISK SAMPLER. GREATER
VARIATIONS WERE OBSERVED IN THE LOWER END OF THE SPECTRUM THAN IN THE UPPER END. THE THEORY
OF SELF-PRESERVING SIZE DISTRIBUTIONS WAS USED WITH SOME SUCCESS TO CORRELATE DATA OBTAINED
IN THIS AND OTHER STUDIES. WHEN THE THEORY APPLIED AND THE R MINUS 4 SUBRANGE EXISTS, THE
SIZE DISTRIBUTION IS GIVEN BY $N(R) \text{ EQUALS } 0.04 \text{ PHI } R \text{ MINUS } 4$ WHERE PHI IS THE VOLUME FRACTION
OF AEROSOL MATERIAL.

*ANALYTICAL TECHNIQUE, CALIBRATION + *INSTRUMENTATION, AIR SAMPLING + *PARTICLE SIZE DISTRIBUTION +
AEROSOL + AEROSOL PROPERTIES + AIR CLEANING + AIRBORNE RELEASE + ATMOSPHERIC POLLUTION + DIFFUSION +
ELECTRON MICROSCOPY + FILTER + FILTER IMPACTION + PARTICLE SIZE + SAMPLING

7-13695 MORRISON DL + GENCO JM + GIESEKE JA + RITZMAN RL + WALTERS CT + WOOTON RO
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR
ACCIDENT. QUARTERLY PROGRESS REPORT, JULY-SEPTEMBER 1966
BATTTELLE MEMORIAL INSTITUTE
BMI-1777 +. 28 PAGES, 4 FIGURES, 35 REFERENCES, OCTOBER 1, 1966

THE FOLLOWING AREAS OF A REACTOR ACCIDENT ARE PRESENTED - COOLANT SHUTDOWN, HEAT TRANSFER AND
THERMODYNAMICS, FISSION-PRODUCT CHEMISTRY, AND AEROSOL AND PARTICLE DYNAMICS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 CY, \$0.50 MN.

*ACCIDENT ANALYSIS + *ACCIDENT, CONSEQUENCES + *FISSION PRODUCT TRANSPORT + ACCIDENT, GENERAL +
AEROSOL PROPERTIES + FISSION PRODUCT RELEASE, GENERAL + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER +
THERMODYNAMICS

7-13717 JACKSON G + DAVIES D + WATERMAN MJ
THE EFFECT OF NEUTRON FLUX ON THE FISSION PRODUCT GAS EMISSION FROM UO2 AT HIGH TEMPERATURES
UNITED KINGDOM ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, ENGLAND

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13717 *CONTINUED*
AERE-M-1607 +. 10 PAGES, 2 TABLES, 3 REFERENCES, JULY 1965

THE EMISSION OF GASEOUS FISSION PRODUCTS FROM URANIUM DIOXIDE (DENSITY 10.5 G/CC) HAS BEEN STUDIED AT 800 TO 1600 C IN A THERMAL NEUTRON FLUX OF 2×10^{10} TO THE 13TH. COMPARISON WITH PREVIOUS RESULTS AT A LOWER FLUX SHOWS THAT THE RELATIONSHIP BETWEEN FRACTIONAL RELEASE AND DECAY CONSTANT IS DEPENDENT ON THE FLUX. THE APPARENT DIFFUSION COEFFICIENT FOR IODINE-133 IS SEVEN TIMES GREATER THAN THAT OF XENON-133 AT 1000 C.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*DIFFUSION COEFFICIENT + *FISSION GAS RELEASE + *TRACER, RADIOACTIVE + FISSION PRODUCT, IODINE + HIGH TEMPERATURE + IODINE + IRRADIATION TESTING + RADIOISOTOPE + URANIUM DIOXIDE + XENON

7-13718 KEITH JR + SHELTON FH
GAMMA FLUXES FROM CIRCULAR AND SPHERICAL SOURCES
KAMAN NUCLEAR, COLORADO SPRINGS, COLORADO
N-65-14857 + KN-691-64-5 +. 26 PAGES, MAY 15, 1964

IN ANALYZING THE EFFECTS OF NUCLEAR WEAPONS IT IS OF INTEREST TO KNOW WHAT MAGNITUDES OF GAMMA FLUXES CAN BE EXPECTED DUE TO THE DELAYED GAMMAS EMITTED AFTER A NUCLEAR DETONATION. THE DIRECT (UNSCATTERED) DELAYED GAMMA FLUXES FROM UNIFORM DISKS AND SPHERES OF RADIOACTIVE DEBRIS ARE CONSIDERED FOR SEVERAL SPECIFIC CONFIGURATIONS AND ARE COMPARED WITH THE FLUX FROM A POINT SOURCE OF COMPARABLE MAGNITUDE. AN ESTIMATE IS MADE OF THE BUILD-UP FACTOR NECESSARY TO OBTAIN THE ACTUAL GAMMA FLUX FROM THE DIRECT GAMMA FLUX.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151

*NUCLEAR DETONATION + *SOURCE, RADIATION + GAMMA EMITTER + SOURCE, POINT

7-13719 RAMM EJ + SMITH PD + REEVE KD
DEVELOPMENT OF CERAMIC COATINGS FOR FISSION PRODUCT RETENTION IN CERAMIC FUELS
AUSTRALIAN ATOMIC ENERGY COMMISSION RESEARCH ESTABLISHMENT, LUCAS HEIGHTS
AAEC-E-148 +. 16 PAGES, 4 TABLES, 7 FIGURES, JANUARY 1966

IN THE CURRENT HIGH TEMPERATURE GAS COOLED REACTOR PROJECT AT LUCAS HEIGHTS, A PEBBLE-BED TYPE REACTOR FUELLED BY ALL-CERAMIC BERYLLIUM OXIDE-BASED SPHERES IS BEING CONSIDERED. THE PROPOSED FUEL ELEMENT CONSISTS BASICALLY OF A SPHERE WITH A FUELLED CORE AND AN UNFUELLED FISSION PRODUCT RETENTIVE COATING. IN THE CORE, PUO_2 - THO_2 FUEL PARTICLES ARE DISPERSED IN BEO, WHICH ACTS AS BOTH FUEL DISPERSANT AND MODERATOR. FOR THE COATING, TWO POSSIBILITIES HAVE BEEN CONSIDERED - DENSE BEO COATINGS AND MODIFIED CERAMIC GLAZES. THIS REPORT DESCRIBES THE DEVELOPMENT AND TESTING OF GLAZE-TYPE COATINGS. THE DEVELOPMENT OF BEO COATINGS, WHICH PROCEEDED TO SOME EXTENT IN PARALLEL, WILL BE REPORTED SEPARATELY. ALL WORK DESCRIBED HERE HAS BEEN CARRIED OUT ON AN ANALOGUE SYSTEM IN WHICH PARTICLES OF UO_2 - THO_2 , RATHER THAN PUO_2 - THO_2 , ARE DISPERSED IN BEO.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*CERAMICS + *COATING + *FISSION PRODUCT RETENTION + COATING, SURFACE + FUEL INTEGRITY + MODERATOR

7-13720 FOSTER RE + MAECK WJ + REIN JE
ADSORPTION OF YOUNG FISSION PRODUCTS ON VARIOUS SURFACES FROM NEUTRAL AND DILUTE ACID MEDIA - APPLICATION TO WATER SAMPLE COLLECTION FOR STEP PROGRAMS
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
IDC-14644 +. 12 PAGES, JANUARY 17, 1964

IN THE STEP REACTOR ACCIDENT STUDY PROGRAMS, WATER SAMPLES AND MOISTURE-SATURATED ATMOSPHERE PLATEOUT SAMPLES WILL BE SUBMITTED FOR ANALYSIS OF VARIOUS FISSION PRODUCT NUCLIDES. THIS STUDY WAS UNDERTAKEN TO MEASURE THE ADSORPTION OF YOUNG FISSION PRODUCTS ON VARIOUS SURFACES PROPOSED FOR USE IN THESE PROGRAMS. ON ALL SURFACES STUDIED, THE ADSORPTION OF FISSION PRODUCTS INCREASED WITH CONTACT TIME. THE MOST STRONGLY ADSORBED NUCLIDES ARE MO -TC-99 AND TE-1-132. THE PRESENCE OF COMPLEXING AGENTS RETARDED THE DEGREE OF ADSORPTION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$1.60 CY, \$0.80 MF

*ADSORPTION + *STEP (SAFETY TEST ENGINEERING PROGRAM) + *SURFACE, GENERAL + DEPOSITION + FISSION PRODUCT TRANSPORT + FISSION PRODUCT, IODINE + IODINE + MOLYBDENUM + TECHNETIUM + TELLURIUM + TRACER, RADIOACTIVE

7-13722 GRUBER WJ + HASCALL JL + BLAKELEY JO + DESCHANE DJ
AUTORADIOGRAPHY AS A METHOD FOR DIFFERENTIATING PUO_2 FROM UO_2 IN IRRADIATED MECHANICALLY MIXED OXIDE FUELS
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-592 + CNF-660518-2 +. 10 PAGES, MAY 11, 1966, FROM AEC ANNUAL METALLOGRAPHY MEETING, DENVER

DAVIES AND DARMITZEL (1) DESCRIBED A METHOD OF RECORDING ALPHA RADIATION ON THIN SHEETS OF CELLULOSE NITRATE BY PLACING THEM IN CONTACT WITH PUO_2 - UO_2 CERAMIC FUEL. BECAUSE CELLULOSE NITRATE RECORDS ALPHA RADIATION EXCLUSIVELY IN HIGH BETA AND/OR GAMMA FIELDS, THE METHOD CAN BE USED WITH IRRADIATED FUELS. IN BATTELLE-NORTHWEST RADIO-METALLURGY LABORATORY CONSIDERABLE

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13722 *CONTINUED*

EFFORT IS EXPENDED IN THE EXAMINATION OF IRRADIATED PLUTONIUM BEARING CERAMIC FUELS. IT WAS DECIDED TO INVESTIGATE THE METHOD FURTHER TO DETERMINE WHETHER THERE WERE ANY APPLICATIONS WHICH WOULD BE USEFUL TO OUR PROGRAMS. WE FOUND THAT ALPHA AUTORADIOGRAPHS ARE EASILY MADE AND CAN BE OF GREAT VALUE IN INTERPRETING METALLOGRAPHY. IN MECHANICALLY MIXED UO₂-PUO₂ FUELS THE PUO₂ PARTICLES CAN BE DISTINGUISHED FROM UO₂. ALSO THE AUTORADIOGRAPHS CAN BE EXAMINED AND PHOTOGRAPHED UP TO 250X MAGNIFICATION. IT IS FELT THAT WITH IMPROVED TECHNIQUES, EXAMINATION OF AUTORADIOGRAPHS OF IRRADIATED SPECIMENS AT HIGHER MAGNIFICATIONS IS POSSIBLE. THE PROCEDURE FOR EXPOSING AND ETCHING CELLULOSE NITRATE TO MAKE ALPHA AUTORADIOGRAPHS ARE DESCRIBED ALONG WITH TECHNIQUES FOR MAKING PHOTOGRAPHS AT HIGH AND LOW MAGNIFICATION. PROBABLY THE MOST IMPORTANT FACT IS THAT THE AREAS CONTAINING PUO₂ REGISTER ON AN ALPHA AUTORADIOGRAPH, EVEN ON A MICRO SCALE, WHILE THE UO₂ DOES NOT. IN THE PHOTOMICROGRAPHS OF THE AUTORADIOGRAPH INDIVIDUAL PUO₂ PARTICLES CAN BE DISTINGUISHED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 \$1.00 CY, \$0.50 MN

*ANALYTICAL TECHNIQUE, CALIBRATION + *PLUTONIUM OXIDE + *RADIOGRAPHY + *URANIUM DIOXIDE + ALPHA EMITTER + IRRADIATION TESTING + RADIOCHEMICAL ANALYSIS

7-13723 MOLLER P + WAGENER K

THE RATE OF SINTERING OF URANIUM DIOXIDE POWDER UNDER OXIDIZING AND REDUCING CONDITIONS AND CONSEQUENCES CONCERNING THE RELEASE OF FISSION PRODUCT GASES (RARE GAS DIFFUSION IN SOLIDS 16)
HAHN-MEITNER-INSTITUT FUR KERNFORSCHUNG BERLIN, SEKTER KERNCHEMIE
NP-TR-1355 +. 19 PAGES (INCLUDES ORIGINAL 3 PAGES) 1965, TRANSLATED FROM NUKLEONIK 7(3), PAGES 113-117 (MARCH 1965)

WHEN TESTING NUCLEAR FUEL CONTAINING URANIUM BY POST-ACTIVATION-DIFFUSION-(PAD)-MEASUREMENTS, THE NEUTRON-IRRADIATED SAMPLES ARE USUALLY ANNEALED EITHER IN A VACUUM OR AN INERT GAS ATMOSPHERE. BY THIS TREATMENT MEASURABLE QUANTITIES OF FISSION RARE GASES CAN BE OBTAINED. DURING THIS PROCEDURE, THE URANIUM DIOXIDE SAMPLES USUALLY ARE NOT IN EQUILIBRIUM WITH THE OXYGEN PARTIAL PRESSURE. THEREFORE THEY ARE OXIDIZED OR REDUCED, RESPECTIVELY, DEPENDING ON THE TEST CONDITIONS.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616 \$1.60 CY, \$0.80 MF

*FISSION GAS RELEASE + *SINTERING + *URANIUM DIOXIDE + DIFFUSION + NOBLE GAS + RADIATION EFFECT

7-13732 MISHIMA J

REVIEW OF METHYL IODIDE BEHAVIOR IN SYSTEMS CONTAINING AIRBORNE RADIOIODINE
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-319 +. 79 PAGES, 25 FIGURES, 26 TABLES, 45 REFERENCES, JUNE 15, 1966

THE SCIENTIFIC LITERATURE DESCRIBING RESEARCH AND OTHER DATA CONCERNED WITH THE FORMATION, BEHAVIOR, AND REMOVAL OF GASEOUS METHYL IODIDE IN A REACTOR-CONTAINMENT SYSTEM FOLLOWING A FUEL MELT-DOWN ACCIDENT IS REVIEWED. THE AMOUNT OF METHYL IODIDE AIRBORNE UNDER ANY SET OF CIRCUMSTANCES IS THE RESULT OF SEVERAL COMPETING MECHANISMS OF FORMATION AND DECOMPOSITION. THE MECHANISMS ARE NOT WELL DEFINED, AND EXTRAPOLATION OF DATA TAKEN UNDER ONE SET OF CONDITIONS TO OTHER SITUATIONS CAN SELDOM BE JUSTIFIED. AT GAS TEMPERATURES UNDER 100 C, THE AIRBORNE METHYL IODIDE IS RELATIVELY STABLE AND MAY AT TIMES BECOME THE PREDOMINANT IODINE SPECIES AIRBORNE. CHARCOAL IS THE MOST GENERALLY FAVORED ADSORBENT FOR REMOVING ORGANIC IODIDES, YET THE USUAL INDUSTRIAL CHARCOALS ARE FOUND TO PERMIT METHYL IODIDE TO BLEED THROUGH WITH TIME, PARTICULARLY UNDER HIGH HUMIDITY. VARIOUS CHEMICALS HAVE BEEN USED TO TREAT THE CHARCOAL TO ENHANCE ITS EFFICIENCY FOR REMOVAL AND RETENTION OF METHYL IODIDE. INVESTIGATION OF IMPREGNATING MATERIALS CONTINUES. VAPOR PHASE REACTIONS OF METHYL IODIDE WITH OTHER COMPOUNDS ARE BEING STUDIED. THE OBJECTIVE OF THESE STUDIES IS TO FIND REACTIONS WHOSE IODINE-CONTAINING PRODUCTS CAN BE COLLECTED ON FILTERS OR SCRUBBED FROM CONTAINMENT ATMOSPHERES. ALTHOUGH MUCH RESEARCH HAS BEEN DEVOTED IN RECENT YEARS TO CLARIFYING THE MECHANISMS OF FORMATION AND THE BEHAVIOR OF METHYL IODIDE THERE REMAIN MANY UNANSWERED QUESTIONS AND A GOOD MANY APPARENT CONFLICTS IN REPORTED OBSERVATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFISCHE

*CHEMICAL KINETICS + *CHEMICAL REACTION + *DECONTAMINATION SPRAY + *FISSION PRODUCT, IODINE + *ORGANIC IODIDE + CHARCOAL + CHROMATOGRAPHY + FILTER, MAY PACK + SPRAY, GENERAL

7-13734 SCOTT JL

FUEL-ELEMENT PERFORMANCE LIMITATIONS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
11 PAGES, 9 FIGURES, 76 REFERENCES, NUCLEAR SAFETY 7(3) PAGES 302-312 (SPRING 1966)

A KEY ASPECT OF THE EVALUATION OF THE SAFETY OF A NUCLEAR REACTOR IS THE PROPER ASSESSMENT OF FUEL-ELEMENT PERFORMANCE LIMITATIONS. THIS ARTICLE REVIEWS RECENT INFORMATION THAT EITHER EXTENDS OR MORE CLEARLY ESTABLISHES PERFORMANCE LIMITATIONS FOR BOTH METAL AND CERAMIC FUELS. A NEW UNDERSTANDING HAS BEEN DEVELOPED OF THE SWELLING MECHANISMS OF METAL FUELS IN THE TEMPERATURE RANGE 400 TO 600 C. AS A RESULT, NEW ALLOYS CAN BE EXPECTED THAT ARE MORE RESISTANT TO SWELLING AT THESE TEMPERATURES. RECENT WORK ON FUEL ELEMENTS CONTAINING BULK UO₂ HAS SHOWN THAT UO₂ CAN BE IRRADIATED AT HIGHER TEMPERATURES AND TO HIGHER BURNUPS THAN THOSE SET AS DESIGN LIMITS IN CONVENTIONAL WATER-COOLED REACTORS IF AN END PLENUM IS PROVIDED FOR FISSION GASES OR THE FUEL ELEMENT IS VENTED. MIXED OXIDES, PUO₂-UO₂ AND THO₂-UO₂, BEHAVE MUCH LIKE UO₂ IN REACTORS. WITH ALL OXIDE FUEL ELEMENTS, IT APPEARS THAT IRRADIATION EMBRITTLEMENT OF THE CLADDING AND FUEL-CLADDING MECHANICAL INTERACTIONS ARE THE MAJOR PROBLEMS. URANIUM CARBIDE AND URANIUM NITRIDE HAVE SOME ATTRACTIVE PROPERTIES - OTHER

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13734 *CONTINUED*

CERAMIC FUELS BEING CONSIDERED ARE US AND UP. PYROLYTIC CARBON COATINGS ON UC2 AND UO2 MICROSPHERES HAVE SHOWN EXCELLENT IRRADIATION STABILITY AT TEMPERATURES AS HIGH AS 1100 C AND BURNUPS IN THE RANGE 10 TO 15 ATOMIC PERCENT.

*COATED PARTICLE + *FUEL BURNUP + *FUEL ELEMENT + *FUEL INTEGRITY + CARBIDE + CARBON + HIGH TEMPERATURE + NITRIDE + OXIDE + PHOSPHORUS + PLUTONIUM + PYROLYTIC + SULFUR + URANIUM + URANIUM DIOXIDE

7-13735 BLOCK MN + DEGREEFF JO
RESEARCH AND DETERMINATION OF RATES OF LEAKAGES OF NUCLEAR FUEL ELEMENTS
EUROPEAN ATOMIC ENERGY COMMUNITY
AT-TRANS-206 +. 28 PAGES, JANUARY 1964, TRANSLATED FOR ATOMIC INTERNATIONAL, CANOGA PARK, CALIFORNIA FROM EURATOM COMMUNICATION 688.

THIS PAPER DESCRIBES THE NONDESTRUCTIVE TESTING OF NUCLEAR FUEL ELEMENTS DURING AND AFTER CANNING. REVIEWS THE EXISTING DETECTORS AND DISCUSSES THE SIGNAL-INTERPRETATION PROBLEM, WHEN ADSORPTION HAS TO BE TAKEN IN ACCOUNT. CONSECUTIVELY, FORMULAS ARE GIVEN FOR THE DIFFERENT CASES OF LEAK RATES AND FINALLY THE RADIFLO LEAK TEST IS DESCRIBED. THE DETECTION AND DETERMINATION OF LEAKS ON THE F.E.-S.A.P. DO NOT POSE ANY PROBLEMS AS LONG AS ONE CAN APPLY A KNOWN PRESSURE OF HELIUM AT ONE SIDE OF THE WALL TO BE TESTED, AND AT THE OTHER SIDE, THE DETECTOR.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$2.60 CY, \$1.04 MF

*FAILURE, CLADDING + *TEST, LEAK RATE + CLAD + FUEL ELEMENT

7-13736 NAGASAKI R + KAWASAKI S
DIFFUSION OF XENON IN METALS
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE, TOKAI-MURA, JAPAN
3 PAGES, 5 FIGURES, SEPTEMBER 12, 1965, JOURNAL OF NUCLEAR MATERIALS 19(1) PAGES 90-92 (APRIL, 1966)

THE DIFFUSION COEFFICIENTS FOR XENON AND KRYPTON IN METALS ARE USUALLY OBTAINED BY MEASURING THE XENON AND KRYPTON GASES WHICH ARE RELEASED FROM THE METALS. HOWEVER, THIS METHOD, OF NECESSITY, INTRODUCES THE ERROR DUE TO THE SURFACE REACTIONS (E.G., OXIDATION AND EVAPORATION). THIS ERROR IS CONSIDERABLE, ESPECIALLY FOR URANIUM METALS. IN ORDER TO ELIMINATE THIS ERROR, WE OBTAINED THE DIFFUSION COEFFICIENT FOR XENON IN THE METAL BY MEASURING THE CONCENTRATION DISTRIBUTION OF XENON IN THE METAL.

*DIFFUSION + *DIFFUSION COEFFICIENT + *XENON + COPPER + FISSION PRODUCT TRANSPORT + KRYPTON + METAL + NOBLE GAS + URANIUM

7-13737 MOORE RL
FISSION PRODUCT RECOVERY RESEARCH AT BATTELLE-NORTHWEST
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-504 + CONF-660305-6 +. 9 PAGES, DECEMBER 27, 1965, FROM AMERICAN NUCLEAR SOCIETY TOPICAL MEETING, AUGUSTA, GEORGIA

THE MAJOR RECENT DEVELOPMENTS IN FISSION PRODUCT RECOVERY AT THE PACIFIC NORTHWEST LABORATORY (FORMERLY HANFORD LABORATORIES) ARE DESCRIBED. PROCESS OPTIMIZATION HAS BEEN STUDIED FOR THE COMPACT-BAND ION-EXCHANGE SEPARATION OF INDIVIDUAL LIGHT-RARE-EARTH ELEMENTS, USING DTPA, EDTA, OR HEDTA AS ELUTING AGENTS. EQUIPMENT FOR PURIFYING KILOGRAM QUANTITIES OF PROMETHIUM WAS INSTALLED RECENTLY AND APPLIED TO THE PREPARATION OF 62,500 CURIES OF VERY HIGH PURITY PROMETHIUM. A PROCESS FOR RECOVERY OF FISSION PRODUCT RHODIUM WAS DEVELOPED, AND USED FOR THE PURIFICATION OF ONE GRAM OF RHODIUM. EARLIER WORK AT HANFORD LABORATORIES IS BRIEFLY SUMMARIZED BY SPECIFIC FISSION PRODUCT, WITH RESPECT TO SCIENTIFIC AND TECHNICAL CONTRIBUTIONS, AS WELL AS TO THE LARGE-SCALE MANUFACTURING PRODUCTION PROGRAM WHICH HAS RESULTED FROM APPLICATION OF THIS NEW TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 \$1.00 CY, \$0.50 MF

*ION EXCHANGE + *PROMETHIUM + *RADIOCHEMICAL PROCESSING + RADIOISOTOPE + RARE EARTH

7-13738 BATTEN AC + JOHNSON CR
GAS PERMEABILITY OF VIBRATORY COMPACTED UO2
BABCOCK AND WILCOX COMPANY
1 PAGE, ANS TRANSACTIONS 9(2) PAGE 393 (1966) WINTER MEETING PITTSBURGH, PENNSYLVANIA OCTOBER 30-NOVEMBER 3, 1966, AMERICAN NUCLEAR SOCIETY

AS PART OF AN AEC-SPONSORED PROGRAM TO DETERMINE THE IRRADIATION PERFORMANCE OF THORIA-URANIA FUEL MATERIALS, THE HELIUM-GAS PERMEABILITY CHARACTERISTICS OF NUCLEAR FUELS WERE INVESTIGATED TO OBTAIN DATA FOR THE ANALYSIS OF FISSION-GAS MOVEMENT WITHIN FUEL RODS. ALSO INVESTIGATED WERE THE OCCURRENCE OF THERMAL TRANSPIRATION AND ITS EFFECT ON PERMEABILITY. PERMEABILITY DATA ON UO2 FUEL THAT HAD BEEN VIBRATORY COMPACTED (86 PERCENT TD) INTO ZIRCALOY-2 TUBING WERE OBTAINED UNDER VARIOUS THERMAL CONDITIONS. A PRIOR LITERATURE SEARCH REVEALED A LACK OF GAS-PERMEABILITY DATA FOR NUCLEAR FUEL MATERIALS, PARTICULARLY FOR HELIUM AND FISSION CASES.

*POROUS DIFFUSION + *URANIUM DIOXIDE + FISSION GAS RELEASE + FUEL INTEGRITY + RADIATION EFFECT + ZIRCALOY

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-13740 ALEKSEEV BA
ON THE QUESTION OF STANDARDIZING THE MONITORING OF WATER PURITY IN NUCLEAR REACTOR LOOPS
INSTITUT ATOMNOI ENERGII, GOSUDARSTVENNYI KOMITET PO ISPOLZOVANIYU ATOMNOI ENERGII SSSR
AEC-TR-6730 + IAE-789 +. 41 PAGES, 1964

THE PAPER EXAMINES THE PRINCIPAL QUESTIONS OF STANDARDIZING THE SAMPLING POINTS, THE FREQUENCY AND METHODS OF ANALYSES FOR WATER OF THE PRIMARY LOOP OF RESEARCH REACTORS OF THE WATER-MODERATED WATER-COOLED TYPE, PRESSURIZED-WATER POWER REACTORS AND EVAPORATIVE AND FILTRATIONAL WATER-PURIFICATION INSTALLATIONS. BY THE COORDINATION OF WORK (IN PARTICIPATING COUNTRIES OF THE UNITED INSTITUTE OF NUCLEAR RESEARCH, DUBNA) ON THE PROBLEM OF WATER IN NUCLEAR REACTORS, DEVELOPED ON THE BASIS OF THE DECISION OF THE FIRST SYMPOSIUM (ROSSENDORF, GERMAN DEMOCRATIC REPUBLIC, 1962), THE USSR AND THE POLISH PEOPLES REPUBLIC WERE CHARGED WITH DEVELOPING PROPOSALS ON THE STANDARDIZATION OF CHEMICAL AND RADIOCHEMICAL MONITORING OF THE PURITY OF LOOP WATERS. USUALLY A BROAD RANGE OF CONTAMINATIONS AND PHYSICAL PROPERTIES OF THE WATER IS DETERMINED - ELECTRICAL CONDUCTIVITY, PH, CORROSION PRODUCTS, CHLORIDE, NITRATE, AMMONIA, CARBONATE AND SULFATE IONS, HYDROGEN PEROXIDE, THE DISSOLVED GASES (OXYGEN AND HYDROGEN), HARDNESS, DRY RESIDUE, CONTENT OF INSOLUBLE SUBSTANCES, SPECIFIC RADIOACTIVITY, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 CY, \$0.50 MN

*ANALYTICAL TECHNIQUE, CALIBRATION + *IN PILE LOOP + INSTRUMENTATION, PROCESS + MONITOR, RADIATION, LIQUID + WATER, GENERAL

7-13907 HART RS + NELSON CT
FISSION PRODUCT RETENTION CHARACTERISTICS OF SODIUM AT HIGH TEMPERATURES
ATOMICS INTERNATIONAL
NAA-SR-MEMO-8712 +. 19 PAGES, 5 FIGURES, 5 TABLES, JUNE 1, 1964

DOCUMENTS THE RESULTS OF EXPERIMENTS TO DETERMINE THE RETENTIVENESS OF SODIUM FOR CS-137, I-131, AND SR-89 AT TEMPERATURES BETWEEN 900 AND 1500 F. A BRIEF DESCRIPTION OF THE EXPERIMENTAL APPARATUS, EXPERIMENTAL AND ANALYTICAL TECHNIQUES IS ALSO GIVEN. FOR THE SPECIFIC CONDITIONS OF THE EXPERIMENTS, THE RESULTS SHOW THAT THE MAXIMUM MEASURED RELEASE FRACTIONS FROM THE SODIUM TO THE COVER GAS ARE INDEPENDENT OF THE SODIUM TEMPERATURE AND LESS THAN $4 \times 10^{(MINUS 4TH)}$ FOR CS-137, $5 \times 10^{(MINUS 6TH)}$ FOR I-131, AND $4 \times 10^{(MINUS 7TH)}$ FOR SR-89.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.60 COPY, \$0.80 MICROFICHE

*FISSION PRODUCT RELEASE, GENERAL + *RADIOISOTOPE + *SODIUM + ANALYTICAL TECHNIQUE, CALIBRATION + CESIUM + FISSION PRODUCT TRANSPORT + FISSION PRODUCT, IODINE + IODINE + REACTOR, LIQUID METAL COOLED + STRONTIUM

7-13910 KARLSSON BM
HEAT TREATMENT OF MOLECULAR SIEVES FOR DIRECT SEPARATION OF ARGON AND OXYGEN AT ROOM TEMPERATURE BY GAS CHROMATOGRAPHY
AGA AKTIEBOLAG, LIDINGO, SWEDEN
2 PAGES, 4 FIGURES, 1 TABLE, ANALYTICAL CHEMISTRY 38(4), PAGES 668-669, (APRIL 1966)

A RAPID AND SIMPLE METHOD FOR DETERMINING OXYGEN AND ARGON MIXTURES AT ROOM TEMPERATURE ON SPECIALLY TREATED MOLECULAR SIEVES WAS DEVELOPED. WE SUCCEEDED IN SEPARATING SMALL QUANTITIES OF ARGON AND OXYGEN ON A THERMISTOR INSTRUMENT USING A 2-METER MOLECULAR-SIEVE 5A COLUMN AT ROOM TEMPERATURE. AS THE DIFFERENCE IN RETENTION TIME BETWEEN ARGON AND OXYGEN AT ROOM TEMPERATURE IS NEGLIGIBLE ON MOLECULAR SIEVES, EXPERIMENTS WERE MADE TO DIMINISH THE INFLUENCE OF THE SIEVES ON ARGON, EMPLOYING A METHOD WHICH CONSISTS OF REDUCING THE CARRIERS INFLUENCE ON THE SAMPLE BY ADMIXING A COMPOUND OF THE SAME NATURE AS THE SAMPLE IN THE STATIONARY PHASE. THE MOLECULAR SIEVES WERE HEATED IN AIR OR HELIUM PURGE WITH A HUMIDITY OF 100 P.P.M. AT 450 C FOR PERIODS VARYING FROM 5 TO 24 HOURS. THIS GAVE A POOR SEPARATION, WHEREAS TREATMENT WITH ARGON UNDER THE SAME CONDITIONS GAVE GOOD RESULTS AFTER ONLY 5 HOURS AT 450 C AND SLOW COOLING.

*ANALYTICAL TECHNIQUE, CALIBRATION + *CHROMATOGRAPHY + *NOBLE GAS + ARGON + MOLECULAR SIEVE + OXYGEN

7-14389 CORDES OL
COMPARISON OF FISSION PRODUCT RELEASE FROM THE DESTRUCTIVE TESTS OF TWO SNAP 10A/2 REACTORS
PHILLIPS PETROLEUM COMPANY
12 PAGES, 19 FIGURES, 1 TABLE, 7 REFERENCES, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

TWO SNAP 10A/2 REACTORS WERE, BY DELIBERATE EXCURSIONS OF NEARLY $4\frac{1}{2}$ -5, TO DEMONSTRATE PUBLIC SAFETY, ONE IN AIR AND ONE IN WATER. 96 PERCENT OF THE NOBLE GASES AND 100 PERCENT OF THE HALOGENS, TELLURIUM AND SOLIDS WERE RETAINED IN THE WATER-IMMERSION TEST, BECAUSE THE QUENCHING OF THE LOW-TEMPERATURE BULK WATER CAUSED GAS ATOMS TO BE TRAPPED IN THE FUEL MATRIX. COMPLETE RETENTION OF IODINE WAS DUE EITHER TO SORPTION IN WATER, OR COMBUSTION WITH THE FUEL-ELEMENT HYDROGEN. IN THE AIR TEST, 45 PERCENT OF THE TELLURIUM WAS RELEASED, DEMONSTRATING THAT TELLURIUM SHOULD BE CLASSED AS A SOLID ONLY WHEN THE REACTOR CORE STAYS IMMERSSED IN WATER. THESE TESTS INDICATE THAT THE EXPENSIVE INTEGRAL-REACTOR-DESTRUCTION EXPERIMENTS YIELD BETTER DATA THAN SCALING UP CONSERVATIVELY SMALL CAPSULE DATA.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, 1967

*FISSION GAS RELEASE + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT RETENTION + ACCIDENT ANALYSIS +

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-14389 *CONTINUED*
ACCIDENT, REACTIVITY + FISSION PRODUCT, IODINE + NOBLE GAS + REACTOR, SPACE +
SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + TELLURIUM

7-14615 QUESTION H-9. PROVIDE VARIOUS DETAILS OF STANDBY GAS TREATMENT FILTERS, INCLUDING IGNITION CHARACTERISTICS
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES H.9.1 TO H.9.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

PERFORMANCE AND TESTING (DOP AND FREON F-112) CRITERIA FOR FILTERS SUMMARIZED. CHARCOAL BURNING WILL BE NO PROBLEM. CALCULATIONS SHOW THE MAXIMUM TEMPERATURE OF THE CHARCOAL TO BE LESS THAN 300 F WITH VALVES CLOSED AND ONLY CONVECTION COOLING. IGNITION TEMPERATURE IS SPECIFIED AS 800 C.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CHARCOAL + DESIGN CRITERIA + FILTER + FIRE + REACTOR OFFGAS + REACTOR, BOILING WATER

7-14870 SCHLAPP FW
STORAGE OF MODERATOR ELEMENTS IN HNPf MODERATOR STORAGE CELLS
ATOMICS INTERNATIONAL
NAA-SR-MEMO-12247 +. 7 PAGES, NOVEMBER 28, 1966

GROUNDWATER WAS ASSUMED TO CONTACT AND START DISSOLVING THE ACTIVATED STAINLESS STEEL PORTIONS OF THE THREE IRRADIATED MODERATOR ELEMENTS NOW STORED IN THE HNPf MODERATOR-STORAGE CELLS. THE SOLUBILITY AND DECOMPOSITION RATES OF THE METAL AND THE CONCENTRATION OF RADIOACTIVITY RELEASABLE TO THE GROUNDWATER WERE ANALYZED. THE RESULTS SHOWED THAT INSIGNIFICANT CONCENTRATIONS OF RADIOACTIVE MATERIALS CAN BE RELEASED, EVEN IF THE CONCRETE CELL STRUCTURE AND THE STEEL LINERS ARE NEGLECTED IN CALCULATING THE DISSOLUTION AND DISPERSAL OF THE MATERIAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*FISSION PRODUCT RELEASE, GENERAL + *RADIOACTIVITY, RELEASE + FUEL INTEGRITY + GROUND WATER, GENERAL + HALLAM + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-10242 \ GOLDMANN K + MINUSHKIN B

SODIUM TECHNOLOGY

UNITED NUCLEAR CORPORATION

TID-8541 +. 105 PAGES, 230 REFERENCES, 37 FIGURES, 14 TABLES, PP. 321-425 OF REACTOR TECHNOLOGY, SELECTED REVIEWS--1965, L. E. LINK, EDITOR, ARGONNE NATIONAL LABORATORY, JANUARY 1966, CFSTI, \$4.50 CY, \$2.00 MN

THIS REVIEW COVERS SODIUM TECHNOLOGY THAT HAS BEEN DEVELOPED IN CONJUNCTION WITH THE DESIGN, CONSTRUCTION, AND OPERATION OF LIQUID-METAL-COOLED REACTOR PLANTS. ALSO REVIEWED IS THE STATE OF THE ART OF SODIUM TECHNOLOGY AS RELATED TO NEXT-GENERATION POWER PLANTS, WHICH ARE PROJECTED TO HAVE A CAPABILITY OF PRODUCING STEAM AT 1050 F, WITH MAXIMUM LIQUID-METAL TEMPERATURES OF 1200 TO 1300 F. WITHIN THIS FRAMEWORK THE LIQUID METALS OF INTEREST ARE SODIUM AND SODIUM-POTASSIUM (NAK). REVIEWED HERE ARE MATERIALS TECHNOLOGY, SUCH AS MATERIALS SELECTION, CORROSION, CONTROL OF SODIUM PURITY, AND THE EXPERIENCE GAINED IN THESE AREAS WITH OPERATING PLANTS.

*NAK (SODIUM POTASSIUM ALLOY) + *SODIUM + CONTAINMENT DESIGN + CORROSION + METAL, LIQUID + OPERATION + REACTOR, LIQUID METAL COOLED

8-10338 WILSON RE + BARNES C + KOONZ R + BAKER L

ISOTHERMAL REACTION OF URANIUM WITH STEAM BETWEEN 400 AND 1600 C

ARGONNE NATIONAL LABORATORY, ILLINOIS

6 PAGES, 9 FIGURES, 3 TABLES, NUCLEAR SCIENCE AND ENGINEERING, 25(2), PP. 109-115 (JUNE 1966)

ISOTHERMAL STUDIES OF THE KINETICS OF THE REACTION OF METALLIC URANIUM WITH STEAM BY A VOLUMETRIC METHOD ARE REPORTED. THE REACTION AT 400 C FOLLOWED A LINEAR RATE, WHILE, AT 500, THE REACTION WAS COMPLICATED BY EFFECTS OF THE TRANSITION FROM A LINEAR REACTION AT LOW TEMPERATURES TO A PARABOLIC REACTION AT HIGHER TEMPERATURES. THE REACTION COULD BE DESCRIBED ACCURATELY BY A PARABOLIC RATE LAW BETWEEN 600 AND 1200 C. BETWEEN 1200 AND 1600 C, ANOTHER PARABOLIC RATE LAW DESCRIBED THE EXPERIMENTAL RESULTS, ALTHOUGH IT WAS LIKELY THAT AN ACTIVATION ENERGY SOMEWHAT GREATER THAN 25 KCAL/MOLE SHOULD BE USED FOR EXTRAPOLATION TO SHORT REACTION TIMES OR HIGHER REACTION TEMPERATURES. REACTION RATES WITH AN ALLOY CONTAINING 1 AT. PERCENT ALUMINUM (1130 PPM) AND ONE CONTAINING 105 PPM ALUMINUM DID NOT DIFFER SIGNIFICANTLY FROM THOSE FOUND WITH UNALLOYED URANIUM.

*METAL WATER REACTION + *STEAM + *URANIUM + CHEMICAL KINETICS + OXIDATION

8-10339 BAKER L

NONISOTHERMAL REACTION OF URANIUM WITH WATER BY THE CONDENSER DISCHARGE METHOD

ARGONNE NATIONAL LABORATORY, ILLINOIS

15 PAGES, 7 TABLES, 7 FIGURES, NUCLEAR SCIENCE AND ENGINEERING, 25(2), PP. 116-130 (JUNE 1966)

A COMBINED EXPERIMENTAL AND THEORETICAL STUDY OF THE REACTION OF SOLID WIRES AND MOLTEN PARTICLES OF URANIUM WITH WATER IS REPORTED. THE EXPERIMENTS WERE PERFORMED BY THE CONDENSER-DISCHARGE METHOD THAT HAD BEEN DEVELOPED FOR STUDIES OF THE ZIRCONIUM-WATER REACTION. THE URANIUM-WATER REACTION WAS STUDIED WITH INITIAL METAL TEMPERATURES FROM 660 TO 4000 C WITH 30- AND 60-MIL WIRES IN WATER AT 25 C AND IN WATER AT 100. WIRES HEATED TO THE MELTING POINT OF URANIUM, 1133 C, REACTED TO A MAXIMUM OF ABOUT 4 PERCENT IN 25 C WATER AND 7 PERCENT IN 100 C WATER. WIRES HEATED ABOVE THE MELTING POINT FORMED MOLTEN PARTICLES WHOSE MEAN DIAMETER DECREASED CONTINUOUSLY WITH INCREASING METAL TEMPERATURE. AT INITIAL METAL TEMPERATURES APPROACHING 4000 C, 45 PERCENT URANIUM-WATER REACTION OCCURRED IN 25 C WATER, AND 100 PERCENT REACTION OCCURRED IN 100 C WATER.

*COMPARISON, THEORY AND EXPERIENCE + *METAL WATER REACTION + *URANIUM + CHEMICAL REACTION + REACTOR KINETICS

8-10413 PEARCE DG + WARD DL + HAYES P

LIQUID-HYDROGEN EXPLOSIONS IN CONTAINMENT VESSELS

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL

AERE-R-4584 +. 70 PAGES, FEBRUARY 1966, HMSO, BIS, \$2.50 CY

A SERIES OF EXPLOSIONS OF LIQUID HYDROGEN AND SOLID AIR WERE PERFORMED IN CLOSED VESSELS. THE PROPORTIONS OF HYDROGEN AND AIR, THE QUANTITIES IN RELATION TO THE CONTAINMENT VOLUME, AND THE CONTAINMENT VOLUMES AND L/D RATIO THEMSELVES, WERE ALL VARIED, AND THE RESULTING PRESSURES, VARIATIONS, AND PEAK PRESSURES WERE MEASURED AGAINST TIME. THE FULL RESULTS ARE ANALYZED HERE AND COMPARED WITH THEORETICAL ANALYSES. THE DYNAMIC RESPONSE OF TYPICAL CONTAINMENT VESSELS SUITABLE FOR USE IN NUCLEAR REACTORS IS CONSIDERED AND COMPARED WITH THE TIME CHARACTERISTICS OF THE EXPLOSION FORCES. IT WAS CLEAR THAT RELEVANT THEORIES WERE DIFFICULT TO LOCATE DESPITE INTENSIVE ENQUIRIES. CONSIDERABLE SCATTER WAS OBSERVED IN THE RESULTS AND APPARENT ANOMALIES OBSERVED WHEN EVALUATING EXPLOSION EFFICIENCIES.

*AIR + *CONTAINMENT INTEGRITY + *EXPLOSION + *HYDROGEN + COMPARISON, THEORY AND EXPERIENCE + TEST, PRESSURE VESSEL

8-12252 RODGERS SJ + EVERSON WA

EXTINGUISHMENT OF ALKALI METAL FIRES

MSA RESEARCH CORPORATION

AD-607978 + APL-TDR-64-114 + N65-11910 +. 86 PAGES, 4 FIGURES, 22 TABLES, 26 BIBLIOGRAPHIES, OCTOBER 1964, CFSTI \$3.00 CY, \$0.75 MN

REDUCTION OF OXYGEN PARTIAL PRESSURE WAS EFFECTIVE IN INHIBITING IGNITION AND DEGREE OF COMBUSTION OF LITHIUM, SODIUM, NAK AND POTASSIUM. RUBIDIUM AND CESIUM DID NOT IGNITE. REDUCED OXYGEN PARTIAL PRESSURE WAS ALSO EFFECTIVE IN INHIBITING IGNITION OF ALKALI METAL JET

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-12252 *CONTINUED*

STREAMS. A NUMBER OF DIFFERENT SALTS, ORGANIC LIQUIDS, AND POLYURETHANE FOAM WERE EVALUATED WITH RESPECT TO ALKALI METAL FIRE EXTINGUISHMENT. MET-L-X AND TEC POWDER WERE THE MOST EFFECTIVE SALTS, WHICH WERE EVALUATED. THE RATIO OF TEC POWDER ALKALI METAL WAS 0.4 FOR 100 LB SODIUM FIRES AND 0.2 FOR 500 LB SODIUM FIRES. POLYURETHANE FOAM WAS FOUND TO BE EFFECTIVE ON LOW TEMPERATURE (1000 F) FIRES AND WAS USEFUL ON ALKALI METAL FIRES ON OR UNDER INSULATION. ORGANIC LIQUIDS WERE NOT PARTICULARLY EFFECTIVE ON ALKALI METAL FIRES.

*CONTROL, GENERAL + *FIRE + *METAL, ALKALI + CESIUM + NAK (SODIUM POTASSIUM ALLOY) + POTASSIUM + RUBIDIUM + SODIUM

8-12266 MARTIN PE
THERMAL RADIATION FROM BURNING HYDROGEN PLUME
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-DC-7313 + CONF-651002-6 +. 5 PAGES, AUGUST 25, 1965, FROM INSTRUMENT SOCIETY OF AMERICA, 20TH ANNUAL CONFERENCE, LOS ANGELES, CFSTI \$1.00 CY, \$0.50 MN

LIQUID HYDROGEN PASSES THROUGH A NUCLEAR REACTOR, IS EJECTED SKYWARD, AND IGNITED. ITS THERMAL RADIATION PATTERN IS TO BE STUDIED SO THAT EXPECTED HEAT RADIATIONS MAY BE CALCULATED FOR LOCATIONS NEAR THE TEST PAD. SEVERAL SENSORS - COMMERCIAL AND HOMEMADE - ARE USED TO DETERMINE THE THERMAL RADIATION RECEIVED AT DISCRETE POINTS. FROM MEASURED RADIATION, RANGE, ASSUMED PLUME HEIGHT, AND SENSOR ORIENTATION AND HEIGHT, THE AVERAGE THERMAL EMITTING POWER PER UNIT DISTANCE ALONG THE VERTICAL PLUME IS CALCULATED. THE RANGES VARY FROM 30 TO 9,720 FEET, AND THE ELEVATIONS FROM 0 TO 120 FEET.

*HYDROGEN + *IGNITION + *PLUME BEHAVIOR, GENERAL + *THERMAL EXPERIMENT

8-12269 FORD JA + CHAMBERLAIN HV + CHASE WL
ANALYSIS OF THE BABCOCK AND WILCOX PROTOTYPE STEAM GENERATOR FOR A SODIUM-WATER REACTION
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT, MICHIGAN
APDA-175 +. 56 PAGES, 16 FIGURES, AUGUST 23, 1965, CFSTI \$3.00 CY, \$0.50 MN

AN ANALYSIS OF THE EFFECTS OF A SODIUM-WATER REACTION IN THE BABCOCK AND WILCOX PROTOTYPE STEAM GENERATOR WAS CONDUCTED. THE GENERATOR, A ONCE-THROUGH-TYPE UNIT, HAS SODIUM ON THE SHELL SIDE AND WATER IN THE HELICALLY COILED TUBE BUNDLES. A 16-INCH RUPTURE DISK AND A 4-INCH RELIEF VALVE ARE PROVIDED AT THE TOP OF THE UNIT FOR REACTION RELIEF. A LEAK IN A TUBE IN THE PROTOTYPE WOULD CAUSE A SODIUM-WATER REACTION WHICH WOULD RESULT IN THE RAPID GENERATION OF LARGE VOLUMES OF HYDROGEN AND HIGH TEMPERATURES. TO ANALYZE THIS ACCIDENT, A MATHEMATICAL MODEL WAS DEVELOPED WHICH WOULD PREDICT THE HYDROGEN BUBBLE PRESSURE. THE MAXIMUM HYPOTHETICAL ACCIDENT CONSISTING OF THE COMPLETE AND SIMULTANEOUS SEVERANCE OF ALL 25 TUBES IN THE BOILER SECTION OF THE UNIT WAS EMPHASIZED. A REACTION IN THE BOILER DOWNCOMER ANNULUS RESULTED IN THE HIGHEST PRESSURE. THE PRESSURE CURVE FOR THIS CASE IS PRESENTED TOGETHER WITH ADDITIONAL DATA ON THE REACTION.

*ACCIDENT ANALYSIS + *ANALYTICAL MODEL + *MATHEMATICAL STUDY + *METAL WATER REACTION + *SODIUM + ACCIDENT, HYPOTHETICAL + HIGH TEMPERATURE + HYDROGEN + STEAM

8-12330 SAVAGE HW
TECHNOLOGY OF LIQUID METALS
OAK RIDGE NATIONAL LABORATORY
ORNL-TR-854 + RT/ING(6511) +. 86 PAGES, APRIL 1965, JCL

A REVIEW OF THE DEVELOPMENT OF LIQUID METAL TECHNOLOGY AT ORNL WAS FOLLOWED BY SUMMARIES OF ACTIVITIES AT OTHER LABORATORIES IN THE UNITED STATES. A GENERAL DISCUSSION OF PROPOSED CNEN LIQUID METAL STUDIES WAS GIVEN WITH EMPHASIS ON FACILITY REQUIREMENTS, COMPATIBILITY TESTS, HEAT TRANSFER TESTS AND IN-PILE LOOPS. CONSIDERABLE DISCUSSION WAS DEVOTED TO HANDLING OF SODIUM INCLUDING STORAGE, CHARGING OF SYSTEMS, PURIFICATION OF SODIUM, PROTECTION OF LOOPS, WASTE DISPOSAL AND SAFETY REQUIREMENTS. COMPONENTS DISCUSSED INCLUDED COLD TRAPS, HOT TRAPS, VALVES, PIPE JOINTS, HEATERS, HEAT EXCHANGERS, PUMPS, INSULATION AND INSTRUMENTATION.

*METAL, LIQUID + *ORNL (OAK RIDGE NATIONAL LABORATORY) + *SODIUM

8-13317 BAKER L + TEVEBAUGH AD
SECTION V. REACTOR SAFETY
ARGONNE NATIONAL LABORATORY
ANL-6925 +. 47 PAGES, 9 TABLES, 50 FIGURES, MAY 1965, PAGES 187-234 OF CHEMICAL ENGINEERING DIVISION SEMIANNUAL REPORT. JULY-DECEMBER 1964, CFSTI \$6.00 CY

THE REACTOR-SAFETY PROGRAM AT ANL COMPRISES (1) THE STUDY OF METAL-WATER REACTIONS, (2) FAST-REACTOR SAFETY, AND (3) METAL OXIDATION AND IGNITION KINETICS. ITEM (1) IS STUDIED BY A HIGH-TEMPERATURE, HIGH-PRESSURE FURNACE METHOD (STEAM WITH STAINLESS STEEL, ZIRCONIUM, ALUMINUM, UO₂), BY REACTION KINETICS OF STEAM WITH REFRACTORY METALS (MOLYBDENUM, RHENIUM, TUNGSTEN, NIOBIUM, AND TANTALUM), BY LASER HEATING (TO DETERMINE RATES OF CHEMICAL REACTION AND HEAT TRANSFER BETWEEN INDIVIDUAL METAL PARTICLES AND WATER), BY TREAT EXPERIMENTS. ITEM (2) RELATES METAL-WATER REACTIONS TO FAST-REACTOR SAFETY. ITEM (3) RELATES EFFECT OF IRRADIATION ON IGNITION.

*LASER HEATING + *METAL WATER REACTION + *METAL, REFRACTORY + ACCIDENT, LOSS OF COOLANT + ALUMINUM + ANL (ARGONNE NATIONAL LABORATORY) + ENERGY SOURCE + OXIDATION + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, TEST + STEAM + STEEL, STAINLESS + TREAT (TRANSIENT TEST REACTOR FACILITY) + URANIUM OXIDE + ZIRCONIUM

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-13472 INOUE FT
PROPERTIES OF LARGE 7079 ALUMINUM ALLOY FORGINGS IN A CRYOGENIC ENVIRONMENT
AEROJET-GENERAL CORP.
NASA-CR-513 +. 87 PAGES, 38 FIGURES, 16 TABLES, JULY 1966

LARGE 7079-T652 HAND-FORGINGS WERE EVALUATED FOR PUMP IMPELLER AND INDUCER APPLICATIONS IN LIQUID-OXYGEN/LIQUID-HYDROGEN ROCKET ENGINES. THE RESULTS OF MECHANICAL PROPERTY TESTS, REHEAT-TREATMENT EXPERIMENTS, AND MICROSTRUCTURAL STUDIES ARE PRESENTED. THE APPLICATION OF 7079 ALLOY IN A CRYOGENIC ENVIRONMENT IS DISCUSSED BASED UPON THE TEST RESULTS, AND RECOMMENDATIONS ARE MADE FOR METALLURGICAL ANALYSIS OF THE MORE PROMISING ALLOYS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY

*ALLOY + *ALUMINUM + *CRYOGENICS + FAILURE, EQUIPMENT + FAILURE, FATIGUE + HYDROGEN + OXYGEN

8-13695 MORRISON DL + GENCO JM + GIESEKE JA + RITZMAN RL + WALTERS CT + WOOTON RO
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR ACCIDENT. QUARTERLY PROGRESS REPORT, JULY-SEPTEMBER 1966
BATTELLE MEMORIAL INSTITUTE
BRI-1777 +. 28 PAGES, 4 FIGURES, 35 REFERENCES, OCTOBER 1, 1966

THE FOLLOWING AREAS OF A REACTOR ACCIDENT ARE PRESENTED - COOLANT SHUTDOWN, HEAT TRANSFER AND THERMODYNAMICS, FISSION-PRODUCT CHEMISTRY, AND AEROSOL AND PARTICLE DYNAMICS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 CY, \$0.50 MY.

*ACCIDENT ANALYSIS + *ACCIDENT, CONSEQUENCES + *FISSION PRODUCT TRANSPORT + ACCIDENT, GENERAL + AEROSOL PROPERTIES + FISSION PRODUCT RELEASE, GENERAL + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + THERMODYNAMICS

8-13701 FERRELL JK + STAHEL EP
HEAT TRANSFER -- ANNUAL REVIEW
NORTH CAROLINA STATE UNIVERSITY
12 PAGES, 10 FIGURES, 724 REFERENCES, INDUSTRIAL AND ENGINEERING CHEMISTRY 58(12) PAGES 42-54 (DECEMBER 1966)

THIS IS AN ANNUAL REVIEW OF THE HEAT TRANSFER LITERATURE. AS IN PAST YEARS THIS REVIEW COVERS THE YEAR PRECEDING MARCH 1966. THE MAJOR CONFERENCE OF THE YEAR WAS THE EIGHTH A.I.C.H.E.-A.S.M.E. JOINT HEAT TRANSFER CONFERENCE HELD IN LOS ANGELES IN AUGUST 1965. WE HAVE ALSO INCLUDED THE PAPERS PRESENTED AT THE THIRD INTERNATIONAL HEAT TRANSFER CONFERENCE HELD IN CHICAGO IN AUGUST 1966. THIS CONFERENCE WAS THE LARGEST TO DATE WITH 177 PAPERS BEING PRESENTED AND PUBLISHED IN THE PROCEEDINGS. THE REFERENCES FOR THIS REVIEW WERE SELECTED AS BEING OF GREATEST USE TO THE CHEMICAL PROCESS INDUSTRY. THE FOLLOWING SUBJECTS ARE REVIEWED - THERMAL PROPERTIES AND MEASUREMENTS, HEAT TRANSFER IN EQUIPMENT, CONDUCTION HEAT TRANSFER, CONVECTION, HIGH VELOCITY HEAT TRANSFER, RADIATION HEAT TRANSFER, BOILING HEAT TRANSFER WITH CHEMICAL REACTION, AND COUPLED TRANSPORT PROPERTIES.

CHEMICAL REACTION + CONDENSATION + FLOW, HIGH SPEED + FLOW, LAMINAR + FLOW, TURBULENT + HEAT CONDUCTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER EXPERIMENT + HEAT TRANSFER, BOILING + HEAT TRANSFER, CONVECTION + HEAT TRANSFER, RADIANT

8-13702 SINGER RM
EXPERIMENT ON WATER EXPULSION FOLLOWING RAPID TRANSIENT HEATING
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
4 PAGES, 1 FIGURE, ANS TRANSACTIONS 9(2), PAGE 550, 1966 WINTER MEETING, PITTSBURGH, PENNSYLVANIA, OCTOBER 30 - NOVEMBER 3, 1966

IN THE INVESTIGATION OF THE EXPULSION OF WATER FROM SIMULATED REACTOR CHANNELS CAUSED BY RAPID TRANSIENT HEATING, SEVERAL INTERESTING RESULTS HAVE BEEN OBTAINED. THE EXPERIMENTAL APPARATUS CONSISTED OF A THIN-WALL (0.005 IN. WALL X 0.750 IN. DIAM) STAINLESS-STEEL TUBE WITH AN OUTER CONCENTRIC QUARTZ PIPE (ANNULAR SPACING OF 0.125 IN.). THE ANNULAR SYSTEM WAS CLOSED AT THE BOTTOM AND OPEN TO THE ATMOSPHERE AT THE TOP. WATER WAS CONTAINED IN THE ANNULUS, AND THE INNER STEEL TUBE WAS HEATED OVER A 10-IN. LENGTH. THE PRESSURE OF THE WATER NEAR THE HEATED SURFACE WAS MEASURED AS WELL AS THE WATER TEMPERATURE - HIGH SPEED MOTION PICTURES WERE TAKEN OF THE HEATED SURFACE AND THE LIQUID-VAPOR INTERFACE. OBSERVATION OF THE HIGH-SPEED (2000 TO 6000 FRAMES PER SECOND) FILM REVEALED THE BEHAVIOR OF THE WATER DURING THESE HEATING TRANSIENTS. THE FIRST SMALL PRESSURE PULSE CORRESPONDS TO THE SUDDEN GROWTH OF VAPOR BUBBLES WHICH ACCELERATES THE WATER AWAY FROM THE HEATED SURFACE. FOR HIGHLY SUBCOOLED WATER, THE VAPOR RECONDENSES CAUSING A PARTIAL VACUUM AND THE WATER FALLS BACK TO THE STILL HOT TEST SECTION AFTER AN UPWARD MOTION OF LESS THAN 1 CENTIMETER, AND VIOLENTLY RE-VAPORIZES, CAUSING ANOTHER PRESSURE PULSE - THE LIQUID AGAIN IS ACCELERATED UPWARD AND THE VAPOR RECONDENSES, RESULTING IN A PARTIAL VACUUM, PULLING BACK THE LIQUID. THIS CYCLE REPEATS UNTIL THE HEATED SURFACE HAS SUFFICIENTLY COOLED SO AS TO NOT FURTHER VAPORIZE THE WATER. THE INITIAL PRESSURE PULSES WHICH ACCELERATE THE LIQUID INCREASE IN MAGNITUDE WITH INCREASED ENERGY GENERATION RATE AND INITIAL WATER TEMPERATURE AS DO THE EXPULSION VELOCITIES. THE SECONDARY PULSES CAUSED BY THE COLLAPSING OF THE VOIDS INCREASE GENERALLY WITH INCREASING ENERGY GENERATION RATE AND INCREASE, REACH A MAXIMUM, AND DECREASE WITH INITIAL WATER TEMPERATURE.

*BLOWDOWN + FLOW STABILITY + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + TEMPERATURE TRANSIENT

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-13733 WITTELS MC
RADIATION EFFECTS IN GRAPHITE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
5 PAGES, 1 TABLE, 19 REFERENCES, NUCLEAR SAFETY 7(3) PAGES 318-322 (SPRING 1966)

A BRIEF REVIEW IS GIVEN OF A NUMBER OF THEORETICAL AND EXPERIMENTAL STUDIES ON GRAPHITE THAT HAVE BEEN RECENTLY PUBLISHED. THE INVESTIGATIONS INCLUDE THEORETICAL MODELS OF DEFECT KINETICS, STORED-ENERGY RELEASE SPECTRA, MOLECULAR RECOMBINATION HYPOTHESES, AND FLUX-LEVEL AND FLUX-SPECTRUM EFFECTS. THE EXPERIMENTAL STUDIES DESCRIBED COMPRISE THE DIRECT OBSERVATION OF DEFECTS IN GRAPHITE SINGLE CRYSTALS, FAST-NEUTRON AND CHARGED-PARTICLE IRRADIATIONS, AND ASSOCIATED RADIATION-INDUCED CHANGES. REACTOR GRAPHITE INVESTIGATIONS ARE GIVEN FOR HARDNESS MEASUREMENTS IN THE MARCOULE (G1) REACTOR, CYCLIC ANNEALING BEHAVIOR OF DIMENSIONAL CHANGES IN THE BROOKHAVEN GRAPHITE RESEARCH REACTOR, AND GENERAL EFFECTS OF RADIATION IN HANFORD REACTORS. THE REVIEW CONSIDERS EFFORTS OF A PURELY RESEARCH NATURE AS WELL AS ACTUAL REACTOR SAFETY APPLICATIONS.

ACTIVATION ENRGY + ANALYTICAL MODEL + CARBON + ELECTRON MICROSCOPY + GRAPHITE + PROPERTY, PHYSICAL + RADIATION DAMAGE + RADIATION EFFECT + THEORETICAL INVESTIGATION + WIGNER ENERGY RELEASE

8-13742 STANDRING J
CALCULATION OF THE GRAPHITE WEIGHT-LOSS IN CIVIL MAGNOX AND ADVANCED GAS-COOLED REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, CULCHETH, ENGLAND
17 PAGES, 3 FIGURES, 12 REFERENCES, JOURNAL OF NUCLEAR ENERGY PARTS A/B, 20(3) PAGES 201-217 (MARCH, 1966)

WHEN GRAPHITE IS USED AS THE MODERATOR IN CO₂-COOLED REACTORS IT SUSTAINS A RADIATION-INDUCED OXIDATION WHICH CAN LEAD TO SIGNIFICANT LOSS OF WEIGHT, ESPECIALLY IN HIGHLY RATED SYSTEMS. THE FACTORS WHICH DETERMINE THE RATE OF OXIDATION ARE EXAMINED AND INCORPORATED INTO A GENERAL EQUATION. IT IS SHOWN HOW TO CALCULATE THE OXIDATION RATE WHEN GRAPHITES WITH DIFFERENT POROSITIES FROM GRADE A ARE USED AND ALSO WHEN THE CO₂ COOLANT CONTAINS ADDITIVES WHICH INHIBIT IN-PILE OXIDATION. THE VARIATION OF OXIDATION RATE WITHIN THE CORE AS A WHOLE AND WITHIN A SINGLE UNIT CELL IS CONSIDERED IN DETAIL, THUS MAKING IT POSSIBLE TO ESTIMATE THE RATE IN SUCH IMPORTANT REGIONS AS FUEL ELEMENT SLEEVES AND CHANNEL WALLS NEAR TO PEAK-RATED FUEL. SINCE OXIDATION OCCURS WITHIN THE PORES OF THE GRAPHITE, WITH A CONSEQUENT INCREASE IN POROSITY, THE RATE WILL ACCELERATE WITH BURNOFF. EQUATIONS ARE DEVELOPED TO ALLOW FOR THIS EFFECT WHEN CALCULATING THE CUMULATIVE WEIGHT-LOSS. FINALLY, TO ILLUSTRATE THE METHODS DESCRIBED, WORKED EXAMPLES ARE PRESENTED FOR CALDER AND A TYPICAL CIVIL A.G.R.

CARBON + CARBON DIOXIDE + CORROSION + GRAPHITE + OXIDATION + REACTOR, GAS COOLED

8-14599 QUESTION G-4. CRITERION 17--MODEL, ASSUMPTIONS AND RESULTS OF METAL WATER REACTION FOLLOWING A LOSS-OF-COOLANT ACCIDENT WITHOUT CORE COOLING SYSTEMS
TENNESSEE VALLEY AUTHORITY
22 PAGES, 1 FIGURE, 14 REFERENCES, PAGES G.4.1 TO 22 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

DISCUSSION OF FUEL-ELEMENT-CLADDING TEMPERATURE, ENERGY RELEASE TO THE CONTAINMENT IN A STANDARDIZED FIGURE-OF-MERIT APPROACH, AND HYDROGEN EVOLUTION. REFUTES ANL-SUGGESTED ZIRCONIA-CRUCIBLE EFFECT BY NOTING THAT THE 9' VOLUME CHANGE AT 2201 F HAS PREVENTED DELIBERATE ATTEMPTS TO MAKE ZIRCONIA CRUCIBLES (UNLESS SIGNIFICANT AMOUNTS OF ADDITIVES ARE PRESENT). THIS CRACKING WOULD ALSO ALLOW LEAKAGE OF MOLTEN DROPS. BWR EXPERIENCE SHOWS HYDROGEN RELEASED AT 0.04 CU.FT/MIN-MWTH. THIS RATIO FOR THE SHUT-DOWN REACTOR SHOWS THAT RADIOLYTIC HYDROGEN IS ONLY 3' THAT PRODUCED BY METAL-WATER REACTIONS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF COOLANT + BROWNS FERRY + CONTAINMENT DESIGN + FAILURE, CLADDING + HYDROGEN + METAL WATER REACTION + RADIOLYTIC GAS + REACTOR, BOILING WATER

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-09287 AMENDMENT NO. 11 TO LICENSE APPLICATION FOR NUCLEAR TEST REACTOR
GENERAL ELECTRIC COMPANY, SAN JOSE
17 PAGES, 1 TABLE, OCTOBER 4, 1965, DOCKET NO. 50-73, PDR

OBJECTIVE OF THIS AMENDMENT - TO SUBMIT TECHNICAL SPECIFICATIONS PROPOSED FOR OPERATION OF NTR
AS ESSENTIALLY FINALIZED THROUGH DISCUSSIONS WITH THE AEC STAFF.

CONTROL ROD + CONTROL SYSTEM + FUEL HANDLING + FUEL STORAGE + INSTRUMENTATION, NUCLEAR +
LICENSING STATUS OF NUCLEAR PROJECTS + OPERATING LIMITS/TECHNICAL SPECIFICATIONS + REACTOR SAFETY SYSTEM +
REACTOR, RESEARCH + SITING, REACTOR + VENTILATION SYSTEM

9-10384 GLOVER D + FLITNER DP
UTILIZATION OF A ONCE-THROUGH TWO-TUBE BOILER IN THE DEVELOPMENT OF A CONTROL SYSTEM FOR THE 630A NUCLEAR
STEAM GENERATOR. ROUGH DRAFT
GENERAL ELECTRIC COMPANY, NUCLEAR MATERIALS + PROPULSION OPERATION
GEMP-338 +. 10 PAGES, JANUARY 1965, CFSTI, \$1.00 CY, \$0.50 MN

A TWO-TUBE, ONCE-THROUGH BOILER AND ASSOCIATED CONTROL WAS DESIGNED AND OPERATED TO AID IN THE
FINAL DETERMINATION OF THE OPTIMUM 630A POWER-RANGE CONTROL SYSTEM. IT WAS ALSO USED TO
OBTAIN STEADY-STATE INFORMATION TO AID IN THE FINAL DESIGN OF THE BOILER. THE USE OF THE
BOILER PROVED THAT IT WAS POSSIBLE TO CONTROL THE STEAM GENERATOR BY USING INTEGRATED
FEEDWATER- AND AIRFLOW-CONTROL LOOPS. THE DATA VERIFIED THE STEADY-STATE ANALYTICAL
PREDICTIONS FOR BOILER OPERATION. IT WAS ALSO DETERMINED THAT THE FLOW INSTABILITY NORMALLY
PRESENT IN ONCE-THROUGH BOILERS COULD BE SUPPRESSED BY ORIFICES IN THE INLET TO THE BOILER
TUBES.

*COMPARISON, THEORY AND EXPERIENCE + *CONTROL SYSTEM + *DESIGN STUDY + *TEST, SYSTEM OPERABILITY +
REACTOR, MARITIME + STEAM + 630 A (MARITIME REACTOR)

9-10445 MILLER DR
ANALYSIS OF VIBRATION CHARACTERISTICS OF A SINGLE-BLADED CONTROL ROD PIVOTED AT ITS DOWNSTREAM END
KNOLLS ATOMIC POWER LABORATORY
CONF-651032-1 +. 57 PAGES, APRIL 30, 1965, FLOW INSTABILITY CONFERENCE, SCHENECTADY, N.Y., CFSTI, \$3.00
CY, \$0.50 MN

PROBLEM - DETERMINE THE CONDITIONS UNDER WHICH A SINGLE-BLADED CONTROL ROD PIVOTED AT ITS
DOWNSTREAM END WILL EXPERIENCE A SUSTAINED COOLANT-FLOW-INDUCED VIBRATION. APPROACH - TWO
THEORETICAL SOLUTIONS ARE PRESENTED. RESULTS - CALCULATIONS ARE BEING REVISED TO INCLUDE THE
EFFECT OF EDGE CROSS FLOW.

*CONTROL ROD + *INSTABILITY + *REACTOR COOLANT + MATHEMATICAL STUDY

9-10464 BOYD LR + DUBRIDGE RA + GREEN WK + PIELAGE HW + STANLEY L
REACTOR CONTROL SYSTEMS BASED ON COUNTING AND CAMPBELLING TECHNIQUES WIDE-RANGE INSTRUMENTATION
DEVELOPMENT PROGRAM. SEVENTH QUARTERLY PROGRESS REPORT, FEBRUARY-APRIL 1965
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-4862 +. 72 PAGES, MAY, 1965, CFSTI, \$3.00 CY, \$0.75 MN

GENERAL ELECTRIC APED PROGRESS REPORT, FEBRUARY-APRIL, 1965. THIS REPORT IS ONE OF A SERIES
OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. TOPIC IS THE DEVELOPMENT OF WIDE-RANGE
NUCLEAR-DETECTION SYSTEMS, USING EITHER IN-CORE OR OUT-OF-CORE CHAMBERS. THE ELECTRONIC
SYSTEMS USE COUNTING TECHNIQUES FOR SOURCE AND LOWER-INTERMEDIATE-RANGE NEUTRON FLUXES, AND
CAMPBELL, OR MEAN-SQUARE-VOLTAGE, TECHNIQUES FOR INTERMEDIATE- AND POWER-RANGE FLUXES.

*CHAMBER, GENERAL + *INSTRUMENTATION, NUCLEAR + *NEUTRON + DESIGN STUDY + EQUIPMENT DESIGN +
TEST, SYSTEM OPERABILITY

9-10467 SCHALLOPP B
A DECADE OF REACTOR INSTRUMENTATION
3 PAGES, 3 FIGURES, NUCLEAR ENGINEERING, 11(119), PP. 303-305 (APRIL, 1966)

BRIEF REVIEW OF THE CHANGES IN REACTOR CONTROL AND SAFETY SYSTEMS OVER THE PAST TEN YEARS.
EMPHASIS IS PLACED ON THE COMPLETE SEPARATION OF SAFETY CHANNELS AND THE ABILITY TO TEST A
CHANNEL FROM SENSOR TO SCRAM ACTUATOR.

*CONTROL SYSTEM + *REACTOR SAFETY SYSTEM + *REVIEW + *SAFETY PRINCIPLES AND PHILOSOPHY +
INSTRUMENTATION, GENERAL + UNITED KINGDOM

9-10468 ENGELKE MJ + HENKEL RL + HIEBERT RD + JENNINGS HK + LANG HJ
AREA RADIATION MONITOR SYSTEM WITH LOGARITHMIC INDICATION AND AUDIOVISUAL WARNING
LOS ALAMOS SCIENTIFIC LABORATORY
LA-DC-6790 + CONF-650306-63 +. 13 PAGES, 1965, PARTICLE ACCELERATOR CONFERENCE, WASHINGTON, D.C., CFSTI,
\$1.00 CY, \$0.50 MN

NEUTRON DETECTION SYSTEM AT A LARGE VAN DE GRAFF ACCELERATOR WAS REDESIGNED TO GIVE A MORE
BELIEVABLE MEASURE OF BIOLOGICAL DAMAGE OR FIRST-COLLISION TISSUE DAMAGE. DETECTOR USES A
LITHIUM-IODIDE CRYSTAL SURROUNDED BY A SPHERE OF POLYETHYLENE. A LOGARITHMIC COUNT-RATE
METER WAS DEVELOPED TO COVER FOUR DECADES.

*INSTRUMENTATION, RADIATION MONITORING + *MONITOR, RADIATION, BACKGROUND +

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-10468 *CONTINUED*
*MONITOR, RADIATION, ENVIRONMENTAL + EQUIPMENT DESIGN + GAMMA + NEUTRON

9-10481 INSTRUMENTATION AND CONTROL IN THE GARIGLIANO AND LATINA NUCLEAR PPWR PLANTS
SOCIETA ELETTRONUCLEARE NATIONALE, ITALY
EUR-2420 D,F,I,N,E +. 248 PAGES, 51 FIGURES, 1965, DEP. MN

COLLECTION OF TEN REPORTS - 1. IN-CORE INSTRUMENTATION OF THE GARIGLIANO REACTOR. 2. THE AUTOCONTROL SYSTEM OF THE LATINA PLANT. 3. LATINA PLANT - SAFETY DEVICES - CONTROL ROOM. 4. GARIGLIANO PLANT NEUTRON MEASUREMENTS. 5. GARIGLIANO REACTOR CONTROL ROD SYSTEM. 6. LATINA PLANT BURST-SLUG DETECTION. 7. GARIGLIANO PLANT TURBINE REGULATION. 8. LATINA POWER PLANT - REGULATING SYSTEM. 9. GARIGLIANO PLANT - REGULATION OF THE OUTPUT OF A BWR DUAL CYCLE POWER PLANT. 10. THE CONTROL ROD DRIVE SYSTEM - GARIGLIANO PLANT.

*CONTROL ROD DRIVE + *CONTROL SYSTEM + *REACTOR SAFETY SYSTEM +
INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + INSTRUMENTATION, GENERAL + INSTRUMENTATION, IN CORE +
ITALY + REACTOR, BOILING WATER + REACTOR, GAS COOLED

9-10498 KLINE KH
THE NEW HEAT TRANSFER PROTECTION SYSTEM FOR THE SODIUM REACTOR EXPERIMENT
ATOMICS INTERNATIONAL
NAA-SR-MEMO-11648 +. 11 PAGES, SEPTEMBER 14, 1965, CFSTI, \$1.00 CY, \$0.50 MN

PROBLEM - IMPROVE THE HEAT-TRANSFER PROTECTION SYSTEM FOR THE SRE AS PART OF A POWER-EXPANSION PROGRAM. SOLUTION - THIS PORTION OF SAFETY SYSTEM INCLUDES THREE CHANNELS OF DIFFERENTIAL TEMPERATURE PROTECTION, THREE CHANNELS OF OUTLET TEMPERATURE PROTECTION, ONE CHANNEL OF COLD-LEG TEMPERATURE PROTECTION, AND ONE CHANNEL OF PRIMARY-COOLANT-FLOW PROTECTION. THE FIRST TWO VARIABLES ARE OPERATED ON A TWO-OUT-OF-THREE BASIS.

*REACTOR SAFETY SYSTEM + EQUIPMENT DESIGN + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED +
SRE (SODIUM REACTOR EXPERIMENT)

9-10499 BENNETT LF
COMPONENT RELIABILITY
3 PAGES, CANADIAN ELECTRONICS ENGINEERING, PP. 29-31 (NOVEMBER, 1964)

PROBLEM - PRESENT METHODS OF MEASURING ELECTRONIC-COMPONENT RELIABILITY ARE COSTLY AND DO NOT ENSURE PROPER SERVICE UNDER OPERATING CONDITIONS. APPROACH - (1) DERATING OF COMPONENTS GIVES MUCH MORE IMPROVEMENT IN RELIABILITY THAN ALL THE LABORATORY LIFE TESTS COMBINED, (2) GIVE COMPLETE DEFINITIONS OF RELIABILITY SINCE MOST STATEMENTS ARE MISLEADING, (3) TEST THE COMPONENTS IN ALL POSSIBLE ENVIRONMENTS THAT MIGHT BE ENCOUNTERED, (4) AVOID USING THE LOWEST BIDDER.

*RELIABILITY ANALYSIS + *RELIABILITY, COMPONENT + TEST, COMPONENT

9-10501 JACQUELIN R
RAPSODIE REACTOR - PRELIMINARY STUDIES IN THE FABRICATION OF CONTROL ROD MECHANISMS. TESTS OF THE NEW GRIPPER
COMMISSARIAT A 1 ENERGIE ATOMIQUE, CADARACHE, FRANCE, CENTRE D ETUDES NUCLEAIRES
ORNL-TR-987 + PNR/SEPR-65.018 +. 23 PAGES, MAY 25, 1965, JCL, \$2.60 FS, \$0.89 MF

PROBLEM - TEST THE PERFORMANCE OF THE REDESIGNED GRIPPER OF THE CONTROL ROD MECHANISM UNDER SIMULATED REACTOR CONDITIONS. RESULTS - TESTS DEMONSTRATED THAT THE GRIPPER SHOULD FUNCTION WELL IN THE REACTOR.

*TEST, CONTROL ROD DRIVE + CONTROL ROD DRIVE + REACTOR, BREEDER + REACTOR, FAST

9-10502 BUKOWIECKI B
ALPHA CONTAMINATION LOCATOR WITH JUNCTION RADIATION DETECTOR
CENTRALNE LABORATORIUM OCHRONY RADIOLOGICZNEJ, WARSAW, POLAND
CLOR-39/D +. 5 PAGES, 1965, DEP.MN

PROBLEM - DEVELOP A MEANS FOR PRECISE LOCATION OF CONTAMINATION, PARTICULARLY ON THE HUMAN BODY. APPROACH - DEVELOPMENT OF A RADIOLOGICAL PROTECTION ALPHA CONTAMINATION LOCATOR. THIS CONSISTS OF A SEMICONDUCTOR RADIATION DETECTOR, PROBE EXTENSION, AND A SMALL, PORTABLE TRANSISTORIZED AMPLIFIER THAT GIVES AN AUDIBLE SIGNAL FOR EACH ALPHA PARTICLE THAT LOSES AT LEAST 600 KEV OF ITS ENERGY WITHIN THE DETECTOR.

*INSTRUMENTATION, RADIATION MONITORING + *SOLID STATE DEVICE + ALPHA EMITTER + EQUIPMENT DESIGN +
MONITOR, RADIATION, SURFACE

9-10503 VOLLMER H + ANDERSON AJ
DEVELOPMENT OF A DYNAMICS MODEL FOR HEAVY WATER BOILING REACTORS AND ITS APPLICATION TO THE H2O REACTOR
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY. OECD HALDEN REAKTOR PROSJEKT
HPR-54 +. 143 PAGES, DECEMBER 1964, DEP.MN

PROBLEM - IMPROVE THE UNDERSTANDING OF THE DYNAMIC BEHAVIOR OF A HEAVY-WATER BOILING REACTOR. APPROACH - (1) IMPROVE AND EXTEND THE DYNAMIC MODELS FOR LIGHT-WATER BOILING REACTORS, (2)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-10503 *CONTINUED*

DEVELOP A GENERAL MODEL FOR THIS TYPE OF REACTOR, (3) APPLY THE MODEL TO SPECIAL CASE OF THE HBWR USING THE SECOND FUEL LOADING. RESULTS - (1) THE STUDY INDICATED THAT THE HBWR WILL HAVE SELF-SUSTAINED OSCILLATIONS UNDER SOME CONDITIONS, (2) THE MODEL WAS VERIFIED WITH SEVERAL EXPERIMENTS.

*PEACTOR DYNAMICS + *REACTOR STABILITY + ANALYTICAL MODEL + COMPUTER PROGRAM + MATHEMATICAL STUDY + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-10507 FRANCHI M + GARRONI A + SCIUTO F
AUTOMATIC CONTROL EQUIPMENT OF THE DRAGON REACTOR
C.C.R. EUPATOM, ISPRA, ITALY

12 PAGES, 20 FIGURES, ENERGIA NUCLEARE, 13(1), PP. 1-11 (JANUARY 1966)

PROBLEM - CONTROL THE POWER AND OUTLET TEMPERATURE OF THE DRAGON REACTOR. APPROACH - THE REGULATING ROD IS CONTROLLED BY A COMBINATION OF A FLUX-ERROR SIGNAL AND AN INTEGRATED OUTLET-TEMPERATURE SIGNAL. THE FLUX SET-POINT IS MADE UP OF THE PRODUCT OF THE MEASURED COOLANT FLOW AND THE DIFFERENCE BETWEEN THE OUTLET-TEMPERATURE SET-POINT AND THE INLET-TEMPERATURE SET-POINT. THIS FORM OF A FLUX SET-POINT GIVES AN ANTICIPATION OF THE NEW FLUX REQUIRED FOR CHANGES IN COOLANT FLOW OR OUTLET-TEMPERATURE SET-POINT. RESULTS - CONTROL SYSTEM GIVES RAPID REGULATION OF OUTLET TEMPERATURE.

*CONTROL SYSTEM + *INSTRUMENTATION, CONTROL + *SYSTEM DESCRIPTION + DRAGON (UK) + EQUIPMENT DESIGN + REACTOR, GAS COOLED

9-10511 KILPATRICK JN + BEAL FS
THE ADVANCING TECHNOLOGY OF THE PRESSURIZED WATER REACTOR
WESTINGHOUSE ATOMIC POWER DIVISION

5 PAGES, 7 FIGURES, EURONUCLEAR, 3(3), PP. 127-131 (MARCH 1966)

BRIEF REVIEW OF WESTINGHOUSE DEVELOPMENT OF THE PWR CONCEPT. THE USE OF CHEMICAL-SHIM CONTROL OF REACTIVITY HAS INCREASED FUEL BURNUP THREEFOLD OVER THE EARLY PWRs. THE CHEMICAL-SHIM SYSTEM IS UNDERGOING A LONG-TERM TESTING IN SAXTON REACTOR. THE ROD-CLUSTER CONTROL ELEMENTS OFFER SEVERAL ADVANTAGES OVER THE EARLIER CRUCIFORM ELEMENTS. IN-CORE INSTRUMENTS ARE IMPROVING CORE PERFORMANCE.

*CHEMICAL SHIM + *CONTROL ROD + *INSTRUMENTATION, IN CORE + *REVIEW + POISON; SOLUBLE + REACTOR, PRESSURIZED WATER + SAXTON

9-10512 IMPROVEMENTS IN OR RELATING TO THE CONTROL OF NUCLEAR REACTORS
BABCOCK AND WILCOX LIMITED, LONDON

BRITISH PAT. 1,005,177 +. 8 PAGES, 6 FIGURES, SEPTEMBER 22, 1965, PATENT (BRITISH)

PATENT FOR A REACTIVITY CONTROL SYSTEM THAT CONTROLS THE MOVEMENT OF BALLS OF POISON MATERIAL BY VARYING THE FLUID FLOW WITHIN A CONDUIT THAT GUIDES THE BALLS. THE BALLS FALL BACK INTO THE CORE FOR A SCRAM BY CUTTING OFF THE FLUID FLOW. THIS SYSTEM APPEARS TO BE SIMPLER THAN THE NORMAL MECHANICAL CONTROL-ROD-DRIVE MECHANISMS, HOWEVER, THIS SYSTEM MAY BE SUBJECT TO THE CRITICISM THAT AN INCREASE IN FLUID FLOW OR IN THE PRESSURE IN THE REACTOR VESSEL MIGHT BLOW THE POISON BALLS OUT OF THE CORE AND PRODUCE A SERIOUS REACTIVITY ACCIDENT.

*CONTROL ROD + *CONTROL ROD DRIVE + REACTIVITY, EXCESS

9-10514 SCHALLOPP B
REACTOR INSTRUMENTATION IN GERMANY

3 PAGES, 3 FIGURES, NUCLEAR ENGINEERING, 10(113), PP. 338-40 (OCTOBER 1965)

SUPERFICIAL REVIEW OF REACTOR INSTRUMENTATION IN GERMANY. THE MAIN EMPHASIS IS PLACED ON MANUFACTURERS. TWO INTERESTING ITEMS ARE MENTIONED - (1) SUBCHANNELS IN A TWO-OUT-OF-THREE SAFETY SYSTEM ARE CONTINUOUSLY COMPARED WITH EACH OTHER TO PARTIALLY MONITOR THE OPERABILITY OF THE SUBCHANNELS, (2) AS A FIRST STEP TOWARDS AUTOMATION, COMPUTERS ARE USED TO PROVIDE OPERATIONAL GUIDES FOR THE OPERATOR.

*INSTRUMENTATION, GENERAL + *REVIEW + CONTROL, COMPUTER + GERMANY + INSTRUMENTATION, CONTROL + INSTRUMENTATION, PROTECTIVE + INSTRUMENTATION, TESTING

9-10523 HORNE RE + KLINKMAN AE
DETERMINATION OF THE SAFETY ROD DROP TIME IN THE ENRICO FERMI REACTOR
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC.
APDA-NTS-3 +. 39 PAGES, JANUARY 1965, DEP.MN

PROBLEM - MEASURE SAFETY-ROD DROP TIMES AND WORTH OF THE RODS. APPROACH - IT WAS NECESSARY TO CALCULATE THE ROD-DROP TIMES FROM THE BEHAVIOR OF THE NUCLEAR KINETICS, BECAUSE IT WAS NOT POSSIBLE TO MAKE ACCURATE MECHANICAL MEASUREMENTS OF SCRAM TIME. RESULTS - (1) ROD-DROP TIMES (630 MSEC) AGREED WITH PREDICTED VALUE, (2) DROP TIMES WERE NOT INFLUENCED BY VARIATION OF COOLANT FLOW OR COOLANT TEMPERATURE, (3) ROD WORTHS AGREED WITH PREDICTED VALUES.

*CONTROL ROD SCRAM MECHANISM + *CONTROL ROD WORTH + *MEASUREMENT, REACTIVITY + *TESTING + FERMI + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LIQUID METAL COOLED

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-11478 HANKINS DE
RESPONSE OF SELECTED NEUTRON MONITORING INSTRUMENTS TO SEVERAL TYPES OF NEUTRON SOURCES
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-DC-7702 + CONF-660621-5 +. 21 PAGES, 1965, FROM HEALTH PHYSICS SOCIETY 11TH ANNUAL MEETING, HOUSTON,
TEXAS, CFSTI, \$1.00 CY, \$0.50 MN

THIS PAPER COMPARES THE RESPONSE OF SEVERAL NEUTRON-MONITORING INSTRUMENTS TO NINE NEUTRON SOURCES AND CONCLUDES THAT DIFFERENCES IN THE NEUTRON SPECTRA AND THE ENERGY DEPENDENCE OF THE INSTRUMENTS SIGNIFICANTLY AFFECT CALIBRATION RESULTS. (NEUTRON SOURCES - PU(238)-BE, PU(239)-BE, AM-BE, PO-BE, RA-BE, AND CM-244.) THE INSTRUMENTS INCLUDED THE HURST ABSOLUTE FAST-NEUTRON DOSIMETER - LUDLUM MODEL 11 - EBERLINE PORTABLE COUNTER - EBERLINE FNIA - 10-IN. SINGLE-SPHERE - AND 8-, 3-, AND 2-IN. MULTISPHERES.

*CHAMBER, NEUTRON + *MONITOR, RADIATION, GENERAL PRACTICE + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, NUCLEAR + MEASUREMENT, REACTIVITY + NEUTRON

9-11643 NOWAK K
ACCIDENTS WHICH COULD HAVE BEEN PREVENTED BY EARTH-LEAKAGE CIRCUIT-BREAKERS OF HIGH SENSITIVITY
6 PAGES, 8 FIGURES, 6 REFERENCES, ELECTROTECH 18(6) PAGES 174-179 IN GERMAN (MARCH 25, 1966)

A GROUND-CURRENT CIRCUIT BREAKER WITH A 30-MA SENSITIVITY WAS DEVELOPED. THE IMPORTANCE OF THE DEVICE FOR ACCIDENT PROTECTION IS SHOWN BY THE NUMBER OF ELECTRICAL ACCIDENTS THAT IT COULD HAVE PREVENTED.

*INSTRUMENTATION, PROTECTIVE + *PERSONNEL PROTECTIVE DEVICE + ELECTRIC POWER, GENERAL + INSTRUMENTATION, RELAY

9-11644 SMITH RD
THE HBWR ATTITUDE ON IN-CORE INSTRUMENTATION. SECTION 1
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-35 (VOL. 1) +. 17 PAGES, 2 FIGURES, 2 TABLES, 7 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 1, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

THE EVOLUTION OF THE IN-CORE INSTRUMENTATION PROGRAM AND ITS SIGNIFICANCE ARE DISCUSSED. THE INSTRUMENTS DEVELOPED AND APPLIED ARE NEEDED TO REDUCE NUCLEAR POWER COST THROUGH ELIMINATION OF UNNECESSARILY CONSERVATIVE LIMITS ON SPECIFIC POWER. AN EVALUATION OF THE LARGE ECONOMIC INCENTIVE FOR IN-CORE INSTRUMENTS IN THE ABOVE APPLICATION IS PRESENTED.

*IN CORE MEASUREMENT + *INSTRUMENTATION, IN CORE + HBWR (HALDEN BOILING WATER REACTOR) + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11645 DEVOLD I
PAST, PRESENT, AND FUTURE INSTRUMENTED FUEL ASSEMBLIES AT HBWR
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-35 (VOL. 1) +. 26 PAGES, 13 FIGURES, 20 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 2, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

THE HISTORICAL DEVELOPMENT OF THE FOUR-INSTRUMENTED FUEL ASSEMBLIES AT HBWR AND THE IMPROVEMENTS MADE DURING THEIR DEVELOPMENT ARE REPORTED. THE PLANS FOR A GROUP OF INSTRUMENTED TUBULAR FUEL ELEMENTS FOR HYDRODYNAMIC MEASUREMENT ARE DESCRIBED, AND THE SCOPE OF THE INSTRUMENTED FUEL IRRADIATION TEST PROGRAM IS COVERED.

*IN CORE MEASUREMENT + *INSTRUMENTATION, IN CORE + HBWR (HALDEN BOILING WATER REACTOR) + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11646 VAPAAVUORI O
IFA-4 RESULTS SHOW THAT INSTRUMENTED FUEL ASSEMBLIES ARE NEEDED TO DETERMINE REAL REACTOR POWER LIMITS
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-35 (VOL. 1) +. 41 PAGES, 20 FIGURES, 2 TABLES, 23 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 3, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

NATURAL CIRCULATION EXPERIMENTS WERE PERFORMED WITH A INSTRUMENTED FUEL ASSEMBLIES AT HBWR. IMPROVED EXPERIMENTAL TECHNIQUE PERMITTED CONTINUOUS COMPUTER CALCULATIONS AND RECORDING OF THE REQUIRED PARAMETERS. CHANNEL FLOW OSCILLATIONS OCCURRING DURING NATURAL CIRCULATION ARE DISCUSSED. A COMPARISON OF THE RESULTS OBTAINED WITH OUT-OF-PILE LOOP EXPERIMENTAL DATA SHOWS THAT THE PREDICTION OF ASSEMBLY BEHAVIOR IN A REACTOR FROM LOOP DATA HAS SEVERE LIMITATIONS.

*BURNOUT HEAT FLUX + *VOID COEFFICIENT + HBWR (HALDEN BOILING WATER REACTOR) + IN CORE MEASUREMENT + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11647 VAN LEEUWEN HN
DEVELOPMENT AND USE OF IN-CORE INSTRUMENTS IN ELECTRICAL MOCK-UPS
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-35 (VOL. 1) +. 22 PAGES, 9 FIGURES, 13 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 4, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-11647 *CONTINUED*

THE PROBLEMS OF SIMULATING IN-PILE FUEL-ASSEMBLY PERFORMANCE IN OUT-OF PILE LOOPS, AND THE METHODS ADAPTED TO IMPROVE SIMULATION AND ALSO TO DEVELOP IN-CORE INSTRUMENTS ARE DEALT WITH. EXPERIMENTS PERFORMED WITH AN ELECTRICALLY HEATED TUBULAR TEST ELEMENT AND A DUPLICATE OF THE FOURTH INSTRUMENTED FUEL ASSEMBLY ARE PRESENTED. FURTHER EXPERIMENTS WITH NEW FUEL TYPES ARE PLANNED.

*HEAT TRANSFER EXPERIMENT + HBWR (HALDEN BOILING WATER REACTOR) + INSTRUMENTATION, IN CORE + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11649 AARSET B

POWER MEASUREMENTS IN A NATURAL CIRCULATION BOILING CHANNEL

INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY

HPR-35 (VOL. I) +. 18 PAGES, 10 FIGURES, 10 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 6, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

REMOTELY CONTROLLED CALIBRATION VALVES THAT PERMIT EITHER FORCED OR NATURAL CIRCULATION IN A FUEL CHANNEL WERE DESIGNED AND INSTALLED IN FOUR INSTRUMENTED FUEL ASSEMBLIES. FORCED CIRCULATION PERMITS BOILING SUPPRESSION AND ENABLES PRECISE POWER CALIBRATIONS TO BE OBTAINED AND REPEATED. THE DESCRIPTION OF THE VALVE AND FUTURE DEVELOPMENTS ARE REPORTED.

*IN CORE MEASUREMENT + *INSTRUMENTATION CALIBRATION + HBWR (HALDEN BOILING WATER REACTOR) + REACTOR, BOILING WATER + REACTOR, HEAVY WATER + TEST, SYSTEM OPERABILITY

9-11650 ASPHAUG B

GAMMA THERMOMETER DEVELOPMENT AT HBWR

INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY

HPR-35 (VOL. I) +. 17 PAGES, 10 FIGURES, 4 TABLES, 8 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 7, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

GAMMA THERMOMETERS WERE DEVELOPED AND USED TO MEASURE POWER IN BOILING CHANNELS AT HBWR. THE PRINCIPLE OF OPERATION, CALIBRATION IN INSTRUMENTED FUEL ASSEMBLIES, AND ANALYSIS OF THE REACTOR OPERATION DATA ARE DESCRIBED. THE POTENTIAL OF GAMMA THERMOMETERS FOR SPECIFIC POWER MEASUREMENTS IS DISCUSSED. THE DESIGN CALCULATIONS ARE GIVEN IN THE APPENDIX.

*IN CORE MEASUREMENT + *INSTRUMENTATION, NUCLEAR + HBWR (HALDEN BOILING WATER REACTOR) + INSTRUMENTATION, IN CORE + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11651 SCHENK K

HBWR TURBINE FLOW METERS ARE BEING DEVELOPED FOR NUCLEAR APPLICATIONS

INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY

HPR-35 (VOL. I) +. 22 PAGES, 12 FIGURES, 6 TABLES, 9 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 8, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

REPORTS THE DEVELOPMENT OF TURBINE FLOWMETERS FOR INSTALLATION INTO INSTRUMENTED FUEL ASSEMBLIES, THEIR CALIBRATION, AND RESULTS OF IN-REACTOR OPERATION. DESIGN DETAILS, IMPROVEMENTS, OPERATING EXPERIENCE, AND THE APPLICATION OF TURBINES TO FUEL-ASSEMBLY-BEHAVIOR ANALYSIS ARE GIVEN. DESIGN CONSIDERATIONS FOR THE TURBINE ARE ALSO GIVEN.

*IN CORE MEASUREMENT + *INSTRUMENTATION, FLOW + HBWR (HALDEN BOILING WATER REACTOR) + INSTRUMENTATION CALIBRATION + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11652 ORBECK I

THE IMPEDANCE VOID METER FOR HBWR

INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY

HPR-35 (VOL. I) +. 49 PAGES, 31 FIGURES, 1 TABLE, 17 REFERENCES, DEVELOPMENT AND APPLICATIONS OF IN-CORE INSTRUMENTATION AT HBWR, SECTION 9, AUGUST 1964, A COMPILATION OF HBWR REPORTS PRESENTED AT THE SYMPOSIUM ON IN-CORE INSTRUMENTATION, OSLO, JUNE 15-19, 1964, DEP. MN

THE IMPEDANCE VOID METER WAS DESIGNED TO MEASURE TRANSIENT VOID CONTENT IN AN INSTRUMENTED FUEL ASSEMBLY AT HBWR. THE DEVICE MAKES USE OF THE CHANGE IN IMPEDANCE BETWEEN TWO ELECTRODES RESULTING FROM A CHANGE IN THE ELECTRICAL PROPERTIES OF THE FLUID FLOWING BETWEEN THEM. THE SPECIFICATIONS, DEVELOPMENT, AND CALIBRATION ARE GIVEN ALONG WITH OPERATING EXPERIENCE IN INSTRUMENTED FUEL ASSEMBLIES.

*IN CORE MEASUREMENT + *VOID COEFFICIENT + HBWR (HALDEN BOILING WATER REACTOR) + INSTRUMENTATION, IN CORE + REACTOR, BOILING WATER + REACTOR, HEAVY WATER

9-11742 VERBINSKI VV + BOKHARI MS

A FAST-NEUTRON SPECTROMETER FOR REACTOR ENVIRONMENTS

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE

ORNL-TM-1546 +. 29 PAGES, 12 FIGURES, 10 REFERENCES, JUNE 7, 1966

A FAST-NEUTRON SPECTROMETER THAT CAN OPERATE IN A REACTOR ENVIRONMENT WAS TESTED IN THE WATER SHIELD OF THE BULK SHIELDING REACTOR I IN GAMMA-RAY FLUXES UP TO 1,000,000 R/HR. THE SPECTROMETER CONSISTS OF A VERY THIN LAYER OF ⁶LiF BETWEEN TWO SILICON-GOLD DIODES. NEUTRONS ARE DETECTED AS A COINCIDENTAL EMISSION OF AN ALPHA PARTICLE AND A TRITON. THE MEASURED

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-11742 *CONTINUED*
SPECTRA ARE IN GOOD AGREEMENT WITH THE CALCULATED.

*FAST NEUTRON + *SPECTROMETRY, NEUTRON + MEASUREMENT, REACTIVITY

9-11747 LEAKE JW
A FAST NEUTRON DOSE EQUIVALENT RATE MONITOR
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4525 +. 16 PAGES, 11 FIGURES, 11 REFERENCES, JANUARY 1965, HMSO, BIS \$0.80 CY

A FAST-NEUTRON-DOSE-EQUIVALENT RATEMETER WAS DEVELOPED (FROM THE EARLIER MODEL OF WASSON) TO COVER THE ENERGY RANGE FROM 3 TO 25 MEV. THE NEUTRON-DOSE EQUIVALENT IS ESTIMATED BY MEASURING THE TOTAL LIGHT EMISSION FROM A LIQUID ORGANIC SCINTILLATOR, NE 213. DOSE EQUIVALENT INDICATION IS GIVEN BY MEANS OF RATEMETER WHOSE OUTPUT IS DIRECTLY PROPORTIONAL TO THE PRODUCT OF THE AMPLITUDE OF THE LIGHT PULSES AND THEIR FREQUENCY. THE GAMMA RAY DISCRIMINATION PROPERTIES CAN BE ADJUSTED SO THAT A GAMMA RAY EXPOSURE RATE OF 10 MR/HR FROM RA-226 GIVES A RESPONSE WHICH IS LESS THAN THAT DUE TO 0.25-MILLIREM/HR OF AMBE NEUTRONS. THE SENSITIVITY OF THE INSTRUMENT, WITH A 1-IN.-DIAM SCINTILLATOR, IS SUCH THAT 1 MILLIREM/HR OF AM-BE NEUTRONS PRODUCES A COUNT RATE OF ABOUT 3 PPS (FOR A 1-MEV NEUTRON BIAS).

*DOSE CALCULATION, EXTERNAL + *FAST NEUTRON + *MONITOR, RADIATION, PERSONNEL +
INSTRUMENTATION, RADIATION MONITORING + RADIUM

9-11907 BUNCH WL + PHILIPP LD + WOOD MR
TIME-TO-POWER AS A REACTOR STARTUP PARAMETER
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
6 PAGES, 7 FIGURES, NUCLEAR APPLICATIONS 2(5), PAGES 357-362, (OCTOBER 1966)

THE TIME-TO-POWER (TTP) APPROACH USES INSTANTANEOUS FLUX AND PERIOD SIGNALS TO PROVIDE ONE CONTROL SIGNAL TO CONTINUOUSLY INCREASE REACTOR POWER TO THE DESIRED LEVEL (ABOUT 96 PERCENT OF FULL POWER), WITH A DECREASING RATE-OF-RISE AS FULL POWER IS APPROACHED. CHOICE OF THE ACTUAL TIME INTERVAL DEPENDS ON ANY LIMITING RATE-OF-RISE CONSIDERATION (MW/MIN), USUALLY AT INTERMEDIATE POWERS. (AN INSTRUMENT WAS BUILT AND TESTED AT HANFORD.) THE ARTICLE DISCUSSES CONCEPTS, MATHEMATICS, AND TRIAL USAGE. BASIC ADVANTAGE IS TO EXTEND RATE-OF-RISE CONTROL CIRCUITS INTO THE POWER RANGE, WHERE TRADITIONALLY SUCH CIRCUITS ARE USELESS BECAUSE SUCH A SLOW RATE OF RISE IS NEEDED.

*INSTRUMENTATION, RATE OF CHANGE + HANFORD SITE + INSTRUMENTATION, NUCLEAR + REACTOR, POWER

9-12049 BERGER H
DETERMINATION OF CADMIUM BURNUP IN REACTOR CONTROL RODS BY NEUTRON RADIOGRAPHY
6 PAGES, NUCLEAR SCIENCE AND ENGINEERING 18(2) PAGES 236-241 (FEBRUARY 1964)

A METHOD OF STUDYING THE BURNUP OF HIGH-CROSS-SECTION MATERIALS IN CONTROL RODS BY NEUTRON RADIOGRAPHY IS DESCRIBED. THE TECHNIQUE HAS BEEN APPLIED TO THE EXAMINATION OF THE BURNUP PATTERN OF A CP-5 CONTROL ROD AND HAS BEEN FOUND TO PROVIDE A DETAILED PICTURE OF THE BURNUP PATTERN, SHOWING A VERY SHARP TRANSITION REGION. THE RADIOGRAPHIC STUDY HAS BEEN MADE BY A COMPARISON METHOD IN WHICH THE NEUTRON TRANSMISSION OF THE IRRADIATED CADMIUM CONTROL MATERIAL HAS BEEN COMPARED TO THAT OF NORMAL CADMIUM. IN THE REGIONS IN WHICH THE CADMIUM CONTROL MATERIAL HAS BEEN HIGHLY DEPLETED IN CD-113, THE EQUIVALENT NORMAL CADMIUM THICKNESS COMPARISON CAN BE MADE TO AN ESTIMATED ACCURACY OF 0.0006 IN.

*CONTROL ROD + *RADIOGRAPHY + CADMIUM

9-12050 HARRIS AM + LEDIN E
DRIVE MECHANISM
U.S. PAT. 3,141,380 +. 8 PAGES, 2 FIGURES, 9 REFERENCES, JULY 21, 1964, PATENT (US)

IT IS A PRIMARY OBJECT OF THE PRESENT INVENTION TO PROVIDE AN IMPROVED FORM OF PRESSURE-FLUID-DRIVE MEANS. A MORE PARTICULAR OBJECT IS TO PROVIDE AN IMPROVED MEANS FOR A CONTROL ROD IN A REACTOR, INCLUDING A DECELERATION DEVICE OPERABLE TO RETARD THE FINAL MOVEMENT OF THE CONTROL ROD INTO THE CORE.

*CONTROL ROD SCRAM MECHANISM + INSTRUMENTATION, CONTROL + POISON, BURNABLE

9-12051 HARRIS AM + LEDIN E
CONTROL ROD FOR NUCLEAR REACTOR
U.S. PAT. 3,121,045 +. 10 PAGES, 2 FIGURES, 10 REFERENCES, FEBRUARY 11, 1964, PATENT (US)

THE PRIMARY OBJECT OF THIS INVENTION IS TO PROVIDE AN IMPROVED FORM OF CONTROL-ROD ASSEMBLY WHICH IS CONSTRUCTED AND ADAPTED TO ACCOMMODATE DISTORTIONS, EXPANSION, OR OTHER MOVEMENTS. THE CONTROL IS DETACHABLY MOUNTED IN THE REACTOR VESSEL AND CONSTRUCTED TO PERMIT ANGULAR DEVIATION WITH RESPECT TO THE VERTICAL AXIS OF THE REACTOR VESSEL. A METHOD FOR INTERNALLY COOLING THE CONTROL ROD WITH A PARALLEL FLOW OF COOLANT THROUGH THE ROD IS DESCRIBED, AND A NOVEL DRIVE MECHANISM IS DESCRIBED, USING PRESSURE FLUID FOR REGULATING MOVEMENT AND SCRAM.

*CONTROL ROD + *CONTROL ROD DRIVE + MAIN COOLING SYSTEM

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12052 LEDIN E
CONTROL ROD FOR NUCLEAR REACTORS
U.S. PAT. 3,120,480 +. 6 PAGES, 1 FIGURE, 6 REFERENCES, FEBRUARY 4, 1964, PATENT (US)

THE OBJECT OF THIS INVENTION IS TO PROVIDE A CONTROL-ROD ASSEMBLY WHEREIN THE NEUTRON-ABSORBING MATERIAL IS ARRANGED IN A MANNER THAT AFFORDS GREATER PROTECTION AGAINST THERMAL AND MECHANICAL FORCES ON THE CONTROL ROD. THE CONTROL ROD COMPRISES AN ELONGATED TUBULAR SUPPORT ROD, A PLURALITY OF SPACER ELEMENTS FIXED TO THE SUPPORT ROD AT UNIFORMLY SPACED INTERVALS, A GENERALLY CYLINDRICAL SECTION OF NEUTRON-ABSORBING MATERIAL COAXIALLY DISPOSED ON THE SUPPORT-ROD INTERMEDIATE ADJOINING PAIRS OF SAID SPACER ELEMENTS, AND A PLURALITY OF FLEXIBLE-METAL COMPRESSIBLE-DISK WASHERS.

*CONTROL ROD + *THERMAL MECHANICAL EFFECT

9-12055 MICHEL JW
CONTROL ROD POSITIONED BY FLUID FLOW THROUGH THE ROD CHANNEL
U.S. PAT. 3,123,532 +. 6 PAGES, 2 FIGURES, MARCH 3, 1964, PATENT (US)

THE OBJECT OF THIS INVENTION IS TO PROVIDE A CONTROL-ROD-DRIVE SYSTEM OF SIMPLIFIED DESIGN HAVING INHERENT SAFETY FEATURES, WHICH WILL OPERATE IN HIGH TEMPERATURES UNDER INTENSE RADIATION. THE PRINCIPLE OF OPERATION OF THE SYSTEM IS SIMILAR TO THE PRINCIPLE OF OPERATION OF A ROTOMETER. THIS IS OF GREAT SIGNIFICANCE AS A SAFETY FEATURE IN A LOSS-OF-POWER OR PUMP-FAILURE ACCIDENT. THE CONTROL ROD WILL FAIL IN THE SAFE POSITION, AND A REACTOR SHUTDOWN TAKES PLACE IN A POWER OUTAGE.

*ACCIDENT, LOSS OF POWER + *CONTROL ROD DRIVE + *HYDRAULIC EFFECT + HIGH TEMPERATURE

9-12058 MCNEES RA + POTTER RA
STABILIZED RARE EARTH OXIDES FOR CONTROL ROD AND METHOD OF PREPARATION
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
U.S. PAT. 3,117,372 +. 4 PAGES, 1 REFERENCE, JANUARY 14, 1964 (FRENCH PATENT 1,374,630-1964) PATENT (US)

A PATENT FILED IN 1962 CLAIMS AS THE OBJECT OF THE INVENTION - (1) TO RENDER EUROPIUM OXIDE STABLE IN THE PRESENCE OF WATER AT ELEVATED TEMPERATURES, (2) TO PROVIDE A EUROPIUM OXIDE CONTAINING MATERIAL RESISTANT TO ATTACK BY HIGH TEMPERATURE WATER, (3) TO PROVIDE A WATER-STABLE CONTROL-ROD DISPERSION CONTAINING AT LEAST 37 WT PERCENT EUROPIUM OXIDE, (4) TO PROVIDE STABILIZED OXIDES OF SAMARIUM, GADOLINIUM, AND DYSPROSIUM. THE PATENT CONTAINS METHODS OF PREPARING EUROPIUM OXIDE.

*CONTROL ROD + *EUROPIUM + HIGH TEMPERATURE + OXIDE + SAMARIUM

9-12067 HAWKE BC + THOMPSON IC
CONTROL ROD DRIVE
U.S. PAT. 3,124,513 +. 10 PAGES, 8 FIGURES, 3 REFERENCES, MARCH 10, 1964, PATENT (US)

THIS INVENTION RELATES TO A FLUID-ACTUATED DRIVE ARRANGEMENT FOR SCRAMMING A NUCLEAR REACTOR. THE INVENTION ALSO RELATES TO A MECHANISM ASSOCIATED WITH THE DRIVE FOR LOCKING THE CONTROL ROD IN ITS SCRAMMED POSITION. THE USE IS FOR MARINE REACTORS.

*CONTROL ROD DRIVE + CONTROL ROD SCRAM MECHANISM + HYDRAULIC EFFECT

9-12068 IMPROVEMENTS IN OR RELATING TO RODS FOR NUCLEAR REACTORS
BRITISH PAT. 933,708 +. 3 PAGES, 2 FIGURES, MARCH, 1965, PATENT (BRITISH)

THIS BRITISH PATENT DESCRIBES A BORON CONTROL ROD WHICH WILL NOT BE SUBJECT TO RUPTURE BY INTERNAL GAS PRESSURE. A METHOD FOR MAKING THE ROD IS ALSO DESCRIBED. THE ROD IS PLUGGED WITH GAS-PERVIOUS, LIQUID-IMPERVIOUS PLUGS OF METAL WOOL AT BOTH ENDS. THE PLUGS MAY HAVE A DENSITY OF ABOUT 95 PERCENT OF THE THEORETICAL. A NEUTRON-ABSORBING MATERIAL IS INSERTED INTO THE TUBE WITH THE POROUS PLUGS AT EACH END OF THE TUBE, THE PLUGS AND MATERIAL FROM BOTH ENDS ARE COMPACTED, AND THE OUTER DIAMETER OF THE CYLINDRICAL TUBE IS REDUCED TO SUCH AN EXTENT THAT THE WOOL PLUGS ARE IMPERVIOUS TO LIQUID AND PERVIOUS TO GAS.

*CONTROL ROD + *CONTROL ROD FABRICATION + *PRESSURE RELIEF + BORON + FUEL ELEMENT + UNITED KINGDOM

9-12069 PRELIMINARY SAFEGUARDS SUMMARY REPORT - APPLICATION TO THE UNITED STATES ATOMIC ENERGY COMMISSION FOR CONSTRUCTION PERMIT AND OPERATING LICENSE
SOUTHWEST ATOMIC ENERGY ASSOCIATION + GENERAL ELECTRIC COMPANY
219 PAGES, 101 FIGURES, 24 TABLES, JANUARY 1965, DOCKET NO. 50-231, PDR

THE OPERATION AND CONTROL OF THE SOUTHWEST EXPERIMENTAL FAST OXIDE REACTOR DURING NORMAL CONDITIONS WILL BE FROM A CENTRAL CONTROL ROOM. THE ROOM WILL CONTAIN THE NECESSARY READOUTS, ALARMS, AND MANUAL CONTROL DEVICES TO ALLOW THE OPERATORS TO START, MAINTAIN CONTROL OF THE MAIN PROCESS DURING NORMAL AND TRANSIENT CONDITIONS, AND TO SHUT THE PROCESS DOWN. THE PLANT INSTRUMENTATION IMPORTANT FOR REACTOR CONTROL AND SAFETY IS DIVIDED INTO SYSTEMS - NEUTRON MONITORING, REFLECTOR CONTROL, AREA AND PROCESS RADIATION MONITORING, AND PROCESS INSTRUMENTATION. EQUIPMENT USED FOR SAFETY-SYSTEM FUNCTIONS WILL BE INDEPENDENT OF THOSE USED FOR CONTROL PURPOSES.

*CONTROL SYSTEM + *INSTRUMENTATION, CONTROL + *INSTRUMENTATION, RADIATION MONITORING + *REACTOR SAFETY SYSTEM + *SEFOR (SOUTHWEST EXP. FAST OXIDE REACTOR) + REACTOR, FAST

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12084 SHINOHARA Y + VALAT J
OPTIMIZATION OF XENON POISONING BY OPTIMIZATION OF BUILD-UP OR OVER-RIDE
ORNL-TR-419 +. 6 PAGES, 2 FIGURES, 2 REFERENCES, COMPTES RENDUS 259, PAGES 186-39, (1964), JCL \$1.10 FS,
\$0.80 MF

THE PRINCIPLE OF THE PONTRYAGIN MAXIMUM ASSOCIATED WITH SOME PHYSICAL CONSIDERATIONS PERMITS A
DETERMINATION OF THE OPTIMUM SHUT-DOWN PROGRAM OF MINIMUM DURATION, DELAYING THE INSTANT OF
POISONING AS MUCH AS POSSIBLE, OR APPROACHING THE INSTANT OF OVER-RIDE AS MUCH AS POSSIBLE.

*PONTRYAGIN'S PRINCIPLE + *XENON + FRANCE + MATHEMATICAL STUDY + POISON, BURNABLE + SHUTDOWN MARGIN

9-12118 WORTON DC + SPEAR WG + HARVEY RA + DRIVER GE + RUSSELL JT + BRENDEN BB
PROGRESS IN INSTRUMENTATION RESEARCH AND DEVELOPMENT. A SUMMARY OF HANFORD LABORATORIES ACHIEVEMENTS IN
THESE PROGRAMS UNDER GENERAL ELECTRIC, 1951-1964
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND
HW-83606 +. 49 PAGES, 159 REFERENCES, OCTOBER 1964, CFSTI \$3.00 CY, \$1.00 MN.

THIS DOCUMENT DESCRIBES A SUMMARY OF HANFORD LABORATORY WORK IN THE INSTRUMENTATION RESEARCH
AND DEVELOPMENT PROGRAMS UNDER GENERAL ELECTRIC FROM 1951 TO 1964. TOPICS DESCRIBED INCLUDE,
UNDER NUCLEAR INSTRUMENTATION - RADIOLOGICAL, BIOLOGICAL, METEOROLOGICAL, AND REACTOR
INSTRUMENTATION, PLUS CHEMICAL-PROCESS AND RESEARCH INSTRUMENTS. ALSO INCLUDED IN THE REPORT
ARE SECTIONS ON OPTICS, SYSTEM ANALYSIS AND ANALOG SIMULATION, AND DIGITAL DATA AND CONTROL
SYSTEMS.

*INSTRUMENTATION, GENERAL + COMPUTER, ANALOG + COMPUTER, DIGITAL + CONTROL SYSTEM +
INSTRUMENTATION, METEOROLOGICAL + INSTRUMENTATION, NUCLEAR + INSTRUMENTATION, PROCESS

9-12121 INMAN JE + KNOWLES DJ
DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION ALARM SYSTEMS INSTALLED IN THE HIGH RADIATION LEVEL
EXAMINATION LABORATORY BUILDING 3525
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
ORNL-TM-1251 +. 21 PAGES, 3 TABLES, AUGUST 26, 1965, CFSTI \$1.00 CY, \$0.50 MN

FACILITY RADIATION AND CONTAMINATION ALARM SYSTEMS WERE INSTALLED IN THE HIGH RADIATION LEVEL
EXAMINATION LABORATORY (BUILDING 3525) TO CONTINUOUSLY AND AUTOMATICALLY MONITOR THE
BETA-GAMMA RADIATION LEVEL, AIR-CONTAMINATION LEVEL, AND NEUTRON LEVEL IN THE ENTIRE FACILITY
AND TO REPORT THE INFORMATION TO A CENTRAL CONTROL PANEL IN THE FIRST-LEVEL OPERATING AREA.
WARNING AND EVACUATION SYSTEMS GIVE VISUAL AND AUDIBLE NOTICE OF DETECTED INCIDENTS.

*MONITOR, RADIATION, AIR + *MONITOR, RADIATION, ENVIRONMENTAL + *PERSONNEL PROTECTIVE DEVICE +
CHAMBER, ION + DOSE MEASUREMENT, EXTERNAL + MONITOR, RADIATION, BACKGROUND

9-12123 FERGUSON WF
EGCR CONTROL ROD DRIVE ENVIRONMENTAL TEST
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
ORNL-TM-1026 +. 57 PAGES, 13 FIGURES, 11 TABLES, 7 REFERENCES, JUNE 1965, CFSTI \$3.00 CY, \$2.00 MN

TO ENSURE RELIABLE OPERATION OF CONTROL-ROD DRIVES, THEY WERE THOROUGHLY TESTED IN AN
ENVIRONMENT SIMILAR TO THAT OF THE REACTOR IN WHICH THEY ARE TO BE USED. A PROTOTYPE OF THE
CONTROL-ROD-DRIVE MECHANISM THAT WAS PROPOSED FOR USE IN THE EXPERIMENTAL GAS COOLED REACTOR
HAS BEEN SUBJECTED TO SUCH A TEST PROGRAM. DURING ENVIRONMENTAL TESTING, THE RODS FAILED TO
SCRAM DUE TO FAILURE OF A CLUTCH TO RELEASE. AFTER BEING REASSEMBLED, THE RODS SCRAMMED
CORRECTLY. IT IS CONCLUDED THAT THE ROD DRIVE MEETS THE FUNCTIONAL REQUIREMENTS OF THE
DESIGN SPECIFICATIONS.

*EGCR (EXPERIMENTAL GAS COOLED REACTOR) + *TEST, CONTROL ROD DRIVE + CONTROL ROD SCRAM MECHANISM +
FAILURE, SCRAM MECHANISM + INSTRUMENTATION, CONTROL + INSTRUMENTATION, CONTROL +
INSTRUMENTATION, TESTING + REACTOR, GAS COOLED + REACTOR, GRAPHITE MODERATED + TEST, SYSTEM OPERABILITY

9-12125 BORKOWSKI CJ + HARRILL CS
INSTRUMENTATION AND CONTROLS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING SEPT. 1, 1964
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
ORNL-3782 +. 158 PAGES, FIGURES, TABLES, AUGUST 1965, CFSTI \$5.00 CY, \$1.00 MN.

A PROGRESS REPORT WHICH COVERS NANOSECOND CIRCUITRY AND TECHNIQUES, PULSE COUNTING AND
ANALYSIS, ELECTROMETERS AND ACCESSORIES, MISCELLANEOUS ELECTRONICS DEVELOPMENTS,
INSTRUMENTATION FOR AUTOMATIC CONTROL OF RESEARCH EQUIPMENT INSTRUMENTATION FOR BIOMEDICAL
RESEARCH, RADIATION MONITORS AND COMPONENTS, RADIATION-MONITORING SYSTEM, DATA COLLECTION AND
ANALYSIS, PROCESS-INSTRUMENTATION-AND-CONTROLS-SYSTEMS ENGINEERING, PROCESS INSTRUMENTATION
DEVELOPMENT, REACTOR-INSTRUMENTATION-AND-CONTROLS ANALYSIS,
REACTOR-INSTRUMENTATION-AND-CONTROLS DEVELOPMENT, INSTRUMENTATION FOR REACTOR OPERATION,
SUPPORT FOR THE HIGH-VOLTAGE ACCELERATOR PROGRAM.

*INSTRUMENTATION, GENERAL + *ORNL (OAK RIDGE NATIONAL LABORATORY) + CONTROL SYSTEM + COUNTER +
HFIR (HIGH FLUX ISOTOPE REACTOR) + INSTRUMENTATION, PROCESS + INSTRUMENTATION, RADIATION MONITORING +
MSRE (MOLTEN SALT REACTOR EXPERIMENT) + REACTOR, MOLTEN SALT + REACTOR, RESEARCH + REACTOR, TEST

9-12126 INSTRUMENTATION AND CONTROLS DIVISION. ANNUAL PROGRESS REPORT FOR PERIOD ENDING SEPTEMBER 1,
1963
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12126 *CONTINUED*
ORNL-3578 +. 135 PAGES, FIGURES, TABLES, JUNE 1964, CFSTI \$2.75 CY

TOPICS COVERED IN THIS PROGRESS REPORT INCLUDE BASIC INSTRUMENTATION, ELECTRONIC SYSTEMS AND COMPONENTS, RADIATION-MONITORING SYSTEMS, RADIATION-DETECTION INSTRUMENTS AND COMPONENTS, DATA HANDLING AND COMPUTATION, PROCESS-INSTRUMENTATION-AND-CONTROL-SYSTEMS ENGINEERING, REACTOR-INSTRUMENTATION-AND-CONTROL DEVELOPMENT (NUCLEAR INSTRUMENTATION, PROCESS INSTRUMENTATION, COMPONENTS AND MATERIALS), AND SUPPORT FOR THE HIGH-VOLTAGE ACCELERATOR PROGRAM.

*COMPUTER PROGRAM + *ORNL (OAK RIDGE NATIONAL LABORATORY) + CONTROL SYSTEM + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, CONTROL + INSTRUMENTATION, GENERAL + INSTRUMENTATION, PROCESS + INSTRUMENTATION, RADIATION MONITORING + INSTRUMENTATION, TESTING

9-12128 ROUX DP + FAIRSTEIN E + HANAUER SH + GUERRANT GC + KAUFMAN JL
A MINIATURIZED FISSION CHAMBER AND PREAMPLIFIER ASSEMBLY (Q-2617) FOR HIGH-FLUX REACTORS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
ORNL-3699 +. 15 PAGES, 5 FIGURES, OCTOBER 1964, CFSTI \$0.50 CY

AN ARTICULATED ASSEMBLY CONSISTING OF A FISSION CHAMBER, A PREAMPLIFIER, AND FLEXIBLE CABLES HAS BEEN DEVELOPED TO MEET THE SPACE AND ENVIRONMENTAL REQUIREMENTS OF HIGH FLUX REACTORS. THIS ASSEMBLY, WHICH HAS AN IN-SERVICE LIFE GREATER THAN 1 YEAR AND LOW NOISE-PICKUP PERFORMANCE, IS PARTICULARLY SUITED AS PART OF A REACTOR COUNTING CHANNEL. THE ENTIRE ASSEMBLY IS WATERPROOF AND CAN OPERATE CONTINUOUSLY AT 100 C. ITS MAXIMUM OUTSIDE DIAMETER IS 3/4 IN., AND ITS MAXIMUM RIGID LENGTH IS 1 FT.

*CHAMBER, FISSION + INSTRUMENTATION, NUCLEAR + MEASUREMENT, REACTIVITY

9-12130 MOORE EA + PECKINPAUGH CL
ON-LINE SHIM ROD CALIBRATION
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-9511 +. 21 PAGES, 6 FIGURES, AUGUST 1, 1964, CFSTI \$0.50 CY

A TECHNIQUE FOR CALIBRATING SHIM RODS WHEN ON-LINE, USING AN ANALOG REACTOR SIMULATOR, WAS PROVEN FEASIBLE. THIS NEW METHOD INCREASES PLANT AVAILABILITY, ELIMINATES OPERATIONAL HAZARDS, AND USES INEXPENSIVE ANALOG EQUIPMENT. IT IS NOT NECESSARY TO ATTACH SPECIAL DEVICES TO DRIVE THE CONTROL ROD OR TO LEAVE A PILE OSCILLATOR IN THE REACTOR CORE. AN ACCURACY OF PLUS OR MINUS 5 PERCENT, COMPARED WITH RESOLUTION OF PLUS OR MINUS 2 PERCENT OBTAINED WHEN USING ZERO POWER PERIOD MEASURING TECHNIQUES, WAS DEMONSTRATED WITH SRE CORE II. IT IS PREDICTED THAT AN ACCURACY OF PLUS OR MINUS 3 PERCENT CAN BE ACHIEVED FOR THE SRE CORE III. THIS IS SUFFICIENT TO MAINTAIN AN ACCURATE REACTIVITY HISTORY PROGRAM FOR MONITORING CORE NORMALCY WITHOUT DISRUPTING REACTOR OPERATION.

*CONTROL ROD CALIBRATION + *SRE (SODIUM REACTOR EXPERIMENT) + COMPUTER, ANALOG + INSTRUMENTATION, TESTING + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED + TEST, PLANT RESPONSE

9-12132 GILES S + MARCUS AA
SNAP 8 CONTROL-DRUM ACTUATORS
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-9645 +. 30 PAGES, 24 FIGURES, 3 TABLES, DECEMBER 15, 1964, CFSTI \$2.00 CY

DESIGN, DEVELOPMENT, AND TEST RESULTS TO DATE ON ELECTROMAGNETIC ACTUATORS FOR THE SNAP-8 CONTROL-DRUM DRIVE SYSTEM ARE SUMMARIZED. THE ACTUATOR DEVELOPMENT IS AN EXTENSION OF THE EARLIER ACTUATOR DEVELOPMENT WORK PERFORMED FOR THE SNAP 10 SYSTEM. THE ENVIRONMENTAL AND OPERATIONAL REQUIREMENTS OF THE SNAP 8 SYSTEM ESTABLISHED THE NEED FOR ACTUATORS WHICH WOULD PERFORM RELIABLY, WITH GREATER TORQUE, LONGER LIFE, AND TOLERANCE TO HIGHER LEVELS OF IRRADIATION, TEMPERATURE, SHOCK, AND VIBRATION. THREE MODELS ARE DISCUSSED - TWO INDIRECT-DRIVE MODELS, THE S8DRM-1 AND S8DS ACTUATORS, AND A DIRECT-DRIVE BACKUP DESIGN, THE 0.5 DEGREE-STEP ACTUATOR, WHICH HAS A HIGH TORQUE-TO-VOLUME RATIO.

*CONTROL ROD DRIVE + *SNAP 8 (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + CONTROL SYSTEM + EQUIPMENT DESIGN + REACTOR, SPACE

9-12133 ROBINSON MN + KIMBLE SG + DAVIES NF + WALKER DM
LOW FLUX NUCLEAR RADIATION EFFECTS ON ELECTRONIC COMPONENTS (BMI-LF-2)
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-10284 +. 146 PAGES, 16 FIGURES, 6 TABLES, APRIL 20, 1965, CFSTI \$4.00 CY

THE SECOND OF A SERIES OF IRRADIATION EXPERIMENTS ON ELECTRONIC DEVICES INTENDED FOR SNAP REACTOR CONTROL SYSTEMS IS DESCRIBED. SEVERAL DIODE AND TRANSISTOR TYPES, SENSISTORS, CAPACITORS, AND AN OSCILLATOR FROM A PROTOTYPE SNAP 10A STARTUP CONTROLLER WERE IRRADIATED TO 3 TIMES 10(15TH) NVT (GREATER THAN 0.1 MEV) AND 5 TIMES (8TH) R (GAMMA) AT THE BATTELLE MEMORIAL INSTITUTE RESEARCH REACTOR. RESULTS ARE PRESENTED OF IN-PILE MEASUREMENTS OF THE CRITICAL ELECTRICAL CHARACTERISTICS, IN THE FORM OF GRAPHS PRODUCED BY A COMPUTER.

*INSTRUMENTATION, COMPONENT + *RADIATION DAMAGE + IN CORE MEASUREMENT + IRRADIATION TESTING + REACTOR, SPACE + RELIABILITY, COMPONENT + SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER)

9-12134 BABBE EL
INCREASING THERMOCOUPLE RELIABILITY FOR IN-PILE EXPERIMENTS

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12134 *CONTINUED*
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-10511 +. 43 PAGES, 19 FIGURES, 9 TABLES, 1 REFERENCE, APRIL 20, 1965, CFSTI \$2.00 CY

AS TEMPERATURE AND REACTOR-RESIDENCE-TIME REQUIREMENTS FOR IN-PILE EXPERIMENTS INCREASE, THERMOCOUPLE FAILURES HAVE BECOME MORE NUMEROUS. BECAUSE THERMAL-CYCLING CONDITIONS CAUSE FAILURE RATES TO INCREASE, LABORATORY-PRODUCED THERMAL-SHOCK TESTS WERE PERFORMED. THE RESULTS INDICATE THAT INCREASED RELIABILITY CAN BE OBTAINED BY USING THERMOCOUPLES MADE WITH INSULATION OF INCREASED DENSITY AND/OR A LOW-THERMAL-EXPANSION SHEATH.

*INSTRUMENTATION, TEMPERATURE + *RELIABILITY, COMPONENT + ATOMICS INTERNATIONAL + IN PILE EXPERIMENT

9-12156 BRIGGS RB
MOLTEN-SALT REACTOR PROGRAM SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1964
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3708 +. 395 PAGES, 62 TABLES, 216 FIGURES, 128 REFERENCES, NOVEMBER 1964, CFSTI \$7.04

FOR THE SEMIANNUAL PROGRESS REPORT FOR THE MOLTEN-SALT REACTOR EXPERIMENT (MSRE), A SECTION IS INCLUDED ON INSTRUMENTATION AND CONTROL. SECTIONS ARE INCLUDED ON TEMPERATURE INSTRUMENTATION, PROCESS MEASUREMENTS, NUCLEAR INSTRUMENTS (THREE TYPES OF NEUTRON SENSORS), ROD DRIVES, SAFETY SYSTEM, REACTOR-SYSTEM CONTROL, LOAD CONTROL, CIRCUIT JUMPING, PROCESS RADIATION MONITORING, HEALTH PHYSICS MONITORING, DATA-LOGGER-COMPUTER, BERYLLIUM MONITORING. A SECTION ON THE CONTROL-ROD SYSTEM IS ALSO INCLUDED UNDER THE COMPONENT-DEVELOPMENT CHAPTER.

*CONTROL ROD + *CONTROL SYSTEM + *INSTRUMENTATION, CONTROL + *MSRE (MOLTEN SALT REACTOR EXPERIMENT) + BERYLLIUM + COMPUTER, DIGITAL + CONTROL ROD DRIVE + INSTRUMENTATION, NUCLEAR + INSTRUMENTATION, TEMPERATURE + REACTOR SAFETY SYSTEM + REACTOR, MOLTEN SALT + SERVOMECHANISM

9-12157 OAKES LC
A REACTIVITY COMPUTER FOR USE WITH NUCLEAR REACTOR CONTROL SYSTEMS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3685 +. 45 PAGES, 7 FIGURES, 2 TABLES, SEPTEMBER 1964, CFSTI \$1.25 CY

AN ELECTROMECHANICAL ANALOG COMPUTER FOR COMPUTING RELATIVELY SLOW CHANGES IN REACTIVITY IN A HIGH-POWER-DENSITY THERMAL REACTOR IS DESCRIBED. ANALYTIC EXPRESSIONS IN THE FORM OF DIFFERENTIAL EQUATIONS DESCRIBING FISSION PRODUCT POISONING AND FUEL DEPLETION ARE GIVEN. THE ANALOG COMPUTER HAS BEEN DESIGNED TO PROVIDE SOLUTIONS TO THESE DIFFERENTIAL EQUATIONS. DESIGN CRITERIA ARE GIVEN. A FUNCTIONAL BLOCK DIAGRAM AND CONSIDERABLE DESIGN DETAILS OF THE COMPUTER ARE ALSO GIVEN. RESULTS OF SEVERAL TESTS INDICATE THAT THE PERCENTAGE OF ERROR IN COMPUTED REACTIVITY IS NO GREATER THAN 3.2. THIS MAXIMUM ERROR OCCURRED IN AN OVERALL OPERATING TIME OF 8.85 HOURS.

*COMPUTER, ANALOG + *CONTROL SYSTEM + *MEASUREMENT, REACTIVITY + FUEL BURNUP + MATHEMATICAL STUDY + REACTOR, THERMAL + TEMPERATURE COEFFICIENT + XENON

9-12202 APPENDIX III 1 - PRINCIPAL MAINTENANCE PERFORMED
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
1 PAGE, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGE 1 OF APPENDIX III FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966, PDR

THE ROD DRIVES ON ACCUMULATOR 8 FAILED TO SCRAM ON A QUARTERLY TEST. THE MASTER SCRAM SOLENOID VALVES, MODIFIED DURING THE 1965 REFUELING OUTAGE, WERE REPLACED TWICE, WITHOUT FUNCTIONING PROPERLY. TESTING REVEALED THAT THE SOLENOID CORE WOULD NOT MOVE BECAUSE THE PILOT GUIDE TUBE BENT WHEN THE COVER WAS TIGHTENED, AS A SLIGHT ROTATIONAL MISALIGNMENT OF COVER AND CASE EXISTED. OTHER DRIVES WERE CHECKED. THE VALVE-INSTALLATION MANUAL DID NOT WARN OF THE EFFECTS OF THIS MISALIGNMENT. THE VENDOR WILL NOW USE DECALS TO SHOW PROPER ALIGNMENT, AND IS CONSIDERING MODIFYING THE VALVE DESIGN.

*FAILURE, INSTALLATION ERROR + *FAILURE, SCRAM MECHANISM + *OPERATIONS SUMMARY FOR AEC + CONTROL ROD DRIVE + HUMBOLDT BAY + MAINTENANCE AND REPAIR + REACTOR, BOILING WATER

9-12203 APPENDIX III. 2 AND 5 - PRINCIPAL MAINTENANCE PERFORMED
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 2-3 OF APPENDIX III FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16 THROUGH AUGUST 15, 1966, PDR

A LOG-N NEGATIVE-HIGH-VOLTAGE SUPPLY SHORTED, AND THE SPARE SUPPLY COULD NOT SUPPLY MORE THAN 250 VOLTS (NORMALLY 800) BECAUSE OF LOW CABLE RESISTANCE. THE READING WAS UNAFFECTED BECAUSE OF HIGH NEUTRON-TO-GAMMA CURRENT RATIO. A STARTUP CHANNEL WAS FOUND FAILED ON A TEST RESTART, AS A MICROSWITCH FAILURE ALLOWED THE CHAMBER OVERTRAVEL TO BREAK THE SIGNAL CABLES. ON A MONTHLY DIESEL TEST, THE ENGINE TRIPPED OUT ON HIGH TEMPERATURE BECAUSE OF LOW-RADIATION-WATER CONTENT. TESTING IS NOW BIWEEKLY. LATER, A LOW-BATTERY-VOLTAGE CONDITION DID NOT ALLOW A START ON TEST. THE REVERSE CURRENT RELAY CONTACT (IN THE VOLTAGE REGULATOR) STUCK, CAUSING THE BATTERY TO DISCHARGE.

*FAILURE, DESIGN ERROR + *FAILURE, INSTRUMENT + *OPERATIONS SUMMARY FOR AEC + EMERGENCY POWER, ELECTRIC + GENERATOR, DIESEL + HUMBOLDT BAY + INSTRUMENTATION, INTERMEDIATE RANGE + INSTRUMENTATION, STARTUP RANGE + REACTOR, BOILING WATER

9-12225 DRESDEN ASKS CHANGE IN CONTROL ROD DRIVE INSPECTION FREQUENCY

ACCESSION NUMBER 9-12134 TO 9-12225

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12225 *CONTINUED*
COMMONWEALTH EDISON COMPANY
2 PAGES, AUGUST 9, 1966, DOCKET NO. 50-10, PDR

DRESDEN REQUESTS THAT THE TIMING OF THE THOROUGH EXAMINATION OF TWO CONTROL-ROD DRIVE MECHANISMS BE CHANGED FROM EVERY MONTH TO EVERY REFUELING OUTAGE. NORMALLY, THE OPERATING CYCLE IS 12-18 MONTHS, BUT REPLACEMENT OF TYPE-II FUEL EXTENDS IT TO 19-20 MONTHS.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTROL ROD DRIVE + DRESDEN 1 + DRESDEN 2 + EXAMINATION + REACTOR, BOILING WATER

9-12240 SELECTED OPERATING EXPERIENCES
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT
8 PAGES, 3 TABLES, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 23 PAGES 7-14, FEBRUARY 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - AFTER THE FEBRUARY 15 OUTAGE, THE COOLANT LOOPS WERE AT 150 F, WHILE THE REACTOR WATER WAS AT 500 F. LOOP-1 FLOW WAS ABNORMALLY LOW, AND EXTENSIVE TESTING SHOWED INTERNAL LEAKAGE BETWEEN THE PIEZOMETER RINGS, SO THE LOW-FLOW ALARM SETPOINT WAS CHANGED. THE LOWER PORTION OF THE WATER-LEVEL COLUMN WAS OBSERVED, AND WHEN THE COLUMN-RECIRCULATION VALVE WAS OPENED MORE, THE COLUMN BOTTOM HEATED UP TO F, THE INDICATED WATER LEVEL INCREASED SLOWLY, AND THE ACTUAL WATER LEVEL DECREASED 12 INCHES. THIS APPARENTLY ELIMINATED 2000 LB/HR OF CARRYOVER, CAUSING THE AVERAGE (SUPERHEATED) STEAM TEMPERATURE TO RISE 16.6 F TO 900 F. VARIOUS OTHER INSTRUMENTATION PROBLEMS ARE NOTED, LOW-WATER-LEVEL ALARMS, PERIOD ALARMS, EMERGENCY CONDENSER OPERATION INITIATED WHEN A SWITCH SET-SCREW LOOSENEED.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + FAILURE, INSTRUMENT + INSTRUMENTATION, FLOW + INSTRUMENTATION, LIQUID LEVEL DETECTION + OPERATING EXPERIENCE + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + STEAM

9-12244 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR APRIL, 1966
COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT + PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO
18 PAGES, 5 FIGURES, 8 TABLES, APRIL 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - BONUS WAS SHUTDOWN MOST OF THE MONTH WHEN AN EXPLOSIVE MIXTURE OF HYDROGEN AND OXYGEN WAS DETECTED IN CONTROL-ROD-RACK HOUSINGS. A VENT LINE WAS DESIGNED, AND A TEST INDICATED A 0.05 SEC DELAY ON INSERTION DURING A SIMULATED VENT LINE BREAK. DURING CONTROL ROD BREAKAWAY TORQUE TESTS, 3 RODS FAILED TO SCRAM A TOTAL OF 11 TIMES. SEAL WATER PUMP PACKING WAS CHANGED TO BUNA-N, WHEN TEFLON-ASBESTOS SHOWN TO SCORE COLMONOY PLUNGERS. BECAUSE OF CONTINUED TROUBLE WITH STATIC INVERTER, AN M-G SET IS BEING CONSIDERED. POWER DISTRIBUTION CALCULATIONS REPORTED.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTROL ROD DRIVE + EMERGENCY POWER, ELECTRIC + FAILURE, SCRAM MECHANISM + OPERATING EXPERIENCE + POWER DISTRIBUTION + RADIOLYTIC GAS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

9-12247 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR JUNE 1966
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT
18 PAGES, 5 FIGURES, 2 TABLES, JUNE 1966, DOCKET NO. 115-4, PDR

BONUS REMAINED SHUT DOWN TO WORK ON CONTROL-ROD PROBLEMS. THE CRACKED AND WARPED CENTRAL ROD WAS REPLACED AND WILL BE SECTIONED FOR ANALYSIS. SEVERAL RODS WERE GIVEN GAMMA SCANS FOR CO-58 TO DETERMINE RELATIVE FAST NEUTRON DOSES. CONTROL ROD DRIVE THREAD CRACKING MAY BE DUE TO DIFFERENTIAL EXPANSION OF RACK NUTS. FALSE SCRAM ANNUNCIATION OF A LOW-REACTOR-WATER-LEVEL SCRAM WAS DUE TO MISSING WASHERS (BETWEEN THE FLOAT-ROD AND THE MERCURIO BRACKET), WHICH ALLOWED MERCURIO ASSEMBLY VIBRATION. APPENDIX A IS A DESCRIPTION OF THE CONTROL-ROD-HOUSING VENT SYSTEM AND AN ANALYSIS OF POTENTIALLY HAZARDOUS CONDITIONS RESULTING FROM VENT-SYSTEM FAILURES.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTROL ROD BURNUP + CONTROL ROD DRIVE + RADIOLYTIC GAS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SCRAM, SPURIOUS + VENTILATION SYSTEM

9-12249 BONUS PROPOSED TECHNICAL SPECIFICATIONS CHANGES 1 AND 2
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO
3 PAGES, AUGUST 2, 1966, DOCKET NO. 115-4, PDR

BONUS REQUESTS (1) ALLOWING REACTOR TO OPERATE UNTIL CONSULTANT CAN ADVISE ON ACRS-RECOMMENDED CHANGES TO REACTOR SAFETY SYSTEM. REVIEW SCHEDULED FOR COMPLETION APRIL 30, 1967, AFTER WHICH COMPONENT PROCUREMENT AND INSTALLATION WILL BE REQUIRED. (2) CRITICALITY EXPERIMENT, UPPER-PRESSURE LIMIT SHOULD BE CHANGED FROM 900 PSIG TO 950, TO ALLOW DATA GATHERING AS CLOSE TO ACTUAL CONDITIONS AS POSSIBLE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ACRS (ADVISORY COMMITTEE ON REACTOR SAFEGUARDS) + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CRITICALITY EXPERIMENT + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12250 BONUS CHANGE 1 TO TECHNICAL SPECIFICATIONS
ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING, WASHINGTON, D. C.
4 PAGES, AUGUST 12, 1966, DOCKET NO. 115-4, PDR

CRITICALITY EXPERIMENTS MAY BE PERFORMED FROM 0-950 PSIG, AND (PERMANENT) REACTOR PROTECTIVE SYSTEM MODIFICATIONS SHALL BE COMPLETED NO LATER THAN JULY 1, 1967. AS NOTED IN STAFF SAFETY EVALUATION DATED JUNE 6, 1966, A BACKUP SCRAM-RELAY SYSTEM HAS BEEN ADDED TO CAUSE A SCRAM WHEN EITHER OF TWO ELECTRONIC SCRAM CHANNELS ARE TRIPPED.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION +
BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + INSTRUMENTATION, COINCIDENT + REACTOR SAFETY SYSTEM +
REACTOR, BOILING WATER + REACTOR, SUPERHEAT + REDUNDANCE

9-12253 LEIRY DW
CONTROL ASPECTS OF A LARGE, DUAL-PURPOSE NUCLEAR REACTOR PLANT
GENERAL ELECTRIC, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
RL-NRD-105 +. 39 PAGES, 12 FIGURES, DECEMBER 1964, CFSTI \$4.00 CY, \$1.00 MN

FOR A BRIEF DESCRIPTION OF THE N-REACTOR PLANT AS BACKGROUND INFORMATION THE GENERAL CONTROL REQUIREMENTS ARE DEVELOPED. MAJOR ATTENTION IS DEVOTED TO DESCRIPTIONS OF SPECIFIC CONTROL REQUIREMENTS, DESIGN OF SYSTEMS TO MEET THESE REQUIREMENTS, AND THE PERFORMANCE OF THESE SYSTEMS IN THEORY AND PRACTICE AS INDICATED BY ANALYTICAL STUDIES AND BY ACTUAL PLANT OPERATION. INCLUDED ARE DESCRIPTIONS OF THE REACTOR CONTROL ROD DRIVES, THE PRIMARY COOLANT FLOW, PRESSURE, AND INVENTORY CONTROLS, THE STEAM GENERATOR LEVEL CONTROLS, THE SECONDARY SYSTEM PRESSURE, FLOW, AND WATER INVENTORY CONTROLS, AND METHODS OF DETERMINING BOTH OPERATING LIMITS AND PERFORMANCE CRITERIA.

*CONTROL SYSTEM + CONTROL ROD DRIVE + INSTRUMENTATION, CONTROL + MAIN COOLING SYSTEM +
NPR (HANFORD NEW PRODUCTION REACTOR) + REACTOR, GRAPHITE MODERATED + REACTOR, PRESSURE TUBE

9-12254 STATUS OF INSTRUMENT DEVELOPMENT FOR THE SNAP-50 REACTOR TEST PROGRAM
PRATT AND WHITNEY AIRCRAFT, MIDDLETOWN, CONNECTICUT
PWAC-473 +. 153 PAGES, 11 FIGURES, 42 REFERENCES, SEPTEMBER 1965.

THIS REPORT SUMMARIZES THE STATUS AS OF TERMINATION OF INSTRUMENT DEVELOPMENT WORK PERFORMED UNDER CONTRACT AT(30-1)-2789. THE WORK PERFORMED WAS DIRECTED AT MEETING INSTRUMENT REQUIREMENTS FOR THE SNAP-50 PROGRAM. THIS INCLUDES THE REACTOR FUEL DEVELOPMENT PROGRAM, REACTOR AND COMPONENT DEVELOPMENT TEST, MATERIALS DEVELOPMENT, AND THE CB-1 ZR ALLOY FABRICATION EFFORT AT CANEL SUPPORTING THE GENERAL SNAP-50 PROGRAM. SOME PHASES OF THE WORK HAVE ULTIMATE APPLICATION OF FLIGHT POWER PLANT SYSTEMS, WHILE THE BULK OF THE WORK RELATES TO MEETING THE SEVERE REQUIREMENTS OF THE DEVELOPMENT TEST PROGRAM.

*CHAMBER, FISSION + *INSTRUMENTATION, PROCESS + *INSTRUMENTATION, TEMPERATURE +
*SNAP 50 (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + CHAMBER, COMPENSATED + CHAMBER, ION + FUEL ELEMENT +
INSTRUMENTATION, GENERAL + METAL, LIQUID + REACTOR, SPACE

9-12256 HELTEMES CJ
REACTOR CONTROL MECHANISMS
UNITED STATES ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR DEVELOPMENT
WASH-1054(PTL) +. 191 PAGES, 4 TABLES, 24 FIGURES, SEPTEMBER 1964, PROCEEDINGS OF THE MEETING ON FAST REACTOR CONTROL MECHANISMS, HELD AT ATOMIC ENERGY COMMISSION HEADQUARTERS BUILDING GERMANTOWN, MARYLAND, SEPTEMBER 16 AND 17, 1964, CFSTI \$5.00

IN SEPTEMBER 1964, THE U.S. AEC HELD AN INFORMAL MEETING TO DISCUSS AND EXAMINE A NUMBER OF FAST-REACTOR CONTROL SYSTEMS. THE PURPOSE OF THE MEETING WAS TO COORDINATE THE EFFORTS OF VARIOUS CONTRACTORS NOW ENGAGED IN THE DEVELOPMENT OF SUCH SYSTEMS AND TO ACQUAINT COMMISSION PERSONNEL AND CONTRACTORS WITH THE EQUIPMENT AND TECHNIQUES. THE FOLLOWING PAPERS CAME OUT OF THE CONFERENCE - FAST-REACTOR-CONTROL FUNDAMENTALS, EBR-I CONTROL-DRIVE MECHANISMS, EBR II CONTROL DRIVES, FARET CONTROL DRIVES, SEFOR CONTROL-DRIVE SYSTEM, LAMPRE I CONTROL-ELEMENT-DRIVE AND FERMI CONTROL RODS.

*CONTROL ROD + *CONTROL ROD DRIVE + *CONTROL SYSTEM + *REACTOR, FAST +
EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS) + FARET (FAST ARGONNE REACTOR EXPERIMENT TEST) + FERMI +
LAMPRE 1 (LASL MOLTEEN PU REACTOR EXPERIMENT) + REACTOR, BREEDER + REACTOR, FAST +
REACTOR, LIQUID METAL COOLED + SEFOR (SOUTHWEST EXP. FAST OXIDE REACTOR)

9-12258 KAUFMAN SF
FABRICATION DEVELOPMENT OF BORON CARBIDE AND BORON CARBIDE + SILICON CARBIDE MIXTURES FOR POSSIBLE APPLICATION AS LUMPED BURNABLE POISONS IN PWR-2
WESTINGHOUSE ELECTRIC CORPORATION, BETTIS ATOMIC POWER LABORATORY, PITTSBURGH
WAPD-244 +. 43 PAGES, 39 FIGURES, 24 TABLES, 13 REFERENCES, JANUARY 1964, CFSTI \$1.00 CY

WAFERS HAVING DENSITIES GREATER THAN 99 PERCENT THEORETICAL WERE PRODUCED FROM B4C AND SIC POWDER MIXTURES RANGING FROM 0 TO 80 VOL. PERCENT SIC. THE EFFECTS OF STARTING POWDER PURITY AND SIZE, BLENDING AND HOT PRESSING VARIABLES, VOLUME FRACTION OF SIC UPON DENSITY, AND MICROSTRUCTURE ARE PRESENTED. THE EFFECT OF DENSITY, B4C PARTICLE SIZE AND VOLUME FRACTION UPON THE CORROSION BEHAVIOR IN 680 F WATER IS GIVEN. FACTORS AFFECTING THE PREPARATION OF HOT-PRESSED B4C CONTAINING BORON ENRICHED OR DEPLETED IN THE ISOTOPE B-10 ARE ALSO DISCUSSED.

*POISON, BURNABLE + *REACTOR, PRESSURIZED WATER + BORON + CARBIDE + COPPER + CORROSION + FABRICATION +
FUEL ELEMENT + SILICON

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12261 COWAN CL
MEASUREMENT OF THE LIVERMORE POOL-TYPE REACTOR (LPTR) TRANSFER FUNCTION USING REACTOR OSCILLATION TECHNIQUES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-12476 +. 23 PAGES, 10 FIGURES, 6 REFERENCES, MARCH 30, 1965, CFSTI \$2.00 CY, \$0.50 MN

THE TRANSFER FUNCTION OF THE LIVERMORE POOL TYPE REACTOR WAS MEASURED WITH THE AID OF A PILE OSCILLATOR MECHANISM. A DESCRIPTION OF THE OSCILLATOR CONSTRUCTION IS PRESENTED AND THE EXPERIMENTAL TRANSFER-FUNCTION CURVES FOR PHASE LAG AND AMPLITUDE ARE INDICATED. THE BREAK FREQUENCY OF THE TRANSFER FUNCTION WAS DETERMINED FROM THE MEASURED CURVES AND THE RATIO OF THE EFFECTIVE DELAYED NEUTRON FRACTION TO THE EFFECTIVE NEUTRON LIFETIME WAS FOUND TO BE 88 (PLUS-OR-MINUS 4) RECIPROCAL SECONDS. THE TRANSFER FUNCTION WAS MEASURED WITH BOTH BARE AND CADMIUM-COVERED DETECTORS. THE FREQUENCY-RESPONSE MEASUREMENTS WERE FOUND TO BE IDENTICAL FOR BOTH DETECTORS.

*REACTOR, POOL TYPE + *TRANSFER FUNCTION + IN CORE MEASUREMENT + OSCILLATOR, REACTIVITY

9-12263 WESLEY EJ + HOPTON RL
RADIOLOGICAL SEARCH INSTRUMENTATION, TRIESTE I
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA
USNRDL-TR-805 +. 20 PAGES, 1 TABLE, 8 FIGURES, 6 REFERENCES, JANUARY 6, 1965, NUCLEAR INSTRUMENTS AND METHODS 37, PAGES 281-287 (1965), DDC

A GROSS COUNTING SYSTEM FOR MEASURING RADIOACTIVITY IN THE OCEAN, CONSISTING OF A LOG-RATEMETER, RECORDER AND A NA(11) SCINTILLATION DETECTOR, HAS BEEN DEVELOPED AND INSTALLED ON TRIESTE I FOR OPERATION TO A MAXIMUM DEPTH OF 16,000 FEET. ALL PULSES FROM THE DETECTOR EQUIVALENT TO 45 KEV GAMMA-RAY OR MORE GAMMA-RAY ENERGY ARE COUNTED. STATISTICAL FLUCTUATION IN THE BACKGROUND COUNTING RATE FROM NORMAL SEA WATER AND DETECTOR ASSEMBLY COMPONENTS LIMIT THE SENSITIVITY. WITH AN INTEGRATING TIME CONSTANT OF 3.5 SEC AND USING 3 TIMES 10(11TH) CURIE/LITER AS THE GAMMA RAY ACTIVITY IN SEA WATER (K-40), THE MINIMUM DETECTABLE INCREASE IN ACTIVITY FOR 1.47 MEV GAMMA RAYS IS 1.36 TIMES 10(11TH) CURIE/LITER. A PERMANENT RECORD OF THE COUNTING RATE WHICH CAN INDICATE TWO DECADES ABOVE THIS LIMIT IS OBTAINED ON THE STRIP CHART RECORDER.

*MONITOR, RADIATION, LIQUID + *OCEAN AND SEA + INSTRUMENTATION, NUCLEAR

9-12299 CONTROL RODS/AND CONTROL ROD DRIVES FOR THE DRAGON HTGR
FIAT, S.P.A., NUCLEAR ENERGY SECTION, TURIN, ITALY
2 PAGES, 2 FIGURES, KERNTTECHNIK 6(5), PAGES 216-217 (1964)

THE DOCUMENT HAS A BRIEF DESCRIPTION OF CONTROL RODS PROVIDED BY FIAT, S.P.A., THE FIRM DOING REACTOR CONSTRUCTION WORK FOR THE DRAGON REACTOR. THE REPORT IS FOR MAY 1964.

*CONTROL ROD + *DRAGON (UK) + CONTROL ROD DRIVE + REACTOR, GAS COOLED + UNITED KINGDOM

9-12300 TALLMAN CR
CRYOGENIC TEMPERATURE MEASUREMENT IN A NUCLEAR RADIATION ENVIRONMENT
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-DC-6649 + CONF-701-10 +. 12 PAGES, 1964, FROM INSTRUMENT SOCIETY OF AMERICA 19TH ANNUAL INSTRUMENT-AUTOMATION CONFERENCE AND EXHIBIT, NEW YORK, OCTOBER 1964 CFSTI \$1.00 CY

A GENERAL DISCUSSION OF THE EFFECT OF RADIATION ON THE PERFORMANCE OF PLATINUM RESISTANCE THERMOMETERS, COPPER-CONSTANTAN THERMOCOUPLES, AND SOLID STATE DEVICES IS GIVEN. THE RADIATION EFFECTS COVERED INCLUDE RATE PHENOMENA AND INTEGRATED DOSE EFFECTS ON THE PRECISION OF THE MEASUREMENT, PARTICULARLY IN THE CRYOGENIC TEMPERATURE RANGE.

*RADIATION EFFECT + INSTRUMENTATION, TEMPERATURE + MEASUREMENT, TEMPERATURE

9-12301 JAKOBSEN E
NEW TYPE OF SAFETY AMPLIFIERS FOR REACTORS
NORWAY INSTITUTE FOR ATOMENERGI, KJELLER
KR-74 +. 14 PAGES, OCTOBER 1964, DEP. MN

THIS REPORT DESCRIBES A NEW TYPE SAFETY AMPLIFIER CIRCUIT USED IN CONNECTION WITH IONIZATION CHAMBERS. THE CAPACITY OF THE IONIZATION CHAMBER AND ITS COAXIAL CABLE IS USED AS A CAPACITOR WHICH IS CHARGED THROUGH A RESISTOR AND DISCHARGED AS PULSES INTO A TRIP CIRCUIT. THE IONIZATION CURRENT, CAUSED BY THE NEUTRON FLUX, ACTS AS A LOAD RESISTOR ACROSS THE CAPACITOR, AND WHEN THIS LOAD INCREASES, THE PULSE FREQUENCY TO THE TRIP CIRCUIT DECREASES. AT A PRE-SET MINIMUM FREQUENCY THE TRIP CIRCUIT RELEASES.

*CHAMBER, ION + *INSTRUMENTATION, NUCLEAR + NORWAY

9-12302 CLEMENTS FK + FEINAUER E
ANALYSIS OF SAFETY CONSIDERATIONS FOR TRANSIENT TESTING OF PBF PROTOTYPE FUEL RODS IN TREAT
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
IDO-17056 + PTR-690 +. 38 PAGES, APRIL 17, 1964, CFSTI \$2.00 CY

A DESCRIPTION OF THE EXPERIMENT EQUIPMENT AND AN ANALYSIS OF THE SAFETY CONSIDERATIONS PERTINENT TO THE TRANSIENT TESTING OF PBF PROTOTYPE FUEL RODS IN TREAT ARE PRESENTED IN THIS REPORT. THE ANALYSIS INCLUDES AN INVESTIGATION OF THE NUCLEAR EFFECTS OF INSERTING THE

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12302 *CONTINUED*

EXPERIMENT IN THE TREAT FACILITY AND A SUMMARY OF THE CONSEQUENCES OF POSTULATED ACCIDENT SITUATIONS.

*FUEL ELEMENT + *IN PILE EXPERIMENT + *REACTOR SAFETY SYSTEM + *TREAT (TRANSIENT TEST REACTOR FACILITY) + PBF (POWER BURST FACILITY) + REACTOR, GRAPHITE MODERATED + REACTOR, TEST

9-12315 BARTOLI AL + MISSONI G

PRECISION MEASUREMENT WITH FREE-AIR IONIZATION CHAMBER OF THE ISTITUTO SUPERIORE DI SANITA
ISTITUTO SUPERIORE DI SANITA, ROME, ITALY
ISS-64/30 +. 13 PAGES, 5 FIGURES, 1 TABLE, JULY 15, 1964, DEP. MN

IN THIS REPORT ALL THE ERRORS ARISING IN THE MEASUREMENT OF EXPOSURE DOSE WITH A FREE-AIR IONIZATION CHAMBER ARE BRIEFLY REVIEWED. THE CORRECTION FACTORS OBTAINED FROM TESTS AND MEASUREMENTS WITH THE STANDARD CHAMBER DESIGNED AND BUILT IN THE PHYSICS LABORATORY OF THE ISTITUTO SUPERIORE DI SANITA ARE THEN REPORTED.

*AIR + *CHAMBER, ION + ITALY + PRESSURE, EXTERNAL

9-12318 RISSFILL JA

DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION SYSTEM INSTALLED IN OAK RIDGE RESEARCH REACTOR BUILDING 3042
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-943 +. 22 PAGES, 2 TABLES, SEPTEMBER 15, 1964, CFSTI \$1.00 CY

A FACILITY RADIATION AND CONTAMINATION SYSTEM WAS INSTALLED IN THE OAK RIDGE RESEARCH REACTOR BUILDING 3042 TO CONTINUOUSLY AND AUTOMATICALLY MONITOR THE BETA-GAMMA RADIATION LEVEL AND AIR-CONTAMINATION LEVEL IN THE ENTIRE FACILITY AND TO REPORT THIS INFORMATION TO A CENTRAL CONTROL PANEL IN THE REACTOR OPERATION CONTROL ROOM. FIFTEEN MONITRONS AND NINE AIR MONITORS ARE CONNECTED IN THE INSTRUMENT NETWORK. A BUILDING EVACUATION SYSTEM AUTOMATICALLY OPERATES WHEN TWO OR MORE MONITRONS OR TWO OR MORE AIR MONITORS DETECT HIGH LEVEL RADIATION OF AIR CONTAMINATION.

*INSTRUMENTATION, PROTECTIVE + *MONITOR, RADIATION, AIR + *ORR (OAK RIDGE RESEARCH REACTOR) + INSTRUMENTATION, RADIATION MONITORING + REACTOR, GENERAL + REACTOR, TEST + RESEARCH AND DEVELOPMENT PROGRAM

9-12350 CHOCK KJ

CORRELATOR FOR EXTRACTING ROD OSCILLATION SIGNALS FROM NOISE
BETTS ATOMIC POWER LABORATORY, WESTINGHOUSE ELECTRIC CORPORATION
WAPD-BT-31 +. 10 PAGES, 10 FIGURES, 3 REFERENCES, BETTS TECHNICAL REVIEW REACTOR TECHNOLOGY, PAGES 59-68, NOVEMBER 1964, CFSTI \$3.00 CY

AN ELECTRONIC CROSS-CORRELATOR HAS BEEN DEVELOPED WHICH DETERMINES THE RESPONSE OF A REACTOR TO ROD OSCILLATIONS OVER THE RANGE OF 0.01 TO 10 CYCLES PER SECOND, EVEN WHEN CONSIDERABLE NOISE ENERGY EXISTS AT THE OSCILLATOR FREQUENCY. THIS DEVICE REQUIRES NO MODIFICATION OF THE ROD OSCILLATOR OR REACTOR INSTRUMENTATION. THE QUADRATURE COMPONENT, COS OMEGA-T, REQUIRED FOR PHASE SHIFT MEASUREMENTS IS GENERATED INTERNALLY. THE APPARENTLY CONTRADICTIONARY FILTER REQUIREMENTS OF ULTRA-LOW CUTOFF FREQUENCY AND FAST TRANSIENT RESPONSE HAVE BEEN SATISFIED BY THE USE OF AN ACTIVE FILTER IN WHICH THE CUTOFF FREQUENCY CAN BE REDUCED IN THE COURSE OF THE TESTS WITHOUT DISTURBING THE MEASUREMENTS. A LABORATORY PROOF-OF-PRINCIPLE TEST HAS BEEN SUCCESSFULLY CONDUCTED WITH A SIGNAL-TO-NOISE RATIO OF UNITY.

*CONTROL ROD + *NOISE + FILTER + MEASUREMENT, NOISE

9-12351 DUMMER GW + GRIFFIN NB

ELECTRONICS RELIABILITY-CALCULATION AND DESIGN
ROYAL RADAR ESTABLISHMENT, ENGLAND
238 PAGES, FIGURES, TABLES, 1966, PERGAMON PRESS, \$4.50 CY

A CHAPTER ON THE THEORY OF RELIABILITY IS GIVEN. OTHER CHAPTERS INCLUDE METHODS FOR CALCULATING EQUIPMENT AND SYSTEM RELIABILITY, SAFETY AND DERATING FACTORS, RELIABILITY IN CONSTRUCTION, ENVIRONMENTAL EFFECTS, AND THE RELIABILITY OF MICROELECTRONICS. DATA IS GIVEN FOR THE FAILURE RATE OF ELECTRONIC COMPONENTS.

*RELIABILITY ANALYSIS + *RELIABILITY, COMPONENT + *RELIABILITY, SYSTEM + INSTRUMENTATION, GENERAL

9-12352 FURET J

SAFETY PERIOD DURING THE START-UP OF NUCLEAR REACTORS
CENTRE D ETUDES NUCLEAIRES DE SACLAY
ORNL-TR-292 + CEA-R-2411 +. 30 PAGES, 21 FIGURES, 6 REFERENCES, MARCH 1964, JCL \$3.60 FS, \$1.13 MF

THE PURPOSE OF THIS STUDY IS TO COMPLETE THE ANALYSIS OF PROBLEMS ASSOCIATED WITH A NEUTRON TRANSIENT, IN ORDER TO SHOW HOW THE REACTIVITY LIBERATION RATE IN THE SUBCRITICAL STATE CAN BE INCREASED AND STILL BE COMPATIBLE WITH RAPID STARTUP (PROVIDED THAT MEASUREMENTS OF THE POWER OR NEUTRON FLUX CAN BE MADE WITH A GOOD DEGREE OF PRECISION OVER RELATIVELY SHORT INTERVALS). ANOTHER OBJECTIVE IS TO PROPOSE SAFETY APPARATUS WHICH MAY LIMIT THE POWER GENERATION RATE DURING STARTUP OF REACTORS.

*CONTROL SYSTEM + *MEASUREMENT, SUBCRITICALITY + *REACTOR STARTUP TESTING + FLUX DISTRIBUTION +

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-12352 *CONTINUED*
MEASUREMENT, REACTIVITY + PERIOD METER + REACTOR SAFETY SYSTEM

9-12383 HESS JW
DESIGN AND OPERATING EXPERIENCE WITH THE CONTROL AND SAFETY ROD DRIVE MECHANISMS FOR THE ENRICO FERMI FAST BREEDER REACTOR
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT
APDA-301 +. 221 PAGES, 42 FIGURES, 6 TABLES, JUNE 1, 1966, CFSTI \$6.00 CY, \$1.25 MN

TRACES THE EVOLUTION OF THE DESIGN AND POLICY FOR THE CONTROL-ROD DRIVES. TESTING AND OPERATING EXPERIENCE ARE SUMMARIZED. DURING THE FIRST YEAR OF REACTOR OPERATION, ONLY TWO SIGNIFICANT MALFUNCTIONS OCCURRED - FAILURE OF A LATCH BELLOWS ALLOWED SODIUM TO FREEZE ONE SAFETY ROD, AND OPENING A BLOCKING VANE TOO FAST WITH A ROTARY SOLENOID DISTURBED THE LIMIT-SWITCH SETTINGS, SOLVED BY OPENING THE VANE WITH A SMALL GEAR MOTOR. EXPERIENCE WITH THESE UNITS ARE EVALUATED AND SUGGESTIONS MADE FOR IMPROVEMENT. MANY PROBLEMS RESULTED FROM LACK OF OPERATING EXPERIENCE, AND THE MOST SERIOUS DIFFICULTIES CAME FROM NOT TESTING COMPONENTS OR PROTOTYPES IN HOT SODIUM BEFORE ATTEMPTING TO INSTALL THEM IN THE REACTOR. EXPERIENCE TO DATE INDICATES THAT CONSIDERATION SHOULD BE GIVEN TO DETAILING PROCEDURES FOR OPERATION, CALIBRATION, AND TROUBLESHOOTING. 140 PAGES OF APPENDIXES PROVIDE DETAILED SPECIFICATIONS AND CALCULATIONS.

*CONTROL ROD DRIVE + *CONTROL ROD, SHIM SAFETY + *DESIGN STUDY + *OPERATING EXPERIENCE +
CONTROL ROD SCRAM MECHANISM + FAILURE, SCRAM MECHANISM + FERMI + MODIFICATION, SYSTEM OR EQUIPMENT +
REACTOR, FAST + REACTOR, LIQUID METAL COOLED + TEST, CONTROL ROD DRIVE

9-13229 AMENDMENT 11 - TRIGA AMERICIUM SOURCES AND FISSION PRODUCT MONITOR
DIVISION OF REACTOR LICENSING
9 PAGES, NOVEMBER 15, 1966, DOCKET NO. 50-170, PDR

AEC APPROVES SUBSTITUTION OF AN AMERICIUM OXIDE STARTUP SOURCE FOR THE PRESENT POLONIUM-BERYLLIUM ONE, AND REMOVAL OF THE WATER FISSION-PRODUCTS MONITOR. THIS MONITOR HAS BEEN UNSTABLE AND DIFFICULT TO MAINTAIN, WAS THE LAST TO DETECT LEAKING FUEL ELEMENTS IN THE ORIGINAL ALUMINUM-CLAD CORE, AND IS NO LONGER USED IN LATER TRIGA MODELS. THERE ARE TWO OTHER SIMILAR INSTRUMENTS - A CONTINUOUS AIR MONITOR ABOVE THE REACTOR POOL, AND A G-M TUBE IN THE PURIFICATION SYSTEM.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + AMERICIUM +
INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + REACTOR, RESEARCH + SOURCE, NEUTRON +
TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

9-13232 INDIAN POINT I CORE B LOW FLOW TRACED TO CHANGED INSTRUMENT CALIBRATION
CONSOLIDATED EDISON CO. OF NEW YORK
3 PAGES, NOVEMBER 4, 1966, DOCKET NO. 50-3

DURING THE SEPTEMBER 1966 OUTAGE, RESISTANCE TEMPERATURE DETECTORS WERE RECALIBRATED DURING HEATUP. LOOSE CONNECTIONS WERE TIGHTENED. THE RESISTANCE-VS-TEMPERATURE CURVE HAD CHANGED. CORE A DATA WAS REEXAMINED, AND INCLUSION OF THE PROPER SECONDARY MOISTURE CARRYOVER SHOWS THAT CORE PRESSURE DROP, FLOW, AND PUMP CHARACTERISTICS ARE THE SAME FOR CORE A AND B. OXIDE ROUGHENING OF THE CORRUGATED-PLATE SCRUBBERS IN THE STEAM DRUM IMPROVES THEIR MOISTURE-REMOVAL EFFICIENCY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*INSTRUMENTATION, FLOW + *INSTRUMENTATION, TEMPERATURE + *OPERATING EXPERIENCE +
*TEST, SYSTEM OPERABILITY + FLOW ORIFICE OR RESTRICTION + INDIAN POINT 1 + REACTOR, PRESSURIZED WATER +
SCRUBBER + STEAM

9-13338 BRAYER RC + CHERNOCK WP
BURNABLE POISON ADDITIONS TO UO2. PROGRESS REPORT FOR PERIOD JANUARY 1-MARCH 31, 1965
COMBUSTION ENGINEERING INC., WINDSOR, CONNECTICUT
CEND-3107-238 + EURAEC-1438 +. 24 PAGES, MAY 1965, CFSTI

FURTHER ANALYSES HAVE BEEN PERFORMED ON A UO2-B4C FUEL ELEMENT WHICH WAS THERMALLY TESTED UNDER BOTH RADIAL AND AXIAL THERMAL GRADIENTS. A NEW SAMPLING TECHNIQUE WAS EMPLOYED WHICH PERMITTED THE DIVISION OF RADIAL SAMPLES INTO SMALLER VOLUMES OF MATERIAL THAN WAS PREVIOUSLY USED FOR BORON ANALYSES. WITH THIS TECHNIQUE, THE BORON LOSSES, PREDICTED FOR OPEN SYSTEMS, WAS OBSERVED, ESPECIALLY IN THAT REGION OF THE FUEL WHICH WAS OPERATING ABOVE 1350 C. NO SIGNIFICANT BORON MIGRATION WAS DETECTED IN EITHER THE RADIAL OR AXIAL DIRECTIONS IN THE FUEL ELEMENT, INDICATING THAT THE BORON LOSSES WERE CARRIED OFF IN THE FLOWING HELIUM STREAM, VERIFYING EARLIER RESULTS IN OPEN SYSTEMS.

*BORON + *POISON, BURNABLE + *URANIUM DIOXIDE + FUEL ELEMENT

9-13373 REISCH F
STABILITY ANALYSIS OF A SAMPLED-DATA CONTROLLED NUCLEAR REACTOR SYSTEM
AR ATOMENERGI, STOCKHOLM
7 PAGES, 10 FIGURES, NOVEMBER 1966, NUCLEAR SCIENCE AND ENGINEERING 26(3), PAGES 378-384

IN A DIGITAL-COMPUTER-CONTROLLED SYSTEM, SEVERAL VARIABLES CAN BE MONITORED ALMOST SIMULTANEOUSLY, AND THE SYSTEM CAN BE CONTROLLED ACCORDING TO THE MOST CRITICAL ONE.

ACCESSION NUMBER 9-12352 TO 9-13373

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-13373 *CONTINUED*

STABILITY OF SUCH A SAMPLED-DATA CONTROL SYSTEM MAY BE HANDLED BY TRANSFORM. DIGITAL COMPUTER PROGRAM FOR THIS IS DEVELOPED.

COMPUTER, DIGITAL + REACTOR CONTROL

9-13381 DITTMAN GL

SINGLE PULSE TIME-OPTIMAL SOLUTION OF THE REACTOR SHUTDOWN PROBLEM

LAWRENCE RADIATION LABORATORY

UCRL-12261 +. 38 PAGES, 1 TABLE, REFERENCES, DECEMBER 16, 1964, CFSTI \$3.00 CY

THE WORK PRESENTED HERE REPRESENTS TIME-INDEPENDENT XENON AND IODINE VARIATIONS IN A NORMALIZED PHASE PLANE. THIS REPRESENTATION GRAPHICALLY ILLUSTRATES THE ENTIRE RANGE OF THE XENON AND IODINE VALUES FOR EITHER A SCRAM SHUTDOWN OR FULL-POWER EXCURSION. FROM A QUALITATIVE CONSIDERATION OF THE PHASE PLANE CURVES, NECESSARY AND SUFFICIENT GENERAL CRITERIA FOR THE OPTIMUM SHUTDOWN OF A REACTOR ARE FORMULATED. IN ADDITION, A SINGLE-PULSE SHUTDOWN PROCEDURE IS GENERATED THAT HAS BEEN PROVEN TO BE THE OPTIMUM SHUTDOWN FOR REACTORS WITH SUFFICIENT EXCESS REACTIVITY. A DIGITAL PROGRAM HAS BEEN WRITTEN THAT CALCULATES AND PLOTS ALL THE EQUATIONS OF INTEREST, DETERMINES THE OPTIMUM ONE-PULSE SHUTDOWN, AND GENERATES MINIMUM-TIME ONE-PULSE SHUTDOWNS AS A FUNCTION OF REACTIVITY BURNOUT.

*REACTOR DYNAMICS + *XENON + COMPUTER PROGRAM + COMPUTER, DIGITAL + IODINE + MATHEMATICAL STUDY

9-13382 BLISS P

HIGH TEMPERATURE THERMOMETRY AT CANEL

PRATT AND WHITNEY AIRCRAFT, CANFL OPERATIONS, MIDDLETOWN, CONNECTICUT

TIM-888 + CONF-650204-8 +. FEBRUARY 8, 1965 PRESENTED AT AEC TECHNICAL MEETING ON HIGH TEMPERATURE THERMOMETRY, WASHINGTON, D.C., FEBRUARY 24-26, 1965.

MATERIAL AND COMPONENT DEVELOPMENT WORK AT PRATT AND WHITNEY AIRCRAFT, CANEL, HAS DEMANDED INCREASINGLY BETTER THERMOCOUPLES - THERMOCOUPLES WITH BETTER ACCURACY AT HIGHER TEMPERATURES FOR LONGER TIMES. IN-PILE OPERATION HAS FOCUSED ATTENTION ON TRANSMUTATION OF ELEMENTS SUFFICIENT TO CAUSE DECALIBRATION DURING THE REQUIRED TEST PERIODS. THE PROBLEM OF CONTAMINATION OF REFRACTORY SHEATH MATERIALS EXPOSED TO LIQUID ALKALI METALS WAS AN UNEXPECTED BLESSING, BECAUSE THE BY-PRODUCT OF ADEQUATE CONTAMINATION CONTROL WAS THE OUT-OF-PILE THERMOELECTRIC STABILITY NEEDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY

*HIGH TEMPERATURE + *INSTRUMENTATION, TEMPERATURE + *MEASUREMENT, TEMPERATURE

9-13615 POOR INSTRUMENTATION CAUSES CONTAINMENT ACTIVITY RELEASE AT ELK RIVER

RURAL COOPERATIVE POWER ASSOCIATION

COO-651-37 +. 1 PAGE, OCTOBER 1966, PAGE 12 OF ELK RIVER REACTOR 48TH MONTHLY OPERATING REPORT, DOCKET NO. 115-1

BOTH THE IMMEDIATE AND DELAYED CONTAINMENT AIR ACTIVITY TRIGGER THE SAME CONTROL ROOM ANNUNCIATOR, SO THAT THERE IS NO CHANGE TO THE ANNUNCIATOR (IF ALREADY IN ALARM STATE BECAUSE OF DELAYED SITUATION) IF AN INCREASE IN ACTIVITY CAUSES VENTILATION DAMPER CLOSURE AND OFF-GAS SYSTEM TRIP. WHEN THIS OCCURRED, THE OFF-GAS SYSTEM WAS RESTARTED WITHOUT KNOWING THE DAMPER HAD CLOSED, AND GAS ENTERED CONTAINMENT INSTEAD OF VENTILATION EXHAUST.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*FAILURE, DESIGN ERROR + AIRBORNE RELEASE + ELK RIVER + FAILURE, OPERATOR ERROR + REACTOR OFFGAS + REACTOR, BOILING WATER

9-13786 NAVAL SCHOOL REPORTS EXCESSIVE PRESSURE INSIDE AGN=201 CONTROL RODS

U. S. NAVY, NAVAL POSTGRADUATE SCHOOL

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 46-47 (DECEMBER 26, 1966)

EARLY IN 1966, THEY ESTIMATED THAT AN EXPOSURE OF 25 KW-MINUTES WOULD INCREASE THE INTERNAL PRESSURE FROM 1 TO 5 PSIG OF THE COARSE CONTROL AND SAFETY RODS. THE ROD PRESSURES WERE BLED OFF EVERY 20 KW-MINUTES OF OPERATION. IN NOVEMBER 1966, FUEL DISCS WERE ADDED TO THE RODS, REDUCING FREE VOLUME BY 11 PERCENT. AT THE NEXT BLEEDOFF, PRESSURES OF 6.5 AND 8 WERE OBSERVED. PROBABLY THE EARLIER POWER CALCULATIONS WERE GREATER THAN THE ACTUAL RUNS, AS SHOWN BY THE CORRESPONDINGLY LARGER CORE-TANK PRESSURES WHICH REACHED 5.2 PSI. PRESSURE WILL NOW BE BLED OFF AT 12 KW-MINUTES EXPOSURE.

*CONTROL ROD BURNUP + AGN (TRAINING REACTOR, AEROJET-GEN. NUCLEONICS) + CONTROL ROD + FAILURE, EQUIPMENT + REACTOR, TRAINING

9-14417 LACY PS + KERN RC + LEWELLEN JW + SMITH JA

CORE COUPLING TESTS

ALLIS-CHALMERS MANUFACTURING COMPANY

ACNP-65599 +. 3 PAGES, 1 FIGURE, PATHFINDER ATOMIC POWER PLANT, BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS, PAGES 3-16 - 3-18, AUGUST 31, 1966, DOCKET NO. 50-130

INITIAL TEST 302 HAD SUPERHEATER UNFUELED, BUT WITH MODERATOR AND CONTROL RODS IN, PREVENTING

ACCESSION NUMBER 9-13373 TO 9-14417

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-14417 *CONTINUED*

COUPLING ACROSS THE SUPERHEATER. CALCULATIONS FOR AN UNBALANCED ROD PATTERN INDICATED AN 8-SECOND LAG BETWEEN DIFFERENT INSTRUMENTS RESPONDING. MEASUREMENTS SHOWED A TIME LAG OF SEVERAL SECONDS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + COUPLED CORES + FLUX TILT + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

9-14592 QUESTION G-1.A. SINGLE-FAILURE CRITERION FOR STEAM LINE ISOLATION VALVES INSTRUMENTATION
TENNESSEE VALLEY AUTHORITY
1 PAGE, PAGE G.1.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

TWO INDEPENDENT SYSTEMS (PIPEWAY-TEMPERATURE DETECTORS AND FLOW ACROSS THE FLOW LIMITER) WITH THE SAME REDUNDANT-COINCIDENT LOGIC AS THE SAFETY SYSTEM WILL GIVE A VALVE-CLOSURE SIGNAL.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER + SINGLE-FAILURE CRITERION

9-14593 QUESTION G-1-B. BACKUP SENSORS FOR STEAM LINE ISOLATION VALVE INSTRUMENTATION
TENNESSEE VALLEY AUTHORITY
1 PAGE, PAGE G.1.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

REACTOR WATER LOW-LOW LEVEL AND HIGH GAMMA RADIATION IN THE PIPEWAY (FROM TWO-PHASE FLOW) WILL BACK UP THE PIPEWAY TEMPERATURE DETECTORS AND THE STEAM-FLOW SIGNALS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + INDEPENDENCE + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER

9-14601 QUESTION G-6. JUSTIFY SELFPOINT OF NEUTRON LEVEL SCRAM AT INCIPIENT CENTERLINE MELTING
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.6.1 TO G.6.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

THE INITIAL SETTING OF 120' WAS CHOSEN ON THE EXPECTATION THAT FINAL DESIGN ANALYSIS WOULD SHOW THAT THIS WAS ADEQUATE. APPENDIX G ATTEMPTED TO DISTINGUISH BETWEEN CENTERLINE MELTING AT 22 KW/FT AND DAMAGE AT 28 KW/FT. A LOAD-REJECTION TRANSIENT PRODUCING A 150-180' NEUTRON FLUX TRANSIENT IS OF SUCH SHORT DURATION THAT THE HEAT FLUX OVERSHOOT IS ONLY 1'. A SLOW INCREASE WOULD BE STOPPED BY A 108' ROD BLOCK OR BY A HIGH-PRESSURE SCRAM WELL BEFORE 120' POWER. THE OBSERVED FREQUENCY IS 2 IN EVERY 10 REACTOR-YEARS FOR LARGE-BWR TRANSIENTS TO THE 110' LEVEL.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CENTERLINE MELTING + INSTRUMENTATION, POWER RANGE + OPERATING LIMITS/TECHNICAL SPECIFICATIONS + PERFORMANCE LIMIT + REACTOR SAFETY SYSTEM + REACTOR TRANSIENT + REACTOR, BOILING WATER

9-14605 QUESTION H-1. DESIGN BASES FOR SHARING OF SPARE ROD DRIVE PUMP
TENNESSEE VALLEY AUTHORITY
PAGE H.1.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

PIPING ARRANGEMENT (FIG. XI-2 OF DAR) IS SUCH THAT EACH PUMP HAS 100' SYSTEM CAPABILITY FOR ONE REACTOR, AND ANY TWO PUMPS SUPPLY ANY TWO REACTORS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CONTROL ROD DRIVE + INDEPENDENCE + PUMP + REACTOR, BOILING WATER + SHARED COMPONENTS

9-14744 PATHFINDER - SELECTED OPERATING EXPERIENCES, INSTRUMENTATION
NORTHERN STATES POWER COMPANY
NSP-6603 +. 4 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 6, 14-16, JANUARY 9, 1967, DOCKET NO. 50-130

SINCE INSTALLING THE ROD OSCILLATOR WOULD REQUIRE REMOVAL OF THE HOLDDOWN MECHANISM AND ENDANGER THE SUPERHEATER THERMOCOUPLES, THESE TESTS WERE POSTPONED UNTIL AFTER 100 PERCENT POWER. NOISE ANALYSIS TO 60 PERCENT POWER GIVES NO INDICATION OF UNSTABLE TENDENCIES. HEAT

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-14744 *CONTINUED*

BALANCES AT 40 MW(TH) GAVE 34-40 MW, DEPENDING ON THE FLOWMETER USED. PRESSURIZATION RESULTS IN A DECREASED NEUTRON-CHAMBER CURRENT, AS CONTROL-ROD AND VOID-CHANGE EFFECTS (1.25 INCREASE FACTOR) ARE LESS THAN THE INCREASED REFLECTOR DENSITY (1.39 DECREASE FACTOR).

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*INSTRUMENTATION, ABNORMAL INDICATION + *NOISE ANALYSIS + *OSCILLATOR, REACTIVITY + INSTRUMENTATION, POWER RANGE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + PRESSURE, INTERNAL + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

9-14747 PATHFINDER - DIFFICULTIES WITH TURBINE INLET VALVES ON AUTO PRESSURE CONTROL
NORTHERN STATES POWER COMPANY
NSP-6603 +. 3 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 35-37, JANUARY 9, 1967, DOCKET NO. 50-130

PATHFINDER WAS SHUT DOWN NOVEMBER 8 TO 29 TO REVIEW DIFFICULTIES CAUSED BY THE INADEQUATE PNEUMATIC POSITIONER OF THE TURBINE-INLET VALVES. THE SOLUTION WAS TO LEAVE THE INLET VALVES ON LOAD-LIMIT CONTROL, WHILE LOWERING THE TURBINE-BYPASS-VALVES SETPOINT LOWER TO CONTROL PRESSURE, WITH SOME FLOW TO CONDENSER. THIS ARRANGEMENT WAS CHECKED ON THE ANALOG COMPUTER, AND THREE SCRAMS ADDED (INLET VALVES CLOSED AND BYPASS VALVE CLOSED LESS THAN 4.5 PERCENT, HIGH STEAM LINE PRESSURE, AND HIGH STEAM TEMPERATURE). A LOW-STEAM-FLOW SCRAM WAS ADDED AS BACKUP PROTECTION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*CONTROLLER + *FAILURE, DESIGN ERROR + *PRESSURE, INTERNAL + *SAFETY ANALYSIS + ACCIDENT, LOSS OF FLOW + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

9-14750 PATHFINDER - WRONG SAFETY SYSTEM BYPASS USAGE
NORTHERN STATES POWER COMPANY
NSP-6603 +. 2 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 69-70, JANUARY 9, 1967, DOCKET NO. 50-130

A COMPLIANCE CITATION WAS ISSUED 8/22/66. A REFRESHER COURSE ON THE TECH.-SPEC. SECTION RELATING TO BYPASS SYSTEM USAGE WAS GIVEN TO SUPERVISORS, AND WE NOW REQUIRE WRITTEN AUTHORIZATION FROM THE OPERATIONS SUPERVISOR FOR EACH USAGE, WITH DETAILS AS TO ITS USAGE AND PERTINENT REACTOR CONDITIONS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*INSPECTION AND COMPLIANCE + ADMINISTRATIVE CONTROLS AND PRACTICES + FAILURE, ADMINISTRATIVE CONTROL + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

9-14751 PATHFINDER - INADVERTANT LIFTING OF ROD DRIVE FROM VESSEL DURING SHUTDOWN WORK
NORTHERN STATES POWER COMPANY
NSP-6603 +. 2 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 73-74, JANUARY 9, 1967, DOCKET NO. 50-130

ON SEPTEMBER 12, ALL CONTROL RODS WERE UNLATCHED TO REMOVE NO. 3 DRIVE. NO. 10 DRIVE WAS DISCONNECTED IN EXPECTATION IT TOO WOULD BE REMOVED, BUT THIS DISCONNECTION WAS NEITHER LOGGED NOR TOLD SUPERVISION. DAYS LATER, WHEN THE REACTOR WAS PRESSURIZED TO 50-100 PSIG FOR PURIFICATION, THE WATER FORCE LIFTED THE DRIVE (BUT NOT THE ROD) 3 FEET. NO DAMAGE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + ACCIDENT, CONTROL ROD EJECTION + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

9-14925 ANNUAL REPORT ON THE OPERATIONS AND MODIFICATION OF THE WHITE SANDS MISSILE RANGE FAST BURST REACTOR FACILITY - REPORT NO. 1, AUGUST 1964 THRU DECEMBER 1966
U. S. ARMY MATERIALS AND RESEARCH AGENCY, HARRY DIAMOND LAB
7 PAGES, 1966

18 CHANGES LISTED. (C) ORIGINAL CIRCULATING-BALL NUT ROD-DRIVE CHANGED TO LEAD SCREW AND NUT DRIVE, AS SHOCK FROM A BURST CAUSED THE BALLS TO BRINNELL THE LEADSCREW. (J) THE SAFETY-BLOCK SCRAM-MAGNET ARMATURE PLATE WAS REDESIGNED. (P) CLOSE VISUAL INSPECTION OF THE CORE RARELY FOUND A PROBLEM BEFORE FAILURE, THUS UNNECESSARILY EXPOSING PERSONNEL. DAILY CHECKS AT THE CORE HAVE BEEN ELIMINATED.

AVAILABILITY - SAFETY OFFICE, OFFICE OF THE CHIEF OF ENGINEERS, DEPT. OF THE ARMY, WASHINGTON, D.C.

*MODIFICATION, SYSTEM OR EQUIPMENT + *OPERATIONS REPORT, GENERAL + CONTROL ROD DRIVE + EXAMINATION + FAILURE, COMPONENT + FAILURE, SCRAM MECHANISM + RADIATION SAFETY AND CONTROL + REACTOR, ARMY + REACTOR, FAST BURST

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-10477 NICKEL HC
ANSWERS TO QUESTIONS ABOUT LACBWR RECEIVED FROM THE DIVISION OF REACTOR LICENSING
ALLIS-CHALMERS, BETHESDA, MARYLAND
ACNP-66548 +. 30 PAGES, 1 FIGURE, 2 TABLES, JUNE 1966, AMENDMENT NO. 26, DOCKET 115-5, PP. II-3-1 THROUGH
II-3-29, PDR

ANSWER II-3. REACTOR ANALYZED FOR EFFECT OF INSTRUMENT-CALIBRATION ERRORS, VARIOUS
TRANSIENTS, E.G., IN THE (P-2/3F) POWER-TO-FLOW SCRAM. THE COMBINED RANDOM ERROR AT FULL
FLOW AND 110 PERCENT POWER IS EQUIVALENT TO A POWER EXCESS OF 3.45 PERCENT FULL POWER.
TRANSIENT HEAT FLUX OVERSHOOT LISTED FOR VARIOUS CONDITIONS. BRIEF DISCUSSION OF THE SAFE
OPERATING REGION AND THE POWER-FLOW LIMIT-CURVE INCLUDED.

*ACCIDENT, GENERAL + *ERROR ANALYSIS + *INSTRUMENTATION, FLOW + *INSTRUMENTATION, NUCLEAR +
*SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + LACROSSE + OPERATING LIMITS/TECHNICAL SPECIFICATIONS +
REACTOR, BOILING WATER

*10-12203 APPENDIX III. 2 AND 5 - PRINCIPAL MAINTENANCE PERFORMED
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 2-3 OF APPENDIX III FROM REPORT ON THE OPERATION OF
HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16 THROUGH AUGUST 15, 1966, PDR

A LOG-N NEGATIVE-HIGH-VOLTAGE SUPPLY SHORTED, AND THE SPARE SUPPLY COULD NOT SUPPLY MORE THAN
250 VOLTS (NORMALLY 800) BECAUSE OF LOW CABLE RESISTANCE. THE READING WAS UNAFFECTED BECAUSE
OF HIGH NEUTRON-TO-GAMMA CURRENT RATIO. A STARTUP CHANNEL WAS FOUND FAILED ON A TEST
RESTART, AS A MICROSWITCH FAILURE ALLOWED THE CHAMBER OVERTRAVEL TO BREAK THE SIGNAL CABLES.
ON A MONTHLY DIESEL TEST, THE ENGINE TRIPPED OUT ON HIGH TEMPERATURE BECAUSE OF
LOW-RADIATION-WATER CONTENT. TESTING IS NOW BIWEEKLY. LATER, A LOW-BATTERY-VOLTAGE
CONDITION DID NOT ALLOW A START ON TEST. THE REVERSE CURRENT RELAY CONTACT (IN THE VOLTAGE
REGULATOR) STUCK, CAUSING THE BATTERY TO DISCHARGE.

*FAILURE, DESIGN ERROR + *FAILURE, INSTRUMENT + *OPERATIONS SUMMARY FOR AEC + EMERGENCY POWER, ELECTRIC +
GENERATOR, DIESEL + HUMBOLDT BAY + INSTRUMENTATION, INTERMEDIATE RANGE + INSTRUMENTATION, STARTUP RANGE +
REACTOR, BOILING WATER

10-13485 LOSS-OF-FLOW INCIDENT WITHOUT DAMAGE AT PLUM BROOK TESTING REACTOR, NOVEMBER 22, 1966
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D.C.
1 PAGE, DECEMBER 2, 1966, DOCKET NO. 50-30, ATOMIC ENERGY CLEARING HOUSE 12(51), PAGE 8, (DECEMBER 19,
1966)

AFTER 7 DAYS AT FULL POWER (60 MW-TH), THE CONTROL POWER BREAKER WAS ACCIDENTALLY OPENED,
INTERUPTING DC TO BOTH MAIN AND SHUTDOWN PUMP BREAKERS AND SCRAMING THE REACTOR. FLOW
COASTDOWN LASTED 30 SEC, FORCED FLOW WAS RESTORED WITHIN AN ADDITIONAL 45 SEC. ALL
COMPONENTS EXAMINED SHOWED NO THERMAL DAMAGE. DC CIRCUITS HAVE BEEN REWIRED TO PROVIDE
SEPARATE BREAKERS AND POWER SOURCES FOR SHUTDOWN PUMPS.

*ACCIDENT, LOSS OF FLOW + *ACCIDENT, LOSS OF POWER + *FAILURE, MAINTENANCE ERROR +
*INCIDENT, ACTUAL, HUMAN ERROR + EMERGENCY POWER, ELECTRIC + PLUM BROOK + REACTOR, TEST

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-06838 EICHLER JB + GALLAHER EV + LIEBERMAN P + SINGER T
STUDIES OF REACTOR CONTAINMENT. PROGRESS REPORT, OCTOBER 1, 1964 - JULY 31, 1965
IIT RESEARCH INSTITUTE, CHICAGO
IITRI-T6042-13 + IITRI-518P21-13 +. 75 PAGES, FIGURES, 2 REFERENCES, JULY 1965, CFSTI \$3.00 CY, \$0.75 MN

PROGRESS ON THREE TASKS IS REPORTED. TASK NO. 1 - CRUSHABLE SHIELD ANALYSIS AND DESIGN. WORK COVERED (A) COMPLETION OF THE SWIMM CODE, (B) THE WRITING OF THE FINAL REPORT ON THE SWIMM CODE, AND (C) THE FORMULATION OF TENTATIVE SHIELD DESIGN TRENDS THROUGH RUNNING A SERIES OF COMPUTER RUNS. TASK NO. 2 - SHOCK IMPINGEMENT EXPERIMENTS. AT THIS TIME, GENERALIZED SOLUTIONS FOR LAYERED ELASTIC SHIELDS AND SPECIFIC SOLUTIONS FOR LAYERED ELASTIC-PLASTIC SHIELDS HAVE BEEN OBTAINED. TASK NO. 3 - COOLANT DECOMPRESSION EXPERIMENTS AND ANALYSIS. WORK PERFORMED ON THIS TASK DEALS WITH (A) ONE-DIMENSIONAL WATER SHOCK TUBE EXPERIMENTS AND ANALYSIS WITH VARIOUS AMOUNTS OF VAPOR PRESENT INITIALLY IN THE DRIVER SECTION, IN CONJUNCTION WITH VARIOUS ORIFICE SIZES, AND (B) THREE-DIMENSIONAL (DRIVEN SECTION) WATER SHOCK TUBE EXPERIMENTS, BOTH WITH AND WITHOUT VAPOR PRESENT INITIALLY IN THE DRIVER SECTION, WITH VARIOUS ORIFICE SIZES.

ACCIDENT, LOSS OF COOLANT + COMPUTER PROGRAM + CONTAINMENT ANALYSIS + CONTAINMENT DESIGN +
CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT VESSEL LOADING +
CONTAINMENT, SHOCK GENERATION AND PROTECTION + FAILURE, PIPE + MATERIAL +
MISSILE GENERATION AND PROTECTION + STEEL

11-08812 BROOMFIELD GH
HYDROGEN EFFECTS IN AN IRRADIATED 1 PERCENT CR, ONE-HALF PERCENT MO PWR PRESSURE VESSEL STEEL
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4705 +. 13 PAGES, 12 FIGURES, 6 TABLES, 15 REFERENCES, SEPTEMBER 1964. UKAEA

AN INVESTIGATION HAS BEEN MADE OF THE EFFECT OF A HYDROGEN CONCENTRATION OF APPROXIMATELY 1.4 CC (NTP) PER 100 G STEEL ON (I) THE ROOM AND ELEVATED TEMPERATURE TENSILE PROPERTIES, (II) NOTCH STRENGTHENING AND BRITTLE FRACTURE CHARACTERISTICS, AND (III) DELAYED FRACTURE TENDENCIES, OF A 1 PERCENT CR, 1/2 PERCENT MO STEEL IN THE UNIRRADIATED AND IRRADIATED (1.0 TO 1.4 TIMES 10¹⁹) FISSION NEUTRONS PER SQUARE CM. THE HYDROGEN EMBRITTLES THE STEEL AT ROOM TEMPERATURE AND TO A DIMINISHING DEGREE WITH INCREASING TEMPERATURE, BUT THE EMBRITTLING EFFECT IS NOT COMPLETELY ELIMINATED EVEN AT 250 C. THE DEGREE OF EMBRITTLMENT OF IRRADIATED STEEL DOES NOT DIFFER SIGNIFICANTLY FROM THAT OF UNIRRADIATED STEEL. IT IS CONCLUDED THAT AT ALL THE TEST TEMPERATURES THE EMBRITTLMENT IS DUE TO A PHYSICAL EFFECT OF THE HYDROGEN IN THE STEEL - HOWEVER, THE MECHANISMS OF THE EMBRITTLMENT AT ROOM TEMPERATURE AND 250 C DIFFER IN THAT THE ROOM TEMPERATURE EMBRITTLMENT IS ASSOCIATED WITH VOID FORMATION IN THE FERRITE WHILST THE 250 C EMBRITTLMENT IS APPARENTLY DUE TO CRACK FORMATION IN THE PEARLITE. LIMITED RESULTS SUGGEST THAT THE DUCTILE BRITTLE TRANSITION TEMPERATURES OF THE UNIRRADIATED AND IRRADIATED STEEL ARE RAISED BY HYDROGEN. HOWEVER, HYDROGEN HAS NO SIGNIFICANT EFFECT ON THE NOTCH STRENGTH, AND THE IRRADIATED STEEL IS NOT PRONE TO HYDROGEN INDUCED DELAYED FRACTURE.

*BRITTLE FRACTURE + *HYDROGEN + *STEEL + TEST, PROOF + TESTING

11-10317 DAVID M
PRESTRESSED CONCRETE PRESSURE VESSELS OF NUCLEAR REACTORS
9 PAGES, IAD. ENERG. 11, PP. 402-10 (NOVEMBER 1965), IN CZECH.

THE ARTICLE DEALS WITH ENGINEERING PROBLEMS OF PRESTRESSED CONCRETE REACTOR PRESSURE VESSELS. TECHNICAL AND ECONOMIC COMPARISONS WITH STEEL VESSELS ARE PRESENTED. EXPERIENCE WITH CONCRETE VESSELS IS REPORTED. THE EVALUATION INDICATED THE NEED OF SOLVING THE PROBLEMS IN CONNECTION WITH THE REALIZATION OF THE CZECHOSLOVAKIAN PROGRAM OF NUCLEAR-POWER DEVELOPMENT.

*CONCRETE, PRESTRESSED + *CONTAINMENT, PRESSURE VESSEL + *CZECHOSLOVAKIA + DESIGN CRITERIA

11-10326 GALL WR
REVIEW OF CONTAINMENT PHILOSOPHY AND DESIGN PRACTICE
OAK RIDGE NATIONAL LABORATORY
5 PAGES, 3 FIGURES, 2 TABLES, REFERENCES, NUCLEAR SAFETY, 7(1), PP. 81-86 (FALL 1965)

THIS ARTICLE REVIEWS THE STATE OF THE ART IN REACTOR CONTAINMENT AS OF 1965. AS LARGER, MORE POWERFUL REACTORS ARE BUILT TO GENERATE NUCLEAR POWER, AND AS THE SITES ARE SELECTED CLOSER TO POPULATION CENTERS, THE NEED FOR ADDITIONAL ENGINEERED SAFEGUARDS IS EVIDENT. MULTIPLE CONTAINMENT WITH PUMPBACK, RECIRCULATION COOLING, CORE-SPRAY INJECTION, RECIRCULATION CLEANUP SYSTEMS, AND EXTERNAL SHIELDING MAKE IT POSSIBLE TO SHRINK THE EXCLUSION ZONE AND LOW-POPULATION ZONES TO SMALLER RADII THAN THOSE REQUIRED BY METHODS GIVEN IN TID-14844. SIMILAR CAPABILITIES ARE OBTAINED BY PRESSURE-SUPPRESSION SYSTEMS BACKED UP BY THE CONVENTIONAL BUILDING CONTAINMENT WITH HIGHLY EFFICIENT AIR CLEANUP SYSTEMS.

*CONTAINMENT, GENERAL + *CONTAINMENT, MULTIPLE + *CONTAINMENT, PRESSURE SUPPRESSION +
*ENGINEERED SAFEGUARD + *SITING, REACTOR + HADDAM NECK + MALIBU + NINE MILE POINT + OYSTER CREEK +
REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER + SAN ONOFRE

11-10332 NICHOLS RW
PREVENTION OF CATASTROPHIC FAILURE IN STEEL PRESSURE CIRCUIT COMPONENTS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, CULCHETH
5 PAGES, 9 FIGURES, 13 REFERENCES, NUCLEAR ENGINEERING, 11(120), PP. 369-373 (MAY 1966)

TESTS TO FAILURE OF STEEL PRESSURE VESSELS INDICATED THAT STORED ENERGY IN THE LOAD INFLUENCES CRACK PROPAGATION. WHEN PRESSURIZING IS DONE WITH A COMPRESSIBLE FLUID, NO CRACK ARREST WAS OBSERVED. WITH HYDRAULIC LOADING, CRACK ARREST WAS OBSERVED. THE STRESS AT INITIAL CRACK

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-10332 *CONTINUED*

INSTABILITY WAS, HOWEVER, THE SAME FOR BOTH CASES. THE NOMINAL STRESS AT FRACTURE FOR A PARTICULAR DEFECT SIZE DID NOT SHOW A MARKED INCREASE AT THE SO-CALLED CRACK-ARREST TEMPERATURE. A RELATIONSHIP DOES EXIST BETWEEN FRACTURE STRENGTH AND CHARPY ENERGY. CRACK-GROWTH ANALYSIS SHOULD BE USED FOR THE DESIGN OF VESSELS MADE OF HIGH-STRENGTH STEELS. PROOF TESTING CAN BE USED TO DETERMINE THE NONEXISTENCE OF CRITICAL DEFECTS.

*BRITTLE FRACTURE + *CONTAINMENT, PRESSURE VESSEL + *FAILURE, PRESSURE VESSEL + *FLAW + *TEST, PRESSURE VESSEL + BURST PRESSURE + COMPARISON, THEORY AND EXPERIENCE + CONTAINMENT INTEGRITY + CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT, HIGH PRESSURE + CYLINDER + INSTABILITY + NDT DATA (NIL DUCTILITY TRANSITION) + PLASTICITY + PRESSURE, INTERNAL + SHELL + STEEL + STRESS + TENSILE PROPERTY

11-10356 SAUVAGE M + GUMUCHIAN M

1000-MWE REACTOR DESIGN STUDY OF A HANDLING CELL

COMMISSARIAT A L ENERGIE ATOMIQUE, CADARACHE, FRANCE, CENTRE D ETUDES NUCLEAIRES

ORNL-TR-988 + PNR/SEPR/65,008 +. 41 PAGES, FEBRUARY 18, 1965, JCL, \$4.60 FS, \$1.43 MF

THIS REPORT REPRESENTS A SUPPLEMENTARY CHAPTER TO THE 1000 MW REACTOR DESIGN AS PRESENTED IN GENEVA (CEA REPORT 2554). IT DESCRIBES A DESIGN MAKING USE OF A CELL INSTEAD OF ROTATING PLUGS TO CARRY OUT HANDLING. THE PURPOSE OF A STUDY OF THIS VARIANT IS TO PROPOSE A REACTOR DESIGN TO SERVE AS A BASIS FOR A MORE-DETAILED STUDY WITHIN THE SCOPE OF A DESIGN PROJECT. THUS, THE PROBLEMS POSED BY THE REACTOR BLOCK, STORAGE, HANDLING AND THE HANDLING CELL, HAVE BEEN EXAMINED, WITH THE STRESS PLACED ON THE LAST TWO POINTS, WHICH PRESENT THE GREATEST DIFFICULTIES. MUCH REMAINS UNKNOWN ABOUT THE CONTAMINATION OF THIS CELL BY SODIUM AT THE TIME OF HANDLING. METHODS ARE PROPOSED TO LIMIT THIS CONTAMINATION TO THE MAXIMUM. A PROGRAM FOR STUDY AND TESTS HAS BEEN SUGGESTED WHICH SHOULD PERMIT AN EVALUATION OF THE EFFICIENCY OF THE PLANNED SYSTEMS. A 1000-MW(E) REACTOR IN WHICH HANDLING TAKES PLACE WITHIN THE PROTECTION OF A CELL, CALLED THE HANDLING CELL, ABOVE THE REACTOR IS INVESTIGATED. THIS STUDY CONSTITUTES A VARIANT OF THAT CONDUCTED AT THE TIME OF THE 1964 GENEVA CONFERENCE, WHICH DEALT WITH A 1000-MW(E) REACTOR WITH HANDLING DONE THROUGH ROTATING PLUGS (CEA REPORT 2554). THE PRINCIPAL ADVANTAGES ARE THE FOLLOWING - (A) HANDLING TAKES PLACE WITHIN SIGHT, BY MEANS OF A SIMPLIFIED AND LIGHTER MACHINE. THIS VISIBILITY IN CERTAIN CASES IS DIRECT THROUGH PORT HOLES PROVIDED IN THE CELL, OR INDIRECT BY MEANS OF PERISCOPES OR TELEVISION CAMERAS. (B) SINCE THIS CELL IS LEAK-PROOF AND FILLED WITH ARGON, THE PROBLEMS OF TIGHTNESS BETWEEN REACTOR AND CELL ARE CONSIDERABLY SIMPLIFIED. (C) THIS CELL ALSO PERMITS HANDLING OF CONTAMINATED EQUIPMENT WITHOUT REQUIRING THE USE OF AUXILIARY, HIGHLY SHIELDED PROTECTIVE EQUIPMENT, WHICH WOULD BE VERY HEAVY. (D) FINALLY, THE CELL PLAYS THE ROLE OF A TIGHT CHAMBER WHICH CAN RETAIN ACTIVE PRODUCTS, ITS STRUCTURE PERMITS IT TO OFFER CONTAINMENT OF A REACTOR EXPLOSION.

*DESIGN CRITERIA + *HOT CELL + *REACTOR, FAST + CONTAINMENT, GENERAL + MAINTENANCE AND REPAIR + REACTOR, LIQUID METAL COOLED

11-10391 ROGERS TG

VISCOELASTIC STRESS ANALYSIS

UNIVERSITY OF NOTTINGHAM, ENGLAND

25 PAGES, 9 FIGURES, 89 REFERENCES, PROCEEDINGS OF THE CONFERENCE ON SOLID MECHANICS, PRINCETON UNIVERSITY CONFERENCE PUBLICATION NO. 40, PP. 49-74, 1965, SOURCE

THIS IS A REVIEW PAPER, AND INCLUDES AN 89-ITEM BIBLIOGRAPHY. LINEAR VISCOELASTIC ANALYSIS IS BASED ON THE PRINCIPLE OF SUPERPOSITION. ACCORDING TO THIS PRINCIPLE, THE RESPONSE TO EACH INCREMENT OF LOAD PROCEEDS INDEPENDENTLY OF THE RESPONSES TO ALL PRIOR OR SUBSEQUENT INCREMENTS OF LOAD. SUCH A SYSTEM IS CALLED A LINEAR SYSTEM. THE BASIC INTEGRAL EQUATION REPRESENTING SUPERPOSITION IS DERIVED AND GENERALIZED TO THREE DIMENSIONS. LINEAR VISCOELASTIC ANALYSIS AND LINEAR ELASTIC ANALYSIS ARE RELATED BY A CORRESPONDENCE PRINCIPLE. THE LAPLACE TRANSFORM OF A VISCOELASTIC SOLUTION HAS THE ALGEBRAIC FORM OF AN ELASTIC SOLUTION. VISCOELASTIC WAVE PROPAGATION, RESIDUAL STRESSES, AND NONLINEAR VISCOELASTIC ANALYSIS ARE BRIEFLY DISCUSSED.

*BIBLIOGRAPHY + *CREEP BEHAVIOR + *STRESS ANALYSIS + CONCRETE + CONCRETE, PRESTRESSED + DEFORMATION + ELASTICITY + HIGH TEMPERATURE + MATHEMATICAL STUDY + STRESS

11-10458 SAFETY STANDARD FOR DESIGN, FABRICATION AND MAINTENANCE OF STEEL CONTAINMENT STRUCTURES FOR STATIONARY NUCLEAR POWER REACTORS

ASA-N6.2-1965 +. 13 PAGES, 1965, PUBLISHED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, SOURCE

THIS IS AN OUTLINE OF THE TECHNICAL REQUIREMENTS FOR STEEL CONTAINMENT SHELLS. DESIGN CODES ARE LISTED. SOME ANALYTICAL PROCEDURES ARE SPECIFIED. MISSILE PROTECTION IS REQUIRED WHEN NECESSARY, BUT THE EXACT TYPE OF PROTECTION IS NOT SPECIFIED. THE SHELL MATERIAL MUST REMAIN DUCTILE AT THE LOWEST OPERATING TEMPERATURE AND UNDER ALL EXPECTED CONDITIONS. PROOF TESTING MUST NOT CAUSE PERMANENT DISTRIBUTION. A MAP OF LOWEST ONE-DAY MEAN TEMPERATURES IS GIVEN FOR REFERENCE.

*CODES AND STANDARDS + *CONTAINMENT DESIGN + CONTAINMENT VESSEL LOADING + DESIGN CRITERIA + PRESSURE, EXTERNAL + PRESSURE, INTERNAL

11-10459 MILLER EC

THE INTEGRITY OF REACTOR PRESSURE VESSELS

OAK RIDGE NATIONAL LABORATORY

ORNL-NSIC-15 +. 61 PAGES, 110 REFERENCES, MAY 1966, CFSTI, \$3.00 CY, \$0.75 MN

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-10459 *CONTINUED*

THE PRESENT (1965) STATE OF KNOWLEDGE REGARDING THE SAFETY OF NUCLEAR PRESSURE VESSELS IS REVIEWED. ACCIDENTS HAVE PRODUCED LOADS EXCEEDING DESIGN LOADS. FABRICATION DEFECTS HAVE BEEN FOUND. PIPING FAILURES HAVE OCCURRED. FATIGUE CRACKS HAVE OCCURRED. HEAD BOLTS HAVE FAILED. YET PRESSURE-VESSEL FAILURES ARE NOT CONSIDERED IN DESIGN. THE SINGLY MOST IMPORTANT ASPECT OF PRESSURE-VESSEL SAFETY IS CORRECT DESIGN TO PREVENT THE FORMATION OF FATIGUE CRACKS WHOSE GROWTH COULD CAUSE EVENTUAL FAILURE. FATIGUE IS MOST APT TO OCCUR AT POINTS OF HIGH STRESS CONCENTRATION. ARBITRARY RULES BASED ON NDT ALONE DO NOT GUARANTEE SAFETY. FEW VESSELS ARE IMMUNE TO FAILURE IN EXCEPTIONAL ACCIDENT SITUATIONS.

*CONTAINMENT INTEGRITY + *CONTAINMENT, PRESSURE VESSEL + *FAILURE, FATIGUE + *FAILURE, PRESSURE VESSEL + ACCIDENT, PROBABILITY OF + BRITTLE FRACTURE + NOZZLE

11-10460 MCKEON JT

PRIMARY PIPING FLEXIBILITY ANALYSIS FOR LIQUID-METAL-COOLED FAST BREEDER REACTORS
M. W. KELLOGG COMPANY, JERSEY CITY, N.J.

COO-1454-1 + RD-65-1084 +. 52 PAGES, AUGUST 20, 1965, CFSTI, \$3.00 CY

COMPLETE SAFETY IN THE DESIGN OF A PIPING SYSTEM IS AN ILLUSION WHICH IS NOT ATTAINABLE WITH OUR PRESENT KNOWLEDGE OF MATERIAL BEHAVIOR AND MATHEMATICAL ANALYSIS. A STUDY HAS BEEN MADE TO IDENTIFY THE PROBLEMS ASSOCIATED WITH THE DESIGNS OF PRIMARY PIPING SYSTEMS FOR FAST REACTORS. DESIGN PROCEDURES SHOULD CONSIDER INELASTIC BEHAVIOR, BUCKLING, CREEP, AND FATIGUE. THE NEED FOR GOOD PLASTIC ANALYSIS OF HIGH-TEMPERATURE PIPING IS LIKELY TO INCREASE IN THE FUTURE. THE IMPORTANCE OF CORRECTLY EVALUATING STRAIN CONDITIONS IS PARTICULARLY IMPORTANT FOR MATERIALS THAT LOSE DUCTILITY UNDER PROLONGED EXPOSURE TO HIGH TEMPERATURES.

*FAILURE, PIPE + *PIPING + *PLASTICITY + BUCKLING + CODES AND STANDARDS + COMPUTER PROGRAM + CONTAINMENT, GENERAL + CREEP BEHAVIOR + DESIGN CRITERIA + FAILURE, FATIGUE + HIGH TEMPERATURE + REACTOR, FAST

11-10463 CHAVE CT

CONTAINMENT FOR WATER REACTOR NUCLEAR POWER PLANTS. PART I. DRY CONTAINMENT
STONE AND WEBSTER ENGINEERING CORP., N.Y.

CONF-650829-1 +. 39 PAGES, 1965, AMERICAN SOCIETY OF CORROSION ENGINEERS, POWER DIVISION SPECIALTY CONFERENCE, DENVER, SOURCE

CONTAINMENT VESSELS MAY BE ROUGHLY CLASSIFIED BY TYPE AS DRY OR PRESSURE-SUPPRESSION. IN DRY CONTAINMENT, NO WATER IS USED TO CONDENSE THE ESCAPING STEAM. STEEL AND CONCRETE ARE THE COMMON MATERIALS USED FOR DRY CONTAINMENT. EXAMPLES OF USE OF EACH IN EXISTING REACTORS ARE CITED. GENERAL DESIGN CONSIDERATIONS AND STRENGTH CRITERIA ARE SUGGESTED. ADVANTAGES AND DISADVANTAGES OF USE OF STEEL LINERS IN CONCRETE CONTAINMENT VESSELS, UNDERGROUND CONTAINMENT, AND VACUUM CONTAINMENT ARE CONSIDERED. POSSIBLE METHODS FOR COOLING THE CORE AND CONTROLLING THE VENTING OF THE CONTAINMENT ATMOSPHERE IN CASE OF A LOSS-OF-COOLANT ACCIDENT ARE DISCUSSED. IT IS CONCLUDED THAT THERE IS AT PRESENT NO SINGLE BEST METHOD OF CONTAINMENT UNDER ANY AND ALL CONDITIONS. FURTHER WORK ON THE PROBLEM IS NEEDED TO ENHANCE EFFECTIVENESS AND REDUCE COST OF CONTAINMENT.

*CONTAINMENT DESIGN + *CONTAINMENT, GENERAL + *CONTAINMENT, HIGH PRESSURE + CONCRETE + CONTAINMENT, PRESSURE RELIEF + CONTAINMENT, PRESSURE SUPPRESSION + CONTAINMENT, UNDERGROUND + EMERGENCY COOLING CONSIDERATIONS + STEEL + STEEL LINER

11-11308 PIERCE GE

URETHANE SPRAY FOAMING

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-TM-1551 +. 10 PAGES, 2 FIGURES, 1 TABLE, AUGUST 1966, CFSTI \$1.00 CY, \$0.50 MN

THE USE OF URETHANE-FOAM SPRAY TO COAT THE INTERIOR OF A STRUCTURE TO INCREASE ITS LEAK-TIGHTNESS IS DESCRIBED. THE APPLICATION WAS IN THE PENTHOUSE OF THE FLUIDIZED-BED VOLATILITY PILOT PLANT. THE NEGATIVE PRESSURE OF THE PENTHOUSE WAS INCREASED FROM 0.15 TO 0.30 IN. OF WATER. THE INSULATION VALUE OF THE WALLS WAS ALSO INCREASED.

*CONTAINMENT PAINT + *CONTAINMENT, PRESSURE VENTING + *FOAM + CONTAINMENT LEAKAGE CONTROL + CONTAINMENT, FUEL REPROCESSING

11-11394 LANDLER G

HNPF-STRESS CORROSION STUDY

ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA

NAA-SR-MEMO-11607 +. 47 PAGES, AUGUST 30, 1965, CFSTI \$2.00 CY, \$0.50 MN

THE FAILURE OF EXPANSION TANK 3 CALLED ATTENTION TO THE POSSIBILITY OF THERE BEING OTHER WELDMENTS IN SODIUM-SYSTEM COMPONENTS WITH THE SAME CORROSIVE DEPOSITS AND THEREFORE POSSIBLY SUBJECT TO STRESS-CORROSION CRACKING. THE REQUIREMENTS FOR SUCH STRESS-CORROSION CRACKING ARE ONLY IMPERFECTLY KNOWN AT THIS TIME BUT APPEAR TO BE A DEPOSIT OF CORROSIVE MEDIA, SUCH AS CHLORIDE, THE PRESENCE OF MOISTURE AT SOME TIME, AND AT LEAST A MODERATE STRESS LEVEL. EXAMINATION OF DRAWINGS AND SPECIFICATIONS INDICATE THAT A LARGE NUMBER OF WELDMENTS CAN BE IDENTIFIED IN THE HNPF SODIUM SYSTEMS WHICH MAY MEET SOME OR ALL THESE REQUIREMENTS. THE ONLY SURE METHOD OF LOCATING POINTS OF INCIPIENT FAILURE IS A DESTRUCTIVE EXAMINATION, ALTHOUGH ULTRASONIC TESTING MAY BE SATISFACTORY IN CERTAIN IDEALIZED CIRCUMSTANCES. MANY OF THE SUSPECT WELDMENTS CANNOT BE INSPECTED BECAUSE OF THE RADIATION LEVELS OR PHYSICAL INACCESSIBILITY. IN THE MOST FAVORABLE CIRCUMSTANCES, IT IS NECESSARY TO REMOVE INSULATION, ELECTRICAL HEATERS, AND, IN SOME INSTANCE, HEATER JACKETS.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-11394 *CONTINUED*

*CHLORINE + *CORROSION + *HALLAM + *STRESS + FAILURE, COMPONENT + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED + SODIUM + TEST, NONDESTRUCTIVE + WELDS

11-11642 PETRICONE R

LARGE PLASTIC DEFORMATION OF ROTATIONALLY SYMMETRIC SHELLS
AEROSPACE RESEARCH CENTER, GENERAL PRECISION, INC., LITTLE FALLS, NEW JERSEY
8 PAGES, 8 FIGURES, 5 REFERENCES, A VOLUME OF TECHNICAL PAPERS PRESENTED AT AIAA 6TH STRUCTURES AND MATERIALS CONFERENCE, PALM SPRINGS, CALIFORNIA, APRIL 5-7, 1965, SOURCE \$14.00

THE LARGE PLASTIC DEFORMATIONS OF A THIN CYLINDRICAL SHELL WITH END CLOSURES UNDER INTERNAL PRESSURE IS ANALYZED BY THE DEFORMATION THEORY OF PLASTICITY. ANISOTROPY IS CONSIDERED, AND A COMPARISON IS MADE WITH EXPERIMENTAL DATA. THE READER IS WARNED THAT THE METHOD OF DETERMINING THE COEFFICIENTS OF ANISOTROPY IS SUFFICIENT ONLY FOR IDEALLY PLASTIC MATERIAL, ALTHOUGH AN ATTEMPT IS MADE TO APPLY THE THEORY TO A CASE INVOLVING STRAIN HARDENING.

*CYLINDER + *PLASTICITY + *SHELL + *STRESS ANALYSIS + COMPUTER PROGRAM + CONTAINMENT, PRESSURE VESSEL + DEFORMATION + MATHEMATICAL STUDY + MEASUREMENT, STRAIN GAGE + PRESSURE, INTERNAL + TEST, PRESSURE VESSEL

11-11846 VAUGHN RD

EXPERIENCE WITH INTEGRAL GAS COOLED REACTORS
NUCLEAR POWER GROUP, ENGLAND

23 PAGES, 13 FIGURES, PRESENTED AT SYMPOSIUM ON THE EVOLUTION OF PROVED NUCLEAR POWER REACTOR CONCEPTS AND POTENTIALITIES OF CONCEPTS STILL IN THE PROTOTYPE STAGE, ROME, JUNE 24-25, 1965, PP 333-43 OF POSSIBILITA E PREVEDIBILE EVOLUZIONE DEI TIPI DI REATTORI SPERIMENTATI O IN CORSO DI SPERIMENTAZIONE. ROME, COMITATO NAZIONALE ENERGIA NUCLEARE, 1966

BRIEFLY DESCRIBES KNOWLEDGE GAINED DURING CONSTRUCTION OF THE OLBURY TWO-REACTOR STATION. CONSTRUCTION OF THE PRESTRESSED CONCRETE VESSEL, WHICH HOUSES BOTH THE CORE AND BOILERS, IS REVIEWED. THE INSULATION USED (0.1 MM STAINLESS STEEL SHEETS SEPARATED BY STAINLESS WIRE MESH HELD IN PLACE BY 6 MM COVER PLATES) RESULT IN A CONSIDERABLE SAVING IN REACTOR VESSEL VOLUME COMPARED WITH ALTERNATE FORMS. DISCUSSES THE DESIGN FEATURES OF THE BOILERS FOR MINIMIZING EXPECTED TUBE VIBRATION. ROBUST DESIGN OF THE GAS BLOWERS IS JUSTIFIED AS A RESULT OF REQUIRED OPERATION IN THE STALLED REGIME WHEN BRINGING ON LINE WITH OTHER BLOWERS OPERATING.

*DESIGN STUDY + *REACTOR DESCRIPTION + CONCRETE, PRESTRESSED + CONTAINMENT CONSTRUCTION + CONTAINMENT STRUCTURE + CONTAINMENT, PRESSURE VESSEL + OLBURY (UK) + REACTOR, GAS COOLED + THERMAL INSULATION + VIBRATION

11-11933 HOSKINS RE

CORE DESIGN AND CONTAINMENT COST STUDY FOR GAS COOLED FAST REACTOR STUDIES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-TM-1194 +. 124 PAGES, 33 FIGURES, 16 TABLES, SEPTEMBER 1966, CFSTI \$4.00 CY, \$0.75 MN

THIS REPORT CONTAINS SOME OF THE SUPPORTING ANALYTICAL WORK PERFORMED AT OAK RIDGE NATIONAL LABORATORY IN 1963 AND 1964 TO DEVELOP CONCEPTS OF GAS-COOLED FAST-BREEDER REACTORS. HEAT-TRANSFER CALCULATIONS ARE GIVEN FOR THE VARIOUS CORE CONFIGURATIONS CONSIDERED, AND THESE CONFIGURATIONS ARE COMPARED ON THE BASIS OF SPECIFIC-POWER AND PUMPING-POWER REQUIREMENTS. SOME ALTERNATIVE FUEL DESIGNS ARE DISCUSSED, ONE OF WHICH IS THE CONCEPT OF COOLANT CIRCULATING INSIDE TUBES THAT ARE SURROUNDED BY FUEL. THERMAL SOWING AND FLOW-INDUCED VIBRATIONS IN FUEL PINS ARE ANALYZED. OPTIMIZATION STUDIES OF SECONDARY CONTAINMENT ARE ALSO INCLUDED.

*DESIGN STUDY + *ECONOMIC STUDY + *REACTOR, FAST + *REACTOR, GAS COOLED + CONTAINMENT ANALYSIS + ORNL (OAK RIDGE NATIONAL LABORATORY)

11-12141 COLUMBIA UNIVERSITY SUBMITS TECHNICAL SPECIFICATIONS FOR REACTOR BUILDING CONFINEMENT SYSTEM FOR IRL
COLUMBIA UNIVERSITY

17 PAGES, 1 FIGURE, 2 TABLES, 13 REFERENCES, SEPTEMBER 28, 1966, DOCKET NO. 50-17, PDR

SIX SPECIFICATIONS SUBMITTED FOR IRL REACTOR INCLUDE (1) MCA - OVERPRESSURE UNFILTERED LEAKAGE WILL NOT EXCEED 0.0045 OF BUILDING VOLUME, AND (6) EMERGENCY EXHAUST CHARCOAL FILTERS WILL HAVE AN EFFICIENCY GREATER THAN 97 PERCENT WHEN TESTED WITH ELEMENTAL IODINE. TESTING INTERVALS SET AT 6 MONTHS. BASIS FOR THIS INCLUDES SYSTEM DESCRIPTION, AN MCA ANALYSIS BASED ON TID-14844, WHICH SHOWS 2-HR THYROID DOSE AT SITE BOUNDARY TO BE 300 REMS.

*CONTAINMENT FILTERING SYSTEM + *CONTAINMENT PENETRATION, CLOSURE OF +
*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTAINMENT, PRESSURE VENTING + REACTOR, RESEARCH

11-12175 FIRE DAMAGES HOT CELL WINDOW

DIVISION OF OPERATIONAL SAFETY, USAEC

2 PAGES, AEC SERIOUS ACCIDENTS BULLETIN NO. 275, (NOVEMBER 4, 1966), DPI

DURING CLEANING OF A FISSION-GAS APPARATUS WITH BUTYL ALCOHOL, A SMALL BIT OF NAK DROPPED OUT AND REACTED IN AIR. THE SPARK IGNITED THE ALCOHOL VAPOR. MANUAL ACTUATION OF A 600-LB TOTAL-FLOODING CO2 SYSTEM PUT OUT THE FIRE, BUT NOT BEFORE THE INNER WINDOW CRACKED. THE MINERAL OIL WAS DRAINED, SO ADDITIONAL FUEL WAS NOT AVAILABLE. CELL NEGATIVE PRESSURE WAS MAINTAINED, AND EXHAUST FILTERS DID NOT CLOG.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-12175 *CONTINUED*
*FIRE + *HOT CELL + *NAK (SODIUM POTASSIUM ALLOY)

11-12179 MORRIS PA
ELK RIVER CHANGE 9 - DEFERRED CONTAINMENT LEAKAGE TEST
DIVISION OF REACTOR LICENSING, USAEC
2 PAGES, NOVEMBER 7, 1966, DOCKET NO. 115-1, PDR

DRL AUTHORIZES A FOUR-MONTH DELAY IN CONTAINMENT-LEAKAGE TESTING (NOT LATER THAN MARCH 1, 1967) TO TAKE ADVANTAGE OF A SCHEDULED SHUTDOWN AND A REDESIGNED REFERENCE-CHAMBER SYSTEM.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTAINMENT, HIGH PRESSURE + ELK RIVER + REACTOR, BOILING WATER + TEST, LEAK RATE

11-12198 ELK RIVER JANUARY SHUTDOWN PLANS
RURAL COOPERATIVE POWER ASSOCIATION
2 PAGES, OCTOBER 10, 1966, DOCKET NO. 115-1, PDR

IN A LETTER TO AEC-DRL, THE RURAL COOPERATIVE POWER ASSOCIATION (THE ELK RIVER OPERATING AGENCY) INDICATES PLANS FOR AN EARLY 1967 SHUTDOWN TO (A) INSPECT BORON STAINLESS-STEEL CONTROL RODS, WHEN THE NEW B4C RODS ARE DELIVERED, AND (B) TO INSTALL A CALIBRATED-GRIFICE LEAK-RATE SOURCE AND TO REDESIGN THE REFERENCE CHAMBER SYSTEM, SO A MORE MEANINGFUL CONTAINMENT TEST MAY BE MADE.

*CONTAINMENT, HIGH PRESSURE + *CONTROL ROD + *TEST, LEAK RATE + CONTAINMENT REFERENCE MEASURING SYSTEM + ELK RIVER + MATERIAL + REACTOR, BOILING WATER

11-12199 REQUEST FOR CHANGE IN THE TECHNICAL SPECIFICATIONS FOR THE ELK RIVER REACTOR - CHANGE REQUEST NO. 9
RURAL COOPERATIVE POWER ASSOCIATION
14 PAGES, 1 FIGURE, OCTOBER 3, 1966, DOCKET NO. 115-1, PDR

PROPOSED TECHNICAL SPECIFICATION CHANGES ARE - SECTION 31(5) - ALLOWABLE LEAK RATE TO BE CHANGED FROM 0.1 PERCENT PER DAY (AT 21 PSIG) TO 0.45 PERCENT PER DAY BECAUSE THE LOWER LEAK RATE IS SO LOW AS TO BE WITHIN THE MEASUREMENT LIMITS OF ACCURACY. APPENDED CALCULATIONS INDICATE THAT A LEAK RATE OF 1.35 PERCENT PER DAY WOULD GIVE 300 RADS THYROID DOSE AT THE EXCLUSION DISTANCE. SECTION 3.4 - THIS SECTION IS COMPLETELY REPLACED WITH A SET OF TEST FREQUENCIES, TEST METHODS, AND ACCEPTANCE CRITERIA FOR LEAKAGE RATE AND LEAK DETECTION OF CONTAINMENT AND VARIOUS KINDS OF PENETRATIONS. INTEGRATED-LEAK-RATE TEST WOULD BE PERFORMED WITHIN 4 MONTHS OF THE PREVIOUSLY FIXED EVERY-18-MONTHS.

*CONTAINMENT, HIGH PRESSURE + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *TEST, LEAK LOCATION + *TEST, LEAK RATE + ELK RIVER + REACTOR, BOILING WATER

11-12200 CONTAINMENT ISOLATION VALVE REVIEW
RURAL COOPERATIVE POWER ASSOCIATION
19 PAGES, 9 FIGURES, 2 TABLES, OCTOBER 10, 1966, DOCKET NO. 115-1, PDR

THIS REVIEW WAS REQUESTED BY AEC. FIVE CRITERIA WERE ESTABLISHED (E.G., LINES OPEN TO CONTAINMENT OR PRIMARY SYSTEM WILL HAVE 2 VALVES IN SERIES, AT LEAST ONE VALVE WILL CLOSE AUTOMATICALLY ON HIGH CONTAINMENT PRESSURE OR ON BACK FLOW). THESE CRITERIA WERE COMPARED TO YANKEE, BIG ROCK POINT, DRESDEN II, AND ROCHESTER GAS AND ELECTRIC DESIGNS, WHERE CONSIDERABLE VARIATION WAS SHOWN. THEN THE 30 ACTUAL CONTAINMENT PIPE-OR-DUCT-PENETRATIONS WERE COMPARED TO THE CRITERIA AND CHANGES SCHEDULED WHERE NECESSARY.

*CONTAINMENT PENETRATION, CLOSURE OF + *DESIGN CRITERIA + *MODIFICATION, SYSTEM OR EQUIPMENT + ELK RIVER + REACTOR, BOILING WATER

11-12206 APPENDIX V. 2 - DISCUSSION OF SIGNIFICANT TESTS
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 2-3 OF APPENDIX V FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966, PDR

CONTINUOUS LEAK-RATE MONITORING SYSTEM INDICATES (BY MEASURING NITROGEN INJECTION) SUPPRESSION CHAMBER 0.035 PERCENT/DAY AT 10 INCHES WATER PRESSURE AND DRY WELL AS 0.052 PERCENT PER DAY AT 20 INCHES WATER (VS 0.05 AND 0.07 FROM LAST INTEGRATED LEAK-RATE TEST). AS AN INDICATION OF THIS ABILITY OF THIS SYSTEM TO QUICKLY EXPOSE ABNORMAL LEAKAGE RATES, SUPPRESSION-CHAMBER PRESSURE WAS FOUND FALLING FASTER THAN NORMAL IN APRIL, THREE DAYS AFTER A STARTUP. AFTER REPEATED OPERATION OF THE VENT VALVES TO GET DIRT OUT OF THE SEATS, THE LEAKAGE RETURNED TO NORMAL. THE EXCESSIVE LEAK RATE WAS KEPT WELL BELOW SPECIFICATIONS AND FOUND WITHIN A DAY AFTER THE VENTING OPERATION.

*CONTAINMENT, PRESSURE SUPPRESSION + *OPERATIONS SUMMARY, FOR AEC + *TEST, LEAK RATE + HUMBOLDT BAY + REACTOR, BOILING WATER

11-12319 SELECTED OPERATING EXPERIENCES
POWER REACTOR DEVELOPMENT COMPANY
EF-28 +, 3 PAGES, POWER REACTOR DEVELOPMENT COMPANY, ENRICO FERMI ATOMIC POWER PLANT REPORT FOR DECEMBER

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-12319 *CONTINUED*

1965 PAGES 1-2 AND 10, DECEMBER 1965, DOCKET NO. 50-16

THE NUCLEAR TESTING AT LESS THAN 1 MW(TH) EXTENDED FROM AUGUST 1963 TO DECEMBER 1965. THE FIRST POWER INCREASE ABOVE 1 MW(TH) TOOK PLACE DECEMBER 29, 1965. THE NEW SOURCE-RANGE DETECTORS (INCLUDING TWO SURROUNDED BY ZIRCONIUM HYDRIDE) WORKED WELL. WHILE DAILY CHECKS OF ELECTRICAL PENETRATION LEAKAGE AT 5 PSIG WERE BELOW 50 SCF/DAY, TESTS AT 32 PSIG INDICATED 110.

USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATIONS SUMMARY FOR AEC + CONTAINMENT, HIGH PRESSURE + FERMI + INSTRUMENTATION, STARTUP RANGE + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + TEST, LEAK RATE

11-12373 REACTOR PRIMARY COOLANT SYSTEM RUPTURE STUDY. QUARTERLY PROGRESS REPORT NO. 5, APRIL-JUNE 1966
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-5192 +. 62 PAGES, 16 FIGURES, 3 TABLES, 15 REFERENCES, AUGUST 1966, CFSTI \$3.00 CY

GEAP-5192, APRIL-JUNE 1966, IS PROGRESS REPORT NUMBER 5 IN A SERIES. FOUR ASPECTS OF THE STRUCTURAL PERFORMANCE OF REACTOR PRIMARY PIPING SYSTEMS ARE BEING STUDIED. - (1) RELIABILITY, (2) STRESS ANALYSIS (3) FRACTURE MECHANICS, AND (4) FATIGUE.

*BRITTLE FRACTURE + *FAILURE, FATIGUE + *FAILURE, PIPE + *PIPING + *RELIABILITY ANALYSIS + ACCIDENT, LOSS OF COOLANT + BIBLIOGRAPHY + COMPUTER PROGRAM + CONTAINMENT RESEARCH AND DEVELOPMENT + ELASTICITY + METAL + STRESS + STRESS ANALYSIS

11-12374 HAKE G

A NOTE ON THE FAST FRACTURE OF A PRESSURE VESSEL

ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER

AECL-2432 +. 9 PAGES, 4 FIGURES, 5 REFERENCES, MAY 1966, AECL \$0.50 CY

THE PURPOSE OF THIS NOTE IS TO GIVE A ROUGH INDICATION OF THE SIZE OF OPENING THAT RESULTS WHEN A PRESSURE VESSEL OR PRESSURE PIPING, WHICH CONTAINS A THROUGH-DEFECT SHORTER THAN THE CRITICAL LENGTH, IS BROUGHT UP TO OPERATING CONDITIONS. THIS INFORMATION IS RELEVANT TO THE ANALYSIS OF THE LOSS OF COOLANT ACCIDENT.

*CONTAINMENT LEAKAGE CONTROL + *FLAW + BRITTLE FRACTURE + CONTAINMENT, PRESSURE VESSEL + FAILURE, PRESSURE VESSEL + PRESSURE, INTERNAL

11-12376 FEARNEHOUGH GD

THE STRAIN RATE SENSITIVITY OF THE YIELD STRESS OF STEELS

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY

TRG-REPORT-1248 + JNPC-MWP-SSG/PI(66)40 +. 21 PAGES, 5 FIGURES, 4 TABLES, 29 REFERENCES, MAY 4, 1966, SOURCE

THE DYNAMIC YIELD STRESS HAS BEEN CALCULATED FROM THE GENERAL YIELD LOAD OF CHARPY SPECIMENS. THE RESULTS SHOW THAT UNIRRADIATED HIGH-YIELD-STRESS STEELS ARE LESS STRAIN-RATE SENSITIVE THAN THE LOW-YIELD-STRESS STEELS. IRRADIATION DOES NOT REDUCE STRAIN-RATE SENSITIVITY EVEN THOUGH IT INCREASES THE YIELD STRESS. THIS INDICATES THAT IRRADIATION HARDENING IS DUE TO THE PRESENCE OF SMALL OBSTACLES. THE TEMPERATURE SENSITIVITY OF THE YIELD STRESS REMAINS UNALTERED AFTER IRRADIATION.

*STRESS STRAIN DATA + EMBRITTLEMENT + FAILURE, PRESSURE VESSEL + IRRADIATION TESTING + PLASTICITY

11-12463 GALLAGHER EV

STUDIES OF REACTOR CONTAINMENT. BIMONTHLY PROGRESS REPORT JUNE 1 THROUGH JULY 31, 1966

IIT RESEARCH INSTITUTE, CHICAGO, ILLINOIS

IITRI-T6042-21 + IITRI-578P21-21 +. 13 PAGES, 1 TABLE, 4 FIGURES, 1966

THIS RESEARCH PROGRAM PERTAINS TO THE GENERATION, TRANSMISSION, AND ATTENUATION OF SHOCK WAVES IN CONTAINMENT STRUCTURES CAUSED BY REACTOR EXCURSIONS OR LOSS-OF-COOLANT ACCIDENTS. PHASE 1, CRUSHABLE-SHIELD ANALYSIS AND DESIGN, AND PHASE 2, SHOCK-IMPINGEMENT EXPERIMENTS ON CRUSHABLE SHIELDS, ARE COMPLETE. PHASE 3, COOLANT-DECOMPRESSION EXPERIMENTS AND ANALYSIS, IS STILL IN PROGRESS. A COMPUTER PROGRAM, SWIMM, WAS WRITTEN TO SOLVE COMPLEX ONE-DIMENSIONAL STRESS-WAVE PROBLEMS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

*CONTAINMENT ANALYSIS + *CONTAINMENT, SHOCK GENERATION AND PROTECTION + COMPUTER PROGRAM + CSE (CONTAINMENT SYSTEMS EXPERIMENT) + REACTOR, PRESSURIZED WATER

11-13402 SM-1A REACTOR PRESSURE VESSEL LIFETIME

U.S. ARMY

ED-6604 +. 45 PAGES, 9 FIGURES, 3 TABLES, 19 REFERENCES, SEPTEMBER 1, 1966, SOURCE

THIS STUDY PRESENTS A DISCUSSION OF FACTORS AFFECTING THE PROJECTED LIFETIME OF THE SM-1A REACTOR PRESSURE VESSEL. THIS DOCUMENT WAS PREPARED IN RESPONSE TO QUESTIONS RAISED BY THE AEC REGULATORY STAFF. THE QUESTIONS PERTAIN TO QUALITY CONTROL, YIELD-STRENGTH VALUES, INITIAL NDT, RATE OF INCREASE OF NDT, OUT OF ROUNDNESS, STRESS ANALYSIS, NDT LIMITS,

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-13402 *CONTINUED*

UNCERTAINTY IN FLUX CALCULATIONS AND RADIATION DAMAGE. THE MAXIMUM ALLOWABLE NDT RISE IS 340 F. EXTENSIVE DOSIMETRY CALCULATIONS ARE USED TO ESTABLISH A LINEAR RELATION BETWEEN NEUTRON FLUX AND NDT SHIFT. THE ESTIMATED END OF SERVICE LIFE IS DECEMBER 1967.

*DOSIMETRY, GENERAL + *EMBRITTEMENT + *NOT DATA (NIL DUCTILITY TRANSITION) + *RADIATION DAMAGE + *REACTOR, ARMY + BRITTLE FRACTURE + CONTAINMENT, PRESSURE VESSEL + SM 1A (STATIONARY MEDIUM POWER PLANT, ALASKA)

11-13403 PRE-STRESSED CONCRETE PRESSURE VESSELS FOR ELECTRICITE DE FRANCE
5 PAGES, FIGURES, TABLES, NUCLEAR ENGINEERING 11(125) PAGES 790-794 (OCTOBER 1966)

DESIGN CRITERIA, METHODS OF ANALYSIS, AND THE RESULTS OF MODEL TESTS ON PRESTRESSED-CONCRETE PRESSURE VESSELS ARE DISCUSSED. SLIDING SKIDS FOR PRESTRESSING CABLES ARE NO LONGER NEEDED. PUMICE-CONCRETE INSULATION IS USED TO KEEP THE VESSEL TEMPERATURE BELOW 80 C. PRESTRESSING CABLES ARE GROUTED. THE MAIN CRITERIA FOR THE CONCRETE ARE LOW THERMAL EXPANSION AND LOW ELASTIC MODULUS. THE VESSEL IS SUPPORTED ON REINFORCED CONCRETE BLOCKS WITH NEOPRENE BEARING PADS TO MINIMIZE RADIAL RESTRAINT. THE LINER IS DUCTILE MILD STEEL. STRESS ANALYSIS IS PERFORMED FOR SERVICE CONDITIONS AND ULTIMATE LOAD. MODEL TESTS SHOWED THAT THERMAL EFFECTS DO NOT REDUCE ULTIMATE STRENGTH.

*CONCRETE + *CONCRETE, PRESTRESSED + *MOCKUP + BURST PRESSURE + CONTAINMENT DESIGN + CONTAINMENT, PRESSURE VESSEL + ELASTICITY + STEEL LINER + STRESS + TEST, DESTRUCTIVE + TEST, NONDESTRUCTIVE + TEST, PRESSURE VESSEL + THERMAL INSULATION

11-13482 DUMAS M

EFFECT OF ALTERNATE TEMPERATURE VARIATIONS ON PRESTRESSING STEELS. CANCELLATION OF RELAXATION ASSOCIATION SCIENTIFIQUE DE LA PRECONTRAINT, FRANCE
ORNL-TR-1348 +. 41 PAGES, 38 FIGURES, 9 TABLES, OCTOBER 1965

IN NORMAL PRESTRESSED CONCRETE CONSTRUCTION, THE PRESTRESSING STRANDS ARE INITIALLY TENSIONED TO 80% OF THEIR ULTIMATE STRENGTH. HOWEVER, DUE TO RELAXATION IN THE STEEL, CREEP IN THE CONCRETE, AND FRICTION BETWEEN THE STRANDS AND THEIR CONDUITS, THE FINAL TENSIONS ARE ABOUT 60% OF ULTIMATE STRENGTH. COLD-WORKING REDUCES RELAXATION LOSSES BY ABOUT 60%. THE MORE THE COLD WORKING, THE GREATER THE REDUCTION IN RELAXATION. RELAXATION IS HIGHER THE HIGHER THE INITIAL TENSION, BUT THIS DOES NOT OFFSET THE BENEFITS OF COLD WORK. RETENSIONING AND PARTIAL RELAXATION AT ELEVATED TEMPERATURES SUBSTANTIALLY REDUCES THE RELAXATION WHICH FOLLOWS FINAL TENSIONING AT ROOM TEMPERATURE.

AVAILABILITY - SPECIAL LIBRARIES ASSOCIATION TRANSLATION CENTER, JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$4.60 COPY, \$1.43 MICROFICHE

*CONCRETE + *CONCRETE, PRESTRESSED + *CREEP PROPERTY + *MEASUREMENT, STRAIN GAGE + *STRESS STRAIN DATA + CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT, PRESSURE VESSEL + DEFORMATION + HIGH TEMPERATURE + PLASTICITY + STRESS + TENSILE PROPERTY

11-13483 TAKAHASHI SK + GATES WE + BENUSKA KI.
RESISTANCE OF TUBULAR STRUCTURES TO DYNAMIC LOADING
NAVAL CIVIL ENGINEERING LABORATORY, PORT HUENEME
NCEL-TR-463 +. 190 PAGES, FIGURES, TABLES, 23 REFERENCES, JULY 1966

STATIC AND DYNAMIC MEASUREMENTS WERE MADE OF THE RESPONSE OF MODEL STEEL-CLAD CONCRETE TOWERS TO LATERAL DYNAMIC LOADING. THE RESULTS COMPARED FAVORABLY WITH A COMPUTER ANALYSIS. FAILURE OCCURRED IN COMPRESSION NEAR THE BASE. THIS REPORT IS EXCEPTIONALLY COMPLETE AND WELL WRITTEN. IT SHOULD BE A USEFUL REFERENCE WITH RESPECT TO THE ANALYSIS OF COMPOSITE STEEL AND CONCRETE CONTAINMENT STRUCTURES SUBJECTED TO EARTHQUAKE LOADS.

AVAILABILITY - DEFENSE DOCUMENTATION CENTER, CAMERON STATION, VIRGINIA

*COMPUTER PROGRAM + *DESIGN STUDY + *EARTHQUAKE + *INTERACTION, SOIL AND STRUCTURE + *TEST, DESTRUCTIVE + *VIBRATION ANALYSIS + COMPUTER, DIGITAL + CONCRETE + CONTAINMENT ANALYSIS + CYLINDER + ELASTICITY + IMPACT SHOCK + MEASUREMENT, STRAIN GAGE + MOCKUP + PLASTICITY + STEEL

11-13487 MONTICELLO AMENDMENT 2 - DESIGN FABRICATION AND ERECTION OF THE REACTOR VESSEL
NORTHERN STATES POWER COMPANY, MINNEAPOLIS, MINNESOTA
350 PAGES, 152 FIGURES, 13 TABLES, NOVEMBER 18, 1966, DOCKET NO. 50-263

DESCRIBES THE PROCESS OF FIELD FABRICATION, STARTING WITH HALF CYLINDERS AND FLANGES. LARGE CLAMPSON MILLING AND BORING MACHINES ARE NOT NOVEL. PREVIOUS CB AND I EXPERIENCE SUMMARIZED. TRAINING OF LOCAL WELDERS PROVIDED FOR, UNION AGREES NON-LOCAL WELDER MAY BE BROUGHT IN. SHIPPING AN ASSEMBLED VESSEL WOULD BE ALMOST IMPOSSIBLE BECAUSE OF VESSEL CLEARANCES, UNDERWATER OBSTACLES, AND ROAD BEDS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + CONTAINMENT, PRESSURE VESSEL + FABRICATION + MONTICELLO + QUALITY CONTROL + REACTOR, BOILING WATER

11-13526 PICKETT AG + GRIGORY SC
STUDIES OF THE FATIGUE STRENGTH OF PRESSURE VESSELS. TECHNICAL SUMMARY REPORT. PART I CYCLIC PRESSURE

ACCESSION NUMBER 11-13402 TO 11-13526

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-13526 *CONTINUED*
TESTS OF FULL-SIZE PRESSURE VESSELS
SOUTHWEST RESEARCH INSTITUTE
SWRI-1228-1-29 +. 139 PAGES, 53 FIGURES, 21 TABLES, 25 REFERENCES, SEPTEMBER 1966

THIS IS A SUMMARY OF THE STRESS ANALYSIS AND FATIGUE TESTING PHASES OF THE SWRI-PVRC PRESSURE-VESSEL-TEST PROGRAM WHICH BEGAN IN 1957. IN PRESSURE VESSELS, EXCEPT HIGH-STRENGTH VESSELS, FATIGUE CRACKS INITIATE ONLY AT POINTS WHICH HAVE UNDERGONE PLASTIC DEFORMATION. THE TEST VESSELS HAD LOWER FATIGUE LIVES THAN LABORATORY SPECIMENS BECAUSE OF INITIAL DEFECTS. THEREFORE, THE FATIGUE ANALYSIS OF AN ACTUAL PRESSURE VESSEL MUST CONSIDER THE PRESENCE OF INITIAL DEFECTS. A WELL-DESIGNED REINFORCED OPENING DOES NOT REDUCE VESSEL STRENGTH ANY MORE THAN OUT-OF-ROUNDNESS, POOR FIT-UP AND FLAWS. OUT-OF-ROUNDNESS CAN CAUSE HOOP STRESSES TO INCREASE BY A FACTOR OF THREE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VIRGINIA \$3.00 CY, \$0.75 MN

*FAILURE, FATIGUE + *FAILURE, PRESSURE VESSEL + *FLAW + *MEASUREMENT, STRAIN GAGE + *NOZZLE + *TEST, PRESSURE VESSEL + BRITTLE FRACTURE + CONTAINMENT LEAKAGE CONTROL + CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT, PRESSURE VESSEL + PLASTICITY + STEEL + STRESS + TEST, DESTRUCTIVE

11-13528 GARG SK + SIEKMANN J + NASH WA + CHENG SL
CONTRIBUTIONS TO BLAST WAVE AND FRACTURE THEORIES. FINAL REPORT
UNIVERSITY OF FLORIDA, GAINESVILLE
AD-468,670 +. 130 PAGES, 8 TABLES, 27 FIGURES, 42 REFERENCES, JULY 1965

THIS REPORT CONTAINS ANALYTICAL DISCUSSIONS OF BLAST-WAVE THEORY AND THE DYNAMIC RESPONSE OF A THIN ELASTIC SPHERICAL SHELL TO A BLAST WAVE. FAILURE CRITERIA FOR THE SHELL ARE DISCUSSED, AND A SUMMARY OF THE INFORMATION REQUIRED FOR THE DESIGN OF A BLAST-LOADED SHELL IS PRESENTED.

AVAILABILITY - S.K. GARG, J. SIEKMANN, W.A. NASH, S.L. CHENG, UNIVERSITY OF FLORIDA, COLLEGE OF ENGINEERING, ENGINEERING SCIENCE AND MECHANICS, ENGINEERING EXPERIMENT STATION, GAINESVILLE, FLA.

*CONTAINMENT, SHOCK GENERATION AND PROTECTION + *EXPLOSION + *SHOCK WAVE + BRITTLE FRACTURE + BURST PRESSURE + CONTAINMENT VESSEL LOADING + ELASTICITY + EXCURSION, LARGE + IMPACT SHOCK + PRESSEUPE, INTERNAL + SHELL + SPHERE + STRESS

11-13539 HARRIS DO
STRESS INTENSITY FACTORS FOR HOLLOW CIRCUMFERENTIALLY NOTCHED ROUND BARS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-14859 +. 26 PAGES, APRIL 29, 1966

STRESS INTENSITY FACTORS ARE PRESENTED FOR HOLLOW, CIRCUMFERENTIALLY NOTCHED, ROUND BAR SUBJECTED TO TENSION, TORSION, BENDING, AND TRANSVERSE SHEAR. THESE PREVIOUSLY UNDETERMINED FACTORS ARE CALCULATED FROM THE LIMITING VALUES OF STRESS CONCENTRATION FACTORS FOR A SMALL NOTCH ROOT RADIUS. THE STRESS INTENSITY FACTORS OBTAINED ARE COMPARED WITH RESULTS OBTAINED BY OTHER INVESTIGATORS, WHEN POSSIBLE, AND A FAVORABLE CORRELATION IS OBSERVED. THE ACCURACY IS FURTHER INDICATED BY THE GOOD AGREEMENT OF THE FRACTURE TOUGHNESS OF 7075-T6 ALUMINUM, DETERMINED IN A SERIES OF TENSION AND BENDING TESTS CONDUCTED ON HOLLOW, NOTCHED, ROUND BARS, WITH THE CORRESPONDING VALUE OBTAINED BY OTHER INVESTIGATORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 COPY, \$0.50 MICRONEGATIVE

*BRITTLE FRACTURE + *IMPACT PROPERTY + *STRESS STRAIN DATA + *TENSILE PROPERTY + ALLOY + ALUMINUM + STRESS + STRESS ANALYSIS + STRESS RUPTURE

11-13540 SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING MARCH 31, 1966. GAS-COOLED REACTOR PROGRAM
OAK RIDGE NATIONAL LABORATORY
QRNL-3951 +. 226 PAGES, FIGURES, TABLES, JULY 1966

ADVANCED GAS-COOLED REACTOR PROGRAM - FUELED-GRAPHITE DEVELOPMENT, INVESTIGATIONS OF FUELED-GRAPHITE SYSTEMS, STUDIES FOR AVR - GERMAN PEBBLE-BED REACTOR, INVESTIGATIONS OF MODERATOR MATERIALS, STUDIES FOR ADVANCED SYSTEMS, FAST REACTOR DEVELOPMENT, AND HIGH-TEMPERATURE GAS-COOLED REACTOR NUCLEAR SAFETY PROGRAM. PART 2. EXPERIMENTAL GAS-COOLED REACTOR PROGRAM - COMPONENT DEVELOPMENT AND TESTING AND IRRADIATION TESTING OF COMPONENTS AND MATERIALS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 COPY, \$1.25 MICROFICHE

*COATED PARTICLE + *FUEL BURNUP + *FUEL INTEGRITY + *IN PILE EXPERIMENT + *IRRADIATION TESTING + *REACTOR, GAS COOLED + *REACTOR, PEBBLE BED + CARBIDE + ENGINEERED SAFEGUARD + FISSION PRODUCT TRANSPORT + FISSION RECOIL + MODERATOR + PYROLYTIC + REACTOR, FAST + SAFETY STUDY + SOL-GEL PROCESS + THERMODYNAMICS

11-13547 RADIATION METALLURGY SECTION, SOLID STATE DIVISION, PROGRESS REPORT FOR PERIOD ENDING FEBRUARY 1966
OAK RIDGE NATIONAL LABORATORY
QRNL-3949 +. 79 PAGES, 37 FIGURES, 7 TABLES, MAY 1966

IN THIS REPORT, RECENT PROGRESS IS REPORTED ON (1) INVESTIGATIONS OF THE EFFECT OF RADIATION

ACCESSION NUMBER 11-13526 TO 11-13547

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-13547 *CONTINUED*

AND POST-IRRADIATION ANNEALING ON THE IMPACT PROPERTIES OF SIMULATED WELD HEAT-AFFECTED-ZONE SAMPLES OF A COMMERCIAL PRESSURE VESSEL STEEL, (2) RADIATION-HARDENING AND POST-IRRADIATION ANNEALING IN IRON AND STEEL, WITH SPECIAL EMPHASIS ON THE EFFECT OF DOSE RATE, (3) DISLOCATION DYNAMICS IN IRRADIATED IRON BY STRESS RELAXATION TECHNIQUES, AND (4) PLASTIC DEFORMATION IN NIOBIUM, INCLUDING THE PREPARATION AND PURIFICATION OF SINGLE CRYSTALS, THE USE OF BORRMANN ANOMALOUS X-RAY TRANSMISSION TO SEE DISLOCATIONS IN STEREO VIEW, ETCH-PIT MEASUREMENTS OF DISLOCATION VELOCITY, SLIP LINE OBSERVATIONS IN UNIRRADIATED AND IRRADIATED SINGLE CRYSTALS, AND STRESS RELAXATION MEASUREMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.50 MN

*BRITTLE FRACTURE + *IRRADIATION TESTING + *NDT DATA (NIL DUCTILITY TRANSITION) + *RADIATION DAMAGE + *STEEL + *TENSILE PROPERTY + EMBRITTLEMENT + IMPACT PROPERTY + IRON + NIOBIUM + RADIATION EFFECT

11-13573 MANNHEIMER WA + PAXTON HW

SOME EFFECTS OF NITROGEN ON THE RESISTANCE TO STRESS CORROSION CRACKING OF TYPE 304 STAINLESS STEEL WIRES
CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURGH
12 PAGES, 5 FIGURES, 1 TABLE, JUNE 15, 1966

IN RECENT WORK ON STRESS CORROSION CRACKING, THE ROLE OF ALLOYING ELEMENTS WHICH MAY EFFECT DISLOCATION DISTRIBUTION AND CRACKING WAS DISCUSSED. NITROGEN WAS INTRODUCED INTO AUSTENITIC STAINLESS STEELS IN THE SOLID STATE FROM NH₃/H₂ MIXTURES AT TEMPERATURES IN THE RANGE 600-750 C. THE RESISTANCE TO CRACKING IS MARKEDLY IMPROVED. THE REASONS FOR THIS IMPROVEMENT ARE UNDER INVESTIGATION.

AVAILABILITY--W. A. MANNHEIMER, H. W. PAXTON, CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURGH, PENN. 15213

*BRITTLE FRACTURE + *CONTAINMENT, CORROSION PROTECTION + *NITRIDE + *STEEL, STAINLESS + ALLOY + CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT, GENERAL + CONTAINMENT, PRESSURE VESSEL + CORROSION + STRESS

11-13585 PICKETT AG + GRIGORY SC

STUDIES OF THE FATIGUE STRENGTH OF PRESSURE VESSELS (1) CYCLIC PRESSURE TESTS OF LARGE SIZE PRESSURE VESSELS, (2) LOW CYCLE FATIGUE TESTING OF ONE-HALF SCALE MODEL PRESSURE VESSELS, (3) EFFECT OF WELD DEFECTS ON THE FATIGUE STRENGTH OF A302B STEEL
SOUTHWEST RESEARCH INSTITUTE
SWRI 1228-1-28 + SWRI 1228-2-28 + SWRI 1228-5-28 +. 70 PAGES, 44 FIGURES, 3 TABLES, SEPTEMBER 14, 1966

THIS IS A DETAILED PROGRESS REPORT OF THE EXPERIMENTAL RESEARCH ON THE FATIGUE LIFE AND FRACTURE STRENGTH OF STEEL PRESSURE VESSELS BEING CONDUCTED AT SWRI. A LIST OF VESSELS TESTED IS GIVEN. CURRENT WORK INCLUDES THE TESTING OF HALF-SCALE MODEL VESSELS TO DETERMINE THE EFFECT OF SIZE ON FATIGUE STRENGTH. A MODEL OF THE PM-2A VESSEL WAS TESTED TO FAILURE BY FRACTURE. EXPERIMENTAL DATA AND PHOTOGRAPHS ARE INCLUDED.

AVAILABILITY - USAEC, DIVISION TECHNICAL INFORMATION EXTENSION, OAK RIDGE, TENNESSEE

*BRITTLE FRACTURE + *CONTAINMENT, PRESSURE VESSEL + *FAILURE, PRESSURE VESSEL + *NUZZLE + *TEST, PRESSURE VESSEL + BURST PRESSURE + CONTAINMENT RESEARCH AND DEVELOPMENT + FLAW + MEASUREMENT, STRAIN GAGE + STEEL + STRESS + TEST, DESTRUCTIVE + WELDS

11-13613 AMENDMENT 5 TO BROWNS FERRY CONSTRUCTION PERMIT APPLICATION - MISCELLANEOUS
TENNESSEE VALLEY AUTHORITY

39 PAGES, 8 TABLES, 11 FIGURES, NOVEMBER 25, 1966, DOCKET NO. 50-259 AND 50-260

REVISIONS MADE FOLLOWING A SEPTEMBER 22, 1966 MEETING WITH DRL APPEARS TO CONSIST OF (1) INCREASED RECREATIONAL POPULATION (2) OFF-GAS FILTER DESIGN TEMPERATURES OF 500 F, (3) HALVING THE FLOW RATE AND THYROID DOSE FOLLOWING A MAIN-STEAM-LINE RUPTURE, (4) HIGHER DRYWELL PRESSURE RESULTING FROM ONLY 1 OF 4 CONTAINMENT COOLING PUMPS OPERATING. ILLUSTRATIONS REVISED APPROPRIATELY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CHARCOAL + CONTAINMENT DESIGN + FILTER + POPULATION DISTRIBUTION + REACTOR, BOILING WATER

11-13774 RIPLING EJ + CROSLLEY P

FRACTURE TOUGHNESS OF REACTOR PRESSURE VESSEL STEELS. DEVELOPMENT OF TEST PROCEDURES, FOR THE PERIOD JUNE 1, 1966 TO JULY 31, 1966
MATERIALS RESEARCH LABORATORY, INC., RICHTON PARK, ILLINOIS
COO-1477-5 +. 8 PAGES, AUGUST 15, 1966

DYNAMIC TESTING METHODS ARE BEING DEVELOPED FOR MEASURING THE FRACTURE TOUGHNESS OF MEDIUM-STRENGTH STEELS SUCH AS A-302-B. THE MOST CONSERVATIVE INITIATION TOUGHNESS VALUES ARE EXPECTED TO BE PRODUCED BY HIGH LOADING RATES. IMPULSE LOADING WITH A LOADING TIME OF ABOUT 100 MILLISECOND IS BEING USED. EXPERIMENTAL DATA HAVE BEEN OBTAINED ON EPOXY AND ALUMINUM ALLOY SPECIMENS. THE DOUBLE CANTILEVER BEAM SHAPE IS BEING STUDIED BECAUSE IT IS A POTENTIAL SURVEILLANCE SPECIMEN FROM WHICH IRRADIATED FRACTURE TOUGHNESS DATA CAN BE OBTAINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

ACCESSION NUMBER 11-13547 TO 11-13774

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-13774 *CONTINUED*

*BRITTLE FRACTURE + *EMBRITTEMENT + CONTAINMENT, PRESSURE VESSEL + ELASTICITY + FAILURE, PRESSURE VESSEL +
FLAW + IMPACT SHOCK + PLASTICITY + STEEL + TENSILE PROPERTY

11-13813 JOHNSTON BM

THERMAL STRESSES IN INFINITE FLAT PLATES

LAWRENCE RADIATION LAB

UCRL-14737 +. 50 PAGES, FIGURES, 9 REFERENCES, JUNE 30, 1966

STRESS CAUSED BY HEAT GENERATION IN INFINITE FLAT PLATES IS INVESTIGATED ANALYTICALLY AND NUMERICALLY BY WELL-KNOWN METHODS. IT IS SHOWN HOW THESE METHODS CAN BE USED TO SOLVE MULTIPLE-PLATE PROBLEMS. THE NUMERICAL METHOD USED ALLOWS ONE TO CONSIDER VERY HIGH (EVEN INSTANTANEOUS) HEAT-GENERATION RATES. A COMPARISON IS GIVEN BETWEEN THE ANALYTICAL AND NUMERICAL SOLUTIONS. THE PROBLEMS ARE ARRANGED IN ORDER FROM THE SIMPLE TO THE MORE COMPLEX, AND THE METHODS, BOTH ANALYTIC AND NUMERICAL, ARE EXPLAINED IN DETAIL SO THAT AN ENGINEER WITH A MINIMUM OF MATHEMATICAL TRAINING CAN UNDERSTAND THIS PAPER, USE THE RESULTS, AND SOLVE SIMILAR PROBLEMS ON HIS OWN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY

*COMPUTER PROGRAM + *ELASTICITY + *HIGH TEMPERATURE + HEAT TRANSFER + MATHEMATICAL STUDY + STRESS + THERMAL INSULATION

11-13814 HALLE H

DEFORMATION ANALYSIS OF A CIRCULAR COUPLED-PLATE STRUCTURE

ARGONNE NATIONAL LABORATORY

ANL-7145 +. 27 PAGES, 10 FIGURES, 1 TABLE, 6 REFERENCES, MARCH 1966

A STRUCTURE CONSISTING OF TWO PARALLEL, EDGE-SUPPORTED, CIRCULAR, FLAT PLATES, CONNECTED BY A GRIDWORK OF SHORT COLUMNS, IS ANALYZED APPROXIMATELY FOR ITS STATIC RESPONSE TO LATERAL PRESSURE. CLAMPED AND SIMPLY SUPPORTED PLATE EDGES ARE CONSIDERED. EXPERIMENTAL DATA FROM PLASTIC MODELS ARE COMPARED WITH THE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*DEFORMATION + *ELASTICITY + *STRESS ANALYSIS + FUEL ELEMENT BOWING + FUEL INTEGRITY + MATHEMATICAL STUDY + MEASUREMENT, STRAIN GAGE + MOCKUP + STRESS

11-13815 ODQVIST FK

MATHEMATICAL THEORY OF CREEP AND CREEP RUPTURE

168 PAGES, 93 FIGURES, 1 TABLE, 110 REFERENCES, 1966

THIS BOOK IS A SHORT TREATISE ON THE ANALYSIS OF CREEP DEFORMATIONS IN STRUCTURES. CREEP RATES ARE GENERALLY TAKEN TO BE PROPORTIONAL TO SOME POWER OF STRESS. UNIAXIAL AND MULTIAXIAL PROBLEMS ARE CONSIDERED. SHAPES ANALYZED INCLUDE PLATES, MEMBRANES, BEAMS, COLUMNS, AND THICK-WALLED CYLINDERS. PROBLEMS INVOLVING BENDING, BUCKLING, CREEP RUPTURE, AND RELAXATION ARE DISCUSSED. A TABLE OF MATERIAL PROPERTIES NEEDED FOR CREEP ANALYSIS IS INCLUDED.

AVAILABILITY - OXFORD UNIVERSITY PRESS, ELY HOUSE, LONDON W.1, ENGLAND, \$7.70

*CREEP BEHAVIOR + *CREEP PROPERTY + *STRESS RUPTURE + BUCKLING + CONTAINMENT, PRESSURE VESSEL + CYLINDER + DEFORMATION + PLASTICITY + STRESS

11-14366 WEMPLE BD + JACKSON DC + LAROCQUE DD

OPERATING EXPERIENCE WITH THE KAPL-RADIOACTIVE MATERIALS LABORATORY METALLOGRAPHY FACILITY

KNOLLS ATOMIC POWER LABORATORY

2 PAGES, 2 REFERENCES, ANS TRANSACTIONS 8(2) PAGES 628-629 (1965 WINTER MEETING)

AFTER 2 YEARS OF OPERATION, CHANGES WERE MADE IN THE SAMPLE-PROCESSING EQUIPMENT AND PROCEDURES WERE INCORPORATED TO IMPROVE OPERATION. THE MAJOR CHANGES ARE - (1) SAMPLE GRINDER REPLACED WITH A FASTER ONE, (2) DEVELOPMENT OF SAMPLE-PREPARATION PROCEDURES, (3) DEVELOPMENT OF AN EXAMINATION PROCEDURE, (4) IMPROVEMENTS IN OPTICAL QUALITY OF METALLOGRAPHS, (5) DESIGN AND FABRICATION OF NEW ELECTRON-MICROSCOPE REPLICATING AND VACUUM-MOUNTING EQUIPMENT.

*HOT CELL + *METAL + *OPERATING EXPERIENCE + EXAMINATION + PROCEDURES AND MANUALS

11-14450 PM 2-A VESSEL FINALLY FRACTURES

2 PAGES, NUCLEONICS WEEK 8(3), PAGE 5 (JANUARY 19, 1967)

THE VESSEL FRACTURED AT 4,475 PSIG AND MINUS 20 F, WITH A NOTCH MACHINED 1-1/4 IN. DEEP (INTO THE 2-3/8 IN.-THICK VESSEL) AND 11 INCHES LONG. THE NOTCH HAD BEEN TREATED WITH ACID FOR TWO HOURS TO SHARPEN ITS POINT. WAPD-TM-640 BY J. M. MONAHAN AND T. J. WALKER CONTAINS DETAILS.

*BRITTLE FRACTURE + *CONTAINMENT, PRESSURE VESSEL + NDT DATA (NIL DUCTILITY TRANSITION) + PM 2A (PORTABLE MEDIUM NUCLEAR POWER PLANT) + REACTOR, ARMY + REACTOR, PRESSURIZED WATER + REACTOR, PRESSURIZED WATER + SAFETY STUDY

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-14467 GAITANIS MJ + TRIPP LF
OPERATIONAL EXPERIENCE AT THE QUEHANNA, PENNSYLVANIA FACILITY - A TWO-MEGACURIE SR-90 CONVERSION AND ENCAPSULATION PLANT
MARTIN COMPANY, CLEARFIELD, PENNSYLVANIA
7 PAGES, 4 FIGURES, 2 REFERENCES, 1966

THE QUEHANNA RADIOISOTOPE FACILITY WAS DESIGNED TO PREPARE SR-90 HEAT SOURCES. THE SOURCES ARE IN THE FORM OF SR-90 TITANATE POWDER PRESSED INTO SUITABLE LINERS AND THEN ENCAPSULATED. PRODUCTION INVOLVES DISSOLUTION OF BULK SR-90 CARBONATE, METERING, CONVERSION, FILTERING, FIRING, BALL-MILLING, STEP PRESSING, ENCAPSULATING, DECONTAMINATING, AND CALORIMETRY. OPERATIONAL EXPERIENCE WITH THE ORIGINAL PROCESS AND EQUIPMENT HAS MADE POSSIBLE THE DEVELOPMENT OF A SECOND-GENERATION SYSTEM WITH GREATLY IMPROVED RELIABILITY AND CONVENIENCE OF OPERATION.

AVAILABILITY - PROCEEDINGS OF 14TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY,

*ENERGY SOURCE + *STRONTIUM + HEAT GENERATION, INTERNAL + HOT CELL + RADIOCHEMICAL PROCESSING

11-14591 QUESTION G-1. STEAM LINE ISOLATION FOLLOWING A RUPTURE
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.1.1 TO G.1.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

SIX QUESTIONS REGARDING THIS ACCIDENT, THE ISOLATION VALVES, AND DOSE CALCULATION. (1) ISOLATION-VALVE SINGLE-FAILURE PROTECTION, (2) ALTERNATIVE VALVE-CLOSURE INSTRUMENTATION AND DELAY TIMES, (3) ANALYSIS OF CONSEQUENCES VS VALVE-CLOSURE DELAY TIME, (4) RE-ANALYZE DOSE WITH DIFFERENT PLUME-RISE EQUATION, (5) TESTING OF ISOLATION VALVES IN ACCIDENT CONDITIONS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + DOSE CALCULATION, EXTERNAL + HEIGHT OF RISE + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER + SYSTEM OPERABILITY IN ACCIDENT CONDITIONS + VALVE

11-14592 QUESTION G-1.A. SINGLE-FAILURE CRITERION FOR STEAM LINE ISOLATION VALVES INSTRUMENTATION
TENNESSEE VALLEY AUTHORITY
1 PAGE, PAGE G.1.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

TWO INDEPENDENT SYSTEMS (PIPEWAY-TEMPERATURE DETECTORS AND FLOW ACROSS THE FLOW LIMITER) WITH THE SAME REDUNDANT-COINCIDENT LOGIC AS THE SAFETY SYSTEM WILL GIVE A VALVE-CLOSURE SIGNAL.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER + SINGLE-FAILURE CRITERION

11-14593 QUESTION G-1-B. BACKUP SENSORS FOR STEAM LINE ISOLATION VALVE INSTRUMENTATION
TENNESSEE VALLEY AUTHORITY
1 PAGE, PAGE G.1.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

REACTOR WATER LOW-LOW LEVEL AND HIGH GAMMA RADIATION IN THE PIPEWAY (FROM TWO-PHASE FLOW) WILL BACK UP THE PIPEWAY TEMPERATURE DETECTORS AND THE STEAM-FLOW SIGNALS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + INDEPENDENCE + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER

11-14594 QUESTION G-1C. PARAMETER STUDY OF ISOLATION VALVE DELAY TIME CONSEQUENCES
TENNESSEE VALLEY AUTHORITY
5 PAGES, 1 FIGURE, PAGES G.1.4 TO G.1.8 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

VALVE-CLOSURE TIME IS ADJUSTED BETWEEN 3-10 SEC BY ORIFICES. DETAILED CALCULATIONS SHOW THAT CORE WOULD BE ONLY PARTIALLY UNCOVERED IF VALVE CLOSED AFTER 10 SEC. EFFECTS OF WATER FLASHING TO STEAM AND DISRUPTING RECIRCULATION FLOW PUMPS WAS CONSIDERED. FUEL CLAD WILL NOT EXCEED SATURATION TEMPERATURE BY 15 F, SO THE CONSEQUENCES ARE UNCHANGED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT ANALYSIS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + REACTOR, BOILING WATER

11-14600 QUESTION G-5. INTERNAL GAS PRESSURE EFFECTS ON CLAD

ACCESSION NUMBER 11-14467 TO 11-14600

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-14600 *CONTINUED*
TENNESSEE VALLEY AUTHORITY
PAGE G.5.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966,
DOCKET NO. 50-259/260

GAS PLENUM MAY BE LONGER THAN 16 INCHES, DEPENDING ON STRESS CALCULATIONS. GRAPH SHOWS THAT A FUEL-ELEMENT END-OF-LIFE PRIMARY MEMBRANE CLADDING STRESS IS 17 KSI (800 F AT 18.5 KW/FT) AND 24.3 KSI AT TRANSIENT OVERPOWER FUEL DAMAGE LIMIT OF 28 KW/FT (950 F).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CLAD + FUEL ELEMENT + PRESSURE, INTERNAL + REACTOR, BOILING WATER + STRESS ANALYSIS

11-14742 PATHFINDER - STEAM LINE ISOLATION VALVE LEAKAGE
NORTHERN STATES POWER COMPANY
NSP-6603 +. 3 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 19, 1966 - NOVEMBER 19, 1966, PAGES 8, 71-72, JANUARY 9, 1967, DOCKET NO. 50-130

STEAM-LINE ISOLATION VALVES WERE DIFFICULT TO MAINTAIN WITHIN ACCEPTABLE LEAK RATES ON SEVERAL TESTS. AS LATE AS APRIL 1966, WELDING SLAG DAMAGED SEATING SURFACES. INCREASED BUILDING PRESSURE CAUSES STEAM-LINE MOVEMENT, WHICH DISTORTS THE VALVE BODY. THE INCREASED NUMBER OF POWER RUNS APPEARS TO HAVE FINALLY SWEEPED OUT THE FOREIGN MATERIAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*CONTAINMENT PENETRATION, CLOSURE OF + *DAMAGE + *TEST, LEAK RATE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

11-14836 EFFECTIVENESS OF CONTAINMENT AIR FILTRATION IN REDUCING OFFSITE DOSE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
12 PAGES, 9 FIGURES, PAGES A-1 TO A-12 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE.
APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

THYROID DOSE COMPUTATION (AT SITE BOUNDARY AND LOW POPULATION RADIUS) ARE GIVEN FOR VARIOUS COMBINATIONS OF CONTAINMENT AIR-RECIRCULATION RATES AND FILTER EFFECTIVENESS. WITH A LEAK RATE (0.3'/DAY) THREE TIMES THE DESIGN LEAK RATE AND NO FILTRATION AT ALL, THE SITE BOUNDARY DOSE IS 450 REMS. WITH ONE FAN/FILTER COMBINATION, THE DOSE IS APPROXIMATELY 170 REMS. IN ADDITION, TRACER TESTS ON-SITE SHOW CONCENTRATIONS LESS THAN 1/10TH THOSE USED IN TID 14844, WHILE THE MODELS USED IN SAFETY ANALYSES USED OVER 4 TIMES THE CONCENTRATION SHOWN BY TRACER TESTS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + AIRBORNE RELEASE + CONTAINMENT FILTERING SYSTEM + DOSE + FISSION PRODUCT, IODINE + REACTOR, PRESSURIZED WATER + TRACER, GENERAL + WIND STATISTICS

11-14839 LOSS-OF-COOLANT CONTAINMENT PRESSURE BUILDUP AND QUENCHING WITH ONLY 1 DELUGE PUMP OPERATING.
CONNECTICUT YANKEE ATOMIC POWER COMPANY
10 PAGES, 7 FIGURES, 1 TABLE, PAGES C-1 TO C-10 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION, DOCKET NO. 50-213, DECEMBER 6, 1966

THE MAXIMUM PRESSURE REACHED IS 32 PSIG WITH ONLY 1 DELUGE PUMP OPERATING, WHILE DESIGN PRESSURE IS 40. A 40' SS-H₂O REACTION WITH HYDROGEN BURNED WOULD ADD 5 PSIG. HEAT ABSORPTION BY STRUCTURE NOT USED. CURVES GIVE HEAT-REMOVAL CAPABILITY OF CONTAINMENT AIR RECIRCULATION AND SPRAY SYSTEMS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + CONTAINMENT AIR COOLING + CONTAINMENT SPRAY + CONTAINMENT, HIGH PRESSURE + METAL WATER REACTION + PRESSURE, INTERNAL + REACTOR, PRESSURIZED WATER

CATEGORY 12
PLANT SAFETY FEATURES

12-08814 TURNBULL AH
HANDLING RADIOACTIVE SAMPLES FOR MASS SPECTROMETRIC ANALYSIS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4774 +. 6 PAGES, 4 FIGURES, 3 REFERENCES, NOVEMBER 1964, UKAEA

A TECHNIQUE IS DESCRIBED FOR MOUNTING RADIOACTIVE SAMPLES AND INTRODUCING THEM INTO THE ION SOURCE OF AN AEI TYPE-MS5 SURFACE-IONIZATION MASS SPECTROMETER.

*FUEL HANDLING + *GLOVE BOX + DECONTAMINATION

12-10356 SAUVAGE M + GUMUCHIAN M
1000-MWE REACTOR DESIGN STUDY OF A HANDLING CELL
COMMISSARIAT A L ENERGIE ATOMIQUE, CADARACHE, FRANCE, CENTRE D ETUDES NUCLEAIRES
ORNL-TR-988 + PNR/SEPR/65,000 +. 41 PAGES, FEBRUARY 18, 1965, JCL, \$4.60 FS, \$1.43 MF

THIS REPORT REPRESENTS A SUPPLEMENTARY CHAPTER TO THE 1000 MW REACTOR DESIGN AS PRESENTED IN GENEVA (CEA REPORT 2554). IT DESCRIBES A DESIGN MAKING USE OF A CELL INSTEAD OF ROTATING PLUGS TO CARRY OUT HANDLING. THE PURPOSE OF A STUDY OF THIS VARIANT IS TO PROPOSE A REACTOR DESIGN TO SERVE AS A BASIS FOR A MORE-DETAILED STUDY WITHIN THE SCOPE OF A DESIGN PROJECT. THUS, THE PROBLEMS POSED BY THE REACTOR BLOCK, STORAGE, HANDLING AND THE HANDLING CELL, HAVE BEEN EXAMINED, WITH THE STRESS PLACED ON THE LAST TWO POINTS, WHICH PRESENT THE GREATEST DIFFICULTIES. MUCH REMAINS UNKNOWN ABOUT THE CONTAMINATION OF THIS CELL BY SODIUM AT THE TIME OF HANDLING. METHODS ARE PROPOSED TO LIMIT THIS CONTAMINATION TO THE MAXIMUM. A PROGRAM FOR STUDY AND TESTS HAS BEEN SUGGESTED WHICH SHOULD PERMIT AN EVALUATION OF THE EFFICIENCY OF THE PLANNED SYSTEMS. A 1000-MW(E) REACTOR IN WHICH HANDLING TAKES PLACE WITHIN THE PROTECTION OF A CELL, CALLED THE HANDLING CELL, ABOVE THE REACTOR IS INVESTIGATED. THIS STUDY CONSTITUTES A VARIANT OF THAT CONDUCTED AT THE TIME OF THE 1964 GENEVA CONFERENCE, WHICH DEALT WITH A 1000-MW(E) REACTOR WITH HANDLING DONE THROUGH ROTATING PLUGS (CEA REPORT 2554). THE PRINCIPAL ADVANTAGES ARE THE FOLLOWING - (A) HANDLING TAKES PLACE WITHIN SIGHT, BY MEANS OF A SIMPLIFIED AND LIGHTER MACHINE. THIS VISIBILITY IN CERTAIN CASES IS DIRECT THROUGH PORT HOLES PROVIDED IN THE CELL, OR INDIRECT BY MEANS OF PERISCOPES OR TELEVISION CAMERAS. (B) SINCE THIS CELL IS LEAK-PROOF AND FILLED WITH ARGON, THE PROBLEMS OF TIGHTNESS BETWEEN REACTOR AND CELL ARE CONSIDERABLY SIMPLIFIED. (C) THIS CELL ALSO PERMITS HANDLING OF CONTAMINATED EQUIPMENT WITHOUT REQUIRING THE USE OF AUXILIARY, HIGHLY SHIELDED PROTECTIVE EQUIPMENT, WHICH WOULD BE VERY HEAVY. (D) FINALLY, THE CELL PLAYS THE ROLE OF A TIGHT CHAMBER WHICH CAN RETAIN ACTIVE PRODUCTS, ITS STRUCTURE PERMITS IT TO OFFER CONTAINMENT OF A REACTOR EXPLOSION.

*DESIGN CRITERIA + *HOT CELL + *REACTOR, FAST + CONTAINMENT, GENERAL + MAINTENANCE AND REPAIR + REACTOR, LIQUID METAL COOLED

12-11308 PIERCE GE
URETHANE SPRAY FOAMING
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1551 +. 10 PAGES, 2 FIGURES, 1 TABLE, AUGUST 1966, CFSTI \$1.00 CY, \$0.50 MN

THE USE OF URETHANE-FOAM SPRAY TO COAT THE INTERIOR OF A STRUCTURE TO INCREASE ITS LEAK-TIGHTNESS IS DESCRIBED. THE APPLICATION WAS IN THE PENTHOUSE OF THE FLUIDIZED-BED VOLATILITY PILOT PLANT. THE NEGATIVE PRESSURE OF THE PENTHOUSE WAS INCREASED FROM 0.15 IN. O.30 IN. OF WATER. THE INSULATION VALUE OF THE WALLS WAS ALSO INCREASED.

*CONTAINMENT PAINT + *CONTAINMENT, PRESSURE VENTING + *FOAM + CONTAINMENT LEAKAGE CONTRL + CONTAINMENT, FUEL REPROCESSING

12-12173 PERRIGO LD + DEMNITT TF + HAYDEN KD + WEED RD + AYRES JA
PLUTONIUM RECYCLE TEST REACTOR DECONTAMINATION FOLLOWING A MGO-PUO2 FUEL ELEMENT FAILURE
BATTELLE NORTHWEST, RICHLAND
BNWL-SA-636 + CONF-660520-3 +. 10 PAGES, 1 FIGURE, 1 TABLE, MARCH 31, 1966, FROM INTERNATIONAL SYMPOSIUM ON THE DECONTAMINATION OF NUCLEAR INSTALLATIONS, HARWELL, ENGLAND, CFSTI \$1.00 CY, \$0.50 MN

THE DECONTAMINATION WAS ACCOMPLISHED BY FIRST REDUCING THE TEMPERATURE TO A MINIMUM TO REDUCE LEACHING OF FISSION PRODUCTS FROM THE FUEL. 3500 GALLONS OF HEAVY WATER WAS REMOVED AND CLEANED BY ION EXCHANGE. LIGHT-WATER FLUSHING AND RINSING WAS PERFORMED. CHEMICAL CLEANING WAS THEN STARTED USING A BUFFERED OXALIC PEROXIDE, ALKALINE PERMANGANATE, OXALIC ACID SOLUTION. INSPECTION SHOWED REDEPOSITION OF RADIOACTIVITY FROM THE OXALIC ACID SOLUTION AFTER THE OXIDE FILMS WERE REMOVED. AN 8 PERCENT DIBASIC AMMONIUM CITRATE SOLUTION WAS SUBSTITUTED FOR THE OXALIC ACID AND GAVE GOOD RESULTS. DECONTAMINATION FACTORS FROM 2.2 TO 15 WERE ACHIEVED. LIGHT-WATER RINSING WAS PERFORMED. ALL GASKETS WERE REPLACED BECAUSE OF CHEMICAL DAMAGE. THE RADIATION LEVELS AFTER DECONTAMINATION ARE LOWER THAN THOSE BEFORE THE RUPTURE. NO CORROSION EFFECTS HAVE BEEN NOTICED AFTER 34 MONTHS OF OPERATION.

*DECONTAMINATION + *MAIN COOLING SYSTEM + CORROSION + FAILURE, FUEL ELEMENT + PRTR (PLUTONIUM RECYCLE TEST REACTOR) + REACTOR, AEC OWNED + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, RESEARCH

12-12174 INTERPRETATION - CODE FOR PRESSURE PIPING ASA B31.1 1955 BRAZED VS SOLDERED JOINTS
DIVISION OF OPERATIONAL SAFETY, USACC
2 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 245, (NOVEMBER 7, 1966), DPI

SECTION 6 - FABRICATION, INDICATES THAT BRAZED OR SOLDERED JOINTS MAY BE USED UNLESS OTHERWISE SPECIFIED. SECTION 2 - INDUSTRIAL GAS AND AIR PIPING (APPARENTLY) SPECIFIES BRAZED JOINTS IN THESE SYSTEMS (APPARENTLY BECAUSE OF ITS SUPERIOR HOLDING STRENGTH AT HIGH TEMPERATURE). AS

CATEGORY 12
PLANT SAFETY FEATURES

12-12174 *CONTINUED*

AN ILLUSTRATION, THE CAMBRIDGE ELECTRON ACCELERATOR FIRE OF JULY 1965 (TID 22594) WAS SUBSTANTIALLY INCREASED BECAUSE A MINOR FIRE UNSOLDERED THE PIPE JOINTS ON THE LIQUIFIED-PETROLEUM-GAS SYSTEM, AND THIS ADDITIONAL FUEL CAUSED MOST OF THE FIRE DAMAGE.

*ACCELERATOR + *FAILURE, INSTALLATION ERROR + *FIRE + FAILURE, PIPE + HYDROGEN + INCIDENT, ACTUAL, GENERAL + OPERATING EXPERIENCE

12-12181 INCLINED FUEL CHANNEL NATURAL CONVECTION TEST LOOP

ARGONNE NATIONAL LABORATORY, ARGONNE

ANL-7255 +. 1 PAGE, SEPTEMBER 1966, PAGE 66 FROM REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, CFSTI \$4.00 CY

CONSTRUCTION IS COMPLETE ON THIS AARR LOOP WHICH WILL PROVIDE DATA ON THE NATURAL-CONVECTION COOLING PROPERTIES OF AN ELECTRICALLY HEATED .040 X 1.125 X 18 INCH FLOW CHANNEL AT HEAT FLUXES UP TO 125,000 BTU/HR-FT SQ, AT ANY ANGLE BETWEEN HORIZONTAL AND VERTICAL.

*CORE, PLATE TYPE + *DECAY HEAT + *FUEL STORAGE + *HEAT TRANSFER, NATURAL CONVECTION + *TESTING + AARR (ARGONNE ADVANCED RESEARCH REACTOR) + REACTOR, TEST

12-12347 INVESTIGATION OF LEAKING POLYETHYLENE BOTTLES

ATOMIC ENERGY COMMISSION

6 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 244, OCTOBER 12, 1966

THE ROCKY FLATS L-3 SHIPPING CONTAINER DEVELOPED LEAKS IN THE INNER POLYETHYLENE BOTTLE WHEN USED WITH PLUTONIUM OR URANYL NITRATE. ISOCEM HAS SINCE DETERMINED THAT THE NECKS OF THE BOTTLES WERE IMPROPERLY FINISHED AND OFFERED EIGHT RECOMMENDATIONS. SEALING PROCEDURE IS INCLUDED.

*SHIPPING CONTAINER + FAILURE, DESIGN ERROR + FUEL STORAGE + LIQUID FUEL + TEST, LEAK RATE + TRANSPORTATION AND HANDLING

12-13629 BLACK DE + LAKEY LT + LEGLER BM
CONTAMINATION DECONTAMINATION EXPERIMENT IN THE ICPP
IDAHO NUCLEAR CORPORATION

9 PAGES, 9 FIGURES, 1966, PRESENTED AT THE 152ND NATIONAL MEETING OF THE AMERICAN CHEMICAL SOCIETY, NEW YORK CITY, NEW YORK, SEPTEMBER 12-16, 1966

THE CONTAMINATION-DECONTAMINATION EXPERIMENT AT THE IDAHO CHEMICAL PROCESSING PLANT PROVIDES MIXTURES OF HIGH-LEVEL, SHORT-COOLED FISSION PRODUCTS FOR DEVELOPMENT STUDIES ON PROTECTIVE COATINGS, DECONTAMINATION TECHNIQUES, SAMPLING DEVICES, AND ANALYTICAL METHODS. THE MIXTURES ARE BEING PRODUCED BY MELTING A FRESHLY IRRADIATED MINIATURE FUEL PIN WITH AN INDUCTION FURNACE. TWO TESTS HAVE BEEN MADE INVOLVING KILOCURIE QUANTITIES OF FISSION PRODUCTS RELEASED FROM ZIRCONIUM-CLAD UO₂ FUEL PINS MELTED IN A STEAM ATMOSPHERE. OPERATION OF THE EXPERIMENTAL SYSTEM HAS BEEN SATISFACTORY AND HAS STARTED US WELL ON THE WAY TO ACCOMPLISHING OUR OBJECTIVES.

AVAILABILITY - D. E. BLACK, IDAHO NUCLEAR CORPORATION, IDAHO FALLS, IDAHO

*CONTAINMENT, FUEL REPROCESSING + *CONTAMINATION + *DECONTAMINATION + *LOFT (LOSS OF FLUID TEST) + *SAMPLING + CHEMICAL REACTION + CLAD + COATING, SURFACE + FUEL ELEMENT + FUEL MELTDOWN + URANIUM DIOXIDE + ZIRCONIUM

12-13640 BECK CK
BASIC ELEMENTS IN THE CHOICE OF REACTOR SITES
ATOMIC ENERGY COMMISSION
9 PAGES, 1966 NUCLEX FAIR

THREE LINES OF DEFENSE - ACCIDENT-PREVENTING SAFEGUARDS, CONSEQUENCE-LIMITING SAFEGUARDS, AND SITING. GENERAL REQUIREMENTS FOR METROPOLITAN SITING.

*SAFETY PRINCIPLES AND PHILOSOPHY + ENGINEERED SAFEGUARD + SITING, REACTOR

12-14372 VALENTIN A + PORTAL A
THE NEW FONTENAY-AUX-ROSES ALPHA-BETA-GAMMA RADIOMETALLURGY LABORATORY-DESIGN AND CONSTRUCTION
COMMISSARIAT A L ENERGIE ATOMIQUE
1 PAGES, ANS TRANSACTIONS 8(2) PAGE 623 (1965 WINTER MEETING)

DESCRIBES THE FACILITY.

*HOT CELL + *METAL

12-14462 HAHS CA + BOTTENFIELD BF + HANNON FL + MCCARTER R + PEISHL FL
REMOTE MAINTENANCE SYSTEMS IN THE TRANSURANIUM PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY

13 PAGES, 17 FIGURES, 5 REFERENCES, 1966, PRESENTED AT ANS WINTER MEETING, PITTSBURGH 1966, PUBLISHED IN PROCEEDINGS OF 14TH CONFERENCE ON REMOTE SYSTEM TECHNOLOGY, 1966

CATEGORY 12
PLANT SAFETY FEATURES

12-14462 *CONTINUED*

THE TRANSURANIUM PROCESSING PLANT AT OAK RIDGE NATIONAL LABORATORY IS DESIGNED TO ACCOMPLISH ALL MATERIAL TRANSFERS BETWEEN THE CELL-BANK INTERIOR AND EXTERIOR WITHOUT LOSS OF ALPHA CONTAINMENT. SEVERAL EQUIPMENT PIECES ARE DESCRIBED THAT ARE DEVELOPMENTS OF THE DOUBLE-COVER TECHNIQUE, THE BAGGING TECHNIQUE, AND COMBINATIONS OF THE TWO. EQUIPMENT THAT HAS BEEN DEVELOPED FOR REMOTE REPLACEMENT OF CONTAMINATED FILTER, REPLACEMENT OF ALPHA SEAL AND CELL-SHIELDING WINDOWS, AND REMOTE EQUIPMENT DECONTAMINATION ARE ALSO DESCRIBED.

AVAILABILITY - PROCEEDINGS OF THE 14TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY, 1966

*EQUIPMENT DESIGN + *MAINTENANCE, REMOTE + *ORNL (OAK RIDGE NATIONAL LABORATORY) + *TRANSURANIUM ELEMENT + DECONTAMINATION + FILTER MAINTENANCE + MAINTENANCE AND REPAIR + RADIOCHEMICAL PROCESSING + SHIELDING + WASTE DISPOSAL, SOLID

12-14466 SNOEBERGER D + HECKMAN R
VENT-GAS TREATMENT PLANT. PROJECT DRIBBLE. SALMON EVENT. FINAL REPORT
LAWRENCE RADIATION LABORATORY
VUF-3016 +. 18 PAGES, 2 FIGURES, OCTOBER 21, 1966

THE VENT-GAS TREATMENT PLANT DESCRIBED IN THIS REPORT IS A RESEARCH FACILITY BUILT TO STUDY RADIOACTIVE GASES GENERATED IN UNDERGROUND NUCLEAR TESTS AT THE TATUM SALT DOME NEAR HATTIESBURG, MISS. THE MAIN PROCESS FEATURES ARE - (1) A FLOW-CONTROL AND DILUTION SYSTEM TO OBTAIN SAFE HYDROGEN DILUTION, (2) SODIUM HYDROXIDE GAS SCRUBBERS, (3) AN ACTIVATED-CHARCOAL ABSOLUTE-TYPE FILTRATION SYSTEM, AND (4) A HIGH STACK TO ENSURE SAFE DILUTION OF THE UNREMOVED RADIOACTIVE EFFLUENT GASES FROM THE PROCESS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ATMOSPHERIC DIFFUSION EXPERIMENT + *FILTER + *HYDROGEN + CHARCOAL + FILTER, ABSOLUTE + FISSION GAS RELEASE + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + RADIOLYTIC GAS + SCRUBBER + TEST, SYSTEM OPERABILITY + WASTE DISPOSAL, ATMOSPHERIC + WASTE TREATMENT, GAS

12-14467 GAITANIS MJ + TRIPP LF
OPERATIONAL EXPERIENCE AT THE QUEHANNA, PENNSYLVANIA FACILITY - A TWO-MEGACURIE SR-90 CONVERSION AND ENCAPSULATION PLANT
MARTIN COMPANY, CLEARFIELD, PENNSYLVANIA
7 PAGES, 4 FIGURES, 2 REFERENCES, 1966

THE QUEHANNA RADIOISOTOPE FACILITY WAS DESIGNED TO PREPARE SR-90 HEAT SOURCES. THE SOURCES ARE IN THE FORM OF SR-90 TITANATE POWDER PRESSED INTO SUITABLE LINERS AND THEN ENCAPSULATED. PRODUCTION INVOLVES DISSOLUTION OF BULK SR-90 CARBONATE, METERING, CONVERSION, FILTERING, FIRING, BALL-MILLING, STEP PRESSING, ENCAPSULATING, DECONTAMINATING, AND CALORIMETRY. OPERATIONAL EXPERIENCE WITH THE ORIGINAL PROCESS AND EQUIPMENT HAS MADE POSSIBLE THE DEVELOPMENT OF A SECOND-GENERATION SYSTEM WITH GREATLY IMPROVED RELIABILITY AND CONVENIENCE OF OPERATION.

AVAILABILITY - PROCEEDINGS OF 14TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY,

*ENERGY SOURCE + *STRONTIUM + HEAT GENERATION, INTERNAL + HOT CELL + RADIOCHEMICAL PROCESSING

12-14596 QUESTION G-1E. TESTING OF ISOLATION VALVES WITH SIMULATED ACCIDENT CONDITIONS
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES G.1.11 TO G.1.13 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1967, DOCKET NO. 50-259/260

MANUFACTURERS TESTS WILL BE DONE IN NONFLOWING SYSTEMS. VALVE DISK AND SEAT ARE SUCH THAT STEAM FLOW TENDS TO CLOSE THE VALVE. SINCE THERE ARE FOUR STEAM LINES TO THE TURBINE, A VALVE CAN BE TESTED DURING NORMAL OPERATION AND THE CLOSURE TIME DETERMINED. LEAK RATE OF CLOSED VALVE CAN BE DETERMINED WITH THE PLANT SHUT DOWN.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + REACTOR, BOILING WATER + SYSTEM OPERABILITY IN ACCIDENT CONDITIONS + TEST, SYSTEM OPERABILITY

12-14611 QUESTION H-5. LEAK RATE AND HEAD CURVES OF PUMPS AND VALVES IN ENGINEERED SAFEGUARDS. ADDITIVES FOR HALOGEN RETENTION
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES H.5.1 TO H.5.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

HEAD AND FLOW DESIGN NUMBERS GIVEN FOR VARIOUS PUMPS, WITH MAXIMUM LEAK RATE 1 GAL/HR. ALLOWABLE VALVE LEAK RATES ARE 2 CC/HR PER INCH OF SEAT DIAMETER. WATER HAS A HIGH CAPABILITY FOR HALOGEN RETENTION. NO PLANS TO USE ADDITIVES.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CONTAINMENT SPRAY + DESIGN CRITERIA + ENGINEERED SAFEGUARD + FISSION PRODUCT RETENTION + REACTOR, BOILING WATER

ACCESSION NUMBER 12-14462 TO 12-14611

CATEGORY 12
PLANT SAFETY FEATURES

12-14612 QUESTION H-6. BACKUP WATER SUPPLY FOR ENGINEERED SAFEGUARDS
TENNESSEE VALLEY AUTHORITY
PAGE H.6.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966,
DOCKET NO. 50-259/260

NORMAL SUPPLY IS FROM SUPPRESSION POOL, WITH BACKUP FROM CONDENSATE SYSTEM THROUGH MAKEUP AND TESTING LINES. THE POOL (CONTAINING OVER 8 MILLION POUNDS OF WATER) IS SPECIFICALLY DESIGNED FOR EMERGENCY COOLING PURPOSES, IS SHIELDED FROM MISSILES, IS DESIGNED TO RESIST BOTH EARTHQUAKE AND ACCIDENT, AND IS A RELIABLE SOURCE OF WATER.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CONTAINMENT, PRESSURE SUPPRESSION + ENGINEERED SAFEGUARD + REACTOR, BOILING WATER + STORAGE CONTAINER + WATER, GENERAL

12-14839 LOSS-OF-COOLANT CONTAINMENT PRESSURE BUILDUP AND QUENCHING WITH ONLY 1 DELUGE PUMP OPERATING. CONNECTICUT YANKEE ATOMIC POWER COMPANY
10 PAGES, 7 FIGURES, 1 TABLE, PAGES C-1 TO C-10 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION, DOCKET NO. 50-213, DECEMBER 6, 1966

THE MAXIMUM PRESSURE REACHED IS 32 PSIG WITH ONLY 1 DELUGE PUMP OPERATING, WHILE DESIGN PRESSURE IS 40. A 40' SS-H₂O REACTION WITH HYDROGEN BURNED WOULD ADD 5 PSIG. HEAT ABSORPTION BY STRUCTURE NOT USED. CURVES GIVE HEAT-REMOVAL CAPABILITY OF CONTAINMENT AIR RECIRCULATION AND SPRAY SYSTEMS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + CONTAINMENT AIR COOLING + CONTAINMENT SPRAY + CONTAINMENT, HIGH PRESSURE + METAL WATER REACTION + PRESSURE, INTERNAL + REACTOR, PRESSURIZED WATER

12-14918 ROWLANDS RP
A FEASIBILITY STUDY OF THE USE OF PVC PRESSURIZED SUITS IN WORKPLACES AT TEMPERATURES OF 40 TO 50 C
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL, ENGLAND
AHSB(RP)-M-43 +. 12 PAGES, AUGUST 1966

PRESENTS FORMULAS AND DISCUSSION OF EXPERIMENTS IN WHICH MEN WORKED IN PRESSURIZED SUITS AT AMBIENT TEMPERATURES. EXTRAPOLATIONS WERE MADE TO 40-50 C TO DETERMINE PHYSIOLOGICAL RESPONSES AND THE APPLICABILITY TO REACTOR OPERATIONS. USE OF SUCH SUITS FOR INSPECTIONS AND REPAIRS IN HEAT EXCHANGERS SHORTLY AFTER SHUTDOWN WHERE HIGH TEMPERATURES AND AIRBORNE CONTAMINATION EXIST WOULD BE A CONVENIENCE AND WOULD SAVE MONEY. UP TO 46 C EXPOSURES OF A FEW HOURS ARE FEASIBLE. BETWEEN 46 AND 50 C, THE LIMIT IS 1 HOUR. ABOVE 50 C, ONLY BRIEF EXPOSURES ARE PERMISSIBLE.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*HIGH TEMPERATURE + *MAINTENANCE AND REPAIR + *PERSONNEL PROTECTIVE DEVICE + HEAT EXCHANGER + RADIATION SAFETY AND CONTROL + REACTOR, GAS COOLED

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-11308 PIERCE GE
URETHANE SPRAY FOAMING
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1551 +. 10 PAGES, 2 FIGURES, 1 TABLE, AUGUST 1966, CFSTI \$1.00 CY, \$0.50 MN

THE USE OF URETHANE-FOAM SPRAY TO COAT THE INTERIOR OF A STRUCTURE TO INCREASE ITS LEAK-TIGHTNESS IS DESCRIBED. THE APPLICATION WAS IN THE PENTHOUSE OF THE FLUIDIZED-BED VOLATILITY PILOT PLANT. THE NEGATIVE PRESSURE OF THE PENTHOUSE WAS INCREASED FROM 0.15 TO 0.30 IN. OF WATER. THE INSULATION VALUE OF THE WALLS WAS ALSO INCREASED.

*CONTAINMENT PAINT + *CONTAINMENT, PRESSURE VENTING + *FOAM + CONTAINMENT LEAKAGE CONTROL + CONTAINMENT, FUEL REPROCESSING

13-11935 JOHNSON ER + WFRSTFR JW + MIHALCZO JT + KISTNER G + THOMAS JT + REEDY RK + RAFFETY SJ
CRITICAL EXPERIMENTS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3973 (VOL 1) +. 12 PAGES, 28 REFERENCES, 10 FIGURES, 8 TABLES, PAGES 14-25, NEUTRON PHYSICS DIVISION
ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1966, SEPTEMBER 1966, CFSTI \$3.00 CY, \$0.75 MN

CRITICALITY OF SPIICRE OF URANYL FLUORIDE SOLUTION AND OF URANIUM CYLINDRICAL ANNULI. FLIGHT-TIME EFFECTS IN COUPLED SUBCRITICAL URANIUM METAL CYLINDERS. SORA CRITICAL EXPERIMENTS. ESTIMATING CRITICALITY OF LARGE ARRAYS OF URANIUM. CRITICALITY OF LATTICES HTRE FUEL ELEMENTS. SAFE HANDLING OF HFIR FUEL ELEMENTS.

*COUPLED CORES + *CRITICALITY EXPERIMENT + HFIR (HIGH FLUX ISOTOPE REACTOR) + REACTOR, AIRCRAFT + REACTOR, FAST BURST

13-12215 IRL WISHES TO CARRY OUT SHIPPING CASK SUBCRITICALITY STUDIES FOR POOL TYPE REACTOR ELEMENTS
COLUMBIA UNIVERSITY, NEW YORK
86 PAGES, FIGURES, TABLES, JULY 8, 1966, DOCKET NO. 50-17, PDR

NATIONAL LEAD CO. HAS A 28-ELEMENT SHIPPING CASK FOR SPENT, POOL-TYPE REACTOR ELEMENTS, POISONED WITH 1/4-IN. BORAL PLATES. MULTIPLICATION MEASUREMENTS MADE EARLIER WERE OVERLY CONSERVATIVE BECAUSE OF PU-BE HIGH-ENERGY NEUTRONS. THIS SET OF CRITICALITY MEASUREMENTS IS INTENDED TO IMPROVE CALCULATIONAL TECHNIQUES AND PROVIDE ACCURATE MEASUREMENTS OF SUBCRITICALITY IN VARIOUS ARRAYS OF 18-PLATE, PARTIALLY SPENT IRL ELEMENTS, WITH ELEMENT ROWS SEPARATED BY BORAL. REVIEWS OF PREVIOUS DATA, SIMILAR EXPERIMENTS, AND HEAT-TRANSFER CALCULATIONS.

*CRITICALITY EXPERIMENT + *MEASUREMENT, SUBCRITICALITY + FUEL STORAGE + REACTOR, POOL TYPE + SHIPPING CONTAINER

13-12309 POTENTIAL OVEREXPOSURE AT NUCLEAR FUEL SERVICES DURING DECONTAMINATION
NUCLEAR FUEL SERVICES, WEST VALLEY, NEW YORK
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 18 (NOVEMBER 21, 1966) DOCKET NO. 50-201

ON SEPTEMBER 29-30 AND OCTOBER 3, 1966, TWO SUBCONTRACTOR EMPLOYEES SANDBLASTED THE INTERIOR OF A CONCRETE WASTE-STORAGE TANK INTERIOR WHILE WEARING DUST HOODS INSTEAD OF ASSAULT MASKS, AS INSTRUCTED BY THEIR FOREMAN. ON OCTOBER 12, NFS COUNTED THE CHEST AREA OF THE MEN AND TWO CONTROLS WITH A THYROID MONITOR AND FOUND NO SIGNIFICANT DIFFERENCE. BEFORE THE SANDBLASTING, CHEMICAL STRIPPING HAD REDUCED THE SURFACE ACTIVITY OF THE CONCRETE TO 23 MR/HR. EFFECTIVE IMMEDIATELY, ALL SUBCONTRACT WORK WITHIN RESTRICTED AREAS WILL REQUIRE A SPECIAL WORK PERMIT (SWP).

*DECONTAMINATION + *FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + CONCRETE + FAILURE, ADMINISTRATIVE CONTROL + NFS (NUCLEAR FUEL SERVICES) + WASTE STORAGE

13-12311 FORSCHER F
EXPOSURES TO AIRBORNE RADIOACTIVITY AT NUMEC
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION, APOLLO, PENNSYLVANIA
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 19-20 (NOVEMBER 21, 1966)

NUMEC REPORTS 2 INSTANCES.- (1) BETWEEN FEBRUARY 15, 1966 (WHEN NUMEC REQUESTED CREDIT FOR RESPIRATOR PROTECTION) AND JUNE 8, 1966 (WHEN AEC ALLOWED CREDIT), VARIOUS WORKERS WORE MASKS IN AIR ABOVE MPC LEVELS AND WERE THUS TECHNICALLY OVEREXPOSED. DETAILS GIVEN. (2) ON SEPTEMBER 27 THROUGH 29, THREE TECHNICIANS WERE EXPOSED TO PLUTONIUM UP TO 193 MPC (AIR) HOURS IN SCRAP RECOVERY DUE TO GLOVE-BOX GLOVE FAILURE, LEAKING PLASTIC BAG, AND INADEQUATE RETRAINING AFTER THE RETURN FROM SIX MONTHS OF MILITARY SERVICE.

*AIRBORNE RELEASE + *FAILURE, ADMINISTRATIVE CONTROL + *INHALATION + ADMINISTRATIVE CONTROLS AND PRACTICES + PLUTONIUM + RADIATION SAFETY AND CONTROL

13-12314 BENFENATI I
INTEGRATED DOSE AND NEUTRON SPECTRA RESULTING FROM A CRITICALITY INCIDENT
EUROCHEMIC
NP-16216 +. 13 PAGES, 5 FIGURES, 16 REFERENCES, JUNE 1966, CFSTI \$1.00, \$0.50 MN

BASICALLY, SHIELDING STUDY RESULTS OF AN ASSUMED 10-TO-THE-17TH FISSIONS CRITICALITY ACCIDENT IN THE EUROCHEMIC PLANT, REVISED FROM EARLIER WORK. FORTY-FIVE CM OF STANDARD CONCRETE REDUCES DOSE TO 25 REMS WITH EVACUATION.

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-12314 *CONTINUED*
*ACCIDENT, CRITICALITY + *SHIELDING + EUROCHEMIC + RADIOCHEMICAL PROCESSING

13-12334 CHEMICAL TECHNOLOGY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1966
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3945 +. 287 PAGES, SEPTEMBER 1966, CFSTI \$6.00 CY, \$1.50 MN

THIS IS ONE OF A SERIES OF ANNUAL PROGRESS REPORTS. TOPICS COVERED ARE VARIOUS STUDIES ON FUEL PROCESSING, WASTE TREATMENT AND DISPOSAL, SOL-GEL PROCESSES, SEPARATIONS CHEMISTRY, CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS, FISSION PRODUCT RECOVERY BY SOLVENT EXTRACTION, BIOCHEMICAL SEPARATIONS, PROTACTINIUM CHEMISTRY, IRRADIATION EFFECTS ON HETEROGENEOUS SYSTEMS, HIGH-TEMPERATURE CHEMISTRY, MECHANISMS OF SEPARATIONS PROCESSES, CHEMICAL ENGINEERING RESEARCH, REACTOR EVALUATION STUDIES, PREPARATION AND PROPERTIES OF ACTINIDE-ELEMENT OXIDES, EUROCHEMIC AND OTHER ASSISTANCE PROGRAMS, WATER RESEARCH PROGRAM, CHEMISTRY OF CARBIDES AND NITRIDES, AND INDUSTRIAL APPLICATIONS OF NUCLEAR ENERGY.

*ORNL (OAK RIDGE NATIONAL LABORATORY) + *RADIOCHEMICAL PROCESSING + *REVIEW + *WASTE TREATMENT, GENERAL + EUROCHEMIC + SOL-GEL PROCESS

13-12349 TECHNICAL ASPECTS OF PLUTONIUM PROCESSING
ATOMIC INDUSTRIAL FORUM, INC. + AMERICAN NUCLEAR SOCIETY
CONF-660308 +. 62 PAGES, FIGURES, TABLES, REFERENCES, MARCH 1966, PAGES 129-191 OF COMMERCIAL PLUTONIUM FUELS CONFERENCE, MARCH 1-2, 1966, WASHINGTON, D.C., CFSTI \$3.00 CY, \$1.50 MN

PLUTONIUM MANAGEMENT POLICIES, PLUTONIUM HANDLING AND CONTROL PRACTICES, AND AEC REGULATORY PRACTICES FOR LICENSING PLUTONIUM PLANTS WERE DISCUSSED IN DETAIL AT THE PLUTONIUM-PROCESSING SESSION OF THE CONFERENCE. MUCH OF THE INFORMATION IS ABOUT CRITICALITY, RADIOCHEMICAL, AND CONVENTIONAL SAFETY PRACTICES AT ARGONNE, PACIFIC NORTHWEST, AND ROCKY FLATS

*PLUTONIUM + *RADIOCHEMICAL PLANT SAFETY + *RADIOCHEMICAL PROCESSING + ANL (ARGONNE NATIONAL LABORATORY) + CRITICALITY SAFETY + GLOVE BOX + HANFORD SITE + ROCKY FLATS + VENTILATION SYSTEM

13-12384 KOONTZ WH + KANE JF
MAJOR REPAIR AND MODIFICATION TECHNIQUES USED ON LARGE-SCALE SEPARATION FACILITIES
ISOICHEM, INC.
1 PAGE, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGE 625, ANS TRANSACTIONS 9(2)

THE METHODS USED TO MODIFY AND MAINTAIN CANYON STRUCTURES AT HANFORD, USING REMOTELY OPERATED CRANES ARE DISCUSSED IN A GENERAL WAY.

*ISOICHEM, INC. + *MAINTENANCE AND REPAIR + HANFORD SITE + RADIOCHEMICAL PROCESSING

13-12385 MCINTOSH JD + RAAB GJ
REMOTE MAINTENANCE IN A LARGE-SCALE SEPARATIONS PLANT
ISOICHEM, INC.
1 PAGE, 2 FIGURES, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGE 624, TRANSACTIONS OF AMERICAN NUCLEAR SOCIETY 9(2)

A REMOTELY OPERATED CRANE, USED ALMOST ENTIRELY FOR EQUIPMENT REPLACEMENT, IS THE MAJOR ITEM USED FOR MAINTENANCE IN THE PUREX CANYON AT HANFORD. METHOD OF OPERATION AND EXPERIENCE IS DESCRIBED.

*ISOICHEM, INC. + *MAINTENANCE AND REPAIR + *RADIOCHEMICAL PROCESSING + HANFORD SITE

13-12386 KESEL GP + LAWS RB
THE SEMI-REMOTELY MAINTAINED PLUTONIUM RECLAMATION FACILITY
ISOICHEM, INC.
1 PAGE, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGE 624, ANS TRANSACTIONS 9(2)

MAINTENANCE PROCEDURES USED AT THIS HANFORD-SITE FACILITY ARE DISCUSSED IN GENERAL TERMS.

*ISOICHEM, INC. + *MAINTENANCE AND REPAIR + *PLUTONIUM + HANFORD SITE

13-12387 BOTTENFIELD BF + HANNON FL + MCCARTER R + HAHS CA + PEISHL FL
REMOTE MAINTENANCE SYSTEMS IN THE TRANSURANIUM PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY
1 PAGE, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGE 623, ANS TRANSACTIONS 9(2)

MAINTENANCE SYSTEMS AND METHODS EMPLOYED AT THE TRANSURANIUM PROCESSING PLANT AT ORNL WERE OUTLINED.

*MAINTENANCE AND REPAIR + HOT CELL + ORNL (OAK RIDGE NATIONAL LABORATORY) + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + TRANSURANIUM ELEMENT

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-12388 HILL AJ + HOBERT RH
REMOTE DECONTAMINATION OF EQUIPMENT IN RADIOISOTOPES SEPARATIONS PLANT
SAVANNAH RIVER LABORATORY
2 PAGES, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGES 622-623, ANS TRANSACTIONS 9(2)

EQUIPMENT IS DECONTAMINATED REMOTELY IN A HOT CELL AT SAVANNAH RIVER BY MEANS OF A HIGH-PRESSURE PUMP, A COMMERCIAL HYDRAULIC JET CLEANER, AND A STEAM HYDROCLEANER. THE ABOVE EQUIPMENT WAS ATTACHED TO NOZZLES CONTROLLED BY MANIPULATORS. EQUIPMENT IN THE CELLS WAS HANDLED WITH CRANES AND MANIPULATORS.

*DECONTAMINATION + *MAINTENANCE AND REPAIR + HOT CELL + RADIOCHEMICAL PLANT SAFETY + SAVANNAH RIVER PLANT

13-12389 NICOL RG
ENGINEERING AND MAINTENANCE PROBLEMS IN A FUEL PROCESSING PILOT PLANT USING THE VOLATILITY METHOD
OAK RIDGE NATIONAL LABORATORY
1 PAGE, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGE 622, ANS TRANSACTIONS 9(2)

MAINTENANCE PROBLEMS AND THEIR SOLUTIONS FOR OPERATING A MOLTEN SALT VOLATILITY PROCESSING PILOT PLANT WERE DISCUSSED. MOST PROBLEMS WERE OF A HEATING NATURE BUT SOME WERE MECHANICAL IN NATURE.

*FLUORIDE VOLATILITY PROCESSES + *MAINTENANCE AND REPAIR + *RADIOCHEMICAL PROCESSING + ORNL (OAK RIDGE NATIONAL LABORATORY)

13-12390 STEVENSON CE + FELDMAN MJ + HAMPSON DC + KLEFFNER JO + PAIGE DM
MAINTENANCE AND REPAIR OF CONTAMINATED EQUIPMENT FOR THE EBR-II FUEL CYCLE FACILITY
ARGONNE NATIONAL LABORATORY
2 PAGES, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30-NOVEMBER 3, 1966, PAGES 621-622, ANS TRANSACTIONS 9(2)

REMOTE PROCESSING AND REFABRICATION OF SHORT-COOLED FUEL FOR EXPERIMENTAL BREEDER REACTOR-II IS ACCOMPLISHED IN THE FUEL CYCLE FACILITY AT THE NRTS. THE MAINTENANCE AND REPAIR OF THE OPERATING EQUIPMENT SUCH AS MANIPULATORS, AND THE SERVICE EQUIPMENT SUCH AS VENTILATION FANS, ETC., WAS DISCUSSED.

*MAINTENANCE AND REPAIR + *RADIOCHEMICAL PLANT SAFETY + CRITICALITY SAFETY + DECONTAMINATION + NRTS (NATIONAL REACTOR TEST STATION)

13-12391 AYERS AL + MURRAY CL
CONTACT MAINTENANCE OF RADIOACTIVE EQUIPMENT AT THE IDAHO CHEMICAL PROCESSING PLANT
IDAHO NUCLEAR CORP.
1 PAGE, 1966 WINTER MEETING AMERICAN NUCLEAR SOCIETY, PITTSBURGH, PENNSYLVANIA, OCTOBER 30, 1966 THROUGH NOVEMBER 3, 1966, PAGE 621, ANS TRANSACTIONS 9(2)

SPECIAL TECHNIQUES FOR REDUCING EXPOSURE TO THE MAINTENANCE STAFF WERE DISCUSSED. THESE TECHNIQUES INVOLVED SCHEDULING AND SPECIAL-TOOLS METHODS.

*MAINTENANCE AND REPAIR + IDAHO FALLS + NRTS (NATIONAL REACTOR TEST STATION) + PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PLANT SAFETY

13-13213 ROM AM
DESIGN OF A CRITICALLY SAFE U-233 BATCH DISSOLVER FOR BUILDING 3019
OAK RIDGE NATIONAL LABORATORY
ORNL-4029 +. 13 PAGES, 3 FIGURES, 10 REFERENCES, OCTOBER 1966, CFSTI \$1.00

DESIGN REPORT FOR A SMALL-SCALE CRITICALITY-PROOF DISSOLVER. THE FUEL IS U-233, AND THE VESSEL IS 4 IN. IN DIAMETER, HEATED BY A JACKET 5 IN. IN DIAMETER.

*CRITICALITY SAFETY + *EQUIPMENT DESIGN + *ORNL (OAK RIDGE NATIONAL LABORATORY) + *RADIOCHEMICAL PLANT SAFETY + *URANIUM-233

13-13214 DETILLEUX E + LOPEZ-MENCHERO E + GEHEM L + MARCUS F
REQUIREMENTS AND PROBLEMS OF HIGH ACTIVITY WASTE MANAGEMENT AT THE EUROCHEMIC REPROCESSING PLANT
EUROCHEMIC
NP-16215 + ETR-192 +. 39 PAGES, 10 FIGURES, 8 TABLES, 6 REFERENCES, APRIL 1966, SOURCE

THIS REPORT OUTLINES THE PROBLEMS IN MANAGING HIGHLY RADIOACTIVE WASTE AT THE EUROCHEMIC PLANT AND SITE, AND ANALYSES THE DIFFERENT WAYS BEING INVESTIGATED TO SOLVE THEM.

*EUROCHEMIC + *RADIOCHEMICAL PLANT SAFETY + *WASTE MANAGEMENT + RADIOCHEMICAL PROCESSING + WASTE DISPOSAL, LIQUID + WASTE TREATMENT, LIQUID

13-13215 SECTION M1 AND M2 - CORROSION STUDIES OF THE FLUIDIZED-BED FLUORIDE-VOLATILITY PROCESS (ORNL).
BATTTELLE MEMORIAL INSTITUTE, COLUMBUS
DMI-1767 +. 1 PAGES, APRIL 1, 1966, FROM PROGRESS RELATING TO CIVILIAN APPLICATIONS DURING MARCH, 1966 BY D. L. KELLER, CFSTI \$2.00 CY, \$0.50 MN

ACCESSION NUMBER 13-12388 TO 13-13215

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-13215 *CONTINUED*

A STUDY OF CORROSION RESISTANCE OF MATERIALS OF CONSTRUCTION FOR COMPONENTS OF THE FLUIDIZED-BED FLUORIDE-VOLATILITY FUEL-RECOVERY PROCESS.

*FLUIDIZED BED + *RADIOCHEMICAL PROCESSING + CORROSION + FLUORIDE VOLATILITY PROCESSES + NICKEL

13-13350 NUCLEX 1966 - CONFERENCE REPORT--PART I

7 PAGES, 6 FIGURES, 2 TABLES, NUCLEAR ENGINEERING 11(125), PAGES 778-784, (OCTOBER 1966)

IN THIS FIRST REPORT ON THE CONFERENCE HELD IN BASLE IN CONJUNCTION WITH THE NUCLEX 1966 EXHIBITION ARE SUMMARIES OF THE SESSIONS ENTITLED RAW MATERIALS, NUCLEAR FUEL TECHNOLOGY, OPERATING POWER REACTOR SYSTEMS, RESEARCH REACTORS AND ADVANCED REACTORS. NOT ALL THE PAPERS PRESENTED ARE INCLUDED, PARTICULARLY THOSE DETAILING SPECIFIC DESIGNS. THE PUBLICATION OF FULL TEXTS WILL DEPEND UPON INDIVIDUAL AUTHORS INTENTIONS, AND IT IS RECOMMENDED THEREFORE THAT FURTHER INFORMATION BE SOUGHT FROM THEM DIRECT IF A FULL ACCOUNT IS DESIRED. A LIST OF AUTHORS AND QUOTED TITLES OF PAPERS APPEARS AT THE END OF THIS SUMMARY.

*MATERIAL + *OPERATING EXPERIENCE + *RADIOCHEMICAL PROCESSING + *REACTOR, RESEARCH

13-13396 APPLICATION FOR LICENSES FPCE PLANT AMENDMENT NO. 3
ISOHEM, INC.

4 PAGES, NOVEMBER 1966, DOCKET NO. 50-258

AMENDMENT 3 CONTAINS (I) A DESCRIPTION OF REVISIONS IN THE FEED AND WASTE SECTION OF THE PLANT, (II) AN EVALUATION OF THE EFFECT OF THESE CHANGES ON THE PREVIOUSLY SUBMITTED SAFETY ANALYSIS, AND (III) A SUMMARY OF THE EFFECT OF THESE CHANGES ON THE TEXT OF THE APPLICATION. THE REVISIONS TO THE FEED AND WASTE SYSTEM CONSIST OF (I) A REDUCTION IN THE VOLUME OF FEED AND CERTAIN WASTE TANKS, (II) REMOVAL OF INTERIOR PARTITIONS IN THE VAULT AREA, (III) RELOCATION OF THE REMOTE-MAINTENANCE FACILITY TO A POSITION OVER THE FEED AND WASTE VAULT, AND (IV) PIPING AND EQUIPMENT CHANGES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*ISOHEM, INC. + APPLICATION FOR AEC LICENSE + CERIUM + CESIUM + FISSION PRODUCT, SEPARATION FROM WASTE + HAZARDS ANALYSIS + PROMETHIUM + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + SAFETY ANALYSIS REPORT, GENERAL + STRONTIUM

13-13721 BAETSLE LH + VAN DEYCK D + HUYS D + GUERY A

STUDIES ON THE SEPARATION OF CS-137 AND SR-90 FROM FISSION PRODUCTS IN AN ACID MEDIUM ON MINERAL ION EXCHANGERS

CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL, BELGIUM

EUR-2497 E +. 70 PAGES, 1965

WITH CONVENTIONAL METHODS FOR TREATING IRRADIATED-FUEL REPROCESSING SOLUTIONS (PUREX PROCESS) THE PARTIAL SEPARATION OF CS AND SR IS ONLY POSSIBLE AFTER NEUTRALIZATION OF THE ACID SOLUTIONS. CONSEQUENTLY, THE FISSION AND CORROSION PRODUCTS PRESENT IN THIS MEDIUM ARE PRECIPITATED OUT BY THE HYDROLYTIC ACTION OF THE NEUTRALIZING AGENTS. THE GELATINOUS MASS THUS FORMED (HYDROXIDES OF RARE EARTHS AND OF FE) ENTRAINS AND INCORPORATES A NOT INCONSIDERABLE PART (A FEW PER CENT) OF THE LONG HALF-LIFE ISOTOPES CS-137 AND SR-90. THE POSSIBILITIES OF THE CONVENTIONAL METHODS ARE SEVERELY RESTRICTED BY THIS ENTRAINMENT, SINCE THE PRECIPITATE FORMED STILL CONTAINS TOO MUCH CS AND SR TO PERMIT A SHORTENING OF THE STORAGE PERIOD. IN FACT, THE TOTAL SR-90 DECONTAMINATION FACTOR NECESSARY FOR A REDUCTION OF THE STORAGE PERIOD FROM 600 TO ABOUT 20 YEARS IS OF THE ORDER OF 10 TO THE 6TH, 10 TO THE 7TH. THIS VERY HIGH FIGURE IS ATTAINABLE BY MEANS OF ION EXCHANGE.

AVAILABILITY - MICROCARD EDITIONS, INC.. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*ION EXCHANGE + *RADIOCHEMICAL ANALYSIS + *RADIOCHEMICAL PROCESSING + CESIUM + CHEMICAL KINETICS + RADIOISOTOPE + STRONTIUM

13-13741 BEONE G

DISSOLUTION OF FUEL-ELEMENT JACKETS OF ALUMINUM AND S.A.P. IN A RECIRCULATING DISSOLVER

CENTRO STUDI NUCLEARI DELLA CASACCIA - CNEN, ROME

ORNL-TR-1247 + RT/CHI(65)-1 +. 43 PAGES, JANUARY 1965

IN THE SYSTEMATIC INVESTIGATION OF THE DISSOLUTION PROCESS OF FUEL CLADDINGS, WE HAVE REPORTED IN THIS WORK RESULTS OF THE DISSOLUTION OF AL BY SULFURIC ACID CATALYZED WITH MERCURIC ION, AND THE DISSOLUTION WITH CAUSTIC OF S.A.P. (SINTERED ALUMINUM - ALUMINUM OXIDE POWDER). THE RECIRCULATING DISSOLVER IN THIS SERIES OF TESTS SERVES TO REDUCE THE DEAD VOLUME AND ALSO MAKES POSSIBLE ON A PLANT SCALE WITH ITS ELONGATED FORM ACCOMMODATING FUEL ELEMENTS OF LARGE DIMENSIONS AND FACILITATING CONFORMANCE TO SUBCRITICAL GEOMETRY. IN FACT, CRITICALITY CONSIDERATIONS IMPOSE THAT THE DISSOLVER HAVE A MAXIMUM DIAMETER OF ABOUT 20 CM PER ELEMENT OF URANIUM OF 5 PERCENT ENRICHMENT, WHEN IT IS PREFERABLE TO ADOPT THE CRITERION OF EVERSAFE GEOMETRY. NATURALLY, AT HIGHER ENRICHMENTS, THE DIAMETER OF THE DISSOLVER IS CORRESPONDINGLY LESS. THE RECIRCULATING DISSOLVER ALSO LENDS ITSELF, IF MADE OF HASTELLOY F OR TITANIUM, TO THE CHEMICAL TREATMENT OF FUEL ELEMENTS OF THE MTR TYPE AND OF POWER-REACTOR FUELS CLAD WITH WIDELY DIFFERENT METALS - STAINLESS STEEL, ZIRCONIUM ALLOYS, MAGNOX A-12, ETC.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$4.60 CY, \$1.49 MF

*RADIOCHEMICAL PROCESSING + ALUMINUM + CHEMICAL REACTION + CLAD + FUEL ELEMENT

ACCESSION NUMBER 13-13215 TO 13-13741

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-13898 KIRCHNER RA + FREIBERG KJ + PUTZIER EA
GLOVEBOX HANDLING OF GRAM QUANTITIES OF CM-244 AT ROCKY FLATS
DOW CHEMICAL CO., GOLDEN, COLO.
RFP-811 +. 6 PAGES, 1 FIGURE, 3 TABLES, SEPTEMBER 1965

APPROXIMATELY 3 G OF CURIUM-244 WERE PROCESSED FROM OXIDE TO METAL IN A STANDARD GLOVEBOX, WHICH INDICATES IT CAN BE HANDLED SAFELY IN THIS MANNER. THE AVERAGE WHOLE-BODY EXPOSURE FOR 11 PERSONS WAS 298 MREMS, AND, AS A RESULT, ROUTINE WORK WITH AMOUNTS OF CURIUM-244 GREATER THAN 100 MILLIGRAMS IS DISCOURAGED UNLESS PERMANENT SHIELDING OR REMOTE-HANDLING FACILITIES ARE PROVIDED. THE AVERAGE NEUTRON EXPOSURE (250 MREMS/HR) WAS ALMOST THREE TIMES THE AVERAGE GAMMA EXPOSURE. NO AIRBORNE ACTIVITY, NOR ALPHA CONTAMINATION EXTERNAL TO THE GLOVEBOX WAS NOTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*CURIUM + *GLOVE BOX + *OPERATING EXPERIENCE + RADIATION SAFETY AND CONTROL + RADIOCHEMICAL PROCESSING

13-14368 STEVENSON CE + PAIGE OM + HOLCOMB WF + KLEFFNER JO
STARTUP EXPERIENCE WITH THE EBR-II FUEL CYCLE FACILITY-1. MANIPULATORS AND PROCESS AUXILIARIES
ARGONNE NATIONAL LABORATORY
1 PAGE, ANS TRANSACTIONS 8(2) PAGE 612 (1965 WINTER MEETING)

THE FACILITY PROVIDES FOR PROCESSING 48-PERCENT-ENRICHED U FUEL AND REFABRICATION OF RADIOACTIVE FUEL ELEMENTS. EXPERIENCE WITH EQUIPMENT IN INERT ATMOSPHERES AND INTERMITTENT EXPOSURE TO RADIATION IS DISCUSSED. EXPERIENCE WITH MASTER-SLAVE MANIPULATORS AND MANIPULATORS HAS BEEN VERY GOOD. MINOR DIFFICULTIES OCCURRED WITH LIMIT SWITCHES AND CLUTCH ADJUSTMENTS. ELECTRIC-MOTOR BRUSH WEAR WAS INITIALLY HIGH, BUT THE BRUSH MATERIALS CONTAINING MOLYBDISULFIDE WERE OPERATIVE WITHOUT SERIOUS WEAR. TRANSFER OPERATIONS BETWEEN THE AIR- AND ARGON-ATMOSPHERE CELLS CONSUMED A LOT OF TIME. ELECTRICAL BREAKDOWN WITH MINERAL-INSULATED (MGO) CONDUCTORS OCCURRED IN FEEDERS TO EQUIPMENT IN THE ARGON-ATMOSPHERE CELL (PROBABLY DUE TO THE LOWER DIELECTRIC CONSTANT OF ARGON). HIGH RATES OF WEAR OCCURRED ON PISTON RINGS FOR COMPRESSORS OPERATING ON THE DRY ARGON USED TO POWER THE PNEUMATIC EQUIPMENT. SHIELD WINDOWS HAVE SHOWN NO LOSS IN LIGHT TRANSMITTANCE. 1000-WATT MERCURY VAPOR LIGHTS SHOWED A 50 PERCENT DECREASE IN OUTPUT AFTER 20,000 HOURS.

*FUEL REPROCESSING + *OPERATING EXPERIENCE + *RADIOCHEMICAL PROCESSING + CONTAINMENT ATMOSPHERE, INERT + EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS) + FAILURE, EQUIPMENT + FAILURE, INSTRUMENT + HOT CELL + REMOTE MANIPULATING AND VIEWING

13-14369 HAMPSUN UC + MITCHELL DL + FRYER RM
STARTUP EXPERIENCE WITH THE EBR-II FUEL CYCLE FACILITY-II
ARGONNE NATIONAL LABORATORY
2 PAGES, 7 REFERENCES, ANS TRANSACTIONS 8(2) PAGES 612-613 (1965 WINTER MEETING)

PROCESSING EXPERIENCES WERE COMPARED WITH DESIGN CRITERIA AND MOCKUP EXPERIENCE. MECHANICAL PROBLEMS IN DECANING RESULT FROM THE TENACITY OF THE BONDING SODIUM. SOLUTIONS HAVE BEEN EVOLVED FOR ALL THESE PROBLEMS ENCOUNTERED. THE RESULTS OF PROCESSING CORE, CONTROL, AND SAFETY FUEL-CONTAINING SUBASSEMBLIES ARE - (1) RECOVERY OF 99 PERCENT OF FUEL IN DISMANTLING AND DECANING, (2) POUR YIELDS IN MELT REFINING IN THE 92 TO 95 PERCENT RANGE, (3) REMOVAL OF ABOUT 75 PERCENT OF THE FISSION PRODUCTS BY MELT REFINING, (4) STOICHIOMETRIC CONVERSIONS OF THE DROSS METAL TO OXIDE. RADIATION LEVELS OF THE FUEL EXCEED 10 TO THE FIFTH R PER HR PER FT.

*FUEL REPROCESSING + *OPERATING EXPERIENCE + *RADIOCHEMICAL PROCESSING + COMPARISON, THEORY AND EXPERIENCE + EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS) + HOT CELL

13-14371 FELDMAN MJ + BACCA JP + ESCHEN VG + MAHAGIN DE
STARTUP EXPERIENCE WITH THE EBR-II FUEL CYCLE FACILITY-III. FUEL FABRICATION
ARGONNE NATIONAL LABORATORY
2 PAGES, 1 TABLE, 7 REFERENCES, ANS TRANSACTIONS 8(2) PAGES 613-614 (1965 WINTER MEETING)

COMPARES DESIGN CRITERIA AND OPERATING METHODS. TWO AREAS OF MODIFICATION TO THE DESIGN PHILOSOPHY WERE MADE DURING THE STARTUP PERIOD. IN THREE PROCESSING STATIONS, SEALED MASTER-SLAVE MANIPULATORS WERE ADDED. ADDITIONAL DESIGN APPEARED NECESSARY BEFORE AUTOMATED OPERATION WAS POSSIBLE. TOLERANCE RANGES FOR THE STEPS IN THE PROCESS WERE NOT COHERENT. RANGES OF TOLERANCE WERE NARROWED FOR THE INDIVIDUAL OPERATION OUTPUTS, AND THE INPUT RANGES WERE WIDENED SO THAT PROCESS FLOW EFFICIENCY WAS EFFECTED.

*FUEL REPROCESSING + DESIGN CRITERIA + EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS) + FAILURE, DESIGN ERROR + HOT CELL + OPERATING EXPERIENCE + RADIOCHEMICAL PROCESSING

13-14441 NUMEC REBUTS DML LETTER ON CRITICALITY CONTROL
UNITED STATES ATOMIC ENERGY COMMISSION
3 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGES 18-20 (JANUARY 30, 1967)

NUMEC (70-135) REBUTS A DECEMBER-16 LETTER STATING THAT A NOVEMBER-11 APPLICATION CONTAINED 3 MISTAKES WITH FUNDAMENTAL CONCEPTS IN CRITICALITY CONTROL. REBUTTAL ASSERTS STATEMENT IS UNWARRANTED AND REFLECTS A REVIEW WHICH DID NOT CONSIDER ALL INFORMATION IN SUBMITTAL. (1) YOUR FIG 24 OF LA3366 CANNOT BE EXTENDED TO A SINGLE MASS, BECAUSE IT APPLIES ONLY TO ARRAYS. (2) OUR USE OF FIG. 1, TID 7026 IS CORRECT BECAUSE ELSEWHERE WE STATED THAT OUR UO2 POWDER WILL BE BLENDED WITH CUSTOMER-SUPPLIED CERAMIC POWDERS TO REDUCE THE URANIUM DENSITY. (3)

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-14441 *CONTINUED*

EXTENSION OF REACTIVITY LOGIC TO ARRAYS OF SUBCRITICAL UNITS IS UNWARRANTED. UNDER A HOMOGENIZATION PROCEDURE, THE FRACTION CRITICAL VALUE DOES INDEED DECREASE WHEN LIKE UNITS ARE ADDED TO AN ARRAY.

*CRITICALITY SAFETY + FUEL STORAGE + MEASUREMENT, SUBCRITICALITY + REGULATION, AEC

13-14462 HAHN CA + BOTTENFIELD BF + HANNON FL + MCCARTER R + PEISHEL FL
REMOTE MAINTENANCE SYSTEMS IN THE TRANSURANIUM PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY

13 PAGES, 17 FIGURES, 5 REFERENCES, 1966, PRESENTED AT ANS WINTER MEETING, PITTSBURGH 1966, PUBLISHED IN PROCEEDINGS OF 14TH CONFERENCE ON REMOTE SYSTEM TECHNOLOGY, 1966

THE TRANSURANIUM PROCESSING PLANT AT OAK RIDGE NATIONAL LABORATORY IS DESIGNED TO ACCOMPLISH ALL MATERIAL TRANSFERS BETWEEN THE CELL-BANK INTERIOR AND EXTERIOR WITHOUT LOSS OF ALPHA CONTAINMENT. SEVERAL EQUIPMENT PIECES ARE DESCRIBED THAT ARE DEVELOPMENTS OF THE DOUBLE-COVER TECHNIQUE, THE BAGGING TECHNIQUE, AND COMBINATIONS OF THE TWO. EQUIPMENT THAT HAS BEEN DEVELOPED FOR REMOTE REPLACEMENT OF CONTAMINATED FILTER, REPLACEMENT OF ALPHA SEAL AND CELL-SHIELDING WINDOWS, AND REMOTE EQUIPMENT DECONTAMINATION ARE ALSO DESCRIBED.

AVAILABILITY - PROCEEDINGS OF THE 14TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY, 1966

*EQUIPMENT DESIGN + *MAINTENANCE, REMOTE + *ORNL (OAK RIDGE NATIONAL LABORATORY) + *TRANSURANIUM ELEMENT + DECONTAMINATION + FILTER MAINTENANCE + MAINTENANCE AND REPAIR + RADIOCHEMICAL PROCESSING + SHIELDING + WASTE DISPOSAL, SOLID

13-14464 TERMINATION OF FISSION PRODUCTS PLANT CONTRACT TO BE NEGOTIATED - EXPRESSIONS OF INTEREST SOUGHT ON HANFORD CHEMICAL PROCESSING OPERATIONS
UNITED STATES ATOMIC ENERGY COMMISSION
PRESS REL. K-10 +. 2 PAGES, JANUARY 19, 1967

ISOCEM, INC., AND THE ATOMIC ENERGY COMMISSION FOUND IT MUTUALLY CONVENIENT TO NEGOTIATE THE TERMINATION OF THE CONTRACT AND RELATED LAND LEASE UNDER WHICH ISOCEM WAS TO BUILD AND OPERATE A COMMERCIAL PLANT TO PROCESS AND ENCAPSULATE USEFUL FISSION PRODUCTS AT THE HANFORD WORKS NEAR RICHLAND, WASHINGTON.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C. 20545

*FPCE PLANT + *ISOCEM, INC. + *REGULATION, AEC + HANFORD SITE + RADIOCHEMICAL PROCESSING

13-14465 CRAMER TL
NFS - FIRST FUEL REPROCESSOR
5 PAGES, 3 FIGURES, NUCLEONICS 24(12) PAGES 48-52 (DECEMBER 1966)

THE NFS SOLVENT-EXTRACTION MECHANICAL-PROCESSING HEAD END PRODUCTION FACILITY AT WEST VALLEY, NEAR BUFFALO, NEW YORK, IS DESCRIBED. THE USUAL URANIUM AND PLUTONIUM EXTRACTION CYCLES TO SEPARATE THESE ELEMENTS FROM RADIOACTIVE FUEL ELEMENTS IS DESCRIBED. WASTE HANDLING IS MENTIONED ONLY BRIEFLY - A CURSORY TREATMENT.

*NFS (NUCLEAR FUEL SERVICES) + RADIOCHEMICAL PROCESSING + WASTE HANDLING

13-14466 SNOEBERGER D + HECKMAN R
VENT-GAS TREATMENT PLANT. PROJECT DRIBBLE. SALMON EVENT. FINAL REPORT
LAWRENCE RADIATION LABORATORY
VUF-3016 +. 18 PAGES, 2 FIGURES, OCTOBER 21, 1966

THE VENT-GAS TREATMENT PLANT DESCRIBED IN THIS REPORT IS A RESEARCH FACILITY BUILT TO STUDY RADIOACTIVE GASES GENERATED IN UNDERGROUND NUCLEAR TESTS AT THE TATUM SALT DOME NEAR HATTIESBURG, MISS. THE MAIN PROCESS FEATURES ARE - (1) A FLOW-CONTROL AND DILUTION SYSTEM TO OBTAIN SAFE HYDROGEN DILUTION, (2) SODIUM HYDROXIDE GAS SCRUBBERS, (3) AN ACTIVATED-CHARCOAL ABSOLUTE-TYPE FILTRATION SYSTEM, AND (4) A HIGH STACK TO ENSURE SAFE DILUTION OF THE UNREMOVED RADIOACTIVE EFFLUENT GASES FROM THE PROCESS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ATMOSPHERIC DIFFUSION EXPERIMENT + *FILTER + *HYDROGEN + CHARCOAL + FILTER, ABSOLUTE + FISSION GAS RELEASE + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + RADIOLYTIC GAS + SCRUBBER + TEST, SYSTEM OPERABILITY + WASTE DISPOSAL, ATMOSPHERIC + WASTE TREATMENT, GAS

13-14467 GAITANIS MJ + TRIPP LF
OPERATIONAL EXPERIENCE AT THE QUEHANNA, PENNSYLVANIA FACILITY - A TWO-MEGACURIE SR-90 CONVERSION AND ENCAPSULATION PLANT
MARTIN COMPANY, CLEARFIELD, PENNSYLVANIA
7 PAGES, 4 FIGURES, 2 REFERENCES, 1966

THE QUEHANNA RADIOISOTOPE FACILITY WAS DESIGNED TO PREPARE SR-90 HEAT SOURCES. THE SOURCES ARE IN THE FORM OF SR-90 TITANATE POWDER PRESSED INTO SUITABLE LINERS AND THEN ENCAPSULATED. PRODUCTION INVOLVES DISSOLUTION OF BULK SR-90 CARBONATE, METERING, CONVERSION, FILTERING, FIRING, BALL-MILLING, STEP PRESSING, ENCAPSULATING, DECONTAMINATING, AND CALORIMETRY.

ACCESSION NUMBER 13-14441 TO 13-14467

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-14467 *CONTINUED*

OPERATIONAL EXPERIENCE WITH THE ORIGINAL PROCESS AND EQUIPMENT HAS MADE POSSIBLE THE DEVELOPMENT OF A SECOND-GENERATION SYSTEM WITH GREATLY IMPROVED RELIABILITY AND CONVENIENCE OF OPERATION.

AVAILABILITY - PROCEEDINGS OF 14TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY,

*ENERGY SOURCE + *STRONTIUM + HEAT GENERATION; INTERNAL + HOT CELL + RADIOCHEMICAL PROCESSING

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-08813 SHERWOOD RJ
RECENT DEVELOPMENTS IN DETERMINING THE RELATIONSHIP OF AIR SAMPLE MEASUREMENTS AND PERSONAL EXPOSURE TO AIRBORNE RADIOACTIVE PARTICLES
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4738 +. 22 PAGES, 2 PLATES, 1 FIGURE, 10 TABLES, 9 REFERENCES, SEPTEMBER 1964, UKAEA

A BRIEF REVIEW IS MADE OF STUDIES UNDERTAKEN AT AERE INTO THE INTERPRETATION OF AIR SAMPLING RESULTS. MOST OF THESE HAVE BEEN CONCERNED WITH THE MEASUREMENT OF PLUTONIUM IN GLOVE BOX AREAS, BUT MORE RECENTLY, INVESTIGATIONS HAVE BEEN MADE IN AREAS WHERE IRRADIATED FUEL IS HANDLED AND WHERE DECONTAMINATION IS UNDERTAKEN. THE RADIOACTIVITY ON A SAMPLING FILTER MAY BE ATTRIBUTABLE TO A SINGLE PARTICLE, SO THAT THE FILTER IS NOT A SAMPLE IN A STATISTICAL SENSE AND CANNOT THEREFORE REPRESENT THE EXPOSURE OF ANY INDIVIDUAL. IT IS SIMPLY A MEASURE OF THE MOST ACTIVE PARTICLE COLLECTED BY THE SAMPLER. EVEN SAMPLES THAT DO REPRESENT A CLOUD OF RADIOACTIVE PARTICLES MAY NOT INDICATE AN EXPOSURE TO AN INDIVIDUAL AS (AT LEAST FOR THE AREAS AND OPERATIONS SO FAR STUDIED) THIS IS A HIGHLY PERSONAL MATTER. SUCH MARKED VARIATIONS OF CONCENTRATIONS MAY EXIST IN TIME AND SPACE THAT, EVEN AVERAGED OVER PERIODS OF MONTHS, EXPOSURE CANNOT EASILY BE ASSESSED WITHIN A FACTOR OF TEN.

*POPULATION EXPOSURE + MONITOR, RADIATION, AIR + PARTICULATE + PLUTONIUM

14-10243 BELTER WG + PEARCE DW
RADIOACTIVE WASTE MANAGEMENT
DIVISION OF REACTOR DEVELOPMENT AND TECHNOLOGY, USAEC + PACIFIC NORTHWEST LABORATORY
TID-8541 +. 100 PAGES, 19 TABLES, 24 FIGURES, 141 REFERENCES, PP. 149-248 OF REACTOR TECHNOLOGY, SELECTED REVIEWS--1965, L. E. LINK, EDITOR, ARGONNE NATIONAL LABORATORY, JANUARY 1966, CFSTI, \$4.50 CY, \$2.00 MN

THIS REVIEW PRESENTS HIGHLIGHTS IN RECENT WASTE-MANAGEMENT EXPERIENCE IN THE UNITED STATES AND ABROAD AND SUMMARIZES ADVANCES IN TECHNOLOGY THAT HAVE OCCURRED DURING THE PAST THREE TO FOUR YEARS. SECTIONS ARE INCLUDED ON TREATMENT, STORAGE AND DISPOSAL, ENVIRONMENTAL STUDIES, AND EVALUATION AND ECONOMICS.

*RIVER, OTTAWA + BATTELLE NORTHWEST + CHALK RIVER + GEOLOGICAL CONSIDERATION, GENERAL + GEOLOGICAL CONSIDERATION, SALT STRUCTURE + GROUND WATER, NUCLIDE OCCURRENCE + OCEAN AND SEA + ORNL (OAK RIDGE NATIONAL LABORATORY) + RIVER, CLINCH + RIVER, COLUMBIA + RIVER, RHONE + RIVER, SAVANNAH + RIVER, THAMES + SAMPLING + SAVANNAH RIVER PLANT + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, SEDIMENT + SURFACE WATER, SUSPENDED MATERIAL + UNITED KINGDOM + WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, BEDROCK + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GAS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, OCEAN + WASTE DISPOSAL, RIVER + WASTE DISPOSAL, SALT + WASTE DISPOSAL, SOLID + WASTE DISPOSAL, TERRESTRIAL + WASTE MANAGEMENT + WASTE STORAGE + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, FIXATION + WASTE TREATMENT, GAS + WASTE TREATMENT, GENERAL + WASTE TREATMENT, LIQUID

14-11635 SOUDAIN G
CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE GASES)
COMMISSARIAT A L'ENERGIE ATOMIQUE, CENTRE D'ETUDES NUCLEAIRES, FONTENAY-AUX-ROSES
CEA-R-2841 +. 60 PAGES, 21 FIGURES, 3 TABLES, 1966, THESIS PRESENTED TO TOULOUSE UNIVERSITY (FRANCE)
FACULTE DES SCIENCES, MARCH 16, 1965, DEP. MN.

TRITIUM IS A DANGEROUS GAS FOR MAN, AND THE MAXIMUM ADMISSIBLE DOSES IN THE ATMOSPHERE ARE SUFFICIENTLY LOW FOR THE DOSAGE TO BE FAIRLY DIFFICULT. WE HAVE DEVELOPED AN APPARATUS FOR MEASURING SELECTIVELY THE CONTAMINATION OF AIR BY THIS GAS WHEN ALONE OR WHEN ASSOCIATED WITH OTHER GASEOUS CONTAMINANTS. THE DIFFERENTIAL APPARATUS USING TWO IONIZATION CHAMBERS MAKES IT POSSIBLE TO ELIMINATE A PARASITIC GAMMA-RADIATION FIELD. IN A FEW PARTICULAR CASES, THE PRESENCE OF THE RADIOACTIVE GAS HAS BEEN STUDIED. FROM THE PRACTICAL POINT OF VIEW, THE USE OF THESE CHAMBERS (MADE OF STAINLESS STEEL) MAKES FOR EASIER USE SINCE THE PROBLEMS CONNECTED WITH WALL ADSORPTION HAVE BEEN SATISFACTORILY RESOLVED. THE METHOD CAN BE APPLIED WITHOUT RESTRICTION AND VERY EASILY TO THE DETERMINATION OF TRACES OF TRITIUM IN AIR OR IN THE FORM OF TRITIATED WATER OR STEAM IN THE ATMOSPHERE.

*ANALYTICAL TECHNIQUE, GAS + *TRITIUM + COUNTER + DOSE MEASUREMENT, EXTERNAL + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + MAXIMUM PERMISSIBLE DOSE (MPD) + SAMPLING

14-11636 SALMON RJ
FINAL REPORT. ENVIRONMENTAL HEALTH PLANNING FOR POSTATTACK CONDITIONS. SOME PROBLEMS, PROGRAMS, AND PRIORITIES
RESEARCH TRIANGLE INSTITUTE, OPERATIONS RESEARCH AND ECONOMICS DIVISION, DURHAM
RTI-OU-197 +. 73 PAGES, 1 TABLE, 1 FIGURE, 71 REFERENCES, APRIL 1966, DOD

CONDITIONS IMPOSED BY MASSIVE NUCLEAR ATTACK WILL DISRUPT NORMAL ENVIRONMENTAL HEALTH SERVICES OF COMMUNITIES THROUGHOUT THE UNITED STATES THREATEN THE HEALTH OF SURVIVING POPULATION. THIS STUDY DEVELOPS A FRAMEWORK TO EVALUATE POSTATTACK CONDITIONS RELATIVE TO ENVIRONMENTAL HEALTH. REVIEW AND ANALYSIS OF EXISTING INFORMATION ON PROBABLE POSTATTACK CONDITIONS OF LOCAL HEALTH DEPARTMENTS, PUBLIC HEALTH ORGANIZATIONS, AND RESOURCE MANAGEMENT PRACTICES IS PRESENTED. ANTICIPATED POSTATTACK ENVIRONMENTAL HEALTH PROBLEMS ARE IDENTIFIED, AND PRIORITY JUDGMENTS ARE MADE ON A COMPARATIVE BASIS IN TERMS OF LEVEL OF GRAVITY. RATIONALE SUPPORTING THE JUDGMENTS IS INCLUDED, AND BOTH ACTION AND RESEARCH PROGRAMS TO IMPROVE PREPAREDNESS ARE RECOMMENDED. IMPORTANT SOURCES OF DATA PRESCRIBED FOR THIS STUDY WERE THE REPORTS AND WORKING PAPERS OF AN EARLIER U. S. PUBLIC HEALTH SERVICE PROJECT, OCO-OS-62-254 (ENVIRONMENTAL HEALTH PROBLEMS IN THE POST SHELTER PERIOD). IN ADDITION, FOUR CITY HEALTH DEPARTMENTS WERE VISITED TO ASSIST IN ANALYSIS OF NORMAL ENVIRONMENTAL HEALTH CONDITIONS RELATIVE TO THOSE EXPECTED IN A POSTATTACK RECOVERY PERIOD AND OF THE ABILITY OF A LOCAL HEALTH AGENCY TO COPE WITH PROJECTED CONDITIONS.

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-11636 *CONTINUED*

*CIVIL DEFENSE + *RECOVERY PROCESS + FALLOUT + NUCLEAR DETONATION + POPULATION EXPOSURE + RECOVERY FACTOR + WATER, DRINKING + WATER, GENERAL

14-11637 HENDERSON RW + FULTYN RV

RADIATION MEASUREMENTS OF THE EFFLUENT FROM THE KIWI B4D-202 AND B4E-301 REACTORS

LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO

LA-3397-MS +. 91 PAGES, 18 TABLES, 57 FIGURES, FEBRUARY 3, 1966 (WRITTEN AUGUST 12, 1965), CFSTI \$3.00 CY, \$0.75 MN.

PRESENTED ARE THE RESULTS OF DOCUMENTATION STUDIES ON THE EFFLUENT FROM THE KIWI B4D-202 AND B4E-301 REACTORS DURING FULL-POWER TESTS. A DESCRIPTION OF PROCEDURES AND EQUIPMENT IS ALSO GIVEN. AN ANALYSIS OF THE ENVIRONMENTAL EFFECTS DUE TO THE PASSAGE AND DEPOSITION OF RELEASED MATERIAL IS GIVEN AS WELL AS DEPOSITION VELOCITIES MEASURED AT VARIOUS LOCATIONS.

*EFFLUENT + *ROVER PROGRAM + AEROSOL + ATMOSPHERIC DIFFUSION + DEPOSITION + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + IODINE + PARTICLE SIZE + SAMPLING

14-11741 LOPEZ-MENCHERO E

RECENT RESEARCH AND DEVELOPMENT WORK IN ENA COUNTRIES RELATED TO THE TREATMENT OF LOW AND INTERMEDIATE LEVEL WASTES

EUROCHEMIC, MOL, BELGIUM

ETR-176 + NP-15946 + CONF-651202-19 +. 49 PAGES, 13 FIGURES, 7 TABLES, 9 REFERENCES, PRESENTED TO THE SYMPOSIUM ON PRACTICES IN THE TREATMENT OF LOW AND INTERMEDIATE LEVEL RADIOACTIVITY WASTES, VIENNA, DECEMBER 1965, CFSTI \$3.00 CY, \$0.50 MN

THE PAPER REVIEWS RESEARCH AND DEVELOPMENT WORK DIRECTED TOWARD THE TREATMENT OF LOW- AND MEDIUM-LEVEL RADIOACTIVE WASTE. AMONG OTHER SUBJECTS, WORK IS REPORTED ON THE SEPARATION OF CERTAIN FISSION-PRODUCT CATIONS BY ION EXCHANGE, THE SEPARATION OF FISSION-PRODUCT CATIONS BY EXTRACTION OR FOAMING TECHNIQUES, THE APPLICATION OF ELECTRODIALYSIS TO DEMINERALIZATION, AND THE RADIOLYTIC STABILITY OF ION-EXCHANGE RESINS.

*WASTE TREATMENT, LIQUID + CESIUM + COBALT + FOAM + ION EXCHANGE + MINERAL EXCHANGE + STRONTIUM + WASTE TREATMENT, SOLID + YTTRIUM

14-11775 VOLCHOK HL

THE GLOBAL STRONTIUM 90 BUDGET

HEALTH AND SAFETY LABORATORY, USAEC

4 PAGES, 1 TABLE, 1 FIGURE, 19 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(6), PAGES 1515-1518 (MARCH 15, 1966)

INVENTORIES OF SR-90 IN THE ENVIRONMENT OF THE EARTH HAVE BEEN MADE FOR A SERIES OF DATES BETWEEN AUGUST 1961 AND MARCH 1965. ON EVERY DATE TESTED THESE INVENTORIES ARE FOUND TO BE DEFICIENT WHEN COMPARED WITH THE AMOUNT OF SR-90 EXPECTED TO BE PRESENT, ON THE BASIS OF NUCLEAR WEAPONS TESTS CONDUCTED IN THE ATMOSPHERE. THE MAJOR PORTION OF THIS DEFICIENCY IS ATTRIBUTED TO A 33 PERCENT ERROR IN THE INVENTORY OF SR-90 DEPOSITED AND IS CAUSED BY ASSUMING THAT THE OBSERVED FALLOUT ON LAND IS EQUIVALENT TO THAT ON THE OCEANS, PER UNIT AREA. IT IS SUGGESTED THAT WATER BODIES COLLECT FALLOUT 1.5 TIMES MORE EFFICIENTLY THAN LAND. APPLYING THIS FACTOR TO THE WORLDWIDE SR-90 DEPOSITION INVENTORY RESULTS IN GOOD AGREEMENT BETWEEN STRATOSPHERIC DEPLETION AND WORLDWIDE DEPOSITION, IN ADDITION TO ACCOUNTING FOR THE APPARENT BUDGET DEFICIENCY.

*FALLOUT + *STRONTIUM + DEPOSITION + OCEAN AND SEA + STRATOSPHERE + SURVEY, RADIATION, ENVIRONMENTAL + TROPOSPHERE

14-11776 BECK JN + KURODA PK

RADIOSTRONTIUM FALLOUT FROM THE NUCLEAR EXPLOSION OF OCTOBER 16, 1964

UNIVERSITY OF ARKANSAS, FAYETTEVILLE

6 PAGES, 1 TABLE, 3 FIGURES, 9 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(10) PAGES 2451-2456 (MAY 15, 1966)

THE RADIOSTRONTIUM DATA OBTAINED AT FAYETTEVILLE, ARKANSAS, SHOW THAT A CONSIDERABLE FRACTION OF THE DEBRIS FROM THE OCTOBER 16, 1964, NUCLEAR EXPLOSION HAS ENTERED THE STRATOSPHERE. IT IS ESTIMATED THAT THE STRATOSPHERIC SR-90 INVENTORY HAS INCREASED BY 0.38 PERCENT AND THE TROPOSPHERIC SR-90 INVENTORY BY 4.0 PERCENT AS A RESULT OF THE CHINESE NUCLEAR EXPLOSION. THE MEAN RESIDENCE TIME OF SR-90 IN THE TROPOSPHERE WAS CALCULATED TO BE 30 DAYS, ACCORDING TO THE TWO-COMPARTMENT MODEL OF THE ATMOSPHERE.

*FALLOUT + *STRONTIUM + DEPOSITION + MATHEMATICAL STUDY + NUCLEAR DETONATION + NUCLEAR EXPLOSION DEBRIS + STRATOSPHERE + TROPOSPHERE

14-11784 HASKELL EE + LEVENTHAL JS + BIANCHI WC

THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA

U. S. DEPARTMENT OF AGRICULTURE, FRESNO + UNIVERSITY OF CALIFORNIA, LOS ANGELES

11 PAGES, 5 FIGURES, 3 TABLES, 21 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(16) PAGES 3849-59 (AUGUST 15, 1966)

THE TRITIUM CONTENT OF WATER FROM IRRIGATION WELLS ALONG TWO EAST-WEST TRAVERSE LINES WAS USED IN ESTIMATING GROUNDWATER VELOCITIES IN THE SAN JOAQUIN VALLEY. TRITIUM PEAKS DUE TO NUCLEAR

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-11784 *CONTINUED*

WEAPONS TESTS WERE IDENTIFIED WITHIN THE GROUNDWATER BODY. THE ESTIMATED VELOCITIES WERE COMPARABLE WITH VELOCITIES EXPECTED IN THE COARSE PARTS OF THE AQUIFERS. THE RATIO OF TRITIUM IN THE WELL WATER TO THAT IN THE RAIN WAS INCONSISTENT WITH PREDICTED RECHARGE, INDICATING THAT RECHARGE WAS LOCALIZED AND THAT WATER FLOWED TO THE SAMPLED WELLS THROUGH THE COARSE AQUIFERS.

*GROUND WATER, TRACER + *HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + *TRITIUM + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + NUCLEAR DETONATION + RAINOUT

14-11833 TAMPLIN AR + FISHER HL

ESTIMATION OF DOSAGE TO THYROIDS OF CHILDREN IN THE U. S. FROM NUCLEAR TESTS CONDUCTED IN NEVADA DURING 1952 THROUGH 1955

UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE

UCRL-14,707 +. 50 PAGES, 4 TABLES, 4 FIGURES, 38 REFERENCES, MAY 10, 1966, CFSTI \$3.00 CY, \$0.50 MN.

THIS REPORT PRESENTS ESTIMATES OF THE THYROID DOSAGE ACCUMULATED BY CHILDREN UP TO 5 YEARS OF AGE IN THE UNITED STATES AS A RESULT OF NUCLEAR WEAPONS TESTS IN NEVADA DURING 1952 THROUGH 1955. THE ESTIMATES ARE BASED UPON THE ASSUMPTION THAT THE CHILDREN WERE CONSUMING 1 LITER OF MILK PER DAY FROM COWS ON PASTURE. IT IS NOT KNOWN TO WHAT EXTENT THIS ASSUMPTION IS VALID. THE DATA, THE ANALYTICAL APPROACH, AND THE ASSUMPTIONS INHERENT TO THE ANALYSIS ARE PRESENTED, TOGETHER WITH THE ESTIMATES.

*DOSE CALCULATION, INTERNAL + *FISSION PRODUCT, IODINE + ANALYTICAL TECHNIQUE, AIR + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + ECOLOGICAL CONSIDERATION + NUCLEAR DETONATION + SAMPLING

14-11834 COLLINS DA + MCINTOSH AE + TAYLOR R + YUILIE WD

EXPERIMENTS RELATING TO THE CONTROL OF FISSION-PRODUCT RELEASE FROM ADVANCED GAS-COOLED REACTORS

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINDSCALE

27 PAGES, 8 FIGURES, 7 TABLES, 11 REFERENCES, JOURNAL OF NUCLEAR ENERGY 20(2), PAGES 97-122 (FEBRUARY 1966)

IT HAS BEEN SHOWN THAT IODINE RELEASED FROM IRRADIATED AGR FUEL ELEMENTS, MAY BE PRESENT IN THREE FORMS - ELEMENTAL IODINE VAPOUR, IODINE CARRIED ON SOLID PARTICLES, AND VAPOUR COMPOUNDS OF IODINE, PRINCIPALLY METHYL IODIDE. OTHER FISSION PRODUCTS, SPECIFICALLY TELLURIUM, CAESIUM, BARIUM/LANTHANUM, STRONTIUM AND RUTHENIUM ARE PRESENT ENTIRELY AS SOLID PARTICLES. THE RELATIVE AMOUNTS OF THE THREE FORMS OF IODINE DEPEND ON SUCH FACTORS AS THE FUEL-ELEMENT TEMPERATURE AND IRRADIATION LEVEL, THE GAS COMPOSITION AND TEMPERATURE AND THE SORPTION/DESORPTION HISTORY OF THE IODINE ON SURFACES. METHYL IODIDE CAN COMPRISE AN APPRECIABLE PERCENTAGE OF THE TOTAL IODINE RELEASED. A TRAPPING SYSTEM CONSISTING OF A COMBINATION HIGH-EFFICIENCY FILTERS AND ACTIVATED CARBON BEDS CAN PROVIDE ADEQUATE PROTECTION AGAINST THE ESCAPE OF THE RELEASED FISSION PRODUCTS (APART FROM THE RARE GASES) PROVIDED THAT THE CAPACITY OF THE CARBON FOR METHYL IODIDE IS NOT EXCEEDED. A COCONUT-SHELL-BASED CARBON (TYPE SC 11), CHOSEN FOR ITS PERFORMANCE AGAINST ELEMENTAL IODINE WILL RETAIN METHYL IODIDE WITH HIGH EFFICIENCY ONLY UP TO A LOADING OF ABOUT 5 G/TE CARBON AT 100 C AND MUCH LESS AT ROOM TEMPERATURE. AN ALTERNATIVE COAL-BASED CARBON (TYPE 207 B) HAS EXCELLENT PERFORMANCE IN RELATIVELY DRY GAS UP TO A LOADING OF ABOUT 500 G/TE CARBON BOTH AT ROOM TEMPERATURE AND AT 100 C. THE PERFORMANCE OF SCALED-DOWN TRAPPING PLANTS CONTAINING EACH OF THESE TYPES OF CARBON HAS BEEN DEMONSTRATED AGAINST THE FISSION PRODUCTS RELEASED FROM OVERHEATED AGR FUEL SPECIMENS IN LABORATORY-SCALE EXPERIMENTS.

*FILTER, EFFICIENCY OF + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT, IODINE + ADSORPTION + AGR (ADVANCED GASCOOLED REACTOR, WINDSCALE, UK) + BARIUM + CESIUM + CHARCOAL + FILTER CHARACTERISTICS + FISSION GAS RELEASE + REACTOR, GAS COOLED + RUTHENIUM + STRONTIUM + TELLURIUM

14-11835 ABRAHAMS JH + JOHNSON RH

SOIL AND SEDIMENT ANALYSIS - PREPARATION OF SAMPLES FOR ENVIRONMENTAL RADIATION SURVEILLANCE

U. S. PUBLIC HEALTH SERVICE

PHS-999-RH-19 +. 25 PAGES, 3 TABLES, 6 FIGURES, 28 REFERENCES, JUNE 1966, SOURCE, FREE

SOIL SAMPLES WERE SEPARATED INTO SIZE FRACTIONS TO DETERMINE THOSE IN WHICH UPTAKE WAS GREATEST FOLLOWING THE ADDITION OF DIFFERENT CONCENTRATIONS OF ZINC-65 TRACER IN AQUEOUS SUSPENSIONS, AND TO EVALUATE SEVERAL METHODS OF FRACTIONATION. ACTIVITY PER GRAM FOR PARTICLES LESS THAN 43 MICRONS WAS 7 TO 8 TIMES GREATER THAN FOR 43 TO 250 MICRON PARTICLES. THIS FACTOR INCREASED AS THE PARTICLE SIZES DECREASED. ACTIVITY ON EACH SIZE FRACTION INCREASED WITH INCREASING CONCENTRATIONS OF THE ZINC-65 TRACER IN AQUEOUS SUSPENSIONS, AS WELL AS WITH INCREASING ORGANIC CONTENT. WET SIEVING WITH MILD PHYSICAL DISPERSION WAS A MORE CONVENIENT AND REPRODUCIBLE METHOD OF SEPARATING THE FINE AND COARSE FRACTIONS THAN SEDIMENTATION AND ELUTRIATION.

*PARTICLE SIZE DISTRIBUTION + ANALYTICAL TECHNIQUE, SOLID + MINERAL EXCHANGE + PARTICLE SIZE + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY + ZINC

14-11917 GARNIER A

ESSAI D EVALUATION DU DEPOT CUMULATIF DE STRONTIUM 90 DANS PLUSIEURS STATIONS FRANCAISES (ATTEMPT TO EVALUATE THE CUMULATIVE DEPOSIT OF SR-90 IN SEVERAL FRENCH CENTERS)

CENTRE D ETUDES NUCLEAIRES, DE FONTENAY-AUX-ROSES, FRANCE

CEA-R-2930 +. 14 PAGES, 4 FIGURES, 4 TABLES, 9 REFERENCES, MARCH 1966, IN FRENCH DEP. MN

THE ESTIMATION OF SR-90 FALLOUT WHICH OCCURRED LOCALLY IN THE YEARS BEFORE SYSTEMATIC CONTROLS WERE ESTABLISHED CAN BE MADE BY ASSUMING THAT THE CONCENTRATION IN RAIN VARIES LITTLE FROM ONE PLACE TO ANOTHER (IF THEY ARE FAIRLY CLOSE) AND THAT THE DEPOSIT CAN BE DEDUCED FROM THAT

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14-11917 *CONTINUED*

MEASURED IN A SINGLE STATION BY MAKING CORRECTIONS FOR DIFFERENCES IN THE RAINFALL. THIS ASSUMPTION IS CONFIRMED BY APPLYING THE METHOD TO THE CALCULATION OF FALLOUT AT ISPRA, MOL, AND AT SEVERAL FRENCH CENTRES. THE VALUES CALCULATED ARE COMPARED TO THOSE OBTAINED BY MEASUREMENTS CARRIED OUT SINCE 1958 IN SOME CASES, AND SINCE 1960 IN OTHERS. THE RESULTS SHOW THAT THE METHOD IS VALID FOR CALCULATING FALLOUT PRIOR TO 1960 (IN THE ABSENCE OF INFORMATION) AND TO DEDUCE WITH SUFFICIENT APPROXIMATION THE SUBSEQUENT CUMULATIVE DEPOSITS IN THE FRENCH CENTRES UNDER CONSIDERATION.

*FALLOUT + *FRANCE + *STRONTIUM + RAINOUT

14-11918 HENDERSON RW + LARSON OW

RADIATION MEASUREMENT OF THE EFFLUENT FROM THE NRX A-2 AND NRX A-3 REACTORS
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO

LA-3394 +. 51 PAGES, 31 FIGURES, 4 TABLES, 4 REFERENCES, JANUARY 1966, CFSTI \$3.00 CY, \$0.50 MN

COMPILATION OF DATA RESULTING FROM THE COLLECTION OF SAMPLES OF THE EFFLUENT CLOUDS FROM THE NRX A-2 AND A-3 REACTORS DURING FULL-POWER OPERATION IS PRESENTED. DATA ARE PRESENTED CONCERNING THE MAGNITUDE AND ISOTOPIC COMPOSITION OF THE AIRBORNE AND GROUND-DEPOSITED MATERIAL. THE ENVIRONMENTAL IMPACT OF THESE TESTS HAS BEEN CALCULATED FOR HYPOTHETICAL CONDITIONS OF LAND USE AND OCCUPANCY, AND THESE DATA ARE INCLUDED. A BRIEF DESCRIPTION OF EQUIPMENT AND TECHNIQUES IS ALSO GIVEN.

*EFFLUENT + *REACTOR, AIRCRAFT + DEPOSITION + FALLOUT + METEOROLOGY + NUCLEAR ROCKET + PARTICULATE + SAMPLING

14-11921 THAL MF + CHEVALIER G

DEGAGEMENT, PROPRIETES ET PIEGEAGE DES IODES RADIOACTIFS DANS LES EFFLUENTS GAZEUX (RELEASE PROPERTIES AND TRAPPING OF RADIOACTIVE IODINES IN WASTE GASES)

COMMISSARIAT A L'ENERGIE ATOMIQUE, SACLAY, FRANCE

CEA-B18-64 +. 80 PAGES, 72 TABLES, 194 REFERENCES, JUNE 1965, DEP. MN, IN FRENCH

THE AMOUNTS OF STABLE AND RADIOACTIVE IODINES FORMED IN A REACTOR ARE LARGE AND DEPEND ON THE POWER OF THE REACTOR, ON THE FUEL, AND ON THE TIME OF IRRADIATION. IN THE EVENT OF AN ACCIDENT, THEY CAN BE RELEASED IN VARIABLE PROPORTIONS DEPENDING ON THE PHYSICAL CONDITIONS OF THE FUEL AND OF THE CARRIER FLUID. A STUDY OF THE VARIOUS COMPOUNDS CAN BE CARRIED OUT WITH CHEMICAL METHODS, PHYSICAL METHODS, AND RADIOMETRIC METHODS. THE METHODS INVOLVING TRAPS DEPEND ON THE PHYSICO-CHEMICAL FORMS IN WHICH THE IODINE IS PRESENT IN WASTE GASES - CONVENTIONAL DUST FILTERS STOP THE MAJORITY OF THE PARTICLES, ADSORBANTS SUCH AS COPPER AND SILVER-COPPER FIX 90 TO 99 PER CENT OF THE MOLECULAR IODINE BY CHEMISORPTION, WHEREAS CARBONS TRAP MOLECULAR IODINE AND IODINE-CONTAINING COMPOUNDS IN THE VAPOUR FORM BY PHYSICAL ADSORPTION WITH CLEANSING COEFFICIENTS OF UP TO 10 TO 4. IT APPEARS THAT THE IODINE CONCENTRATION AND THE WATER-CONTENT OF THE CARRIER GAS PLAY A VERY IMPORTANT ROLE. FOR WASTE-GAS TEMPERATURES OF ABOVE 350 DEG - SPECIAL ADSORBANTS ARE USED WHICH OPERATE UP TO 500 C. DAMP TRAPS ARE STILL USED IN SOME PARTICULAR CASES. INDUSTRIAL CLEANSING PLANTS FOR WASTE GASES USE GENERALLY AN ABSOLUTE FILTER AND A TRAP FILLED WITH ACTIVE CHARCOAL, SET UP IN SERIES.

*FISSION PRODUCT, IODINE + *IODINE + ADSORPTION + FISSION PRODUCT RELEASE, GENERAL + RADIOACTIVITY, RELEASE

14-11922 LANGHAM WH + HARRIS PS + SHIPMAN TL

PLUTONIUM DISPERSAL BY ACCIDENTAL OR EXPERIMENTAL LOW-ORDER DETONATION OF ATOMIC WEAPONS

LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO

LA-1981(RFV) +. 40 PAGES, 6 FIGURES, DECEMBER 1955 (REVISED FEBRUARY 1966), CFSTI \$2.00 CY, \$0.50 MN

ACCIDENTAL OR EXPERIMENTAL DETONATION OF ATOMIC WEAPONS THAT CONTAIN PLUTONIUM UNDER CONDITIONS SUCH THAT THE DEGREE OF CRITICALITY PRODUCED IS INSIGNIFICANT MAY CREATE AN IMMEDIATE AND A RESIDUAL OR DELAYED PLUTONIUM HEALTH HAZARD. URANIUM IS NOT A RADIOACTIVE HEALTH HAZARD. THE IMMEDIATE HAZARD IS ASSOCIATED WITH THE INHALATION OF PLUTONIUM DURING CLOUD PASSAGE AND ON THE BASIS OF THEORETICAL CONSIDERATIONS APPEARS TO BE RELATIVELY INSIGNIFICANT. THE DELAYED HAZARD RESULTS FROM RESIDUAL PLUTONIUM DEPOSITED IN THE FALL-OUT PATTERN, WHICH MAY PRODUCE CHRONIC CONTAMINATION. SUGGESTIONS ARE MADE AS TO THE COURSE OF ACTION THAT SHOULD BE FOLLOWED IN THE EVENT OF AN ACCIDENTAL DETONATION OF THE TYPE UNDER CONSIDERATION.

*NUCLEAR DETONATION + *PLUTONIUM + BIOLOGICAL CONCENTRATION, MAN + FALLOUT + HAZARD, RELATIVE + INHALATION + MAXIMUM PERMISSIBLE BODY BURDEN

14-11930 ULTIMATE DISPOSAL OF ADVANCED-TREATMENT WASTE. PART 1. INJECTION. PART 2. PLACEMENT IN UNDERGROUND CAVITIES. PART 3. SPREADING

R. A. TAFT SANITARY ENGINEERING CENTER

PHS-PUB-999-WP-10 + HWTR-8 +. 146 PAGES, 3 FIGURES, 3 TABLES, 21 REFERENCES, MAY 1964, SOURCE, FREE

COST ESTIMATES ARE MADE FOR ULTIMATE DISPOSAL OF THE CONTAMINANTS RESULTING FROM COMPLETE RENOVATION OF A MUNICIPAL WASTE WATER PLANT. THE PROCESSES INVESTIGATED ARE - INJECTION TO UNDERGROUND FORMATIONS, PLACEMENT IN UNDERGROUND CAVITIES, AND SPREADING. FOR INJECTION, CAPABILITY WAS THE STRONGEST DETERMINANT OF CONDITIONING AND INJECTING COSTS. INJECTION IS VERY MUCH CHEAPER THAN WET OXIDATION, BUT MAY BE LIMITED BY AVAILABILITY OF INJECTION SITES. DISPOSAL OF ADVANCED-TREATMENT WASTES IN SALT CAVITIES CREATED FOR SUCH USE IS INAPPLICABLE BECAUSE THE DIFFICULTY OF DISPOSING OF THE SALT REMOVED GREATER THAN THAT OF DISPOSING OF THE WASTE. FEASIBILITY DEPENDS UPON GEOGRAPHICAL DISTRIBUTION. INJECTION IS PREFERABLE TO PLACEMENT IN CAVITIES WHERE POSSIBLE. SPREADING IS BY FAR THE CHEAPEST DISPOSAL METHOD. THE

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14-11930 *CONTINUED*

COSTS ARE 1 PERCENT OR LESS OF THOSE FOR ANY OTHER DISPOSAL METHOD INVESTIGATED, BUT SPREADING IS SEVERELY LIMITED IN APPLICATION BECAUSE OF POTENTIAL GROUND WATER POLLUTION.

*WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SALT + WASTE DISPOSAL, TERRESTRIAL + WASTE MANAGEMENT

14-12109 HOUSE SUBCOMMITTEE RECOMMENDS INCREASED R AND D FUNDING FOR WASTE MANAGEMENT SUBCOMMITTEE ON SCIENCE, RESEARCH AND DEVELOPMENT, HOUSE COMMITTEE ON SCIENCE AND ASTRONAUTICS 1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(46), PAGE 1 (NOVEMBER 14, 1966)

THE HOUSE SUBCOMMITTEE ON SCIENCE, RESEARCH, AND DEVELOPMENT RECOMMENDS, IN A REPORT ON HEARINGS ON ADEQUACY OF THE TECHNOLOGY FOR POLLUTION ABATEMENT, THAT PRESENT 30 MILLION/YEAR FUNDING BE INCREASED TO 300 MILLION/YEAR TO BRING WASTE MANAGEMENT UNDER CONTROL. THEN, REFERRING TO THE AEC, THE SUBCOMMITTEE SAID THAT THEY HAD DONE AN EXCELLENT JOB OF RESTRICTING WASTES FROM NUCLEAR POWER. REFERRING TO SOMEWHAT MORE WASTE-HEAT REJECTION THAN COAL PLANTS, THEY REMINDED THAT NUCLEAR PLANTS DO NOT PRODUCE CO₂, AND THAT COAL PLANTS DISCHARGE MORE RADIONUCLIDES UP THE STACK THAN NUCLEAR PLANTS DO.

*AIR POLLUTION + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + WASTE MANAGEMENT

14-12168 BODURTHA FT

CONTROL OF POWER PLANT STACK EMISSIONS FOR CLEAN AIR

E. I. DU PONT DE NEMOURS AND COMPANY, WILMINGTON, DELAWARE

13 PAGES, 1 TABLE, 4 FIGURES, 28 REFERENCES, PAGES 399-411 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS,

CONSIDERS THE SO₂ EMITTED FROM A COAL BURNING PLANTS STACK IN NORMAL CONDITIONS. (OUT OF THE PLETHORA OF PLUME-RISE EQUATIONS, AUTHOR BELIEVES THAT THE BOSANQUET-PEARSON DISPERSION EQUATIONS WITH THE LUCAS PLUME-RISE EQUATION GIVE THE OPTIMUM ANSWER. THE B-P EQUATION IS A BASIS FOR NEW JERSEY LEGISLATION). PLUME RISE IS A MORE IMPORTANT FACTOR THAN DISPERSION, INVERSION (DESPITE LOWER WIND SPEEDS, HOT PLUMES WILL STAY ALOFT, YIELDING LOWER GROUND-LEVEL CONCENTRATIONS THAN IN NORMAL CONDITIONS, ALSO FUMIGATION RESULTS IN LESSER CONCENTRATIONS THAN NEUTRAL STABILITY, EXCEPT FOR LOW-LEVEL EMISSIONS), OR FOG (SUGGESTS THAT IN THE THREE FAMOUS AIR-POLLUTION INCIDENTS, SO₂ WAS CONVERTED TO SO₃ AND CONCENTRATED IN THE FOG AS H₂SO₄ - THIS EFFECT IS SUGGESTED AS MORE IMPORTANT THAN THE ORDINARILY INERT PARTICLES GENERALLY HYPOTHESIZED AS THE CAUSE). TOPOGRAPHY IS DISCUSSED (AN INVERSION-TRAPPED PLUME HAS BEEN SEEN TO BE DEFLECTED DOWNWARD BY A HILL AND THEN RETURN TO THE STACK BASE - VALLEY LOCATIONS ARE POOR). APPENDIXES PRESENT THE PERTINENT EQUATIONS, WITH MODIFICATIONS FOR BUOYANT AND NONBUOYANT PLUMES. THE B-P EQUATIONS GIVE 30-MINUTE CONCENTRATIONS, WHILE PEAK ONE-MINUTE CONCENTRATIONS MAY BE 5-10 TIMES THESE.

*AIR POLLUTION + *SOURCE, CONTINUOUS + ANALYTICAL MODEL + BREEZE, VALLEY + DISPERSION + LAPSE RATE, STABLE

14-12220 WALKER SM

RADIOLOGICAL RECOVERY REQUIREMENTS, STRUCTURES, AND OPERATIONS RESEARCH. VOLUME III, DECONTAMINATION ANALYSIS OF SELECTED SITES AND FACILITIES IN SAN JOSE, CALIFORNIA. FINAL REPORT

RESEARCH TRIANGLE INSTITUTE, DURHAM

RTI-R-OU-214, VOL. III +. 228 PAGES, 134 FIGURES, 97 TABLES, 3 REFERENCES, SOURCE

FOLLOWING A TECHNIQUE DESCRIBED IN ANOTHER VOLUME OF THIS SERIES (DECONTAMINATION FACTORS FOR A TECHNIQUE WERE ASSIGNED, AND DOSE RATES WERE COMPUTED AT AN ARBITRARY LOCATION WITHIN A BUILDING, USING UNIFORM FALLOUT TO COAT HORIZONTAL SURFACES), 16 SITES WERE ANALYZED IN SAN JOSE, CALIFORNIA. RESULT OF THE COST-VS-EFFECTIVENESS COMPUTATION IS AN OPTIMUM STRATEGY FOR EACH SITE. ROOF DECONTAMINATION BY FIREHOSING SEEMED THE MOST EFFECTIVE.

*DECONTAMINATION + *ECONOMIC STUDY + *FALLOUT

14-12223 RYAN JT

RADIOLOGICAL RECOVERY REQUIREMENTS, STRUCTURES, AND OPERATIONS RESEARCH. FINAL REPORT, VOLUME IV, DECONTAMINATION ANALYSIS OF SELECTED SITES AND FACILITIES IN DETROIT, MICHIGAN

RESEARCH TRIANGLE INSTITUTE, DURHAM

RTI-R-OU-214, VOL. IV +. 268 PAGES, 218 FIGURES, 74 TABLES, 3 REFERENCES, SOURCE

FOLLOWING A TECHNIQUE DESCRIBED IN ANOTHER VOLUME OF THIS SERIES (DECONTAMINATION FACTORS FOR A TECHNIQUE ARE ASSIGNED, AND DOSE RATES COMPUTED AT AN ARBITRARY LOCATION WITHIN A BUILDING USING UNIFORM FALLOUT, COATING HORIZONTAL SURFACES), 12 SITES WERE ANALYZED IN DETROIT, MICHIGAN. RESULT OF THE COST-VS-EFFECTIVENESS COMPUTATION IS AN OPTIMUM STRATEGY FOR EACH SITE. CONCLUSIONS - PROPERLY FIREDHOSE DECONTAMINATION CAN REDUCE RADIATION DOSE RATE A FACTOR OF 5 TO 50. MOST EFFECTIVE IS FIREHOSING THE ROOF DIRECTLY ABOVE THE DETECTOR LOCATION. THE INTENSITY AT OUTDOOR LOCATIONS CAN ALSO BE REDUCED APPRECIABLY BY DECONTAMINATING THE SURFACES THAT CONTRIBUTE MOST TO THE INTENSITY AT THE DETECTOR.

*DECONTAMINATION + *ECONOMIC STUDY + *FALLOUT

14-12275 BLANCO RE + BLOMEKE JO + ROBERTS JT

FUTURE MAGNITUDE AND PROPOSED SOLUTIONS OF THE WASTE DISPOSAL PROBLEM OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

12 PAGES, 2 TABLES, 1 FIGURE, 16 REFERENCES, FEBRUARY 1966, PRESENTED AT THE SYMPOSIUM ON THE

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RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-12275 *CONTINUED*

SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, FEBRUARY 14-18, 1966, SOURCE

AT THE PRESENT TIME, HIGH LEVEL RADIOACTIVE WASTES PRODUCED IN ALL COUNTRIES ARE STORED IN TANKS AND THIS PRACTICE WILL CONTINUE FOR AN INTERIM PERIOD UNTIL DEVELOPMENT OF A SAFER OR MORE ECONOMICAL DISPOSAL METHOD IS COMPLETED. THE RELATIVE ADVANTAGES OF THE SOLIDIFICATION OF THESE WASTES AND THEIR PERMANENT STORAGE IN DRY UNDERGROUND MEDIUM AS A PERMANENT DISPOSAL METHOD AS OPPOSED TO TANK STORAGE IS DISCUSSED EXTENSIVELY. BOTH METHODS APPEAR TO BE APPLICABLE IN MOST COUNTRIES.

*WASTE DISPOSAL, GENERAL + *WASTE MANAGEMENT + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, LIQUID + WASTE STORAGE + WASTE TREATMENT, FIXATION

14-12276 WEEREN HO

DISPOSAL OF RADIOACTIVE WASTES BY HYDRAULIC FRACTURING - PART II, DESIGN ORNLS SHALE FRACTURING PLANT OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
10 PAGES, 8 FIGURES, 1 TABLE, 8 REFERENCES, APRIL 26, 1966, NUCLEAR ENGINEERING AND DESIGN 4(1) PAGES 108-117, (MAY, JUNE 1966)

THE SHALE FRACTURING PROGRAM HAS BEEN CONCERNED WITH THE DEVELOPMENT OF A TECHNIQUE FOR THE SAFE AND ECONOMIC DISPOSAL OF LARGE BATCHES OF RADIOACTIVE WASTE BY MIXING THE WASTE WITH CEMENT AND INJECTING THE MIX INTO BEDS OF SHALE AT DEPTHS OF ABOUT 1000 FT. A FACILITY WAS BUILT AT ORNL TO MAKE A SERIES OF SEVEN EXPERIMENTAL INJECTIONS. LARGE VOLUMES OF WASTE SOLUTION (UP TO 150,000 GALLONS PER INJECTION) WERE SUCCESSFULLY INJECTED. PRECISE CONTROL OF THE PROPORTION OF CEMENT AND WASTE SOLUTION REMAINS A DIFFICULT PROBLEM. THE FACILITY IS NOW SCHEDULED FOR MODIFICATION FOR REGULAR DISPOSAL OF LABORATORY WASTE.

*WASTE DISPOSAL, HYDRAULIC FRACTURING + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + ORNL (OAK RIDGE NATIONAL LABORATORY) + WASTE DISPOSAL, LIQUID

14 12277 SCHAFER WF + BOFGY WJ + PARKER FL + BRADSHAW RL + EMPSON FM + MCCLAIN WC

PROJECT SALT VAULT - DESIGN AND DEMONSTRATION OF EQUIPMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-P-1987 + CONF-660208-4 +. 36 PAGES, (1964), FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, CFSTI \$3.00 CY, \$0.50 MN

HANDLING, TRANSFER, AND STORAGE TECHNIQUES APPLICABLE TO HIGH-LEVEL SOLID WASTE DISPOSAL OPERATIONS HAVE BEEN SUCCESSFULLY DEMONSTRATED WITH SHORT-COoled ETR FUEL ASSEMBLIES. THE DESIGN OF PROJECT SALT VAULT EQUIPMENT FOR THE ENCAPSULATION OF THE FUEL ASSEMBLIES, CROSS COUNTRY SHIPMENT, TRANSFER FROM THE SURFACE TO THE MINE LEVEL, MOVEMENT WITHIN THE MINE, AND TRANSFER INTO STORAGE IS DESCRIBED. THE OPERATIONS ARE UNIQUE IN THAT HIGH-LEVEL RADIOACTIVE MATERIALS ARE TRANSFERRED FROM A SHIPPING CASK ON THE SURFACE TO THE MINE LEVEL 1000 FEET BELOW WITHOUT THE USE OF HOT CELLS.

*WASTE DISPOSAL, SALT + *WASTE HANDLING + FUEL ELEMENT + WASTE TRANSPORTATION

14-12278 BHATNAGAR VS + SADASIVAN S

MEASUREMENTS OF RADIOACTIVE FALLOUT IN INDIVIDUAL RAIN SHOWERS AT BOMBAY
ATOMIC ENERGY ESTABLISHMENT, TROMBAY, INDIA
AEET-215 +. 35 PAGES, 1965, DEP.MN

A FEW INDIVIDUAL RAIN SHOWERS WERE COLLECTED AT BOMBAY DURING THE 1963 MONSOON WITH THE OBJECT OF STUDYING THE VARIATION OF FALLOUT RADIOACTIVITY OF RAIN WATER DURING THE COURSE OF A SINGLE RAIN SHOWER. THE FALLOUT RADIOACTIVITY OF RAIN WATER DUE TO CS-137, RU-106 AND ZR-95 WAS DETERMINED USING A GAMMA-RAY SCINTILLATION SPECTROMETER. RELEVANT METEOROLOGICAL OBSERVATIONS, E.G., RAINFALL INTENSITY, WIND, AND LOWEST CLOUD BASE HEIGHTS, WERE ALSO OBTAINED, AND EFFORTS MADE TO RELATE THE VARIATION IN SPECIFIC RADIOACTIVITY TO THESE PARAMETERS.

*METEOROLOGY + *RAINOUT + CESIUM + FALLOUT + INDIA + RUTHENIUM + ZIRCONIUM

14-12279 BRANDES S

THEORETICAL INVESTIGATION OF THE MAXIMUM CREDIBLE ACCIDENT WITH REGARD TO THE STORAGE OF HIGHLY RADIOACTIVE FISSION PRODUCTS IN SALT FORMATIONS
TECHNISCHE HOCHSCHULE, AACHEN
BMWF-FBK-65-03 +. 47 PAGES, OCTOBER 1965, DEP.MN

TO GET KNOWLEDGE FOR DIMENSIONING THE SALT CAVITIES FILLED WITH WASTE A MAXIMUM ACCIDENT IS DEFINED - THE SPHERICAL HEAP OF FUEL ELEMENTS SEPARATED FROM SALT BY A LAYER OF AIR WILL REACH A TEMPERATURE OF MORE THAN 100 C SO THAT WATER, WHICH RUNS SLOWLY INTO THE CAVITY, WILL BOIL AND EVAPORATE. THE TEMPERATURE DISTRIBUTIONS ARE CALCULATED FOR STATIONARY AND INSTANTANEOUS CASES WITH A GIVEN MAXIMUM TEMPERATURE OF 100C IN THE WASTE. IN THIS INVESTIGATION FUEL ELEMENTS OF THE SCHULTEN-TYPE WERE TAKEN, FOR THOSE WILL PROBABLY BE THE FIRST WHICH MIGHT BE TAKEN FOR A STORAGE. BECAUSE THE FORMATION OF CRITICAL ARRANGEMENTS OF WASTE IN SALT IS POSSIBLE, THE CRITICAL RADIUS OF THE SPHERE WAS CALCULATED. THE VALUE IS 2.9 METERS.

*WASTE DISPOSAL, SALT + ACCIDENT, MAXIMUM CREDIBLE (MCA) + FUEL ELEMENT + GEOLOGICAL CONSIDERATION, SALT STRUCTURE + GERMANY + HEAT GENERATION, INTERNAL

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-12280 MUDRA PJ + SCHMALZ BL
AN APPRAISAL OF GASEOUS WASTE DISPOSAL INTO THE LITHOSPHERE AT THE NATIONAL REACTOR TESTING STATION, IDAHO
IDAHO OPERATIONS OFFICE, U.S. ATOMIC ENERGY COMMISSION, IDAHO FALLS, IDAHO
IDO-12024 +. 141 PAGES, SEPTEMBER 1965, CFSTI \$4.00 CY, \$1.00 MN

HELIUM WAS USED AS A TRACER GAS TO IDENTIFY APPROXIMATELY 33 MILLION STANDARD CUBIC FEET OF AIR INJECTED INTO POROUS ZONES BOTH ABOVE AND BELOW THE REGIONAL WATER TABLE WITHIN THE SUBSURFACE BASALTS UNDERLYING THE STATION AND INTO THE UNCONSOLIDATED SANDY REGOLITH MATERIALS. THE MAXIMUM DEPTH OF INJECTION WAS 400 FEET BELOW LAND SURFACE. OBSERVATIONS INDICATED THAT NO FINITE GEOLOGICAL RESERVOIR EXISTED IN THE SUBSURFACE AND THAT THE REGOLITH MATERIALS OFFERED THE MOST RESTRICTIVE BARRIER TO VERTICAL MOVEMENT. THE COST FOR A LITHOSPHERIC DISPOSAL SYSTEM IS ESTIMATED AT A MAXIMUM OF 250,000 DOLLARS.

*WASTE DISPOSAL, GAS + DILUTION + DISPERSION + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + HELIUM + NRTS (NATIONAL REACTOR TEST STATION) + SAMPLING + TRACER, GAS + TRACER, RADIOACTIVE + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, TERRESTRIAL

14-12282 ROVINSKII FY
METHOD FOR CALCULATING THE RADIOACTIVE IMPURITY CONCENTRATION IN THE WATER AND THE BOTTOM LAYER OF STAGNANT RESERVOIRS
6 PAGES, 2 TABLES, 4 FIGURES, 3 REFERENCES, SOVIET ATOMIC ENERGY 18(4), PAGES 480-485 (APRIL 1965)

THE PRESENT ARTICLE IS CONCERNED WITH CERTAIN TRENDS IN THE MIGRATION AND REDISTRIBUTION OF RADIOACTIVE IMPURITIES IN STAGNANT RESERVOIRS AFTER THEY HAVE BEEN CONTAMINATED ONLY ONCE. THE CAPTURE OF THE DISSOLVED IMPURITIES BY THE BOTTOM LAYER OCCURS AS A RESULT OF ION-EXCHANGE AND MOLECULAR ADSORPTION PROCESSES. ON THIS BASIS, WE DERIVED EQUATIONS DESCRIBING THE VARIATION IN THE CONCENTRATION OF RADIOACTIVE ISOTOPES IN DEPENDENCE ON THE TIME OF THEIR PRESENCE IN THE WATER AND THE BOTTOM LAYER. THE DERIVED EQUATIONS MAKE IT POSSIBLE TO CALCULATE THE IMPURITY PERCENTAGES IN THE COMPONENTS OF STAGNANT RESERVOIRS.

*SURFACE WATER, NUCLIDE OCCURRENCE + *SURFACE WATER, SEDIMENT + MATHEMATICAL STUDY + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, SUSPENDED MATERIAL + UNION OF SOVIET SOCIALIST REPUBLICS + WASTE DISPOSAL, LIQUID

14-12283 MERCER BW + TOUHILL CJ + COLEMAN LF + SVOBODA CJ
SURVEY OF METHODS FOR THE TREATMENT AND DISPOSAL OF GLASS MELTER CONDENSATES CONTAINING SULFURIC ACID
BATTELLE-NORTHWEST, PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-514 + CONF-660208-7 +. 14 PAGES, FEBRUARY 2, 1966, FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, CFSTI \$1.00 CY, \$0.50 MN

METHODS FOR THE TREATMENT OF SULFURIC ACID CONDENSATE FROM THE PHOSPHATE GLASS MELTER WERE INVESTIGATED. PROJECTED FISSION PRODUCT CONCENTRATIONS IN THE CONDENSATE ARE ESTIMATED TO BE MORE THAN 100 CI/GAL (PREDOMINANTLY RUTHENIUM) WHEN PROCESSING WASTES FROM 20,000 MWD/TONNE FUEL. TWO GENERAL APPROACHES WERE TAKEN FOR THE TREATMENT AND DISPOSAL OF THE CONDENSATE. THEY ARE - (1) CONVERSION OF THE CONDENSATE OR THE SULFATE CONTAINED THEREIN TO SOLIDS WHICH RETAIN ALL OR A PORTION OF THE FISSION PRODUCTS, (2) SEPARATION OF THE SULFATE FROM THE FISSION PRODUCTS WHICH WOULD BE RECYCLED TO THE GLASS PROCESS.

*WASTE TREATMENT, FIXATION + CONDENSATION + WASTE DISPOSAL, SOLID + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12284 STEVENSON CE
CURRENT PRACTICES IN HANDLING AND STORING SOLID RADIOACTIVE WASTE FROM REACTORS
ARGONNE NATIONAL LABORATORY
4 PAGES, 1 TABLE, 7 REFERENCES, NUCLEAR SAFETY 7(2) PAGE 231-234, (WINTER 1965-1966)

FROM DATA OBTAINED IN A SURVEY OF REPRESENTATIVE REACTOR OPERATORS (20 REACTORS), AMERICAN STANDARDS ASSOCIATION SUBCOMMITTEE N5.2 HAS PREPARED A SUMMARY OF SOLID-WASTE HANDLING PRACTICES. SUCH SOLID RADIOACTIVE WASTES INCLUDE FILTERS AND ION-EXCHANGE RESINS, CORE HARDWARE, FAILED SYSTEM COMPONENTS, PROTECTIVE CLOTHING, AND OTHER MATERIALS CONTAMINATED IN MAINTENANCE OPERATIONS. AT TWO SITES, COMBUSTIBLES ARE INCINERATED AND THE ASHES ARE DRUMMED. AT OTHER SITES, BOTH COMBUSTIBLES OF A BULKY NATURE ARE GENERALLY BALED OR DRUMMED DIRECTLY FOR OFF-SITE DISPOSAL AT AEC-APPROVED SITES. AT SEVERAL SITES, SOLIDS, INCLUDING RESINS, MAY BE FIXED IN DRUMS OF CONCRETE. AT OTHER SITES, RESINS ARE STORED IN UNDERGROUND TANKS. A FEW SITES ARE PROVIDED WITH VAULTS FOR TEMPORARY STORAGE OF SOLIDS.

*WASTE DISPOSAL, SOLID + INCINERATION + WASTE HANDLING + WASTE STORAGE + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, SOLID

14-12286 EMPSON FM + BRADSHAW RL + BOEGLY WJ + MCCLAIN WC + PARKER FL + SCHAFER WF
PROJECT SALT VAULT - DESIGN AND OPERATION
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-P-2058 + CONF-660208-15 +. 20 PAGES, 1965, FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON

THE DEMONSTRATION DISPOSAL OF HIGH-LEVEL RADIOACTIVE SOLIDS, INITIATED IN NOVEMBER 1965 IN THE CAREY SALT MINE AT LYONS, KANSAS, IS KNOWN AS PROJECT SALT VAULT. FOURTEEN IRRADIATED FUEL ASSEMBLIES FROM THE ENGINEERING TEST REACTOR SERVE AS A SOURCE OF RADIATION IN LIEU OF ACTUAL SOLIDIFIED WASTES. THE ASSEMBLIES, CONTAINED IN SEVEN CANS, HAVE BEEN PLACED IN AN ARRAY OF HOLES IN THE FLOOR. DURING THE COURSE OF THE 2-YEAR TEST, FOUR SETS OF ASSEMBLIES WILL BE USED TO ACHIEVE A PEAK DOSE TO THE SALT OF ABOUT 800,000,000 RADS, AND THE TEMPERATURE OF THE ADJACENT SALT WILL BE RAISED TO 200 C WITH AUXILIARY ELECTRICAL HEATERS.

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-12286 *CONTINUED*

*WASTE DISPOSAL, SALT + CREEP BEHAVIOR + DOSE + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + GEOLOGICAL CONSIDERATION, SALT STRUCTURE + WASTE HANDLING + WASTE TRANSPORTATION

14-12287 HAWKINS DB + SCHMALZ BL

ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION
IDAHO OPERATIONS OFFICE, U.S. ATOMIC ENERGY COMMISSION, IDAHO FALLS
IDN-12043 + CONF-651108-1 +. 46 PAGES, 4 FIGURES, AUGUST 1965, PRESENTED AT SYMPOSIUM ON ISOTOPE TECHNIQUES, URBANA, ILLINOIS, CFSTI \$2.00 CY, \$0.50 MN

INFORMATION ON THE CONCENTRATION OF TRITIUM IN WASTE, PRECIPITATION, AND SURFACE AND GROUND WATER AT THE NATIONAL REACTOR TESTING STATION AND SURROUNDING AREAS IS PRESENTED. IT IS SHOWN THAT THE PRESENT CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL WATER IS ABOUT 100 TIMES PRE-HYDROGEN-BOMB LEVELS. NRTS OPERATIONS HAVE NOT NOTICEABLY CONTRIBUTED TO THIS CONTAMINATION EXCEPT IN THE CASE OF GROUND WATER DOWN GRADIENT FROM THE CHEMICAL PROCESSING PLANT. TRITIATED WATER EMANATING FROM THE IDAHO CHEMICAL PROCESSING PLANT HAS BEEN DETECTED DOWN THE GROUND-WATER GRADIENT OVER AN AREA OF ABOUT 75 SQUARE MILES. THE TRITIUM CONCENTRATION IN GROUND WATER DECREASES EXPONENTIALLY WITH DISTANCE FROM THE POINT OF INJECTION. AN EMPIRICAL EQUATION HAS BEEN DERIVED WHICH DESCRIBES THIS FUNCTION.

*NRTS (NATIONAL REACTOR TEST STATION) + *TRITIUM + GROUND WATER, NUCLIDE OCCURRENCE + HYDROLOGICAL CONSIDERATION, GENERAL + HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + RAINOUT + SURFACE WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, TERRESTRIAL

14-12200 SCHULTZ MR

REMOVAL OF LOW-LEVEL RADIOACTIVE WASTES BY A SANITARY WATER TREATMENT PROCESS
OAK RIDGE GASEOUS DIFFUSION PLANT, OAK RIDGE, TENNESSEE
K-C-785 + CONF-650943-1 +. 10 PAGES, 1965, PRESENTED AT THE TECHNICAL MEETING OF THE LOCAL CHAPTERS OF THE AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, INDUSTRIAL MEDICAL ASSOCIATION, AND THE HEALTH PHYSICS SOCIETY, GATLINBURG, TENNESSEE, SEPTEMBER 30 - OCTOBER 1, 1965, CFSTI \$1.00 CY, \$0.50 MN

THIS PAPER PRESENTS A STUDY OF THE CLEANUP FACTORS WHICH WERE OBTAINED ACROSS A POTABLE WATER TREATMENT PLANT USING NORMAL TREATMENT METHODS. IT WAS NOTED THAT THE AVERAGE GROSS BETA RADIOACTIVITY WAS REDUCED BY 15 PERCENT AND THE STRONTIUM BETA CONCENTRATIONS BY 6 PERCENT. A SUMMARY AND EVALUATION OF SIX MONTHS DATA OBTAINED FROM DAILY FIELD SAMPLES OF THE RAW WATER SUPPLY, AS WELL AS THE FINISHED WATER PRODUCT, IS INCLUDED. SAMPLE ANALYSIS INCLUDED DETERMINATIONS FOR GROSS BETA RADIOACTIVITY AND RADIOSTRONTIUM. THE RAW WATER CONCENTRATIONS WERE LESS THAN HALF OF THE MPC (WATER) RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION.

*WASTE TREATMENT, LIQUID + *WATER, DRINKING + GROSS BETA + STRONTIUM + WATER TREATMENT

14-12289 SHEFCIK JJ

OPERATING EXPERIENCE ON IN-TANK SOLIDIFICATION OF RADIOCHEMICAL WASTES
ISOHEM INC., RICHLAND, WASHINGTON
ISO-SA-1 + CONF-660208-8 +. 19 PAGES, FEBRUARY 1966, PRESENTED AT THE INTERNATIONAL SYMPOSIUM ON THE SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, HELD IN RICHLAND, WASHINGTON, FEBRUARY 14 - 18, 1966, CFSTI \$1.00 CY, \$0.50 MN

THE OPERATION OF THE FIRST IN-TANK SOLIDIFICATION UNIT IS DESCRIBED. RADIOCHEMICAL WASTE SOLUTIONS ARE EVAPORATED WITHIN A 750,000-GALLON UNDERGROUND TANK BY SPARGING WITH AIR ELECTRICALLY HEATED TO 1200 F. THE AIR SPARGER IS ALSO AN AIR-LIFT CIRCULATOR USED FOR AGITATION. TO MINIMIZE ENTRAINMENT, MOST OF THE HEAT IS TRANSFERRED TO THE SOLUTION BY PASSING THE AIR DOWN THE HOLLOW WALL OF THE CIRCULATOR-SPARGER. STUD FINS IMPROVE HEAT TRANSFER. THE OFF-GAS IS FILTERED AND DEHUMIDIFIED, PRODUCING EFFLUENT STREAMS LOW IN RESIDUAL RADIOACTIVITY. DECONTAMINATION FACTORS LARGER THAN 10,000 ARE OBTAINED.

*WASTE DISPOSAL, GENERAL + *WASTE TREATMENT, FIXATION + DECONTAMINATION + EVAPORATION + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12290 TUTHILL EJ + WETH GG + EMMA LC + STRICKLAND G + HATCH LP

BROOKHAVEN NATIONAL LABORATORY PROCESS FOR THE CONTINUOUS CONVERSION OF HIGH-LEVEL RADIOACTIVE WASTE TO PHOSPHATE GLASS
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
BNL-10109 + CONF-660208-16 +. 36 PAGES, 1965, PRESENTED AT SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, CFSTI \$2.00 CY, \$0.50 MN

THE CONVERSION OF HIGH-LEVEL RADIOACTIVE WASTES TO PHOSPHATE GLASS OFFERS A PROMISING MEANS OF INCORPORATING FISSION PRODUCTS IN STABLE MEDIA SUITABLE FOR ULTIMATE DISPOSAL. IN THE BROOKHAVEN PROCESS, PHOSPHORIC ACID IS ADDED TO THE AQUEOUS WASTE AND THE SOLUTION CONVERTED TO PHOSPHATE GLASS IN A CONTINUOUS OPERATION UPON RAISING THE TEMPERATURE IN TWO STEPS TO 1100-1200 C. THE PROCESS HAS BEEN TESTED ON A PILOT PLANT SCALE FOR SOME 3000 HOURS. THE REPORT PRESENTS THE RESULTS OF THE BROOKHAVEN INVESTIGATION ON THE DEVELOPMENT OF THE PHOSPHATE GLASS PROCESS WITH EMPHASIS ON THE PERFORMANCE CHARACTERISTICS OF THE INDIVIDUAL PROCESS UNITS.

*WASTE DISPOSAL, GENERAL + *WASTE TREATMENT, FIXATION + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12291 UPSON UL + WETH GC

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-12291 *CONTINUED*

FIXATION OF HIGH-LEVEL RADIOACTIVE WASTES IN PHOSPHATE GLASS

BATTELLE-NORTHWEST, PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON

BNWL-SA-564 + CONF-660208-14 +. 22 PAGES, FEBRUARY 1, 1965, PRESENTED AT SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, CFSTI \$1.00 CY, \$0.50 MN

THE BROOKHAVEN PROCESS FOR CONVERTING HIGH-LEVEL AQUEOUS FUEL REPROCESSING WASTE DIRECTLY TO A PHOSPHATE GLASS, WITHOUT AN INTERMEDIATE DRYING STEP, WAS DEMONSTRATED WITH ACTUAL PUREX 1WW WASTE. A SMALL-SCALE PILOT PLANT WAS REMOTELY INSTALLED IN A HOT CELL CONTAINING THE EQUIPMENT FROM A PRECEDING STUDY ON WASTE CALCINATION. TECHNICAL FEASIBILITY OF THE PROCESS WAS TESTED, OPERATING CHARACTERISTICS WERE OBSERVED, AND THE OFF-GAS DECONTAMINATION PROBLEM EVALUATED. SAMPLES OF GLASS WERE PRODUCED FOR OBSERVATION AND EVALUATION OF STABILITY AND CHEMICAL DURABILITY.

*WASTE DISPOSAL, GENERAL + *WASTE TREATMENT, FIXATION + BATTELLE NORTHWEST + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12292 MOORE RL

HOT-CELL STUDIES OF THE SPRAY AND POT CALCINATION OF FULLY RADIOACTIVE FUEL REPROCESSING WASTES

BATTELLE-NORTHWEST, PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON

BNWL-SA-569 + CONF-660208-13 +. 15 PAGES, MARCH 4, 1966, PRESENTED AT SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, CFSTI \$1.00 CY, \$0.50 MN

A SMALL PILOT PLANT FOR THE EXPERIMENTAL STUDY OF THE CALCINATION OF FULL-LEVEL RADIOACTIVE WASTES WAS CONSTRUCTED IN A LARGE HOT CELL AT HANFORD AND OPERATION INITIATED IN 1962. BOTH RADIANT-HEAT SPRAY CALCINATION AND POT CALCINATION WERE PROVEN OPERABLE. THE RADIOACTIVE OFF-GAS WAS FOUND TO BE READILY DECONTAMINATED TO SAFE DISCHARGE LEVELS. THE RESULTS OBTAINED AND IMPLICATIONS FOR A FULL-SIZE PLANT ARE DISCUSSED, AS ARE TECHNIQUES USED FOR DECONTAMINATING THE CELL FOLLOWING OVER TWO YEARS OF OPERATION.

*CALCINATION + *WASTE TREATMENT, FIXATION + BATTELLE NORTHWEST + DECONTAMINATION + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12320 WHICKER FW

FACTORS INFLUENCING THE ACCUMULATION OF FALLOUT IN MULE DEER

COLORADO STATE UNIVERSITY

COO-1156-11 +. 238 PAGES, MAY 1965, CFSTI \$6.00 CY, \$1.25 MN

THIS INVESTIGATION WAS CONCERNED WITH FACTORS INFLUENCING THE ACCUMULATION OF FALLOUT CESIUM-137 IN A WILD POPULATION OF MULE DEER IN THE CACHE LA POUDE DRAINAGE OF NORTH-CENTRAL COLORADO. AIR, PRECIPITATION, SOILS, TWELVE DEER-FORAGE SPECIES, AND DEER WERE SAMPLED PERIODICALLY FROM VARIOUS ELEVATIONS WITHIN THE STUDY AREA OVER A THREE-YEAR PERIOD. AIR CONCENTRATIONS OF CS-137 WERE MAXIMAL IN 1963. CONCENTRATIONS WERE SIGNIFICANTLY HIGHER DURING SPRING AND EARLY SUMMER MONTHS OF EACH YEAR. THE MAJORITY OF CS-137 IN SOILS WAS LOCATED IN THE 0- TO 1-IN. LAYER. SOIL RADIOACTIVITY GENERALLY INCREASED WITH ELEVATION AND ASSOCIATED HIGHER AVERAGE PRECIPITATION RATES. MAXIMUM VEGETATIONAL LEVELS OF CS-137 WERE OBSERVED IN 1963. MAXIMUM LEVELS OF CS-137 IN DEER WERE OBSERVED IN 1963. IT WAS CONCLUDED THAT THE DEGREE OF FOLIAGE CONTAMINATION AND FOOD HABITS WERE THE MOST IMPORTANT FACTORS CONTRIBUTING TO CS-137 BURDENS IN DEER. INHALATION, THE DRINKING OF SURFACE WATERS, AND THE INGESTION OF SNOW WERE MINOR SOURCES OF CS-137 INTAKE BY DEER, COMPARED WITH INGESTION OF FORAGE.

*CESIUM + *ECOLOGICAL CONSIDERATION + *FALLOUT + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, VEGETATION + DEPOSITION + INGESTION + INHALATION + RAINOUT + SOIL, NUCLIDE OCCURRENCE + WATER, DRINKING

14-12321 FARRIS GC

SR-90 IN ANTLERS AND SELECTED BONES OF COLORADO MULE DEER

COLORADO STATE UNIVERSITY

COO-1156-12 +. 91 PAGES, MAY 1965, CFSTI \$3.00 CY, \$0.75 MN

LEVELS OF STRONTIUM-90 IN ANTLERS AND VARIOUS BONES OF COLORADO MULE DEER IN THE CACHE LA POUDE DRAINAGE OF NORTH-CENTRAL COLORADO WERE INVESTIGATED FROM JULY 1961 THROUGH DECEMBER 1964. FOR THE SEVEN-TO FIFTEEN-MONTH-OLD DEER, THE ANTLER-FEMUR RATIO WAS 0.9, COMPARED WITH THE ADULT DEER RATIO OF 1.5. THE LARGER RATIO FOR THE ADULT DEER MAY INDICATE A LOWER SKELETAL DEMAND FOR STRONTIUM AND CALCIUM. WITH THE RESUMPTION OF NUCLEAR TESTING IN SEPT. 1961 THE FEMUR BONES OF SEVEN-TO EIGHTEEN-MONTH-OLD DEER SHOWED A FACTOR-OF-FIVE INCREASE IN STRONTIUM-90 DURING THE REMAINDER OF THE STUDY PERIOD. STRONTIUM BODY BURDENS OF SIX AGE CLASSES OF DEER COLLECTED IN OCT. 1962 WERE SIGNIFICANTLY DIFFERENT. HOWEVER, THE HIGHEST LEVELS OF ACTIVITY WERE IN THE YOUNGER DEER. SEX DID NOT INFLUENCE THE STRONTIUM BODY BURDENS IN DEER UP TO 17 MONTHS OLD.

*BIOLOGICAL CONCENTRATION, ANIMAL + *ECOLOGICAL CONSIDERATION + *STRONTIUM + FALLOUT

14-12322 WHICKER FW + FARRIS GC + DAHL AH

CONCENTRATION PATTERNS OF SR-90, CS-137 AND I-131 IN A WILD DEER POPULATION AND ENVIRONMENT

COLORADO STATE UNIVERSITY

COO-1156-13 + CONF-660405-2 +. 30 PAGES, 1966, FROM SYMPOSIUM ON RADIOECOLOGICAL CONCENTRATION PROCESSES, STOCKHOLM, CFSTI \$2.00 CY, \$0.50 MN

THIS INVESTIGATION WAS CONCERNED WITH CONCENTRATIONS OF SR-90, CS-137, AND I-131 FROM FALLOUT IN WILD MULE DEER. OF PARTICULAR INTEREST WAS THE VARIABILITY IN RADIONUCLIDE BURDENS AMONG

ACCESSION NUMBER 14-12291 TO 14-12322

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-12322 *CONTINUED*

INDIVIDUAL DEER AND THE FACTORS RESPONSIBLE FOR PRODUCING THE VARIATIONS. FREQUENCY DISTRIBUTIONS OF LEVELS OF SR-90 IN BONE, CS-137 IN MUSCLE AND I-131 IN THYROID WERE CONSTRUCTED AND STATISTICALLY CHARACTERIZED AS LOG-NORMAL. THE FACTORS WHICH WERE SHOWN TO AFFECT THE SHAPES OF THE DISTRIBUTIONS WERE TIME AND TIME-ASSOCIATED PHENOMENA, AGE, FOOD HABITS, ELEVATION OF RESIDENCE AND ASSOCIATED CLIMATIC AND VEGETATIVE DIFFERENCES, AND THE ACTUAL STRUCTURE OF THE POPULATION SAMPLED. THE IMPORTANCE OF EACH FACTOR WAS QUANTITATIVELY ESTIMATED AND FOUND TO VARY CONSIDERABLY AMONG THE THREE RADIONUCLIDES STUDIES. THE DISTRIBUTION PATTERNS INDICATED THAT A SMALL PERCENTAGE OF THE POPULATION COULD ACCUMULATE RADIONUCLIDE BODY BURDENS SEVERAL TIMES GREATER THAN THOSE OF THE MAJORITY OF INDIVIDUALS. SIMPLE CONCENTRATION FACTORS FOR PREDICTING AVERAGE TISSUE LEVELS AND DOSES FROM VEGETATIVE CONCENTRATIONS WERE CALCULATED FOR SR-90 AND CS-137 AND COMPARED WITH THE OBSERVED VALUES.

*BIOLOGICAL CONCENTRATION, ANIMAL + *CESIUM + *IODINE + *STRONTIUM +
BIOLOGICAL CONCENTRATION, ANIMAL FEED + DOSE CALCULATION, INTERNAL + ECOLOGICAL CONSIDERATION + FALLOUT + SAMPLING

14-12323 LONGHURST WM + GOLDMAN M + DELLA ROSA RJ
COMPARISON OF THE ENVIRONMENTAL AND BIOLOGICAL FACTORS AFFECTING THE ACCUMULATION OF SR-90 AND CS-137 IN DEER AND SHEEP
CALIFORNIA UNIVERSITY
SAN-34-2 + CONF-660405-4 +. 30 PAGES, 1966, FROM SYMPOSIUM ON RADIOECOLOGICAL CONCENTRATION PROCESSES, STOCKHOLM, CFSTI \$2.00 CY, \$0.50 MN

FACTORS AFFECTING THE ACCUMULATION OF STRONTIUM-90 AND CESIUM-137 IN DEER AND SHEEP, ON CONTRASTING NATURAL DIETS HAVE BEEN UNDER INVESTIGATION SINCE 1951. THESE TWO RUMINANTS HAVE SHOWN THAT ALTHOUGH THEY OCCUPY THE SAME AREA, THEY ARE SEPARATED ECOLOGICALLY BY THEIR FOOD PREFERENCE. DEER ARE PRIMARILY BROWSERS, WITH 70 PERCENT OF THEIR INTAKE CONSISTING OF THE LEAVES AND TWIGS OF WOODY FORAGE PLANTS, WHILE THE DIET OF SHEEP IS ABOUT 80 PERCENT GRASS. A NUMBER OF OTHER ENVIRONMENTAL AND SPECIES-SPECIFIC BIOLOGICAL FACTORS HAVE BEEN STUDIED. A MODEL OF SR-90 ACCUMULATION IN THE TWO ANIMALS IS PRIMARILY A FUNCTION OF THE TIMING OF RADIONUCLIDE INTAKE IN RELATION TO THE RATE OF SKELETAL GROWTH. IN THE CASE OF CS-137, WHICH HAS A RELATIVELY RAPID TURNOVER TIME, ANIMAL SOFT TISSUES PRIMARILY REFLECT INTAKE LEVELS OVER A SHORT TIME (ABOUT 1 TO 2 MONTHS) PRIOR TO SAMPLING.

*BIOLOGICAL CONCENTRATION, ANIMAL + *CESIUM + *ECOLOGICAL CONSIDERATION + *STRONTIUM +
BIOLOGICAL CONCENTRATION, ANIMAL FEED

14-12334 CHEMICAL TECHNOLOGY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1966
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3945 +. 287 PAGES, SEPTEMBER 1966, CFSTI \$6.00 CY, \$1.50 MN

THIS IS ONE OF A SERIES OF ANNUAL PROGRESS REPORTS. TOPICS COVERED ARE VARIOUS STUDIES ON FUEL PROCESSING, WASTE TREATMENT AND DISPOSAL, SOL-GEL PROCESSES, SEPARATIONS CHEMISTRY, CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS, FISSION PRODUCT RECOVERY BY SOLVENT EXTRACTION, BIOCHEMICAL SEPARATIONS, PROTACTINIUM CHEMISTRY, IRRADIATION EFFECTS ON HETEROGENEOUS SYSTEMS, HIGH-TEMPERATURE CHEMISTRY, MECHANISMS OF SEPARATIONS PROCESSES, CHEMICAL ENGINEERING RESEARCH, REACTOR EVALUATION STUDIES, PREPARATION AND PROPERTIES OF ACTINIDE-ELEMENT OXIDES, EUROCHEMIC AND OTHER ASSISTANCE PROGRAMS, WATER RESEARCH PROGRAM, CHEMISTRY OF CARBIDES AND NITRIDES, AND INDUSTRIAL APPLICATIONS OF NUCLEAR ENERGY.

*ORNL (OAK RIDGE NATIONAL LABORATORY) + *RADIOCHEMICAL PROCESSING + *REVIEW + *WASTE TREATMENT, GENERAL + EUROCHEMIC + SOL-GEL PROCESS

14-12355 SUDDATH JC + HANCHER CW + HOLMES JM
ENGINEERING DEVELOPMENT OF THE POT PROCESSES FOR SOLIDIFICATION OF RADIOACTIVE WASTE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
7 PAGES, 20 FIGURES, 7 TABLES, 10 REFERENCES, FEBRUARY 1966, PRESENTED AT THE SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, FEBRUARY 15-18, 1966

THE POT-CALCINATION PROCESS IS USED TO SOLIDIFY RADIOACTIVE WASTE SOLUTIONS BY DRYING AND CALCINING OR MELTING IN POTS WHICH CAN BE SEALED FOR STORAGE. EXPERIMENTAL DATA FROM RUNS USING SIMULATED WASTE SOLUTIONS HAVE BEEN CORRELATED USING A MATHEMATICAL MODEL WHICH WILL ALLOW THE PREDICTION OF PLANT CAPACITY WHEN RADIOACTIVE DECAY HEAT IS PRESENT. SEVERAL RUNS WERE MADE USING PHOSPHATE FLUX SUCH THAT THE CALCINED SOLIDS WOULD MELT TO GIVE A GLASSY SOLID WHEN COOLED. PROBLEMS IN CONTROL OF A CLOSELY COUPLED EVAPORATOR-POT SYSTEM WERE INVESTIGATED AND A SATISFACTORY CONTROL SYSTEM WAS EVOLVED. ENGINEERING TECHNIQUES HAVE BEEN DEVELOPED AND TESTED FOR HANDLING AND SEALING THE POTS.

*WASTE TREATMENT, FIXATION + CALCINATION + MATHEMATICAL STUDY + ORNL (OAK RIDGE NATIONAL LABORATORY) + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12356 GODBEE HW + CLARK WE + FITZGERALD CL
PHYSICAL PROPERTIES OF SOLIDS INCORPORATING SIMULATED RADIOACTIVE WASTES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
22 PAGES, 4 TABLES, 9 FIGURES, 9 REFERENCES, FEBRUARY 1966, PRESENTED AT THE SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, FEBRUARY 14-18, 1966

THE DEVELOPMENT AND EVALUATION OF METHODS FOR CONVERTING HIGH LEVEL RADIOACTIVE WASTES TO STABLE SOLIDS OF LOW SOLUBILITY REQUIRES A KNOWLEDGE OF THE PROPERTIES OF THE PRODUCTS FORMED. AMONG THE MORE IMPORTANT PROPERTIES ARE MELTING OR SOFTENING POINT, DENSITY, FRACTION OF THE PRODUCT THAT IS FROM THE WASTE, SOLUBILITY IN WATER, THERMAL CONDUCTIVITY,

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14-12356 *CONTINUED*

AND VISCOSITY AS WELL AS DENSITY OF THE MOLTEN MATERIAL. MOST OF THE GLASSY SOLIDS WHOSE PROPERTIES HAVE BEEN DETERMINED WERE PHOSPHATES BUT A FEW WERE SILICATES.

*PROPERTY, PHYSICAL + *WASTE TREATMENT, FIXATION + CALCINATION + ORNL (OAK RIDGE NATIONAL LABORATORY) + WASTE SOURCE AND TYPE + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12357 CLARK WE + GODBEE HW + FITZGERALD CL

LABORATORY DEVELOPMENT OF POT PROCESSES FOR SOLIDIFICATION OF RADIOACTIVE WASTES

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

26 PAGES, 8 TABLES, 8 FIGURES, 19 REFERENCES, FEBRUARY 1966, PRESENTED AT THE SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, FEBRUARY 14-18, 1966

THREE POT PROCESSES FOR FIXATION OF HIGH LEVEL AQUEOUS WASTES HAVE BEEN DEVELOPED AT THE OAK RIDGE NATIONAL LABORATORY. ALL THREE PRODUCE SOLIDIFIED WASTE IN A CYLINDRICAL PIPE POT SUITABLE FOR PERMANENT STORAGE, AND ALL THREE PRODUCE ONLY DILUTE NITRIC ACID AS A SIDESTREAM. SINCE THE OFF-GAS VOLUME IS MINIMUM IN ALL THREE PROCESSES, CAPITAL COSTS FOR CONSTRUCTION OF THE PROCESSING FACILITY SHOULD BE MINIMUM. IN ALL THREE PROCESSES THE FIXATION VESSEL IS CONNECTED TO AN EVAPORATOR IN A LOOP, WITH THE EVAPORATOR SERVING BOTH TO CONCENTRATE THE FEED TO THE POT AND TO GIVE AN EXTRA DECONTAMINATION FACTOR FROM RADIONUCLIDES, PRINCIPALLY RUTHENIUM. THE EVAPORATOR WAS NOT OPERATED AS AN INTEGRAL PART OF THE LABORATORY TESTS.

*WASTE TREATMENT, FIXATION + CALCINATION + ORNL (OAK RIDGE NATIONAL LABORATORY) + WASTE SOURCE AND TYPE + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-12361 GOYA HA + LAI MG + KUBOSE DA

RADIOACTIVITY RELEASE FROM RADIONUCLIDE POWER SOURCES. II. RELEASE OF STRONTIUM TITANATE TO THE OCEAN ENVIRONMENT

U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA

USNRDL-TR-1042 +. 11 PAGES, 1 TABLE, 4 REFERENCES, APRIL 24, 1966, CFSTI \$1.00 CY, \$0.50 MN

THE DISSOLUTION IN AN OCEAN ENVIRONMENT OF TWO STRONTIUM-85 TITANATE PELLETS WAS STUDIED TO DETERMINE THE RATE OF RELEASE OF RADIOACTIVITY. THE EXPERIMENT WAS INTENDED TO INDICATE THE DISSOLUTION BEHAVIOR OF STRONTIUM-90 RADIOISOTOPIC FUEL IN THE OCEAN, AS LIMITED BY THE MUCH LOWER ACTIVITY OF THE SPECIMENS AND THE LACK OF LABORATORY CONTROL WHICH PRECLUDED THE COVERAGE OF ALL PARAMETERS AND HIGHLY SENSITIVE DISSOLUTION DETECTION.

*OCEAN AND SEA + *STRONTIUM + ECOLOGICAL CONSIDERATION + ENERGY SOURCE + RADIOACTIVITY, RELEASE + SURFACE WATER, NUCLIDE OCCURRENCE

14-12362 OPHEL IL

ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVE WASTE DISPOSAL

ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER

AECL-2478 + CONF-661015-1 +. 12 PAGES, 2 TABLES, 11 REFERENCES, AUGUST 1966, FROM NATIONAL CONFERENCE ON POLLUTION AND OUR ENVIRONMENT, MONTREAL, CANADA

THE DIRECT MEASUREMENT OF RADIONUCLIDES IN ENVIRONMENTAL MATERIALS, SUCH AS AIR, DRINKING WATER AND MILK, ENSURE THAT PERMISSIBLE RADIATION DOSES ARE NOT EXCEEDED. ESTIMATES OF PUBLIC EXPOSURE DUE TO WASTE DISPOSAL OPERATIONS AT THE CHALK RIVER NUCLEAR LABORATORIES HAVE BEEN MADE. THEY SHOW THAT, EVEN UNDER THE MOST UNFAVOURABLE CIRCUMSTANCES, THE MAXIMUM EXPOSURE OF ANY PERSON IS LESS THAN ONE PERCENT OF THE PERMISSIBLE AMOUNT.

*ATMOSPHERIC POLLUTION + CHALK RIVER + DOSE + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + RADIATION SAFETY AND CONTROL + WASTE DISPOSAL, GENERAL

14-12363 BURTON CA

A GRAPHICAL METHOD FOR CALCULATING THE DOSE IN MAN FROM INDIVIDUAL RADIONUCLIDES IN FALLOUT LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE

UCRL-14922 +. 20 PAGES, 3 FIGURES, JUNE 3, 1966, CFSTI \$2.00 CY, \$0.50 MN

THE FALLOUT DEPOSITION REQUIRED TO DELIVER A SPECIFIC INTEGRATED 30-YR DOSE TO ANY TISSUE IN MAN, FOR ANY AND ALL RADIONUCLIDES IN A SINGLE EVENT, IS PRESENTED IN GRAPHICAL AS WELL AS ANALYTICAL FORM. THE MODEL IS CONSISTENT WITH THE DATA AVAILABLE TO THIS PROBLEM AT PRESENT. A TABLE OF EFFECTIVE TISSUE HALF-LIVES FOR GIVEN RADIOLOGICAL AND BIOLOGICAL HALF-LIVES IS GIVEN FOR USE WITH THE GRAPHS. SAMPLE CALCULATIONS ARE ALSO INCLUDED.

*DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + *FALLOUT + BIOLOGICAL CONCENTRATION, VEGETATION + DOSE + EQUATION, GENERAL + MATHEMATICAL STUDY + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE

14-12368 HEDLUND R + LINDSKOG A

THE RADIOACTIVE WASTE MANAGEMENT AT STUDSVIK AKTIEBOLAGET ATOMENERGI, STOCKHOLM

AE-225 +. 14 PAGES, APRIL 1966, DEP. MN

THE REPORT WAS ORIGINALLY PREPARED AS A CONTRIBUTION TO THE DISCUSSIONS IN AN IAEA PANEL ON ECONOMICS OF RADIOACTIVE WASTE MANAGEMENT HELD IN VIENNA FROM 13-17 DECEMBER 1965. IT CONTAINS THE ANSWERS AND COMMENTS TO THE QUESTIONS OF A QUESTIONNAIRE FOR THE PANEL CONCERNING THE VARIOUS OPERATIONS ASSOCIATED WITH THE MANAGEMENT (COLLECTION, TRANSPORT, TREATMENT,

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14-12368 *CONTINUED*

DISCHARGE, STORAGE, AND OPERATIONAL MONITORING) OF RADIOACTIVE LIQUID WASTES, SOLID WASTES, GASEOUS WASTES, AND EQUIPMENT DECONTAMINATION FACILITIES AND RADIOACTIVE LAUNDRIES.

*SWEDEN + *WASTE MANAGEMENT + DECONTAMINATION + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID + WASTE SOURCE AND TYPE + WASTE STORAGE + WASTE TRANSPORTATION + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, GENERAL

14-12369 DE LAGUNA W

BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES

OAK RIDGE NATIONAL LABORATORY

4 PAGES, JANUARY 1965, BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES BY C. A. MAWSON

THE COMBINATION OF TERSE EXPOSITION AND CAREFULLY SELECTED REFERENCES WILL BE EQUALLY INVALUABLE TO THE NOVICE AND TO THE EXPERIENCED PRACTITIONER BECAUSE NO OTHER BOOK ON THE SUBJECT SO CLEARLY AND IMPARTIALLY EXPLAINS THE STATE OF THE ART AND THE RESEARCH IN PROGRESS, WHILE SERVING ALSO AS A BAEDEKER FOR THOSE WHO WOULD THOROUGHLY EXPLORE SOME SPECIAL TOPIC.

*REVIEW + *WASTE MANAGEMENT + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, GENERAL

14-12370 BRADSHAW RL

BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES

OAK RIDGE NATIONAL LABORATORY

2 PAGES, 1965, BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES BY C. A. MAWSON

THIS BOOK SHOULD BE A VALUABLE ADDITION TO THE LIBRARY OF THOSE PROFESSIONALLY INTERESTED IN SOME ASPECT OF RADIOACTIVE WASTE MANAGEMENT, INCLUDING THOSE ENGAGED IN DESIGN AND OPERATION OF WASTE DISPOSAL FACILITIES, AS WELL AS THOSE WHO ARE INVOLVED WITH THE DESIGN OR OPERATION OF FACILITIES WHICH PRODUCE RADIOACTIVE WASTES.

*REVIEW + *WASTE MANAGEMENT + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, GENERAL

14-12371 CONCRETE PROBLEMS

1 PAGE, MARCH 1966, EURONUCLEAR 3(3), PAGE 121

THE INCINERATOR AT MARCOULE HAS NOW CLOCKED UP ITS 100TH TON OF RADIOACTIVE WASTE, CORRESPONDING TO 800 CUBIC METRES OF MATERIAL SUCH AS PAPER, RUBBER, PVC, POLYETHYLENE AND WOOD. IN ADDITION MORE THAN 10,000 LITRES OF CONTAMINATED OILS HAVE BEEN DESTROYED.

*INCINERATION + *WASTE TREATMENT, SOLID + FRANCE + WASTE DISPOSAL, SOLID

14-12396 PITMAN RW

WATER TREATMENT - THEORY AND PRACTICES - AS USED AT HANFORD ATOMIC PRODUCTS OPERATION

HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND

HW-83801 + CONF-762-1 +. 11 PAGES, FROM AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, REGIONAL MEETING, LONGVIEW, WASHINGTON, OCTOBER 1964, CFSTI \$1.00 CY.

THE BASIC PRINCIPLES OF THE REMOVAL OF SUSPENDED MATERIALS AND LARGE MOLECULES FROM WATER ARE REVIEWED. THE USE OF ALUM AND ACTIVATED SILICA IN WATER TREATMENT IS DISCUSSED. TURBIDITY ANALYSIS OF THE WATER IS BEING DONE USING LIGHT-SCATTERING MICROPHOTOMETRY, AND RESULTS ARE REPORTED OF AN INVESTIGATION OF POSSIBLE IMPROVEMENTS OF WATER TREATMENT. THE FACTORS IMPORTANT TO IMPROVED WATER TREATMENT ARE LISTED. SAVINGS OF CONVERTING TO THE IMPROVED HANFORD WATER TREATMENT PROCESS ARE TABULATED FOR THE PASCO, WASHINGTON, PLANT.

*BATTELLE NORTHWEST + *WATER TREATMENT + RIVER, COLUMBIA + SURFACE WATER, PROPERTY + SURFACE WATER, SUSPENDED MATERIAL

14-12398 RAYMOND JR + MCGHAN VL

SCINTILLATION PROBE RESULTS ON 200 AREA WASTE DISPOSAL SITE MONITORING WELLS

HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND

HW-84577 +. 62 PAGES, DECEMBER 17, 1964, CFSTI \$3.00 CY

SCINTILLATION-WELL PROBES WERE USED TO MONITOR THE SUB-SOIL CONTAMINATION BELOW RADIO-ACTIVE LIQUID WASTE GROUND DISPOSAL FACILITIES. RESULTS ARE DISCUSSED FOR THE 200-EAST AND 200-WEST FACILITIES. THE RESULTS INDICATE THAT SIGNIFICANT LATERAL SPREAD OF WASTES OCCURS IN THE SEDIMENTS BENEATH THE 200 AREAS AND THAT THE DOWNWARD MIGRATION RATES OF GROSS GAMMA EMITTERS IS RELATIVELY SLOW.

*MONITOR, RADIATION, ENVIRONMENTAL + *WASTE DISPOSAL, LIQUID + BATTELLE NORTHWEST + HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + SOIL, NUCLIDE OCCURRENCE

14-12399 DECONTAMINATION CAPABILITIES

HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND

HW-SA-3539 +. 20 PAGES, JUNE 1964, CFSTI \$1.60 CY, \$0.80 MF

A BROCHURE IS GIVEN ON CURRENT STATUS AND CAPABILITY OF THE EQUIPMENT DECONTAMINATION AND SOLID WASTE HANDLING FACILITIES AT HANFORD. THE HIGH- AND LOW-LEVEL DECONTAMINATION

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14-12399 *CONTINUED*

FACILITIES ARE DESCRIBED. SOME OF THE IMPROVEMENTS IN THE DECONTAMINATIONS ARE ILLUSTRATED WITH EXAMPLES. PROGRESS IN THE BURIAL OF CONTAMINATED WASTE IS ALSO SUMMARIZED.

*DECONTAMINATION + *WASTE HANDLING + BATTELLE NORTHWEST + WASTE DISPOSAL, SOLID + WASTE MANAGEMENT

14-12400 HOFFMANN E + VAN LINT JM + VANDE POEL M
WASTE TREATMENT PLANT MANAGEMENT AND ACCOUNTING PROCEDURE
SOCIETE BELGE POUR L'INDUSTRIE NUCLEAIRE, BRUSSELS
TID-22428 +. 104 PAGES, NOVEMBER 1965, CFSTI \$4.00 CY, \$0.75 MN

A WASTE TREATMENT PLANT IS DESCRIBED TOGETHER WITH THE WAY IN WHICH ITS ACCOUNTING IS CARRIED OUT AND YIELDS THE INFORMATION REQUIRED FOR EFFICIENT RUNNING AND POSSIBLE IMPROVEMENTS. THE INFORMATION IS GIVEN TO SHOW HOW A TREATMENT COST IS DETERMINED AND UNDERSTOOD.

*WASTE TREATMENT, GENERAL + BELGIUM + DECONTAMINATION + WASTE DISPOSAL, GENERAL + WASTE MANAGEMENT + WASTE SOURCE AND TYPE + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, GAS + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-13093 MANNESCHMIDT JF
RECENT ADVANCES IN MONITORING OF RADIOACTIVE GASEOUS WASTES AT ORNL
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1569 +. 37 PAGES, 19 FIGURES, 6 REFERENCES, OCTOBER 13, 1966

MANY ACTIVITIES AT THE OAK RIDGE NATIONAL LABORATORY ARE CONCERNED WITH THE CHEMICAL PROCESSING OF RADIOACTIVE MATERIALS. GASEOUS EFFLUENTS FROM THESE OPERATIONS ARE TREATED TO REMOVE DANGEROUS CONTAMINANTS PRIOR TO RELEASE TO THE ATMOSPHERE. ROUTINE MONITORING OF SUCH EMISSIONS WAS STARTED IN 1956 WHEN MANUALLY OPERATED PARTICULATE MONITORS WERE INSTALLED AT EACH OF THREE PROCESS STACKS. SINCE THAT DATE, COVERAGE HAS BEEN EXTENDED TO SIX STACKS, THE SAMPLE WITHDRAWAL SYSTEM HAS BEEN REBUILT, AND THE DETECTION EQUIPMENT HAS BEEN ADDED TO AND MODERNIZED. THE INTENSIVE MONITORING HAS LEAD TO PROCESS IMPROVEMENTS WHICH HAVE REDUCED THE ENVIRONMENTAL RELEASES OF RADIOACTIVITY IN THE LABORATORY'S GASEOUS WASTE EFFLUENTS BY A FACTOR OF THREE SINCE 1962.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*MONITOR, RADIATION, GAS + *MONITOR, RADIATION, STACK + *ORNL (OAK RIDGE NATIONAL LABORATORY) + PARTICULATE + RADIATION SAFETY AND CONTROL + RADIOACTIVITY, RELEASE + SAMPLING + WASTE DISPOSAL, GAS

14-13201 MONTHLY AVERAGES OF GROSS BETA RADIOACTIVITY IN AIR IN THE WESTERN HEMISPHERE, SEPTEMBER 1961-AUGUST 1965.
PUBLIC HEALTH SERVICE, WASHINGTON
NP-15678 +. 83 PAGES, OCTOBER 20, 1965, CFSTI

THE MONTHLY AVERAGES OF GROSS BETA RADIOACTIVITY FOR 75 RADIATION SURVEILLANCE NETWORK STATIONS AND 6 PAN AMERICAN HEALTH ORGANIZATION STATIONS ARE PRESENTED IN BOTH TABULAR AND GRAPHICAL FORM FOR THE PERIOD SEPTEMBER 1961 THROUGH AUGUST 31, 1965. THE SAMPLING PROCEDURE USED IS DESCRIBED.

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + FALLOUT + GROSS BETA + SAMPLING

14-13203 SAMUELS ER
SR-90 IN CANADIAN WHEAT FROM THE 1963 CROP YEAR
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15641 +. 6 PAGES, APRIL 1965, PAGES 3-8 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 4, CFSTI

THE RESULTS OF MEASUREMENTS MADE ON CANADIAN HARD RED SPRING WHEAT GROWN AND HARVESTED DURING 1963 ARE REPORTED. THE RESULTS SHOWED SIGNIFICANT VARIATIONS IN THE SR-90 LEVELS OF WHEAT GROWN IN DIFFERENT GEOGRAPHICAL AREAS. THE LOWEST LEVELS WERE FOUND IN MANITOBA AND THE HIGHEST LEVELS IN CENTRAL ALBERTA. THE AVERAGE CONCENTRATION OF SR-90 IN CANADIAN WHEAT GROWN DURING 1963 INCREASED BY A FACTOR OF ABOUT 3 OVER THAT OBSERVED IN 1962. IT WAS ALSO ESTABLISHED THAT SR-90 ENTERS THE WHEAT GRAIN EITHER THROUGH ROOT UPTAKE FROM THE SOIL OR THROUGH DIRECT DEPOSITION OF FALLOUT ON THE FOLIAR SURFACES.

*BIOLOGICAL CONCENTRATION, FOOD + *CANADA + FALLOUT + STRONTIUM

14-13204 SAMUELS ER + MOHINDRA VK
CANADIAN FALLOUT DATA FOR MARCH 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE
NP-15641 +. 13 PAGES, APRIL 1965, PAGES 9-21 OF DATA FROM RADIATION PROTECTION PROGRAMS VOLUME 3, NO. 4, CFSTI

THE RESULTS OF FALLOUT MONITORING ON AIR, PRECIPITATION, AND MILK IN MARCH, 1965, ARE REPORTED. THE RESULTS SHOWED A GENERAL BUT SLIGHT, DECREASE IN FALLOUT LEVELS FOR MOST ASPECTS OF THE MONITORING PROGRAM. DATA ARE TABULATED.

*FALLOUT + AIR + BIOLOGICAL CONCENTRATION, MILK + CESIUM + GROSS BETA + PRECIPITATION + RAINOUT + STRONTIUM + SURVEY, RADIATION, ENVIRONMENTAL

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14-13205 SAMUELS ER + MOHINDRA VK
REACTOR ENVIRONMENT MONITORING FOR MARCH 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15641 +. 8 PAGES, APRIL 1965, PAGES 22-29 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 4, CFSTI

THE RESULTS OF MONITORING STUDIES ON SURFACE WATERS NEAR THE SITES OF THE CHALK RIVER REACTORS, NUCLEAR POWER DEMONSTRATION REACTOR NEAR ROLPHTON, AND THE DOUGLAS POINT REACTOR ARE REPORTED. SAMPLES OF RABBITS AND FISH WERE ALSO MONITORED. THE RADIOISOTOPES DETERMINED WERE SR-89, SR-90, AND CS-137.

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + CANADA + CESIUM + GROSS ALPHA + GROSS BETA + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE

14-13206 KOSTYRKO A
STUDY ON REMOVAL OF SOME RADIONUCLIDES FROM SEWAGE WATER SOLUTIONS BY SORPTION ON PEAT
INSTITUTE OF NUCLEAR RESEARCH, WARSAW
INR-609/XIX/D +. 45 PAGES, 10 REFERENCES, FEBRUARY 1965, DEP.

STUDIES WERE MADE ON THE INTERACTION BETWEEN PEAT MOSS AND THE FOLLOWING CATIONS - NA, CA, CO, ZN, SR, Y, RU, CS, CE, EU, TI, HG, AND PB. SOME COMPARATIVE TESTS WERE PERFORMED ALSO WITH HUMUS-RICH PEAT SPECIMENS, AS WELL AS WITH PEAT MOSS PRETREATED WITH IN HCL. PEAT MOSS WAS FOUND TO BE HYDRAULICALLY SUITABLE AS A COLUMN MATERIAL. AS WAS EXPECTED, DISTRIBUTION COEFFICIENTS FOR PEAT MOSS WERE LESS PH DEPENDENT THAN THOSE FOR HUMUS-RICH PEATS. TOTAL SORPTION CHARACTERISTICS WERE DISTINGUISHED FROM ION EXCHANGE CAPACITIES, AND THE ORDER OF SELECTIVE AFFINITY BY PEAT FOR THESE NUCLIDES WAS CHECKED.

*WASTE TREATMENT, LIQUID + DECONTAMINATION + POLAND + SOIL, PROPERTY + SORPTION + WASTE DISPOSAL, GENERAL + WATER TREATMENT

14-13207 FALLOUT IN NEW ZEALAND. QUARTERLY REPORT APRIL-JUNE 1965
NATIONAL RADIATION LABORATORY
NP-15639 + NRL-F17 +. 20 PAGES, FIGURES, JUNE 1965, DEP. MN

DATA ARE GIVEN FOR MEASUREMENTS OF TOTAL BETA AND GAMMA ACTIVITY IN ATMOSPHERE AND DEPOSITION ON GROUND AND STRONTIUM-90 IN MILK AND RAIN AND CESIUM-137 IN MILK. METHOD OF MEASUREMENT AND SAMPLE COLLECTION ARE DISCUSSED.

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + ANALYTICAL TECHNIQUE, GENERAL + BIOLOGICAL CONCENTRATION, MILK + CESIUM + DEPOSITION + GROSS BETA + GROSS GAMMA + HAZARDS ANALYSIS + NEW ZEALAND + SAMPLING + STRONTIUM

14-13208 PLUTONIUM ABSTRACTS. VOLUME 5, NUMBER 8. A METHOD TO COMPENSATE THE NATURAL AIR-RADIOACTIVITY BY MEANS OF BETA-ALPHA-PSEUDOCOINCIDENCES
4 PAGES, KERNTECHNIK 7(7), PAGES 322-325, (JULY 1965).

A DESCRIPTION IS GIVEN OF AN APPARATUS WHICH MAKES THE COMPENSATION OF THE NATURAL AIR-RADIOACTIVITY POSSIBLE BY MEANS OF BETA-ALPHA PSEUDOCOINCIDENCES. A FLAT METHANE-FLOW COUNTER IS USED AS DETECTOR. TO GIVE A PRACTICAL EXAMPLE THE CONTROL OF THE PU-239 ACTIVITY CONCENTRATION IN A HOT LABORATORY IS DISCUSSED.

*RADIATION SAFETY AND CONTROL + AIR + COUNTER + GERMANY + INSTRUMENTATION, RADIATION MONITORING + PLUTONIUM

14-13212 SAMUELS ER + MOHINDRA VK
REACTOR ENVIRONMENT MONITORING FOR AUGUST 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15642 +. 13 PAGES, SEPTEMBER 1965, PAGES 33-45 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 9, DEP. MN

THE RESULTS OF MONITORING STUDIES NEAR THE SITES OF THE CHALK RIVER REACTORS, THE NUCLEAR POWER DEMONSTRATION REACTOR NEAR ROLPHTON, AND THE DOUGLAS POINT REACTOR ARE REPORTED. SOME MILK AND ATMOSPHERE SAMPLES WERE ALSO MONITORED. ALL THE DATA ARE IN GENERAL AGREEMENT WITH OBSERVATIONS MADE IN THE FALLOUT PROGRAM. THEY DO NOT SHOW ANY ANOMALIES THAT COULD BE ATTRIBUTED TO A RELEASE OF CONTAMINATION FROM THE REACTORS. DATA ON TOTAL ALPHA AND BETA ACTIVITY, SR-90, SR-90, AND CS-137 ARE TABULATED.

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, MILK + CANADA + CESIUM + FALLOUT + GROSS ALPHA + GROSS BETA + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE

14-13217 HONSTEAD JF + HILDEBRANDT PW
UPTAKE AND RETENTION OF ZN-65 FROM CERTAIN FOODS
BATTELLE-NORTHWEST, RICHLAND
BNWL-SA-293 + CONF-651014-1 +. 9 PAGES, SEPTEMBER 13, 1965, FROM WESTERN INDUSTRIAL HEALTH CONFERENCE, SAN FRANCISCO

THE UPTAKE AND RETENTION OF ZN-65 FROM THE CONSUMPTION OF OYSTERS COLLECTED ON THE WASHINGTON COAST NEAR THE MOUTH OF THE COLUMBIA RIVER WAS MEASURED BY WHOLE-BODY COUNTING OF A MAN. THE SUBJECT WAS COUNTED IN A WHOLE-BODY COUNTER TO ESTABLISH AN INITIAL BACKGROUND COUNT. DURING THE NEXT 20 MO. HE ATE 81 MEALS OF OYSTERS, AN AVERAGE OF ABOUT ONE MEAL PER WEEK. THE ZN-65

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CONTENT OF EACH ENTIRE OYSTER MEAL WAS DETERMINED. A TOTAL OF 13 WHOLE-BODY COUNTS WERE MADE DURING THE PERIOD. THE TOTAL ZN-65 INGESTED BY THE SUBJECT WAS 709 NANOCURIES INCLUDED IN 17,430 G OF OYSTERS. THE MAXIMUM ZN-65 BODY BURDEN ATTAINED BY THE SUBJECT WAS 40 NANOCURIES. IT WAS CONCLUDED THAT THE ZN-65 CONTENT IN PACIFIC OYSTERS DOES NOT CONTRIBUTE SIGNIFICANTLY TO THE RADIATION EXPOSURE OF MEMBERS OF LOCAL POPULATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY

*BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + *BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + COUNTER, WHOLE BODY + OCEAN AND SEA + RIVER, COLUMBIA + ZINC

14-13218 DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 4, NO. 1
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15921 +. 47 PAGES, JANUARY 1966

ION EXCHANGE COLUMN AND FUMING NITRIC ACID PRECIPITATION PROCEDURES FOR THE SEPARATION OF SR FROM CA IN LIQUID MILK WERE COMPARED. IT WAS CONCLUDED THAT SR-90 CAN BE DETERMINED BY EITHER PROCEDURE WITH COMPARABLE PRECISION. DATA ARE PRESENTED ON RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIR PARTICLES, PRECIPITATION, MILK, WATER, SOIL, WHEAT, AND HUMAN BONE COLLECTED IN CANADA IN DEC. 1964. DATA ARE INCLUDED ON THE ENVIRONMENTAL RADIOACTIVITY IN THE ENVIRONS OF CANADIAN REACTORS DURING DEC. 1965.

AVAILABILITY MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN, 54669

*ANALYTICAL TECHNIQUE, MILK + *STRONTIUM + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + CANADA + FALLOUT + PARTICULATE + RAINOUT + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, NUCLIDE OCCURRENCE

14-13219 ANNUAL REPORT ON RESEARCH CONTRACT NO. 201/R1/RB, JULY 1964-JUNE 1965
INSTITUT RUDJER BOSKOVIC, ZAGREB
NP-15916 +. 104 PAGES, REFERENCES, JUNE 1965, DEP. MN

PROGRESS IS REPORTED IN INVESTIGATIONS ON THE RADIOECOLOGY OF THE BAY OF VENICE. FIELD OBSERVATIONS ON SEVERAL PERMANENT HYDROGRAPHIC STATIONS WERE MADE. BESIDES THE COMMON METEOROLOGICAL, PHYSICAL, AND CHEMICAL PARAMETERS FOR THE WHOLE VERTICAL COLUMN OF WATER AND ABOVE IT, INVESTIGATIONS CONCERNING THE QUALITY AND QUANTITY OF THE PHYTOPLANKTON WERE MADE. THESE RESULTS WERE COMPLETED WITH THE LABORATORY DETERMINATION OF THE PHOTOSYNTHETIC RATE FOR PHYTOPLANKTON SAMPLES. THE PHYSICO-CHEMICAL BEHAVIOR OF SOME MICROCONSTITUENTS IN SEA WATER WAS INVESTIGATED USING ELECTROMIGRATION TECHNIQUES AND STUDYING PRECIPITATION PHENOMENA. THE BIOACCUMULATION OF VARIOUS RADIOELEMENTS IN SOME CHARACTERISTIC ANIMALS AND NATURAL POPULATIONS OF PHYTOPLANKTON WAS STUDIED IN LABORATORY EXPERIMENTS.

*BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + *ECOLOGICAL CONSIDERATION + *HYDROLOGICAL CONSIDERATION, GENERAL + *OCEAN AND SEA + COBALT + HYDROLOGICAL CONSIDERATION, QUALITY OF WATER + IRON + MANGANESE + PRECIPITATION + RUTHENIUM + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, PROPERTY + WASTE DISPOSAL, GENERAL + YUGOSLAVIA + ZINC + ZIRCONIUM

14-13220 CAREY AG + PEARCY WG + OSTERBERG CL
ARTIFICIAL RADIONUCLIDES IN MARINE ORGANISMS IN THE NORTHEAST PACIFIC OCEAN OFF OREGON
OREGON STATE UNIVERSITY
RLO-1750-3 + CNF-660507-2 +. 20 PAGES, FOR PRESENTATION AT SYMPOSIUM FOR THE DISPOSAL OF RADIOACTIVE WASTES INTO SEA, OCEANS, AND SURFACE WATERS, VIENNA, MARCH 3, 1966, CFSTI \$3.00 CY

ALTHOUGH ZN-65 IS FOUND IN ALL GROUPS OF ANIMALS IN THE PELAGIC AND BENTHIC ENVIRONMENTS, IN HIGHER CONCENTRATIONS IN SOME ANIMAL GROUPS THAN OTHERS, THE HIGHEST LEVELS MEASURED ARE STILL VERY MUCH BELOW HAZARD LEVELS. HIGHEST CONCENTRATIONS OF ZN-65 IN THE FAUNA USUALLY WERE FOUND NEAR THE COLUMBIA RIVER, A POINT SOURCE. ZIRCONIUM-95-NIOBIUM-95 WERE FOUND AT ALL DEPTHS, THOUGH IN THE PELAGIC FAUNA THEY WERE IN HIGHER CONCENTRATION IN SURFACE WATERS. ZINC-65 WAS FOUND THROUGHOUT THE FOOD CHAIN, WHILE ZR-95--NB-95 DECREASED RAPIDLY AFTER THE FIRST TWO TROPHIC LEVELS.

*BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + *BIOLOGICAL CONCENTRATION, GENERAL + *OCEAN AND SEA + ECOLOGICAL CONSIDERATION + NIOBIUM + RIVER, COLUMBIA + ZINC + ZIRCONIUM

14-13221 OSBURN WS
RADIOECOLOGY OF THE COLORADO FRONT RANGE
UNIVERSITY OF COLORADO
COO-1191-10 +. 173 PAGES, 1964, CFSTI \$5.00 CY, \$1.00 MN

RESULTS ARE REPORTED FROM A STUDY OF PATTERNS AND PROCESSES INVOLVED IN THE DISTRIBUTION OF FALLOUT IN AN ALPINE WATERSHED. THE AREA SELECTED FOR STUDY WAS THE BOULDER CITY WATERSHED, BOULDER, COLO. THE CHARACTERISTICS, LOCATION, TOPOGRAPHY, AND PHYSIOGRAPHY OF THE 11 SQ. MILE AREA ARE DESCRIBED AND THE TYPICAL ANIMAL ACTIVITIES AND PLANT RESPONSES USUALLY ASSOCIATED WITH THE GENERAL CLIMATIC SEQUENCE ARE OUTLINED FOR AN ENTIRE YEAR. DATA ARE INCLUDED ON THE SOIL CHARACTERISTICS, PRECIPITATION (INCLUDING SNOW), POPULATION OF SMALL ANIMALS, AND GROUND-SURFACE GROSS RADIOACTIVITY.

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13221 *CONTINUED*
*ECOLOGICAL CONSIDERATION + *FALLOUT + GROSS BETA + HYDROLOGICAL CONSIDERATION, GENERAL + SOIL, PROPERTY + TOPOGRAPHY

14-13222 GROSS MG + BARNES CA
DISTRIBUTION AT SEA OF COLUMBIA RIVER WATER AND ITS LOAD OF RADIONUCLIDES
UNIVERSITY OF WASHINGTON
RLO-1725-41 + CONF-660507-1 +. 12 PAGES, FOR PRESENTATION AT SYMPOSIUM FOR THE DISPOSAL OF RADIOACTIVE WASTES INTO SEA, OCEANS, AND SURFACE WATERS, VIENNA, 1966, CFSTI \$1.00 CY, \$0.50 MN

THE PROPERTIES, DISTRIBUTION, AND MOVEMENT OF COLUMBIA RIVER WATER IN THE NORTHEAST PACIFIC OCEAN AND OF THE SEDIMENTS NEAR THE RIVER MOUTH HAVE BEEN INVESTIGATED IN SOME DETAIL SINCE 1961. ATTENTION IS GIVEN HERE TO THE DISTRIBUTION OF SALINITY, NUTRIENTS, CHLOROPHYL AND FISSION PRODUCTS FROM ATMOSPHERIC FALLOUT, AND NEUTRON-ACTIVATION PRODUCTS FROM THE HANFORD REACTOR.

*RIVER, COLUMBIA + ACTIVATION PRODUCT + BATTELLE NORTHWEST + HYDROLOGICAL CONSIDERATION, GENERAL + HYDROLOGICAL CONSIDERATION, QUALITY OF WATER + HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + OCEAN AND SEA + SURFACE WATER, SEDIMENT + SURFACE WATER, TRACER

14-13223 ARCHITECTURE REMOVAL OF RADIOACTIVE FALLOUT MATERIAL. PART I
ZENTRALSTELLE FUER ATOMKERNENERGIE-DOKUMENTATION, GELIN-INSTITUT FUER ANORGANISCHE CHEMIE UND GRENZGEBIETE, FRANKFURT
AED-C-01-12 +. 142 PAGES, 1965, DEP. MN

ABSTRACTS OF 127 PAPERS DEALING WITH VARIOUS ASPECTS OF THE DISPOSAL OF RADIOACTIVE WASTE MATERIAL ARE PRESENTED.

*WASTE DISPOSAL, GENERAL + BIBLIOGRAPHY + GERMANY

14-13224 COLEMAN NT
ACCUMULATION OF CERIUM, YTTRIUM, AND CESIUM IN PLANTS AS AFFECTED BY THEIR SOIL CHEMISTRY AND THE AERATION OF THE SOIL
UNIVERSITY OF CALIFORNIA
TID-22715 +. 34 PAGES, MAY 1966, CFSTI \$2.00 CY, \$0.50 MN

RESULTS ARE SUMMARIZED FROM STUDIES ON THE ACCUMULATION OF CS IN PLANTS AS AFFECTED BY SOIL CHEMISTRY. FOUR SOIL MATERIALS WERE USED TO DETERMINE HOW MINERALS ESPECIALLY BIOTITE, HYDROBIOTITE, AND VERMICULITE CONTROL THE AVAILABILITY OF CS TO THE PLANTS AND TO ESTABLISH THE ROLE OF K, NH₄, AND GENERAL SALT CONCENTRATION IN MODIFYING PLANT AVAILABILITY UNDER VARIOUS SOIL MINERAL REGIMES. THE TEXTURAL AND GENERAL CHEMICAL CHARACTERISTICS OF THE SOIL SAMPLES ARE SUMMARIZED. DATA ARE PRESENTED FROM TRACER STUDIES OF THE SORPTION OF CS UNDER DIFFERENT CS LEVELS, THE CS FIXING CAPACITY UNDER VARIOUS CS CONCENTRATIONS, SORPTION-DESORPTION CHARACTERISTICS OF TRACE AMOUNTS OF CS IN VARIOUS SOIL TYPES AND WITH VARIOUS SALT CONCENTRATIONS, AND THE UPTAKE OF CS BY SUDAN GRASS.

*BIOLOGICAL CONCENTRATION, VEGETATION + *SOIL, PROPERTY + CERIUM + CESIUM + ECOLOGICAL CONSIDERATION + POTASSIUM + SOIL, NUCLIDE OCCURRENCE + SORPTION + YTTRIUM

14-13225 COOLEY CR + PLATT AM
THE WASTE SOLIDIFICATION ENGINEERING PROTOTYPES TECHNICAL PROGRAM
BATTELLE-NORTHWEST, RICHLAND
BNWL-SA-467 + CONF-660208-6 +. 25 PAGES, FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, FEB. 1, 1966, CFSTI \$1.00 CY, \$0.50 MN

THE OBJECTIVES AND FUTURE PLANS FOR THE WASTE SOLIDIFICATION ENGINEERING PROTOTYPES ARE DISCUSSED. THE EMPHASIS ON SPECIFIC SAFEGUARDS, TECHNICAL, AND ECONOMIC EVALUATIONS AND THE PROGRAM STEPS TO ACHIEVE DEMONSTRATION OF SOLIDIFICATION METHODS ARE OUTLINED FOR AN OAK RIDGE NATIONAL LABORATORY POT CALCINATION AND RISING LEVEL GLASS PROCESS, A PACIFIC NORTHWEST LABORATORY SPRAY SOLIDIFICATION PROCESS, AND A BROOKHAVEN NATIONAL LABORATORY PHOSPHATE GLASS PROCESS. PLANS FOR THE FIRST PORTION OF THE PROGRAM ARE REVIEWED.

*WASTE TREATMENT, FIXATION + WASTE DISPOSAL, GENERAL + WASTE MANAGEMENT + WASTE SOURCE AND TYPE + WASTE TREATMENT, LIQUID

14-13227 GREATORX JL + GLASS W
ADVANCED STUDY OF MILK DECONTAMINATION BY ELECTRODIALYSIS
IONICS, INC., WATERTOWN
AD-626210 +. 27 PAGES, OCTOBER 1965, CFSTI \$2.00 CY, \$0.50 MN

A FIVE GPH ELECTRODIALYTIC MILK DECONTAMINATION TEST PLANT WAS BUILT AND OPERATED. PREVIOUS RESEARCH HAD ESTABLISHED THAT RADIOACTIVE CONTAMINATION CAN BE REMOVED BY FLUSHING CATIONS THROUGH A LAYER OF MILK. APPROXIMATELY 8,000 LBS OF MILK WERE TREATED. DECONTAMINATION AVERAGED 90 PERCENT. THE ION-SELECTIVE MEMBRANES SHOWED NO DECREMENT IN PERFORMANCE FOLLOWING AN INITIAL DROP FROM 90 PERCENT CURRENT EFFICIENCY TO 82 PERCENT DURING THE FIRST 60 HOURS OF OPERATION. A SUITABLE IN SITU METHOD OF CLEANING THE MEMBRANE STACK WAS DEVELOPED. THE CHEMICAL COSTS OF THIS CLEANING METHOD CAME TO ABOUT 0.03 CENTS/GALLON MILK.

*ANALYTICAL TECHNIQUE, MILK + CESIUM + CIVIL DEFENSE + DECONTAMINATION + STRONTIUM

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RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13244 FREILING EC + CROCKER GR + ADAMS CE

NUCLEAR-DEBRIS FORMATION

U.S. NAVAL DEFENSE LABORATORY, SAN FRANCISCO

CONF-765 +. 43 PAGES, 15 FIGURES, 2 TABLES, 34 REFERENCES, PAGES 1-43 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

TWO FALLOUT-FORMATION PREDICTION SYSTEMS HAVE BEEN PROGRAMMED FOR COMPUTER CALCULATION. THE GREATEST NEEDS FOR IMPROVEMENT APPEAR TO BE FOR THE DEFINITION OF PARTICLE-SIZE DISTRIBUTION, THE ACCOUNTING FOR AGGLOMERATION EFFECTS, AND THE DEVELOPMENT OF A KINETIC APPROACH. PRELIMINARY STEPS IN THE DEVELOPMENT OF A KINETIC APPROACH ARE DESCRIBED. DECAY RATES, DOSE RATES, AND SPECTRA ARE GIVEN FOR THE MOST IMPORTANT CASE OF U-238 FISSION PRODUCED BY A THERMONUCLEAR NEUTRON SPECTRUM. SOME RESULTS OF CORRELATING RADIOCHEMICAL DATA FROM FRACTIONATED SAMPLES OF AIR-BURST DEBRIS ARE DISCUSSED. PRELIMINARY LABORATORY INVESTIGATIONS OF FISSION-PRODUCT INTERACTION WITH VARIOUS SUBSTRATE MATERIALS ARE DESCRIBED. THESE SHOW LARGE NEGATIVE DEVIATIONS FROM RAOULTS LAW, PARTICULARLY WHEN THE INTERACTION IS BETWEEN A BASIC FISSION PRODUCT AND ACIDIC SUBSTRATE OR AN ACIDIC FISSION PRODUCT AND BASIC SUBSTRATE.

*FALLOUT + DIFFUSION + NUCLEAR DETONATION + SOIL, PROPERTY

14-13245 MILLER CF + SARTOR JD

SMALL BOY SHOT FALLOUT RESEARCH PROGRAM

STANFORD RESEARCH INSTITUTE, MENLO PARK

CONF-765 +. 28 PAGES, 8 FIGURES, 9 TABLES, 10 REFERENCES, PAGES 44-71 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

IN THIS PAPER, THE GENERAL OUTLINE OF A FIELD-TEST PROGRAM IS PRESENTED ALONG WITH THE APPLICATION OF THE OUTLINE TO THE DESIGN OF THE EXPERIMENTAL PROGRAM FOR THE SMALL BOY SHOT. ALSO, PRELIMINARY ANALYSIS AND CORRELATION OF THE DATA OBTAINED ON TWO OF THE PROJECTS IS PRESENTED IN A DISCUSSION AND AN EVALUATION OF THE INTENSITY-ACTIVITY RATIO AND THE INTENSITY-AREA INTEGRAL PER UNIT FISSION YIELD (I.E., THE RATIO OF ROENTGENS PER HOUR AT 1 HR PER KILOTON PER SQUARE MILE) FOR THE FALLOUT FROM THE SMALL BOY SHOT.

*FALLOUT + *NUCLEAR DETONATION + DOSE CALCULATION, EXTERNAL + TEST, WEAPONS (HP ASPECTS)

14-13246 CROCKER GR + KAWAHARA FK + FREILING EC

RADIOCHEMICAL-DATA CORRELATIONS ON DEBRIS FROM SILICATE BURSTS

U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO

CONF-765 +. 10 PAGES, 5 FIGURES, 1 TABLE, 4 REFERENCES, PAGES 72-81 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

LOCAL-FALLOUT SAMPLES COLLECTED IN 1962 IN THE JOHNNIE BOY, SMALL BOY, AND SEDAN SHOTS WERE ANALYZED RADIOCHEMICALLY. THE RESULTS OF THE CORRELATION WERE COMPARED WITH THOSE FROM SIMILAR CORRELATIONS FOR A CORAL-SURFACE BURST AND SOME AIR BURSTS. THE RESULTS INDICATE THAT DIFFERENCES IN THE FRACTIONATION BEHAVIOR OF THE NUCLIDES ARE OF DEGREE RATHER THAN OF KIND. CORRELATION OF RADIOCHEMICAL RESULTS WITH PARTICLE SIZE INDICATES INCREASING DEGREE OF FRACTIONATION WITH INCREASING PARTICLE SIZE.

*FALLOUT + *NUCLEAR DETONATION + *RADIOCHEMICAL ANALYSIS

14-13247 KREY PW + FRIED RE

LONG-RANGE FALLOUT FROM SEDAN AND SMALL BOY SHOTS

ISOTOPES, INC., WESTWOOD

CONF-765 +. 16 PAGES, 9 FIGURES, 7 TABLES, 3 REFERENCES, PAGES 82-97 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

A SAMPLING NETWORK WAS ESTABLISHED ACROSS THE UNITED STATES TO COLLECT DEBRIS FROM THE SEDAN AND SMALL BOY SHOTS. GROSS GAMMA ASSAYS, GAMMA-DECAY MEASUREMENTS, AND GAMMA-SPECTRUM AND RADIOCHEMICAL ANALYSES WERE PERFORMED ON RETRIEVED SAMPLES. SEDAN, AN UNDERGROUND BURST, PRODUCED A CLOUD THAT WAS FAIRLY HOMOGENEOUS AND HIGHLY FRACTIONATED. SMALL BOY, A SURFACE BURST, PRODUCED A HETEROGENEOUS CLOUD AND EVEN GREATER FRACTIONATION EFFECTS THAN SEDAN. MOLYBDENUM-99 IN BOTH SHOTS BEHAVED AS A REFRACTORY MATERIAL AND DID NOT REPRESENT AN IDEAL TRACER OF FISSION-PRODUCT DEBRIS.

*FALLOUT + *NUCLEAR DETONATION + *SAMPLING + GROSS GAMMA + RADIOCHEMICAL ANALYSIS

14-13248 BENSON P + GLEIT CE + LEVENTHAL L

PHYSICAL CHARACTERISTICS OF SINGLE PARTICLES FROM HIGH-YIELD AIR BURSTS

TRACERLAB, INC.

CONF-765 +. 10 PAGES, 6 FIGURES, 1 TABLE, PAGES 98-107 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

PARTICLES, ISOLATED FROM HIGH-ALTITUDE NUCLEAR EXPLOSIONS, WERE SEPARATED AND THEIR PHYSICAL PARAMETERS DETERMINED. THE PARTICLES VARIED IN COLOR FROM COLORLESS TO BLACK. THEY WERE GENERALLY SPHERICAL, AND SOME HAD SATELLITES THAT WERE A RESULT OF COLLISIONS OF SMALL PARTICLES WITH LARGER PARTICLES BEFORE COMPLETE SOLIDIFICATION HAD OCCURRED. PARTICLES WITH DIAMETERS GREATER THAN 2 MICRONS WERE ISOLATED. THE BETA RADIOACTIVITY OF THE PARTICLES WAS MEASURED AT 25 DAYS. INDIVIDUAL PARTICLES WERE ALLOWED TO DECAY TO DETERMINE THE DECAY RATE

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14-13248 *CONTINUED*

OF THE FISSION-PRODUCT MIXTURES. THE DEVIATIONS WERE NOT A FUNCTION OF PARTICLE SIZE OR COLOR. THEY ARE EXPLAINED AS BEING A RESULT OF THE WIDELY DIFFERENT RADIONUCLIDE CONTENT OF THE PARTICLES.

*FALLOUT + *NUCLEAR DETONATION + GROSS BETA + PARTICLE SIZE DISTRIBUTION

14-13249 BENSON P + GLEIT CE + LEVENTHAL L

RADIOCHEMICAL FRACTIONATION CHARACTERISTICS OF SINGLE PARTICLES FROM HIGH-YIELD AIR BURSTS TRACERLAB, INC.

CONF-765 +. 11 PAGES, 7 FIGURES, 2 TABLES, 4 REFERENCES, PAGES 108-118 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE RADIOCHEMICAL FRACTIONATION CHARACTERISTICS FROM TWO OPERATION DOMINIC HIGH-YIELD AIR BURSTS WERE STUDIED. PARTICLES MEASURING FROM 2.5 TO 20.0 MICRONS WERE ISOLATED FROM FILTER-PAPER MATRICES BY AUTORADIOGRAPHIC REGISTRATION AND CONFIRMED BY OPTICAL MICROSCOPY. AFTER PHYSICAL MEASUREMENTS, RADIOCHEMICAL AND/OR GAMMA-SPECTROSCOPY STUDIES WERE PERFORMED ON INDIVIDUAL AND AGGREGATES OF PARTICLES. OF PARTICULAR INTEREST WAS THE DISTRIBUTION OF VOLATILE AND REFRACTORY NUCLIDES FOR EACH PARTICLE SIZE. THE PARTICLES WERE EXTREMELY FRACTIONATED. A LOGARITHMIC FRACTIONATION-CORRELATION PLOT FOR BA-140 WAS DETERMINED, AND IS COMPARED WITHIN THE LIMITS OF ERROR WITH DATA PLOTTED BY FREILING FOR HIGH-YIELD WATER BURSTS. THE RESULTS POINT TOWARD CONDENSATION OF THE REFRACTORY NUCLIDES INITIALLY WITH SUBSEQUENT PRECIPITATION OF THE VOLATILES ON THE PARTICLES AT LATER TIMES.

*FALLOUT + *NUCLEAR DETONATION + PARTICLE SIZE + RADIOCHEMICAL ANALYSIS + SPECTROMETRY, GAMMA

14-13250 LOCKHART LB + PATTERSON RL + SAUNDERS AW

DISTRIBUTION OF AIRBORNE RADIOACTIVITY WITH PARTICLE SIZE U.S. NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

CONF-765 +. 15 PAGES, 14 FIGURES, 3 TABLES, 3 REFERENCES, PAGES 119-133, OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

PARTICLE-SIZE RESOLUTION OF RADIOACTIVE PARTICLES HAS BEEN OBTAINED BY USE OF A FILTER-PACK TECHNIQUE WHEREIN ATMOSPHERIC AIR CONTAINING RADIOACTIVE AEROSOL PARTICLES SUCCESSIVELY TRANSITS A SERIES OF FILTERS OF INCREASING RETENTIVITY FOR SMALL PARTICLES. FOLLOWING THE TERMINATION OF ATMOSPHERIC TESTING OF NUCLEAR DEVICES IN DECEMBER 1962, FISSION-PRODUCT RADIOACTIVITY WAS OBSERVED TO BECOME ASSOCIATED WITH PARTICLES OF SMALLER AVERAGE SIZE. RADIOCHEMICAL ANALYSIS OF MATERIAL COLLECTED BY THREE-FILTER PACKS DURING 1963 AND 1964 SHOWED NO GROSS EVIDENCE OF ISOTOPIC FRACTIONATION WITH SIZE. IT IS CONCLUDED THAT NUCLEAR DEBRIS FROM A STRATOSPHERIC SOURCE BECOMES ASSOCIATED WITH THE RELATIVELY LARGE NONRADIOACTIVE AEROSOLS CHARACTERISTIC OF THE TROPOSPHERIC AIR BY THE TIME THE DEBRIS ARRIVES AT GROUND LEVEL. THE RESULTING PARTICLES HAVE AN AVERAGE SIZE BETWEEN 0.3 AND 1.0 MICRON IN DIAMETER (ASSUMING SPHERICAL PARTICLES OF 1.8 G/CC DENSITY) AND A RATHER RESTRICTED PARTICLE-SIZE DISTRIBUTION.

*FALLOUT + AEROSOL + FILTER PACK + GROSS BETA + PARTICLE SIZE + RADIOCHEMICAL ANALYSIS + SAMPLING

14-13260 FEELY HW + BAZAN F

STRATOSPHERIC DISTRIBUTION OF NUCLEAR DEBRIS IN 1962, 1963, AND 1964 ISOTOPES, INC.

CONF-765 +. 22 PAGES, 19 FIGURES, 1 TABLE, 9 REFERENCES, PAGES 301-322 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

AN ESTIMATE MAY BE MADE OF THE STRATOSPHERIC DISTRIBUTION OF NUCLEAR DEBRIS BY USING A COMBINATION OF DATA FROM THE BALLOON SAMPLING PROGRAM AND THE WU-2 AIRCRAFT SAMPLING PROGRAM. THE STRATOSPHERIC SR-90 DISTRIBUTIONS FROM JANUARY 1962 THROUGH MAY 1964 HAVE BEEN ESTIMATED, AND FROM THEM THE STRATOSPHERIC BURDENS (RANGING FROM 0.9 MEGACURIES BEFORE THE 1961 U.S.S.R TESTS TO PERHAPS OVER 7 BY EARLY 1963 AND THEN FALLING TO ABOUT 4.4 IN LATE 1963) HAVE BEEN CALCULATED.

*NUCLEAR DETONATION + AIR POLLUTION + ATMOSPHERIC CIRCULATION, GLOBAL + MANGANESE + STRATOSPHERE + STRONTIUM + TRACER, RADIOACTIVE

14-13266 SALTER LP

STRATOSPHERIC RADIOACTIVITY IN THE SOUTHERN HEMISPHERE FROM 1961 AND 1962 WEAPON TESTS NEW YORK OPERATIONS OFFICE, USAEC HEALTH AND SAFETY LABORATORY, NEW YORK

CONF-765 +. 13 PAGES, 3 FIGURES, 4 TABLES, 13 REFERENCES, PAGES 409-421 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

STRONTIUM-90 FROM THE 1961 USSR TEST SERIES WAS PRESENT IN SMALL AMOUNTS BELOW 70,000 FT AT 34 DEGREES S THROUGHOUT 1962 AND MAY HAVE BEEN A SIGNIFICANT COMPONENT OF THE RELATIVELY LARGE LEVELS OBSERVED ABOVE 100,000 FT IN LATE 1962 AND EARLY 1963. THIS MATERIAL PROBABLY ACCOUNTED FOR A MAJOR PART OF THE FIVEFOLD INCREASE IN SR-90 CONCENTRATION FROM APRIL TO JUNE 1963 BETWEEN 70,000 AND 90,000 FT. WE ASCRIBE THE 1961 DEBRIS ABOVE 70,000 FT TO THE APPROXIMATELY 25 MT SHOT OF THE SERIES. AS DEDUCED FROM MEASUREMENTS OF CD-109, STARFISH PRIME DEBRIS FIRST APPEARED WITHIN THE RANGE OF THE SAMPLING PROGRAM IN DECEMBER 1962 AT 105,000 FT AT 34 DEGREES S. BY MID-1964 IT WAS PRESENT THROUGHOUT THE STRATOSPHERE OF BOTH HEMISPHERES. THE DISTRIBUTION OF THIS MATERIAL APPEARS SIMILAR TO THAT FROM ORANGE, THE

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14-13266 *CONTINUED*

HIGH-ALTITUDE ROCKET SHOT OFF AUGUST 1958. THE FOLLOWING MOVEMENTS BROADLY DESCRIBE THE DOMINANT FEATURES OF THE DISTRIBUTION PATTERN - (1) RAPID HORIZONTAL SPREADING AT HIGH ALTITUDES (2) SUBSIDENCE INTO THE POLAR STRATOSPHERE, AND (3) MOVEMENTS IN THE STRATOSPHERE TOWARD THE EQUATOR IN THE HEMISPHERIC SPRING AND SUMMER.

*STRATOSPHERE + ATMOSPHERIC CIRCULATION, GLOBAL + CADMIUM + NUCLEAR DETONATION + SAMPLING + STRONTIUM

14-13300 MAWSON CA + COWSER KE

REVIEW OF HEALTH PHYSICS SOCIETY PAPERS ON ENVIRONMENTAL MONITORING, HAZARDS ANALYSIS, AND WASTE DISPOSAL
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER + OAK RIDGE NATIONAL LABORATORY
5 PAGES, 23 REFERENCES, NUCLEAR SAFETY 7(3), PAGES 370-374, (SPRING 1966)

A REVIEW IS PRESENTED OF PAPERS ON THREE TOPICS DISCUSSED AT THE TENTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY (JUNE 14 TO 17, 1965, AT LOS ANGELES, CALIF.) - ENVIRONMENTAL MONITORING, HAZARDS ANALYSIS, AND WASTE DISPOSAL. IN THIS REVIEW, PAPERS ON RADIATION EXPOSURES IN THE VICINITIES OF NUCLEAR OPERATIONS AT OAK RIDGE, HANFORD, AND SAVANNAH RIVER, WHICH WERE PRESENTED IN THE SESSION ON ENVIRONMENTAL MONITORING, ARE DISCUSSED. ALSO, PROBLEMS IN ENVIRONMENTAL MONITORING DEALING WITH ECONOMY, PRACTICE AND THEORY, CLOUD DISPERSION, DIETARY SURVEYS, UNDERGROUND EXPLOSIONS, TRITIUM IN JAPAN, AND THE CONVERSION OF LIQUID WASTE TO SOLIDS ARE COVERED. FOR THE SESSION ON HAZARDS ANALYSIS, SEVERAL PAPERS ON INTERNAL AND EXTERNAL DOSE ESTIMATES AND EXPOSURES FOLLOWING THE RELEASE OF RADIONUCLIDES ARE SUMMARIZED. WITH REGARD TO WASTE DISPOSAL, SOME RECENT TESTS CONCERNING THE ULTIMATE DISPOSAL OF LIQUID WASTE BY THE HYDRAULIC-FRACTURING TECHNIQUE ARE DESCRIBED BRIEFLY, AND STUDIES OF LIQUID-WASTE DISPOSAL AT OAK RIDGE AND HANFORD ARE REVIEWED. A BRIEF COMMENT ON U.S. AND SOVIET WASTE-DISPOSAL STANDARDS IS ALSO GIVEN.

*RADIATION PROTECTION, ORGANIZATION + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + DOSIMETRY, GENERAL + HAZARDS ANALYSIS + PERSONNEL EXPOSURE, RADIATION + POPULATION EXPOSURE + SURVEY, RADIATION, ENVIRONMENTAL + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, GENERAL

14-13306 KRUGER P + MILLER A

TRANSPORT OF RADIOACTIVITY IN RAIN AND AIR ACROSS THE TRADE WIND INVERSION AT HAWAII
STANFORD UNIVERSITY, STANFORD + SAN JOSE STATE COLLEGE, SAN JOSE
13 PAGES, 4 FIGURES, 4 TABLES, 23 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(18), PAGES 4243-4255, SEPTEMBER 15, 1966.

RADIOCHEMICAL ANALYSES OF AEROSOLS AND PRECIPITATION COLLECTED ALONG THE SLOPES OF MAUNA LOA VOLCANO IN HAWAII SHOW THAT THE CONCENTRATION OF RADIOACTIVITY IN AEROSOLS GENERALLY INCREASES WITH HEIGHT ACROSS THE TRADE WIND INVERSION. THE TIME VARIATIONS OF THE VERTICAL DISTRIBUTION OF RADIOACTIVITY CONCENTRATION AND MOISTURE MIXING RATIO WERE INVERSELY CORRELATED. INTRUSIONS OF DRY AIR HAVING HIGHER CONCENTRATIONS OF RADIOACTIVITY ACCOMPANIED VERTICAL OSCILLATIONS IN THE UPPER BOUNDARY OF THE MOIST SURFACE LAYER. THE CONCENTRATION OF SR-90 IN RAIN ALONG THE SLOPES GENERALLY DECREASED WITH ALTITUDE ABOVE THE CLOUD BASE. THIS DECREASE IS ATTRIBUTED TO THE CONTINUOUS DEPLETION OF CONDENSATION NUCLEI THROUGH RAINOUT WHILE REMAINING DROPLETS IN THE AIR PARCELS CONTINUE TO GROW AS THEY MOVE UPSLOPE.

*METEOROLOGY + *NUCLEAR EXPLOSION DEBRIS + AEROSOL + FALLOUT + PRECIPITATION + RAINOUT + STRONTIUM

14-13307 KRUGER P + HOSLER CL + DAVIS LG

RADIOCHEMICAL STUDY OF TWO EXTRATROPICAL CYCLONES CONTAINING NUCLEAR DEBRIS OF DIFFERENT AGES
STANFORD UNIVERSITY, STANFORD + PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK
10 PAGES, 3 FIGURES, 2 TABLES, 8 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(18), PAGES 4257-4266, SEPTEMBER 15, 1966.

THE RADIOSTRONTIUM RATIOS IN PRECIPITATION FROM TWO EXTRATROPICAL CYCLONES IN CENTRAL PENNSYLVANIA INDICATED THE INVOLVEMENT OF AIR MASSES CONTAINING NUCLEAR DEBRIS OF DIFFERENT SOURCES AND AGES. THE STORM OF NOVEMBER 10, 1962, WHICH OCCURRED DURING THE PERIOD OF ATMOSPHERIC TESTING OF NUCLEAR WEAPONS IN THE SOVIET UNION, INCLUDED AIR MASSES CONTAINING AT LEAST TWO SOURCES OF NUCLEAR DEBRIS, ONE FROM THE SPRING 1962 TESTS AND THE OTHER FROM THE FALL 1962 TESTS. THE STORM OF MARCH 4, 1963, WHICH OCCURRED MORE THAN 2 MONTHS AFTER THE LAST DETONATIONS IN THE ATMOSPHERE, SHOWED TWO LAYERS IN THE ATMOSPHERE WITH DEBRIS OF DIFFERENT AVERAGE AGES. IN BOTH CASES, THE SR-89/SR-90 RATIO AND CONCENTRATION DATA SHOWED VARIATIONS RELATED TO CHANGES IN THE HEIGHT OF THE PRECIPITATION-GENERATING LEVEL AND THE RATES OF GROWTH AND EVAPORATION AS DEDUCED FROM TIME-HEIGHT-INTENSITY RADAR OBSERVATIONS.

*ATMOSPHERIC CIRCULATION, CYCLONIC + *METEOROLOGY + *NUCLEAR EXPLOSION DEBRIS + FALLOUT + STRONTIUM

14-13320 BARTON GB

SOLIDIFICATION OF HIGH LEVEL WASTES - PART IV. PHOSPHATE MELTS FOR FIXATION OF RADIOACTIVE RESIDUES FROM PUREX TYPE WASTES - THREE TO FIFTY PER CENT FISSION PRODUCT OXIDES
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-80 +. 38 PAGES, JULY 1965, CFSTI \$2.00 CY, \$0.50 MW

THE POSSIBLE COMPOSITION RANGE FOR THE HIGH-LEVEL RADIOACTIVE WASTES GENERATED FROM VARIOUS POWER REACTOR FUELS PROCESSED THROUGH A PUREX-TYPE PROCESS IS VERY BROAD. THIS REPORT COVERS A PARTIAL SURVEY OF THIS WIDE RANGE IN AN EFFORT TO ESTABLISH THE COMPOSITION LIMITS THAT BOUND THE OPERABLE RANGE OF THE PHOSPHATE MELT SYSTEM. TWO SCREENING CRITERIA HAVE BEEN USED - (A) DRIP TEMPERATURE, AN EMPIRICAL MEASURE OF FLOW TEMPERATURE AT WHICH A CONTAINER COULD BE FILLED, AND (B) SOLUBILITY. MEASUREMENTS HAVE INDICATED THE OCCURRENCE OF TWO (OR POSSIBLY MORE) OPTIMUM PHOSPHATE ADDITIONS NEAR M20/P205 RATIOS OF 2.1 AND 1.0. IT HAS BEEN FOUND THAT FISSION PRODUCTS EQUIVALENT TO AT LEAST 50 PERCENT OF THE WEIGHT OF OXIDES IN THE

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13320 *CONTINUED*

PLANT WASTE CAN BE SUCCESSFULLY INCORPORATED IN A PHOSPHATE MELT THAT CAN BE TRANSFERRED AS A FLUID INTO CONTAINERS AT LESS THAN 900 C.

*CERAMICS + *GLASS + *WASTE TREATMENT, FIXATION + PHOSPHATE + THERMAL CONSIDERATION + WASTE SOURCE AND TYPE

14-13322 WARD GM + JOHNSON JE

THE CESIUM-137 CONTENT OF BEEF FROM DAIRY AND FEED-LOT CATTLE
COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO

6 PAGES, 2 TABLES, 10 REFERENCES, JUNE 11, 1964 HEALTH PHYSICS 11(2) PAGES 95-100 (FEBRUARY 1965)

SAMPLES OF MEAT WERE COLLECTED FROM PRODUCING DAIRY COWS, DRY COWS, YOUNG CALVES AND FEED-LOT FATTENED CATTLE AND ANALYZED FOR CS-137, POTASSIUM, FAT AND MOISTURE. THE DIETS, WHICH WERE CONTAMINATED WITH VARYING LEVELS OF FALLOUT CS-137, WERE ANALYZED TO ESTIMATE DAILY INTAKE OF THE NUCLIDE. THE CS-137 LEVELS PER KG OF EDIBLE MEAT LEVELED OFF AT LESS THAN 1 PER CENT OF THE DAILY INTAKE IN MATURE DAIRY CATTLE, AT 3 PER CENT IN FEED-LOT CATTLE AND AT 15 PER CENT IN CALVES. IT IS NOT CLEAR WHETHER DIFFERENCES ARE DUE TO AGE OR THE DIET OF THE ANIMALS. THE RATIO OF ACTIVITY MEAT/MILK PER KG RANGED FROM 1.2 TO 4.9. IT IS ESTIMATED THAT THE AVERAGE CONSUMER WILL OBTAIN MORE CS-137 FROM MILK THAN BEEF, ALTHOUGH UNDER CERTAIN CONDITIONS THE REVERSE COULD EASILY OCCUR.

*CESIUM + *INGESTION + BIOLOGICAL CONCENTRATION, ANIMAL FEED + FALLOUT +
MONITOR, RADIATION, ENVIRONMENTAL + POTASSIUM

14-13342 PLATT AM

FIXATION OF RADIOACTIVE RESIDUES. QUARTERLY PROGRESS REPORT, JANUARY-MARCH 1966

BATTELLE-NORTHWEST, RICHLAND

BNWL-267 +. 30 PAGES, 6 FIGURES, 6 TABLES, MAY 1966

THIS PROGRESS REPORT IS THE TWENTY-NINTH IN A SERIES PRESENTING RESEARCH AND DEVELOPMENT ACTIVITIES IN THE FIELD OF RADIOACTIVE WASTES. EXPERIMENTAL WORK CHARGED TO PROGRAMS OTHER THAN THOSE OF THE DIVISION OF REACTOR DEVELOPMENT AND TECHNOLOGY IS SOMETIMES INCLUDED FOR GENERAL INTEREST AND COMPLETENESS. SUCH WORK IS IDENTIFIED IN THE HEADINGS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$2.00 CY, \$0.50 MN

*WASTE TREATMENT, FIXATION + CESIUM + HAZARDS ANALYSIS + STRONTIUM + WASTE MANAGEMENT +
WASTE SOURCE AND TYPE + WASTE STORAGE + WASTE TRANSPORTATION

14-13352 VELA UNIFORM PROJECT SHOAL

NEVADA BUREAU OF MINES + UNIVERSITY OF NEVADA

VUF-1001 (FINAL REPORT) +. 369 PAGES, 17 FIGURES, 5 TABLES, APRIL 26, 1965

THIS FINAL REPORT COVERS GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS ASSOCIATED WITH THE EXPLORATORY AND OPERATIONAL STAGES OF PROJECT SHOAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$7.00 COPY

*GEOLOGICAL CONSIDERATION, GENERAL + *GEOLOGICAL CONSIDERATION, GEOCHEMICAL +
*GEOLOGICAL CONSIDERATION, GEOPHYSICAL + *HYDROLOGICAL CONSIDERATION, GENERAL +
*VELA UNIFORM PROGRAM, PROJECT SHOAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY +
HYDROLOGICAL CONSIDERATION, QUALITY OF WATER + METEOROLOGY + NEVADA TEST SITE + NUCLEAR DETONATION +
SEISMOLOGY + TOPOGRAPHY

14-13370 TADMOR J + GILAAD Y + GALRON H

ON THE RADIATION DOSES FROM A RADIOACTIVE CLOUD AND FROM DEPOSITION OF FISSION PRODUCTS, IN THE HAZARDOUS

EVALUATION OF NUCLEAR REACTORS

ISRAEL ATOMIC ENERGY COMMISSION

5 PAGES, 6 FIGURES, 1 TABLE, 8 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1489-1493, (OCT. 1966)

AS PART OF THE EVALUATION OF THE HAZARDS ARISING FROM AN ACCIDENT IN A NUCLEAR REACTOR, THE RADIATION DOSES CAUSED BY A RADIOACTIVE CLOUD AND BY DEPOSITION OF FISSION PRODUCTS WERE STUDIED. THE STUDY WAS BASED ON SUTTONS DIFFUSION EQUATIONS WITH CHAMBERLAIN'S DEPOSITION CORRECTION. IT WAS ASSUMED THAT (1) FOLLOWING A MELTDOWN ACCIDENT, 100 PERCENT OF THE NOBLE GASES, 25 PERCENT OF THE HALOGENS, 15 PERCENT OF THE VOLATILE FISSION PRODUCTS AND 1 PERCENT OF THE SOLID FISSION PRODUCTS ARE RELEASED FROM THE FUEL, AND THAT (2) AN INSTANTANEOUS SOURCE IS RELEASED INTO THE ENVIRONMENT FOLLOWING THE ACCIDENT.

*DOSE CALCULATION, EXTERNAL + *FISSION PRODUCT RELEASE, GENERAL + DEPOSITION + DILUTION + DISPERSION +
FALLOUT + HAZARDS ANALYSIS

14-13372 BRESLIN A.I.

TOWARD MORE REALISTIC SYSTEMS FOR THE DISCHARGE OF RADIOACTIVE AIRBORNE WASTES

NEW YORK OPERATIONS OFFICE, USAEC

6 PAGES, 3 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1496-1501, (OCTOBER 1966)

REVIEWS THE REQUIREMENTS FOR THE SAFE DISCHARGE OF RADIOACTIVE AIRBORNE WASTES. RECOMMENDS THE RATES OF DISCHARGE THAT ARE PERMISSIBLE WITH NO AIR CLEANING REQUIREMENT.

ACCESSION NUMBER 14-13320 TO 14-13372

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13372 *CONTINUED*
*AIR CLEANING + *WASTE DISPOSAL, GAS

14-13397 BLANCO RE + PARKER FL
WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT JULY-DECEMBER, 1965
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1465 +. 95 PAGES, FIGURES, 22 TABLES, 30 REFERENCES, JUNE 1966

REPORTS PROGRESS IN ENGINEERING AND LABORATORY DEVELOPMENT OF THE SOLIDIFICATION OF HIGH-LEVEL WASTES ON LOW- AND INTERMEDIATE-LEVEL WASTE TREATMENT, ON ENGINEERING, ECONOMICS AND SAFETY EVALUATIONS, DISPOSAL BY HYDROFRACTURING, DISPOSAL IN NATURAL SALT FORMATIONS, SOIL STUDIES, BEHAVIOR OF RADIONUCLIDES IN THE GROUND, AND DISPOSAL OF GASES INTO PERMEABLE FORMATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$4.00 CY, \$0.75 MN

*WASTE TREATMENT, GENERAL + CESIUM + COMPUTER PROGRAM + RIVER, CLINCH + SAFETY STUDY + SOIL, NUCLIDE OCCURRENCE + SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GAS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, RIVER + WASTE DISPOSAL, SALT + WASTE TREATMENT, FIXATION + WASTE TREATMENT, LIQUID

14-13398 RICKARD WH
ACCUMULATION OF CS-137 IN LITTER AND UNDERSTORY PLANTS OF FOREST STANDS FROM VARIOUS CLIMATIC ZONES OF WASHINGTON
BATTELLE-NORTHWEST
BNWL-SA-530 + CONF-660405 +. 11 PAGES, FEBRUARY 8, 1966, FROM SYMPOSIUM ON RADIOECOLOGICAL CONCENTRATION PROCESSES, STOCKHOLM, CFSTI \$1.00 CY, \$0.50 MN

ESTIMATES OF THE ENTIRE AMOUNT OF CS-137 PRESENT IN PACIFIC NORTHWEST CONIFER FOREST STANDS ARE DIFFICULT TO OBTAIN BECAUSE OF THE DIFFICULTIES OF OBTAINING SAMPLES FROM TALL TREES. HOWEVER, A SAMPLING OF FOREST FLOOR PLANTS AND LITTER INDICATES THAT GROSS DIFFERENCES IN CS-137 ACCUMULATIONS CAN OCCUR IN FOREST HABITATS CHARACTERISTIC OF CONTRASTING CLIMATIC ZONES OF THE SAME LATITUDE. CESIUM-137 TENDS TO ACCUMULATE IN CARPETS OF FOREST MOSS OR IN LITTER. THERE IS LITTLE MOVEMENT OF CS-137 INTO THE MINERAL SOIL OF THE FOREST FLOOR.

*BIOLOGICAL CONCENTRATION, VEGETATION + *ECOLOGICAL CONSIDERATION + CESIUM + FALLOUT + SAMPLING

14-13400 HARDY EP + RIVERA J
FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, JUNE 1-SEPTEMBER 1, 1966
NEW YORK OPERATIONS OFFICE USAEC, HEALTH AND SAFETY LABORATORY
HASL-173 + APPENDIX +. 472 PAGES, OCTOBER 1, 1966

THIS REPORT PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, ARGONNE NATIONAL LABORATORY, THE ARGENTINE ATOMIC ENERGY COMMISSION, THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH IN NEW ZEALAND, THE NATIONAL RADIATION LABORATORY IN NEW ZEALAND, EURATOM JOINT NUCLEAR RESEARCH CENTRE, AND ISOTOPES, INC. RADIONUCLIDE LEVELS IN FALLOUT, MILK, TAPWATER, DIET, SURFACE AND HIGH-ALTITUDE AIR, ARE GIVEN IN TABULAR FORM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$7.72 CY, \$2.00 MN

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + ARGENTINA + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + EURATOM + MONITOR, RADIATION, AIR + NEW ZEALAND + RAINOUT + SAMPLING + SOIL, NUCLIDE OCCURRENCE + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + WATER, DRINKING

14-13425 YAMAMOTO Y + MIYAUCHI T + KUNII D + KIYOSE R
CHEMICAL ENGINEERING STUDIES ON THE PROCESSING OF RADIOACTIVE LIQUID WASTES BY EVAPORATION. FINAL REPORT
JANUARY 1, 1964 - MARCH 31, 1965
TOKYO UNIVERSITY, JAPAN
NP-15371 +. 27 PAGES, 1965

IN STUDIES ON THE USE OF THE FLUIDIZED-BED SPRAY-TYPE EVAPORATOR FOR ECONOMICAL PROCESSING OF RADIOACTIVE LIQUID WASTES, COLD EXPERIMENTS WERE CONDUCTED TO OBTAIN FUNDAMENTAL DATA ON EVAPORATION AND SOLIDIFICATION PROCESSES OF SOLUTIONS SPRAYED AND HEATED IN SUPERHEATED STEAM. HEAT TRANSFER RATE IN THE PREHEATING STAGE IS QUITE RAPID AS THE PROCESS IS CONSIDERED TO BE CONDENSATION HEAT TRANSFER. IN THE VAPORIZATION PROCESS, SENSIBLE HEAT TRANSFER THROUGH THE FILM AROUND THE LIQUID DROPS IS CONSIDERED DOMINANT AND THE PROCESS IS SOMEWHAT SLOWER THAN THE PREHEATING STAGE. ENGINEERING DATA FOR THE FLUIDIZED-BED ARE CORRELATED. IT WAS CONCLUDED THAT THE SELECTION OF THE POSITION OF INJECTION POINT OF THE FEED LIQUID IS NOT A CRITICAL PROBLEM IN THIS TYPE OF EVAPORATOR. LIQUID DROP SIZE HAS, HOWEVER, AN IMPORTANT EFFECT ON THE OPERATION CHARACTERISTICS OF THE BED. FROM A BENCH SCALE EXPERIMENT IT WAS CONCLUDED THAT THE MINIMUM RECYCLING OF STEAM IS NECESSARY TO MAINTAIN THE GOOD FLUIDIZING CONDITION.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*EVAPORATION + *WASTE TREATMENT, LIQUID + HEAT TRANSFER + JAPAN

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13426 YAMAMOTO Y + MIYAUCHI T + KUNII D + KIYOSE R
CHEMICAL ENGINEERING STUDIES ON THE PROCESSING OF RADIOACTIVE LIQUID WASTES BY EVAPORATION. PROGRESS
REPORT JANUARY 1-JUNE 30, 1964
TOKYO UNIVERSITY, JAPAN
NP-15367 +. 24 PAGES, 1964

THE OPERATIONAL CHARACTERISTICS OF FLUIDIZED-BED SPRAY EVAPORATOR FOR PROCESSING RADIOACTIVE LIQUID WASTES WERE INVESTIGATED. ALTHOUGH THE PRINCIPAL IDEA OF THE PROCESS IS ALMOST THE SAME AS THE DOUBLE-EFFECT EVAPORATOR, BY USING THE SPRAY EVAPORATOR FOR FINAL EVAPORATION AND SOLIDIFICATION, IT BECOMES POSSIBLE TO GET THE PRODUCT DIRECTLY FROM THE EVAPORATOR AS SOLID PARTICLES AND THUS TO MINIMIZE THE COST OF DISPOSAL OF RADIOACTIVE LIQUID WASTES.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*EVAPORATION + *WASTE TREATMENT, LIQUID + JAPAN

14-13433 BRADSHAW RL + LOMENICK TF + MCCLAIN WC + BOEGLY WJ + EMPSON FM + PARKER FL
PROJECT SALT VAULT - EFFECTS OF TEMPERATURE AND RADIATION ON PLASTIC FLOW AND MINE STABILITY
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-P-2006 + CONF-660208-10 +. 20 PAGES, 1966, PRESENTED AT PROCEEDINGS OF INTERNATIONAL SYMPOSIUM ON THE SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON, FEBRUARY 14-18, 1966

IN MINES IN FLAT-LYING SALT DEPOSITS, HEAVING FLOORS AND SAGGING ROOFS CAN PROVE HAZARDOUS. THE EFFECTS OF TEMPERATURE AND LOAD STRESS (IN ROOF-SUPPORTING PILLS) ON SUCH STABILITY PROBLEMS HAVE BEEN STUDIED BY MEANS OF MODEL PILLS. ALSO, WE HAVE INVESTIGATED THE EFFECTS OF RADIATION (DOSES UP TO 5 TIMES 10 TO THE 8TH R) ON SMALL TEST SPECIMENS. OPERATION OF THE RADIOACTIVE AND ELECTRICAL ARRAYS IN PROJECT SALT VAULT HAS NOT REVEALED ANY SIGNIFICANT EFFECT OF RADIATION ON THE SALT FLOW OR STABILITY (AS OF JANUARY 1, 1966). HOWEVER, THERMAL STRESSES FROM THE HEAT IN THE FLOOR HAVE BEEN FOUND TO BE TRANSMITTED TO THE ROOF, RESULTING IN A FIVEFOLD INCREASE IN THE RATE AT WHICH THE ROOF IS SAGGING. NO PROBLEMS DUE TO THE INCREASED FLOW ARE ANTICIPATED, EITHER IN THE DEMONSTRATION OR IN A PROPERLY DESIGNED ACTUAL DISPOSAL FACILITY, BUT THE NEED FOR CAREFUL STUDY OF SUCH EFFECTS IS UNDERSCORED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

*WASTE DISPOSAL, SALT + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + GEOLOGICAL CONSIDERATION, SALT STRUCTURE + HEAT TRANSFER + RADIATION EFFECT + THERMAL CONSIDERATION + THERMAL EXPERIMENT + WASTE DISPOSAL, SOLID

14-13434 WETH GG + STRICKLAND G + TUTHILL EJ
PLATINUM FOR HIGH TEMPERATURE CRUCIBLES USED IN PROCESSING RADIOACTIVE WASTE
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
BNL-10132 + CONF-660208-17 +. 14 PAGES, 1966, FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON

IN THE DEVELOPMENT OF THE PHOSPHATE-GLASS PROCESS FOR CONVERSION OF HIGHLY RADIOACTIVE WASTES TO STABLE SOLIDS, PLATINUM HAS BEEN USED SUCCESSFULLY FOR THE HIGH TEMPERATURE CRUCIBLE. IN THIS APPLICATION A PLATINUM CRUCIBLE HAS BEEN USED AT TEMPERATURES OF 800-1200 C FOR A TOTAL OF 8000 HOURS WITH NO SIGNS OF DETERIORATION. IT WAS DEMONSTRATED THAT CHEMICAL REDUCING CONDITIONS MUST BE AVOIDED. OTHERWISE, RAPID DETERIORATION OF PLATINUM MAY TAKE PLACE IN THE PRESENCE OF MOLTEN PHOSPHATE. TESTS TO DETERMINE THE USEFUL LIFE OF PLATINUM INCLUDED LONG-TERM CREEP MEASUREMENTS AT 1250 C. THE LATEST RESULTS OF THESE TESTS, WHICH ARE STILL IN PROGRESS, ARE PRESENTED. ECONOMIC FACTORS ASSOCIATED WITH THE USE OF PLATINUM IN HIGH LEVEL WASTE PROCESSING ARE DISCUSSED BRIEFLY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

*GLASS + *WASTE TREATMENT, FIXATION + THERMAL CONSIDERATION

14-13436 KOLB JW
HIGH INTEGRITY BULK PACKAGING FOR LONG-TERM STORAGE OF RADIOACTIVE WASTES
ISOCEM INC.
RL-SA-60 + CONF-660208-12 +. 67 PAGES, FEBRUARY 9, 1966, FROM SYMPOSIUM ON SOLIDIFICATION AND LONG-TERM STORAGE OF HIGHLY RADIOACTIVE WASTES, RICHLAND, WASHINGTON

FACILITIES FOR PACKAGING MEGACURIE QUANTITIES OF RADIOACTIVE WASTES (STRONTIUM-90, CESIUM-137) IN ALL-WELDED STAINLESS-STEEL HELIUM-LEAK-TIGHT CONTAINERS FOR LONG-TERM STORAGE (MANY DECADES) OR RETRIEVAL AT ANY TIME ARE PRESENTED. UNIQUE FEATURES OF THE FACILITIES INCLUDE - (1) REMOTE OPERATION IN A SEPARATIONS PLANT CANYON WITHOUT THE USE OF MANIPULATORS OR PENETRATION BETWEEN THE OPERATING GALLERY AND CONTAMINATED ZONE. (2) REMOTE ENCAPSULATION AND REPLACEMENT OF EQUIPMENT BY CANYON CRANE AND IMPACT WRENCH WITHOUT SHUTDOWN, CELL CLEANUP OR CONTAMINATION SPREAD. (3) EQUIPMENT COMPONENTS EXCEPT THOSE THAT MUST CONTACT CONTAINER OR WASTE STREAM ARE LOCATED IN CLEAN ZONE. (4) REMOTE CLEANUP OF CONTAMINATED PORTION OF EQUIPMENT FOR SUBSEQUENT CONTACT MAINTENANCE AT GLOVE BOX.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA \$3.00 CY, \$0.50 MN

*WASTE HANDLING + *WASTE STORAGE + CESIUM + STRONTIUM + WASTE MANAGEMENT

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13437 OSLOOND JH
RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION
USAEC HEALTH AND SAFETY DIVISION, IDAHO FALLS, IDAHO
IDO-12040 +. 36 PAGES, APRIL 7, 1965

SUMMARIZES THE DATA PERTAINING TO THE DISPOSAL OF RADIOACTIVE WASTE AT THE NATIONAL REACTOR TESTING STATION. THE VOLUMES OF LIQUID, GASEOUS, AND SOLID WASTES ARE REPORTED, WITH THE CONCENTRATION AND TOTAL AMOUNTS OF CONTAINED NUCLIDES GIVEN. DETAILED INFORMATION IS LISTED FOR THE YEARS 1962 THROUGH 1964. YEARLY SUMMARY TOTALS ARE LISTED FOR THE YEARS SINCE 1955.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA \$2.00

*IDAHO FALLS + *WASTE MANAGEMENT + WASTE DISPOSAL, GAS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID

14-13441 HARPER JA + JOLLY L
A METHOD FOR DISPOSAL OF LARGE QUANTITIES OF DEGRADED AND LOW-LEVEL CONTAMINATED SOLVENT
E. I. DU PONT DE NEMOURS COMPANY, AIKEN, SOUTH CAROLINA, SAVANNAH RIVER PLANT
DPSPU-64-30-88 + CONF-642-31 +. 12 PAGES, MAY 1964, PRESENTED AT THE ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY IN CINCINNATI, JUNE 1964 AND FOR PUBLICATION IN HEALTH PHYSICS

SOLVENTS USED IN RADIOCHEMICAL SEPARATIONS PROCESSES IS DEGRADED DURING EXPOSURE TO RADIATION AND RETAINS CERTAIN FISSION WASTE DISPOSAL PROBLEMS OF CONSIDERABLE MAGNITUDE. OF SEVERAL DISPOSAL METHODS CONSIDERED, CONTROLLED OPEN-PAN BURNING WAS SELECTED AS THE SAFEST AND MOST ECONOMICAL. AN EXTENSIVE AIR-SAMPLING PROGRAM SHOWED THAT MORE THAN 99 PERCENT OF ALL THE SOLVENT RADIOACTIVITY, PRIMARILY FISSION PRODUCTS AND PLUTONIUM, REMAINED IN A GUMMY RESIDUE. DURING TWO YEARS, 80,000 GALLONS OF SOLVENT WAS BURNED WHICH CONTAINED ABOUT 8 CURIES OF GAMMA-EMITTING ISOTOPES AND ABOUT 60 MILLICURIES OF ALPHA-EMITTERS. NO ADVERSE EFFECT ON THE ENVIRONMENT THE BURNING OPERATIONS WAS DETECTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA \$1.00

*INCINERATION + *WASTE DISPOSAL, GENERAL

14-13443 FREDERICKSON RL
ABBOTT LABORATORY PROGRESS IN REDUCING STACK RELEASES OF IODINE
ABBOTT LABORATORIES, NORTH CHICAGO, ILLINOIS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGES 18-19 (DECEMBER 12, 1966)

THE ROOF OF THE BUILDING WAS MADE A RESTRICTED AREA, AND AIR SAMPLERS ON THE ROOF HAVE NOT SHOWN ABOVE MPC YET. THE ABSOLUTE FILTER OF THE F-11 SYSTEM WAS REPLACED WITH A HALF-INCH, AND LATER, A ONE-INCH CHARCOAL FILTER. WHILE THE RELEASE LAST MAY WAS 38,000 TIMES THE MPC, TODAY THE SAME RELEASE WOULD ONLY BE 22 TIMES BECAUSE OF A FACTOR-OF-TWENTY BETTER FILTRATION AND A FACTOR OF 90 BY THE ZONING CHANGE.

*FISSION PRODUCT, IODINE + *SOURCE, CONTINUOUS + CHARCOAL + FILTER

14-13458 SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-640413 +. 138 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1964, IN FRENCH

THE 23 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

*TRITIUM + FISSION PRODUCT RELEASE, GENERAL

14-13460 EMELITY LA + CHRISTENSON, CW
OPERATIONAL PRACTICES IN THE TREATMENT OF LOW AND INTERMEDIATE LEVEL RADIOACTIVE WASTES--ARGONNE AND LOS ALAMOS LABORATORIES.
LOS ALAMOS SCIENTIFIC LAB. + ARGONNE NATIONAL LABORATORY
LA-DC-7249 + SM/71-24 + CONF-651202-3 +. 18 PAGES, FOR PRESENTATION AT SYMPOSIUM ON PRACTICES IN THE TREATMENT OF LOW AND INTERMEDIATE LEVEL RADIOACTIVE WASTE, VIENNA, 1965

SEVERAL FUNDAMENTAL DIFFERENCES EXIST BETWEEN WASTE DISPOSAL PRACTICES AT ARGONNE AND LOS ALAMOS, BUT THE BASIC CONCENTRATE-AND-CONTAIN POLICY IS IDENTICAL. THERE IS ALSO COMPLETE AGREEMENT BETWEEN THE LABORATORIES AS TO THE PRIMARY RESPONSIBILITY FOR PROTECTION OF OPERATING PERSONNEL AND THE PUBLIC IN PURSUING THE ESTABLISHED PRACTICES. ENVIRONMENTAL SURVEYS WITNESS THE FACT THAT PRECAUTIONARY ATTITUDES ARE SUCCESSFUL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*WASTE TREATMENT, LIQUID + ANL (ARGONNE NATIONAL LABORATORY) + LASL (LOS ALAMOS SCIENTIFIC LABORATORY) + SURVEY, RADIATION, ENVIRONMENTAL + WASTE DISPOSAL, GENERAL + WASTE MANAGEMENT

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13462 AMARANTOS A + HATZIKAKIDIS A
THE EVAPORATION OF RADIOACTIVE WASTES BY SOLAR ENERGY. REPORT NO. 1, PROGRESS REPORT
DEMOCRITUS NUCLEAR RESEARCH CENTER, ATHENS, GREECE
NP-15662 +. 18 PAGES, TABLES, 1964

FIELD EXPERIMENTS WITH A FLAT-PLATE COLLECTOR (BLACK-BODY PANELS) AS THE HEAT SOURCE FOR A SOLAR EVAPORATOR ARE DESCRIBED. FROM THE FIELD EXPERIMENTS CONCLUSIONS WERE MADE IN CONNECTION WITH THE CALCULATION AND DESIGN OF THE EVAPORATOR. REASONS ARE GIVEN FOR CHOOSING TO HEAT THE EVAPORATOR BY HEAT EXCHANGERS INSTEAD OF PASSING THE WASTES THROUGH THE SOLAR COLLECTORS. CALCULATIONS ON THE HEAT TRANSFER WERE BASED ON MAXIMUM VALUES OF RECEIVED SOLAR RADIATION. TWO EVAPORATING SYSTEMS ARE DESCRIBED, AND POWER AND EVAPORATING CAPACITY FOR EACH WERE DETERMINED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALE, WISC.

*EVAPORATION + *WASTE TREATMENT, LIQUID

14-13492 GIRDLER RM
HANDLING OF LOW AND MEDIUM LEVEL LIQUID WASTE AT SAVANNAH RIVER PLANT
E. I. DU PONT DE NEMOURS AND COMPANY, SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
DPSPU-65-30-30 + CONF-651202-1 +. 18 PAGES, SEPTEMBER 1965, PRESENTED AT SYMPOSIUM ON PRACTICES IN THE TREATMENT OF LOW AND INTERMEDIATE LEVEL RADIOACTIVE WASTE, VIENNA

DISCUSSES THE VARIOUS MEANS USED TO CONTROL THE RADIOACTIVITY IN LIQUID WASTES WHICH MAY REACH THE ENVIRONMENT BY WAY OF DRAINAGE TO THE SAVANNAH RIVER - SEEPAGE BASINS, DISTILLATION, ION EXCHANGE ON SYNTHETIC ZEOLITE, TANK STORAGE, AND AGING AND SETTLING. THE COST OF EACH METHOD IS GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, 22151, \$1.00 CY, \$0.50 MN

*RIVER, SAVANNAH + *SURFACE WATER, DISPOSAL MEDIA + ION EXCHANGE + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, RIVER + WASTE STORAGE + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, GENERAL

14-13499 BACKMAN GE
DISCUSSION OF RADIOACTIVE WASTE MANAGEMENT PRACTICES
GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-SA-3575 + CONF-708-1 +. 18 PAGES, JUNE 5, 1964, FROM LECTURE ON RADIOACTIVE WASTE MANAGEMENT PORTLAND, OREGON, JUNE 1964

THE MAIN CONSIDERATION IN RADIOACTIVE WASTE MANAGEMENT IS TO PREVENT UNDUE RADIATION EXPOSURE AS ECONOMICALLY AS POSSIBLE. THE TWO DISPOSAL CONCEPTS OF CONCENTRATION-CONTAINMENT AND DILUTION-DISPERSION ARE DISCUSSED FOR GASEOUS, LIQUID, AND SOLID WASTES, RESPECTIVELY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY

*WASTE MANAGEMENT + DILUTION + DISPERSION + POPULATION EXPOSURE + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, GENERAL

14-13500 ROHRMANN CA
THE FISSION PRODUCTS
GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-SA-3080(REV) + CONF-635-1 +. 17 PAGES, MAY 8, 1964, FROM AEC ATOMIC INDUSTRIAL FORUM, WASHINGTON, D.C., MAY 1964

RADIOISOTOPES AS POTENTIAL HEAT SOURCES ARE DISCUSSED BRIEFLY. OF THE USABLE RADIOISOTOPES, FOUR ARE FISSION PRODUCTS - CE-144, CS-137, PM-147, AND SR-90. THE SEPARATION OF THESE FISSION PRODUCTS FROM WASTES AT HANFORD IS DISCUSSED, AND THE RESULTS OF AN ENGINEERING STUDY OF THE ECONOMICS OF SUCH SEPARATION IN THE FUTURE ARE SUMMARIZED. THE PROCESSES FOR CARRYING OUT THE SEPARATION AND PURIFICATION ARE DESCRIBED. SEPARATION OF OTHER ISOTOPES FROM POWER REACTOR FUEL REPROCESSING IS ALSO CONSIDERED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.60 CY, \$0.80 MF

*RADIOCHEMICAL PROCESSING + *RADIOISOTOPE + *WASTE TREATMENT, LIQUID + CERIUM + CESIUM + PROMETHIUM + STRONTIUM

14-13505 REPORT ON THE PROBLEM OF THE POSSIBILITY OF THE UNDERGROUND DISPOSAL OF RADIOACTIVE WASTES
BUNDESANSTALT FUER BODENFORSCHUNG, HANOVER, WEST GERMANY
AEC-TR-6549 +. 77 PAGES, TRANSLATED FROM A REPORT OF THE BUNDESANSTALT FUER BODENFORSCHUNG, HANOVER, GERMANY, UNDATED.

STUDIES WERE CARRIED OUT ON THE POSSIBLE UNDERGROUND STORAGE OF LARGE AMOUNTS OF WASTES IN WEST GERMANY. BOTH AQUIFEROUS AND CAVERN DEPOSITS WERE CONSIDERED, AND VARIOUS POSSIBLE PLACES IN GERMANY ARE DISCUSSED. SALT DEPOSITS, MASSES, AND STRUCTURES ARE DESCRIBED IN SOME DETAIL.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$7.60 CY

*GERMANY + *WASTE DISPOSAL, TERRESTRIAL + GEOLOGICAL CONSIDERATION, GENERAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + HYDROLOGICAL CONSIDERATION, GENERAL + WASTE DISPOSAL, SALT

ACCESSION NUMBER 14-13462 TO 14-13505

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13520 MATHEWS ER
SYMPOSIUM ON PRACTICES IN THE TREATMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTES
DIVISION OF HEALTH, SAFETY, AND WASTE MANAGEMENT, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
4 PAGES, NUCLEAR SAFETY 8(1) PAGES 47-50 (FALL 1966)

A SYMPOSIUM ON PRACTICES IN THE TREATMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTES WAS HELD DECEMBER 6-10, 1965, AT INTERNATIONAL ATOMIC ENERGY AGENCY HEADQUARTERS, VIENNA, AUSTRIA. LIQUID-WASTE TREATMENT WAS REPORTED TO STILL CONSIST OF THE THREE BASIC PROCESSES - CHEMICAL TREATMENT, ION EXCHANGE, AND EVAPORATION. RECENT WORK HAS BEEN DIRECTED TOWARD MODIFYING AND IMPROVING THESE BASIC PROCESSES. INSOLUBILIZATION OF CONCENTRATES AND SOLID WASTES WITH BITUMEN HAS BEEN ACCEPTED AS A DESIRABLE PROCESS BY A NUMBER OF COUNTRIES, AND SEVERAL NEW PLANTS FOR THE UTILIZATION OF THIS PROCESS HAVE BEEN BUILT. HOWEVER, SOLIDIFICATION WITH CEMENT AND CEMENT-VERMICULITE STILL GIVES ADEQUATE CONTAINMENT FOR MANY LOCATIONS. INCINERATION UNITS HAVE BEEN INSTALLED AT A NUMBER OF ESTABLISHMENTS AND ARE NOW GIVING SATISFACTORY SERVICE. BALING OF COMPRESSIBLE SOLID WASTES IS ALSO RECEIVING INCREASED ATTENTION.

*WASTE TREATMENT, LIQUID + EVAPORATION + ION EXCHANGE + WASTE MANAGEMENT + WASTE TREATMENT, FIXATION

14-13538 AURAND K + ARNDT J + WOLTER R
BEHAVIOR OF RADIONUCLIDES IN SEWER SYSTEMS AND PURIFICATION PLANTS SUBSEQUENT TO DISCHARGE OF RADIOACTIVE WASTES WITH CONCENTRATIONS INCREASED OVER SHORT PERIODS
BUNDESGESUNDHEITSAMT, BERLIN
RMWF-FBK-66-04 +. 40 PAGES, APRIL 1966

THIS REPORT GIVES AN EVALUATION OF HAZARDS FOR SEWER WORKERS AND POPULATION CAUSED BY RADIOACTIVE SUBSTANCES IN SEWAGE. FOR SEWER WORKERS, THERE IS PRACTICALLY NO DANGER OF INCORPORATION. HAZARDS FOR SEWER WORKERS DUE TO EXTERNAL RADIATION EXPOSURE ARE ONLY POSSIBLE UNDER EXTREMELY HIGH ACTIVITIES, WHICH PRACTICALLY DO NOT OCCUR. THE POPULATION MAY INGEST RADIOACTIVE SUBSTANCES INTRODUCED INTO THE ENVIRONMENT BY WAY OF SEWAGE, EITHER THROUGH DRINKING WATER OR FOODSTUFFS. LIMITING OF CONCENTRATIONS IN SEWAGE ENSURES SAFE PROTECTION AGAINST HAZARDOUS INGESTION THROUGH DRINKING WATER. FOR FOODSTUFFS, LIMITING OF ACTIVITIES TO BE RELEASED MAY BE NECESSARY DUE TO POSSIBLE CONCENTRATIONS, PARTICULARLY OF LONG-LIFE RADIONUCLIDES. THE DILUTION OF RADIONUCLIDES TEMPORARILY ENTERED INTO SEWAGE, WAS STUDIED EXPERIMENTALLY IN LOW-CAPACITY PURIFICATION PLANTS OF DIFFERENT DESIGN ACCORDING TO DIN 4261.

AVAILABILITY - MICROCARD EDITIONS INC., ACCOUNTING AND SHIPPING DEPT., W. SALEM, WISCONSIN 54669

*POPULATION EXPOSURE + PERSONNEL EXPOSURE, RADIATION + WASTE DISPOSAL, LIQUID

14-13549 FEELY HW + KATZMAN D + RISCAYE PE + PANACCIONE JB + FRENCH ER
FLIGHT DATA AND RESULTS OF RADIOCHEMICAL ANALYSES OF FILTER SAMPLES COLLECTED DURING 1965. THE THIRTEENTH PROGRESS REPORT ON PROJECT STARDUST
ISOTOPES, INC., WESTWOOD, NEW JERSEY
HASL-176 +. 88 PAGES, MAY 1, 1966

THIS IS THE FOURTH OF A SERIES OF REPORTS OF FLIGHT DATA AND OF RESULTS OF RADIOCHEMICAL ANALYSES OF STRATOSPHERIC AND TROPOSPHERIC AIR FILTER SAMPLES COLLECTED DURING PROJECT STARDUST. THE FIRST THREE REPORTS IN THIS SERIES CONTAINED DATA FOR SAMPLES COLLECTED DURING THE FIRST THREE AND ONE HALF YEARS OF THE PROJECT, JUNE 1961 TO DECEMBER 1964. THEY WERE PUBLISHED AS REPORTS HASL-153, HASL-168 AND HASL-169 BY THE HEALTH AND SAFETY LABORATORY OF THE USAEC. THE PRESENT REPORT CONTAINS FLIGHT DATA AND RESULTS OF RADIOCHEMICAL ANALYSIS OF AIR FILTER SAMPLES COLLECTED DURING JAN. TO DEC. 1965.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., 22151, \$3.00 CY, \$0.75 MN

*AIRBORNE RELEASE + *FALLOUT + *SAMPLING, HIGH ALTITUDE + *STRATOSPHERE + *TROPOSPHERE +
ATMOSPHERIC CHEMISTRY + ATMOSPHERIC POLLUTION

14-13550 WINSCHKE WE + DAVIS MW
INSOLUBILIZATION OF FISSION PRODUCTS
CANADIAN PAT. 720,046 +. 20 PAGES, 5 TABLES, OCTOBER 1965

THE INVENTION RELATES TO NUCLEAR REACTOR WASTE DISPOSAL (MORE PARTICULARLY TO THE DEHYDRATION, INSOLUBILIZATION AND SOLIDIFICATION OF AQUEOUS NUCLEAR REACTOR WASTE SOLUTIONS CONTAINING LONG-LIVED RADIOISOTOPES IN SUCH A WAY AS TO MAKE THE RESULTING SOLIDS SUITABLE FOR STORAGE FOR AN INDEFINITE PERIOD) AND TO A NOVEL APPARATUS FOR CARRYING IT OUT. IN ACCORDANCE WITH THE PRESENT INVENTION, FISSION-PRODUCT SPECIES, ESPECIALLY THOSE PRESENT IN AQUEOUS SOLUTION AND SLURRY FORMS, ARE INSOLUBILIZED BY INCORPORATING THE SAME IN A MENSTRUUM OF MOLTEN SULFUR, THEREBY PROMOTING DEHYDRATION AND PROGRESSIVE CONVERSION OF THE SPECIES TO SUBSTANTIALLY INSOLUBLE FORMS, AND THEREAFTER COOLING THE MENSTRUUM TO SOLIDIFY SAME, THEREBY ENCAPSULATING THE RESULTING SPECIES WITHIN A SOLID WATER-REPELLENT MATRIX WHICH IS VIRTUALLY IMMUNE TO DEGRADATION BY THE RADIATION OF THE SPECIES.

AVAILABILITY - PHOTOCOPIES MAY BE OBTAINED FROM THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C. (30 CENTS PER PAGE)

*SULFUR + *WASTE DISPOSAL, SOLID + *WASTE STORAGE + *WASTE TREATMENT, GENERAL + WASTE TREATMENT, LIQUID +
WASTE TREATMENT, SOLID

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13566 STINCHCOMBE RA + COLOSMITH P
REMOVAL OF IODINE FROM THE ATMOSPHERE BY CONDENSING STEAM
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL
15 PAGES, 6 FIGURES, 3 TABLES, 14 REFERENCES, OCTOBER 22, 1965, JOURNAL OF NUCLEAR ENERGY PARTS A/B 20(4),
PAGES 261-275, (1966)

SOME EXPERIMENTS HAVE BEEN CARRIED OUT ON THE REMOVAL OF IODINE AT LOW CONCENTRATIONS (LESS THAN 1 MICROGRAM PER CUBIC METER) FROM AIR BY CONDENSING STEAM FROM A MIXTURE OF STEAM AND THE AIR IN A 2 IN. DIAMETER WATER-COOLED TUBE. THE RESULTS INDICATED THAT WITH AN AIR FLOW OF 10 LITERS/MIN STEAM CONDENSING AT A RATE OF 3-5 G/MIN, COULD EFFECT THE REMOVAL OF ABOUT 97% OF THE ELEMENTAL IODINE, 50% OR LESS OF GASEOUS IODINE COMPOUNDS, AND ABOUT 95 TO 99% OF IODINE ATTACHED TO PARTICULATE MATERIAL.

*AIR + *CONDENSATION + *IODINE + DECONTAMINATION + PARTICULATE + SAMPLING

14-13567 DE LAGUNA W
DISPOSAL OF RADIOACTIVE WASTES BY HYDRAULIC FRACTURING. PART I. GENERAL CONCEPT AND FIRST FIELD EXPERIMENTS
OAK RIDGE NATIONAL LABORATORY
19 PAGES, 15 FIGURES, 8 REFERENCES, DECEMBER 28, 1965, NUCLEAR ENGINEERING AND DESIGN 3(2) PAGES 338-352,
(FEBRUARY/MARCH 1966)

THE FEASIBILITY OF RADIOACTIVE WASTE DISPOSAL BY HYDRAULIC FRACTURING HAS BEEN DEMONSTRATED AT OAK RIDGE NATIONAL LABORATORY. THIS DISPOSAL METHOD IS AN ADAPTATION OF HYDRAULIC FRACTURING TECHNIQUES USED IN THE PETROLEUM INDUSTRY AND IS AIMED AT REPLACING CURRENT METHODS OF SHALLOW GROUND DISPOSAL. A NUMBER OF PROBLEMS HAD TO BE SOLVED IN THE DEVELOPMENT OF THIS METHOD. FIRST, IT HAD TO BE SHOWN THAT THE FRACTURES FORMED IN SHALES AT OAK RIDGE WOULD FOLLOW THE BEDDING PLANES AND NOT BREAK UP VERTICALLY TOWARD THE SURFACE. THIS HAS BEEN DONE, AS IS DESCRIBED IN THIS PAPER.

*WASTE DISPOSAL, HYDRAULIC FRACTURING + EXPERIMENT, GENERAL + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY

14-13574 PUBLIC HEALTH ENGINEERING ABSTRACTS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
40 PAGES, PUBLIC HEALTH ENGINEERING ABSTRACTS 46(2-3), PAGES 41-80, (MARCH 1966)

PUBLIC HEALTH SERVICE REPORT, FEB.-MARCH 1966. THIS ONE REPRESENTS A MONTHLY REVIEW OF MORE THAN 800 DOMESTIC AND FOREIGN JOURNALS OF SCIENCE AND ENGINEERING, REPORTS OF STATE AND FEDERAL GOVERNMENTS, AND REPORTS AND PROCEEDINGS OF SCIENTIFIC RESEARCH GROUPS. TOPICS COVERED IN THIS REPORT ARE - (1) ATMOSPHERIC POLLUTION, (2) GARBAGE AND OTHER REFUSE, (3) INSECTS AND INSECT-BORNE DISEASES, (4) MILK AND OTHER FOODS, (5) OCCUPATIONAL HEALTH, (6) PUBLIC-HEALTH PRACTICE, (7) RADIOLOGICAL HEALTH AND SAFETY, (8) SEWERAGE, INDUSTRIAL WASTES, AND WATER POLLUTION, AND (9) WATER SUPPLIES AND PLUMBING.

*BIBLIOGRAPHY + AIR POLLUTION + ATMOSPHERIC POLLUTION + BIOLOGICAL CONCENTRATION, MILK + RADIATION SAFETY AND CONTROL + WASTE DISPOSAL, GENERAL + WATER POLLUTION + WATER, DRINKING

14-13596 PENSKO J
DOSIMETRY OF ENVIRONMENTAL GAMMA-RADIATION IN POLAND BY MEANS OF GAMMA-RAY SPECTRA IN THE FIELD
CENTRAINE LABORATORIUM OCHRONY RADIOLOGICZNEJ, WARSAW, POLAND
CLOR-48/D +. 27 PAGES, 1966

THE DIRECT MEASUREMENTS OF THE GAMMA-RAY BACKGROUND EXPOSURE RATE WAS CARRIED OUT UP TO DATE BY MEANS OF IONIZATION CHAMBERS OR GEIGER-MULLER COUNTERS. THESE METHODS ARE VERY SENSITIVE AND ACCURATE BUT DO NOT ALLOW TO SEPARATE NATURAL GAMMA BACKGROUND FROM THE FALLOUT COMPONENTS. THE EXPOSURE RATE CAUSED BY FALLOUT WAS USUALLY DETERMINED BY THE CONCENTRATION MEASUREMENTS OF THE MORE IMPORTANT FISSION PRODUCTS IN THE SOIL OR PLANTS. IN THIS PAPER, SOME OF OUR EXPERIENCES WITH THE SPECTROMETRIC METHOD ARE PRESENTED WHICH MAKE IT POSSIBLE FOR DIRECT EVALUATION OF DOSE-RATES FROM THE MAIN GAMMA EMITTERS OF BACKGROUND RADIATION IN POLAND. SOME RESULTS OBTAINED WERE COMPARED WITH THE EXPOSURE RATE COMPUTATION AFTER THE ESTIMATION OF POTASSIUM, URANIUM AND THORIUM CONCENTRATION IN THE SOIL SAMPLES. THE 1962-1965 RESULTS OF ENVIRONMENTAL DOSE RATE MEASUREMENTS OF MORE IMPORTANT GAMMA EMITTERS (NATURAL AND FISSION PRODUCTS) FOR 20 PLACES IN POLAND WERE PRESENTED AND DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151

*DOSE MEASUREMENT, EXTERNAL + *DOSIMETRY, GENERAL + *MONITOR, RADIATION, BACKGROUND + *SURVEY, RADIATION, ENVIRONMENTAL + GAMMA + POLAND + POTASSIUM + SOIL, NUCLIDE OCCURRENCE + THORIUM + URANIUM

14-13597 PENSKO J
NATURAL AND ARTIFICIAL (FROM NUCLEAR EXPLOSIONS) GAMMA BACKGROUND RADIATION IN POLAND - DOSES RECEIVED BY THE POPULATION
CENTRAINE LABORATORIUM UCHRONY RADIOLOGICZNEJ, WARSAW, POLAND
CLUR-49/D +. 38 PAGES, 1966

THE RESULTS OF THE ENVIRONMENTAL DOSE RATE MEASUREMENTS OF MORE IMPORTANT GAMMA EMITTERS (NATURAL AND FISSION PRODUCTS) FOR 20 PLACES IN POLAND ARE PRESENTED AND DISCUSSED. MAINLY THE SPECTROMETRIC METHOD WAS USED, AND SOME MEASUREMENTS WERE DONE BY MEANS OF THE HIGH-PRESSURE IONIZATION CHAMBER. THE FISSION PRODUCTS FROM NUCLEAR EXPLOSIONS CONSIDERABLY

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13597 *CONTINUED*

CHANGED THE NATURAL GAMMA-RAY BACKGROUND IN POLAND ESPECIALLY IN SUMMER 1963. THE PHOTOPEAK OF MN-54 WHICH CORRESPONDS TO THE ENERGY OF 0.840 MEV WAS OBSERVED IN THE SPECTROGRAMS OBTAINED IN 1964.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 COPY

*DOSE MEASUREMENT, EXTERNAL + *SURVEY, RADIATION, ENVIRONMENTAL + ANALYTICAL TECHNIQUE, GENERAL + FALLOUT + GAMMA + MONITOR, RADIATION, BACKGROUND + NUCLEAR EXPLOSION DEBRIS + POLAND

14-13601 LEISTNER L

INVESTIGATION ON RADIOACTIVE CONTAMINATION OF FOODSTUFFS STEMMING FROM ANIMALS
EUROPEAN ATOMIC ENERGY COMMUNITY, COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
EUR-2287.D +. 60 PAGES, JANUARY 4, 1965

DATA RELATING TO THE TRANSFER OF THE MOST IMPORTANT RADIONUCLIDES FROM THE ENVIRONMENT THROUGH ANIMAL PRODUCTS TO MAN ARE PRESENTED. AS THESE ARE NOT DIRECTLY UTILIZED FOR THE COUNTRIES OF THE EUROPEAN COMMUNITY, FURTHER STUDIES ARE PROPOSED ON THE CHANGING ECOLOGICAL CONDITIONS.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, MAN + ECOLOGICAL CONSIDERATION + EURATOM + FALLOUT

14-13602 GARNIER A

EVALUATION AS A FUNCTION OF AGE OF THE EFFECTIVE ENERGY ABSORBED IN ANY GRAM OF ORGANS OTHER THAN THE GASTROINTESTINAL TRACT BY THE PRINCIPAL RADIONUCLIDES WHICH COULD EVENTUALLY CONTAMINATE THE FOOD AND THE ENVIRONMENT
COMMISSARIAT A L'ENERGIE ATOMIQUE, FORTENAY-AUX-ROSES, FRANCE. CENTRE ETUDES NUCLEAIRES
EUR-2425.F + CEA-R-2809 +. 95 PAGES, JUNE 1965, IN FRENCH

TO EVALUATE INTERNAL RADIATION DOSES FROM INGESTED FISSION PRODUCTS, IT IS NECESSARY TO KNOW THE EFFECTIVE ENERGY DISSIPATED IN ANY GRAM OF THE ORGAN OF REFERENCE, WHICH DEPENDS, FOR ANY RADIONUCLIDE, ON THE PHYSICAL ENERGY ABSORBED IN THE BODY ORGAN, ON THE RELATIVE BIOLOGICAL EFFECTIVENESS (RBE), ON THE RELATIVE DAMAGE FACTOR AND ON THE MASS OF THE ORGAN. THIS EFFECTIVE ENERGY MAY BE EVALUATED AS A FUNCTION OF THE SIZE AND OF THE MASS OF THE ORGANS FROM BIRTH TO ADULT AGE. THIS WORK IS DONE FOR THE PRINCIPAL RADIONUCLIDES THAT COULD EVENTUALLY CONTAMINATE THE FOOD AND THE ENVIRONMENT.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, MAN + *BIOMEDICAL + *DOSE MEASUREMENT, INTERNAL + DOSE + EURATOM + INGESTION

14-13603 RADIOACTIVE CONTAMINATION OF FOODSTUFFS IN THE COUNTRIES OF THE COMMUNITY IN 1963

EUROPEAN ATOMIC ENERGY COMMUNITY
EUR-2460.D,F,I,N +. 67 PAGES, 1965, IN GERMAN, FRENCH, ITALIAN, AND DUTCH

FOOD CONTAMINATION WITH SR-89, AND SR-90, AND CS-137 WAS MEASURED IN EURATOM COUNTRIES DURING 1963. RADIATION DOSES TO THE POPULATION RESULTING FROM MILK CONTAMINATED BY SR-89 AND SR-90 AND DIETARY CONTAMINATION BY SR-90 WERE ESTIMATED. THE PATTERN OF CONTAMINATION IS ILLUSTRATED BY TABLES AND GRAPHS. AVERAGE CONTAMINATION WAS CALCULATED AND COMPARED WITH THAT IN THE UNITED STATES, CANADA, AND THE UNITED KINGDOM AND WITH MILK DATA FOR 1962 IN THE EURATOM COUNTRIES.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CESIUM + CONTAMINATION + DOSE + DOSE CALCULATION, INTERNAL + EURATOM + FALLOUT + STRONTIUM

14-13604 NELSON RW

A SEQUENCE FOR PREDICTING WASTE TRANSPORT BY GROUND WATER
BATTELLE NORTHWEST

8 PAGES, 11 REFERENCES, PAGES 80-87 OF PROCEEDINGS OF AMERICAN WATER RESOURCES ASSOCIATION, SERIES NO. 1, FIRST ANNUAL MEETING, CENTER FOR CONTINUING EDUCATION, UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS, DECEMBER 1-3, 1965

AN ANALYSIS SEQUENCE IS PRESENTED TO ENABLE RATIONAL PREDICTIONS OF CONTAMINANT CONCENTRATIONS ENTERING STREAMS, RIVERS, OR OTHER POTABLE WATERS TRAVERSING THE REGION OF STUDY BY GROUND-WATER TRANSPORT. THE PURPOSES ARE TO GIVE AN OVERALL DESCRIPTION OF THE SEQUENCE, BRIEFLY DESCRIBE THE METHODS DEVELOPED, AND INDICATE THE COMPUTER PROGRAMS AVAILABLE TO ASSIST IN THE ANALYSIS.

AVAILABILITY - AMERICAN WATER RESOURCES ASSOCIATION P. O. BOX 434, URBANA, ILLINOIS, 61801, \$6.00 COPY (FOR NON-MEMBERS)

*HYDROLOGICAL CONSIDERATION, GENERAL + GROUND WATER, GENERAL + GROUND WATER, PROPERTY + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, PROPERTY + SURFACE WATER, SEDIMENT

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13605 RADIOACTIVE WASTE DISPOSAL INTO THE GROUND
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-SS-15 + STI/PUB/103 +. 111 PAGES, 28 FIGURES, 106 REFERENCES, 1965, SAFETY SERIES NO. 15

THIS PUBLICATION PRESENTS THE RESULTS OF A PANEL REVIEW OF TERRESTRIAL DISPOSAL OF RADIOACTIVE WASTES THAT WAS SPONSORED BY THE IAEA IN 1962. MOST OF THE INFORMATION PRESENTED WAS OBTAINED FROM NUCLEAR ESTABLISHMENTS THAT PRACTICE GROUND DISPOSAL ON AN OPERATIONAL SCALE. MOST OF THE EMPHASIS IS DEVOTED TO LOW AND INTERMEDIATE LEVEL WASTES. ITEMS DISCUSSED INCLUDE GEOLOGY, HYDROLOGY, MINERAL EXCHANGE, SITE EVALUATION, MONITORING REQUIREMENTS, AND RADIONUCLIDE MOVEMENT THROUGH THE GROUND.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, 16, N.Y.

*WASTE DISPOSAL, TERRESTRIAL + DILUTION + DISPERSION + GEOLOGICAL CONSIDERATION, GENERAL + HYDROLOGICAL CONSIDERATION, QUALITY OF WATER + HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + MINERAL EXCHANGE + MONITOR, RADIATION, ENVIRONMENTAL + SOIL, RADIONUCLIDE MOVEMENT THROUGH + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID

14-13645 BATTLE J
CALCULATING ERD DURING A PROLONGED EXPOSURE IN A FALLOUT ENVIRONMENT
RESEARCH TRIANGLE INSTITUTE
NP-14774 +. 19 PAGES, REFERENCES, JUNE 8, 1964

THE EQUIVALENT-RESIDUAL-DOSE (ERD) CONCEPT PROPOSED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION PERMITS A MORE RELIABLE PREDICTION OF THE MEDICAL EFFECTS OF NUCLEAR RADIATION EXPOSURE DURING EMERGENCIES. THIS STUDY DESCRIBES A SIMPLE COMPUTER TOOL FOR CALCULATING ERD UNDER A VARIETY OF FALLOUT CONDITIONS, LEVELS OF PROTECTION, AND TIME-VARYING EXPOSURE PATTERNS. SEVERAL APPLICATIONS OF THE TOOL ARE PRESENTED. ONE IS THE DETERMINATION OF TIME SAVED IN THE RECOVERY OF ACTIVITIES AS A FUNCTION OF DECONTAMINATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA.

*CIVIL DEFENSE + *DOSE + *RADIATION EFFECT + BIOMEDICAL + COMPUTER PROGRAM + DECONTAMINATION + DOSE CALCULATION, EXTERNAL + FALLOUT + RADIATION PROTECTION, ORGANIZATION + RADIATION SAFETY AND CONTROL

14-13649 KAUL A + NAY U + RAJEWSKY B + STAHLHOFEN W + UNNEWEHR F
DISTRIBUTION OF CAESIUM-137 IN THE HUMAN ORGANISM AND IN THE HUMAN FOETUS
MAX PLANCK-INSTITUT FUR BIOPHYSIK, FRANKFURT AM MAIN
3 PAGES, 3 FIGURES, 2 TABLES, 14 REFERENCES, NATURE VOL. 209, (5030) PAGES 1310-12 (MARCH 26, 1966)

BECAUSE OF THE DIFFERENT RESULTS PUBLISHED BY SEVERAL AUTHORS CONCERNING THE ACTIVITY RATIO OF CAESIUM-137 IN SOFT TISSUE TO THAT IN BONE, THE CAESIUM-137 ACTIVITY AS A FUNCTION OF AGE AND THE BEHAVIOUR OF THE PLACENTA FOR CAESIUM, WE MEASURED THE DISTRIBUTION OF CAESIUM-137 WITHIN THE HUMAN AND ANIMAL ORGANISM. WE ALSO DETERMINED THE CAESIUM-137 ACTIVITY OF SAMPLES OF HUMAN BONE AND TISSUE FOR DIFFERENT AGE GROUPS. IN ORDER TO DISCOVER WHETHER OR NOT THE PLACENTA IS A BARRIER FOR CAESIUM WE ANALYSED FOETAL, PLACENTAL AND SOFT TISSUE OF ADULTS. THE PARAMETERS TO WHICH THE CONTENT OF CAESIUM-137 IS RELATED ARE FRESH WEIGHT AND CONTENT OF POTASSIUM, SINCE CAESIUM IS KNOWN TO FOLLOW TO A CERTAIN EXTENT THE METABOLIC PATHWAY OF ITS PERIODIC RELATIVE, POTASSIUM.

*BIOLOGICAL CONCENTRATION, MAN + *CESIUM + *DOSIMETRY, GENERAL + ACCIDENT, RADIOISOTOPE

14-13650 PETERSEN OF + LANGHAM WH
NEUTRON ACTIVATION OF SULFUR IN HAIR. APPLICATION IN A NUCLEAR ACCIDENT DOSIMETRY STUDY
LOS ALAMOS SCIENTIFIC LABORATORY
4 PAGES, 2 TABLES, 17 REFERENCES, HEALTH PHYSICS VOL. 12(3) PAGES 381-384, (MARCH 1966)

INCIDENT FAST NEUTRON DOSES SUSTAINED BY PERSONNEL INVOLVED IN THE WOOD RIVER JUNCTION, UNITED NUCLEAR CORPORATION CRITICALITY ACCIDENT OF 24 JULY 1964, HAVE BEEN ESTIMATED FROM INDUCED P-32 ACTIVITY IN HAIR SULFUR. FAST NEUTRON DOSES TO THE HEAD AND PUBIS OF THE FATALLY INJURED VICTIM WERE 1200 AND 4800 RAD RESPECTIVELY, CORRESPONDING TO TOTAL GAMMA PLUS NEUTRON DOSE ESTIMATED OF APPROXIMATELY 11,000 AND 48,000 RAD. IDENTIFICATION OF P-32 IN HAIR SAMPLES FROM TWO INDIVIDUALS WHO ENTERED THE AREA LATER CONFIRMED THE NOTION THAT THE SYSTEM EITHER REMAINED CRITICAL OR THAT A SECOND EXCURSION OCCURRED. COMPARISON WITH THE LOS ALAMOS FATALITY OF 1958 INDICATED THAT, ALTHOUGH DOSES TO THE PELVIS DIFFERED BY A FACTOR OF 40 AND THE AVERAGE TOTAL BODY DOSE MAY HAVE DIFFERED BY ABOUT A FACTOR OF 3, DOSES TO THE HEAD MAY HAVE BEEN ESSENTIALLY THE SAME (APPROXIMATELY 10,000 RAD). SIMILARITIES IN CLINICAL COURSE AND SURVIVAL OF THE TWO CASES MAY REFLECT THE DEBILITATION FROM MASSIVE RADIATION EXPOSURE MAY BE MORE DEPENDENT ON DOSE TO THE HEAD AND THORAX THAN ON AVERAGE TOTAL BODY DOSE.

*ACCIDENT, RADIOISOTOPE + *ACTIVATION + *BIOLOGICAL CONCENTRATION, MAN + *DOSIMETRY, GENERAL + ACTIVATION PRODUCT + INCIDENT, FATALITY + PHOSPHORUS + SULFUR

14-13655 CERRE P + MESTRE E + BARRAL S + LEBRUN P
NEW DEVICE FOR PROCESSING SOLID WASTE AT THE SACLAY NUCLEAR RESEARCH CENTER
CENTRE D'ETUDES NUCLEAIRES DE SACLAY
10 PAGES, BULLETIN D'INFORMATIONS SCIENTIFIQUES ET TECHNIQUES NO. 99, PAGES 73-82, (DECEMBER 1965)

THE SERVICES THAT PRODUCE RADIOACTIVE WASTE NEARLY ALWAYS USE DRUMS FOR ITS STORAGE AND TRANSPORTATION TO THE PROCESSING INSTALLATION. THE LARGE NUMBER OF DRUMS CONTAINING METALS,

ACCESSION NUMBER 14-13605 TO 14-13655

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13655 *CONTINUED*

SCREENINGS, AND MATERIALS CONTAMINATED BY FISSION PRODUCTS COMING MAINLY FROM THE DISMANTLING OF THE FONTENAY-AUX-ROSES PLUTONIUM PLANT LED US TO DEVELOP A PRESS CAPABLE OF COMPRESSING THE DRUM AND ITS CONTENTS. THE ARTICLE DESCRIBES THIS INSTALLATION WHICH MAKES IT POSSIBLE TO OBTAIN A LARGE REDUCTION FACTOR AND TO REDUCE CONSIDERABLY THE COST OF PROCESSING SOLID WASTE.

*FRANCE + *WASTE TREATMENT, SOLID + WASTE TREATMENT, ECONOMICS

14-13656 BONNER NA + MISKEL JA
RADIOACTIVITY. DISTRIBUTION FROM CRATERING IN BASALT
LAWRENCE RADIATION LAB., LIVERMORE, CALIFORNIA
4 PAGES, SCIENCE, VOL. 150, PAGES 489-492, (OCTOBER 22, 1965)

SAMPLES OF AIRBORNE AND GROUND-DEPOSITED DEBRIS PRODUCED BY AN EXPERIMENT IN NUCLEAR EXCAVATION WERE ANALYZED TO DETERMINE THE FATE OF VARIOUS RADIOACTIVE NUCLIDES. A FEW TENTHS PERCENT OF THE NONVOLATILE SPECIES AND 10 TO 20 PERCENT OF THE VOLATILE SPECIES ESCAPED BEYOND THE IMMEDIATE VICINITY OF THE CRATER.

*NUCLEAR EXPLOSION DEBRIS + EXCAVATION, NUCLEAR + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + SOIL, NUCLIDE OCCURRENCE

14-13657 HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 13, 1966
OAK RIDGE NATIONAL LABORATORY
ORNL-4007 +. 300 PAGES, FIGURES, TABLES, OCTOBER 1966

RECENT DATA AND FINDINGS ARE SUMMARIZED IN THE AREAS OF (1) WASTE DISPOSAL, (2) RADIATION ECOLOGY, (3) RADIATION PHYSICS, (4) RADIATION DOSIMETRY, (5) INTERNAL DOSIMETRY, AND (6) HEALTH PHYSICS TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$7.00 CY, \$1.50 MN.

*WASTE DISPOSAL, TERRESTRIAL + AEROSOL + AMERICIUM + BIOLOGICAL CONCENTRATION, GENERAL + CERIUM + CESIUM + DOSE CALCULATION, INTERNAL + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, GENERAL + ECOLOGICAL CONSIDERATION + HAZARDS ANALYSIS + HEALTH PHYSICS TRAINING + KRYPTON + MINERAL EXCHANGE + PLUTONIUM + POPULATION EXPOSURE + RADIATION EFFECT + RADIATION SAFETY AND CONTROL + RIVER, CLINCH + RUTHENIUM + STRONTIUM + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, SALT

14-13658 HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1965
OAK RIDGE NATIONAL LABORATORY
ORNL-3849 +. 225 PAGES, FIGURES, TABLES, OCTOBER 1965

RECENT DATA AND FINDINGS ARE SUMMARIZED IN THE AREAS OF (1) WASTE DISPOSAL, (2) RADIATION ECOLOGY, (3) RADIATION PHYSICS, (4) RADIATION DOSIMETRY (5) INTERNAL DOSIMETRY, AND (6) HEALTH PHYSICS TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 CY

*WASTE DISPOSAL, TERRESTRIAL + AEROSOL + AMERICIUM + BIOLOGICAL CONCENTRATION, GENERAL + CESIUM + CURIUM + DOSE CALCULATION, INTERNAL + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, GENERAL + ECOLOGICAL CONSIDERATION + HAZARDS ANALYSIS + HEALTH PHYSICS TRAINING + KRYPTON + MINERAL EXCHANGE + PLUTONIUM + POPULATION EXPOSURE + RADIATION EFFECT + RADIATION SAFETY AND CONTROL + RIVER, CLINCH + RUTHENIUM + STRONTIUM + TRITIUM + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, SALT

14-13659 QUARTERLY PROGRESS REPORT RESEARCH AND DEVELOPMENT ACTIVITIES FIXATION OF RADIOACTIVE RESIDUES. JANUARY-MARCH, 1965
PACIFIC NORTHWEST LABORATORY, RICHLAND
BNWL-76 +. 44 PAGES, 15 FIGURES, APRIL 1965

THIS REPORT DISCUSSES THE MOST RECENT DEVELOPMENTS IN SOLIDIFICATION AND FIXATION OF RADIOACTIVE WASTES AT BNWL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY

*WASTE TREATMENT, FIXATION + CALCINATION + HEAT TRANSFER + WASTE STORAGE + WASTE TRANSPORTATION

14-13661 KNOWN METHODS CAN COPE WITH ATOMIC WASTES
3 PAGES, CHEMICAL AND ENGINEERING NEWS 44(9) PAGES 46-48 (FEBRUARY 28, 1966)

THIS ARTICLE IS A DESCRIPTION OF WASTE TREATMENT PROCESSES FOR DEALING WITH HIGH-LEVEL WASTES. IT IS WRITTEN FOR AN AUDIENCE WITH A SCIENTIFIC BACKGROUND BUT WITH NO SPECIAL INTERESTS IN RADIOACTIVE WASTE TREATMENT.

*WASTE MANAGEMENT + FUEL REPROCESSING + GLASS + WASTE DISPOSAL, SALT + WASTE HANDLING + WASTE STORAGE + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, FIXATION

ACCESSION NUMBER 14-13655 TO 14-13661

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13711 TREATMENT OF LIQUID WASTES BY FOAM SEPARATION AND FREEZE DRYING
OAK RIDGE NATIONAL LABORATORY + BROOKHAVEN NATIONAL LABORATORY
13 PAGES, 9 FIGURES, 3 TABLES, 44 REFERENCES, REACTOR FUEL PROCESSING 8(2) PAGES 111-123 (SPRING 1965)

THE MOST RECENT PROGRESS IS SUMMARIZED IN THE FIELD OF RADIOACTIVE WASTE TREATMENT AND DISPOSAL. THIS ISSUE DISCUSSES FOAM SEPARATION, FREEZE DRYING, CALCINATION, CONVERSION TO GLASS, FISSION PRODUCT RECOVERY, DISPOSAL BY HYDRAULIC FRACTURING, AND DISPOSAL IN SALT.

*WASTE TREATMENT, FIXATION + *WASTE TREATMENT, LIQUID + CALCINATION + CERIUM + CESIUM + FISSION PRODUCT, SEPARATION FROM WASTE + FOAM + GLASS + PROMETHIUM + STRONTIUM + TECHNETIUM + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, SALT

14-13725 BERGHOUT CF + DAUER M + LANARD FW + MINX RP + SENOSKI WE + WARD UT
RADIOACTIVE WASTE MATERIAL INCINERATOR
U.S. PAT. 3,218,997 +. 5 PAGES, 3 FIGURES, NOVEMBER 23, 1965

THE INVENTION DESCRIBES AN INCINERATOR FOR USE IN DISPOSING OF COMBUSTIBLE RADIOACTIVE MATERIALS. SPECIAL FEATURES ARE INCORPORATED TO MINIMIZE RADIATION EXPOSURE TO OPERATING PERSONNEL AND TO PREVENT RELEASE OF HAZARDOUS AMOUNTS OF RADIOACTIVITY TO THE ENVIRONMENT.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D. C. (\$.25 PER COPY)

*INCINERATION + *WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, SOLID

14-13764 BOEGLY WJ + PARKER FL + STRUXNESS EG
DISPOSAL OF RADIOACTIVE WASTES IN GEOLOGIC FORMATIONS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
IRPA-92 +. 10 PAGES, 11 FIGURES, 21 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

THE ULTIMATE DISPOSAL OF RADIOACTIVE WASTES INTO GEOLOGIC FORMATIONS HAS RECEIVED INCREASING ATTENTION DURING THE PAST 10 YEARS. DUE TO THE VARYING HEAT-GENERATION RATES OF THE DIFFERENT CATEGORIES OF WASTES AND THE ALLOWABLE COSTS, NO SINGLE FORMATION IS CAPABLE OF HANDLING THE ENTIRE SPECTRUM OF WASTES PRODUCED. THEREFORE, THREE DIFFERENT METHODS OF DISPOSAL HAVE BEEN INVESTIGATED TO HANDLE THE HIGH-, INTERMEDIATE-, AND LOW-LEVEL WASTES GENERATED. HIGH-LEVEL, SMALL-VOLUME WASTES WOULD BE CONVERTED TO SOLIDS AND STORED IN A DRY IMPERMEABLE UNDERGROUND FORMATION SUCH AS SALT - INTERMEDIATE-VOLUME WASTES WOULD BE SLURRIED WITH CEMENT AND ADDITIVES AND INJECTED INTO SLIGHTLY PERMEABLE FORMATIONS USING THE HYDROFRACTURING TECHNIQUE - AND LOW-LEVEL, LARGE-VOLUME WASTES WOULD BE INJECTED INTO DEEP POROUS FORMATIONS. THE ENGINEERING-SCALE DEMONSTRATION OF HYDROFRACTURING HAS BEEN COMPLETED, AND A DEMONSTRATION OF THE DISPOSAL OF RADIOACTIVE SOLIDS IN A SALT MINE IS UNDERWAY.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*GEOLOGICAL CONSIDERATION, GENERAL + *WASTE DISPOSAL, TERRESTRIAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SALT + WASTE DISPOSAL, SOLID

14-13765 NISHIWAKI Y + HONDA Y + KAWAI H + HARADA T + KIMURA Y + MORISHIMA H + KOGA T
STUDIES ON THE RELEASE OF RADIOACTIVITIES FROM THE ION EXCHANGE RESINS INTO THE SEA WATER
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE
IRPA-91 +. 57 PAGES, 18 FIGURES, 5 TABLES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

TO ESTIMATE THE RELEASE OF RADIOACTIVITY FROM ION EXCHANGE RESINS INTO SEAWATER, WE HAVE CONDUCTED A SERIES OF EXPERIMENTS IN A WATER BATH CONTAINING NATURAL SEAWATER USING SUCH RADIOACTIVE NUCLIDES AS CR-51, FE-55, CO-60, SR-89 AND FISSION PRODUCTS, BY CHANGING THE WEIGHT RATIO OF THE ION EXCHANGE RESIN TO THE SEAWATER AND THE AMOUNT OF NUCLIDE INITIALLY ABSORBED ON THE ION EXCHANGE RESIN UNDER STATIC AND TURBULENT CONDITIONS. THE RESULTS ARE SUMMARIZED AS FOLLOWS - (1) THE RADIOACTIVITY WAS RAPIDLY RELEASED FROM THE ION EXCHANGE RESIN PARTICLES (DOWEX 50 AND DOWEX 1, 50-100 MESH) ON CONTACT WITH THE SEAWATER. HOWEVER, SOME DIFFERENCES WERE OBSERVED IN THE DEGREE OF RELEASE DEPENDING ON THE DIFFERENT NUCLIDES. SUCH NUCLIDES AS CO-60 AND SR-89 WERE EASILY RELEASED WHILE CR-51 AND FE-55 WERE NOT RELEASED AS EASILY. (2) THE RELEASED ACTIVITY WAS OBSERVED TO INCREASE WITH THE DECREASING WEIGHT RATIO OF THE ION EXCHANGE RESIN TO THE SEAWATER - BUT WITH THE WEIGHT RATIO BELOW 10 (MINUS 4) OF THE ION EXCHANGE RESIN TO THE SEAWATER NO REMARKABLE DIFFERENCE WAS OBSERVED. (3) THE RESULTS OF FRACTIONATION OF THE SUSPENDED MATTER IN THE SEAWATER CONTAINING FE-55, CO-60 AND SR-89 WILL ALSO BE DISCUSSED.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*ION EXCHANGE + *OCEAN AND SEA + CHROMIUM + COBALT + DESORPTION + IRON + STRONTIUM + SURFACE WATER, PROPERTY + WASTE DISPOSAL, OCEAN

14-13810 CLARK WE + SUDDATH JC + HANCHER CW + BLANCO RE + GODBEE HW + HOLMES JM + FITZGERALD CL
DEVELOPMENT OF PROCESSES FOR SOLIDIFICATION OF HIGH LEVEL RADIOACTIVE WASTE. SUMMARY FOR POT CALCINATION AND RISING LEVEL POTGLASS PROCESSES
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1584 +. 132 PAGES, FIGURES, TABLES, AUGUST 13, 1966

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13810 *CONTINUED*

DEVELOPMENTAL WORK ON SOLIDIFICATION OF AQUEOUS RADIOACTIVE WASTES BY TWO BATCH OR SEMI-CONTINUOUS PROCESSES, POT CALCINATION (POTCAL PROCESS) AND RISING LEVEL GLASS (RL-POTGLASS PROCESS), IS SUMMARIZED IN CONSIDERABLE DETAIL. ONLY WORK DONE AT THE OAK RIDGE NATIONAL LABORATORY IS SUMMARIZED. THE POTCAL PROCESS HAS BEEN COMPLETELY DEVELOPED THROUGH LABORATORY AND FULL ENGINEERING-SCALE DEMONSTRATIONS ON A WIDE VARIETY OF WASTE TYPES. SOLIDIFICATION OF ACTUAL RADIOACTIVE WASTE ON AN ENGINEERING-SCALE REMAINS TO BE DEMONSTRATED IN FULL ENGINEERING-SCALE EQUIPMENT, BUT FURTHER DEVELOPMENTAL WORK IS NEEDED TO DEFINE COMPOSITIONAL PARAMETERS WHICH CAN BE ALLOWED FOR EACH WASTE TYPE. THE PRINCIPAL LIMITING FACTOR IS THE CORROSIVITY OF THE MELT AT THE OPERATING TEMPERATURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VAL, \$4.00 CY, \$1.00 MM

*CALCINATION + *GLASS + *WASTE TREATMENT, FIXATION + *BIBLIOGRAPHY + CESIUM + EVAPORATION + ORNL (OAK RIDGE NATIONAL LABORATORY) + RUTHENIUM + WASTE HANDLING

14-13828 FERNANDEZ N

THE WASTE PROCESSING PLANT. ITS PROBLEMS, OPERATION, AND RESULTS.

COMMISSARIAT A L'ENERGIE ATOMIQUE

AEC-TR-6164 +. 25 PAGES, 1 TABLE, TRANSLATED FROM ENERGIE NUCLEAIRE 5, PAGES 282-90, (1963)

THE NECESSITY FOR WASTE PROCESSING IN A PU EXTRACTION PLANT AND THE DIFFICULTIES ENCOUNTERED IN THE CHEMICAL PROCESS CHOSEN ARE DESCRIBED. THE EQUIPMENT USED IN THE PLANT WAS NOT SPECIALLY DESIGNED BUT WAS COMMERCIALY AVAILABLE. THE PROCESS IS DESCRIBED. THE RESULTS OBTAINED ARE SATISFACTORY, WITH REMOVAL OF THE MOST DANGEROUS RADIOISOTOPES AND 19/20 OF THE TOTAL RADIOACTIVITY RECEIVED AT THE PLANT. A MODIFICATION BEING MADE TO THE PROCESS (REDUCTION OF THE VOLUME TO BE TREATED BY RECIRCULATION AND COATING OF THE SLUDGE WITH BITUMEN) ARE DISCUSSED.

AVAILABILITY - FOR SALE BY THE SPECIAL LIBRARIES ASSOCIATION TRANSLATION CENTER, JOHN CRERAR LIBRARY, 25 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$2.60 COPY, \$0.95 MICROFICHE

*FRANCE + *WASTE TREATMENT, LIQUID + CERIUM + CESIUM + EFFLUENT + RUTHENIUM + STRONTIUM + WASTE TREATMENT, EQUIPMENT + ZIRCONIUM

14-13865 FLORA JW + SMITH GH

ATMOSPHERIC POLLUTION FROM NUCLEAR POWER PLANTS

U.S. ATOMIC ENERGY COMMISSION

6 PAGES, 1 TABLE, 15 REFERENCES, NUCLEAR SAFETY 6(1) PAGES 81-87 (FALL 1964)

RADIOACTIVE POLLUTION OF THE ATMOSPHERE BY NUCLEAR POWER PLANTS IS A SUBJECT UNDER RELATIVELY INTENSE DISCUSSION. THERE ARE TWO ASPECTS OF THIS QUESTION - ONE INVOLVES THE CASE OF A CATASTROPHIC ACCIDENT, AND THE OTHER, LESS IN PROMINENCE, INVOLVES RADIOACTIVITY RELEASED TO THE ATMOSPHERE IN THE COURSE OF NORMAL OPERATION OF THE PLANTS. IT IS THE PURPOSE OF THIS PAPER TO DISCUSS AIR POLLUTION IN TERMS OF NORMAL OPERATION OF THE PLANTS AND TO PRESENT PERTINENT DATA COMPILED BY THE DIVISION OF COMPLIANCE OF THE USAEC. A REVIEW IS ALSO INCLUDED OF (1) THOSE ASPECTS OF NUCLEAR REACTOR OPERATION THAT CAN LEAD TO DISCHARGE OF RADIOACTIVE GASES, (2) THE DESIGN MEASURES TAKEN BY LICENSEES TO LIMIT THESE RELEASES, AND (3) THE BASES OF THE LIMITS THE COMMISSION HAS IMPOSED UPON SUCH RELEASES. IT IS APPARENT THAT THE RELEASE CONTROLS CURRENTLY IN USE AT THESE ON-LINE PLANTS ARE EFFECTIVE.

*AIR + *FISSION GAS RELEASE + EFFLUENT + REGULATION, AEC + REGULATION, GENERAL + REGULATION, STATE + SURVEY, RADIATION, ENVIRONMENTAL + WASTE DISPOSAL, GAS + WASTE TREATMENT, GAS

14-13867 PARKER FL

DISPOSAL OF RADIOACTIVE WASTES IN FRESH WATER

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

6 PAGES, 48 REFERENCES, NUCLEAR SAFETY 6(1) PAGES 89-97 (FALL 1964)

PROGRESS TOWARD THE SOLUTION OF PROBLEMS OF DISCHARGE OF RADIOACTIVE WASTE INTO FRESH-WATER SYSTEMS HAS BEEN MORE RAPID SINCE THE SUBJECT WAS LAST REVIEWED IN A PREVIOUS ISSUE OF NUCLEAR SAFETY THAN IN ALL THE YEARS SINCE THE PRACTICE BEGAN IN 1944. BASIC TO THIS IS THE SEPARATION OF RIVER PROBLEMS INTO THOSE CAUSED BY LARGE-SCALE PRODUCERS OR USERS OF RADIONUCLIDES AND THOSE RESULTING FROM SMALL-SCALE USES OF NUCLIDES. A FUNDAMENTAL ASPECT OF THIS DISTINCTION IS THE VIEW THAT THE ONLY METHOD OF ASSESSING POLLUTION IS THE DEGREE OF HARM TO MAN OR HIS ENVIRONMENT. BY THIS CRITERION IT IS POSTULATED THAT SMALL-SCALE USERS CANNOT USUALLY CAUSE DAMAGE TO MAN OR HIS ENVIRONMENT. ANOTHER EQUALLY IMPORTANT DISTINCTION IS BETWEEN OPERATIONAL OR APPLIED RESEARCH AND BASIC RESEARCH. HOWEVER, ALTHOUGH ALL BIG PRODUCERS MUST DO SOME APPLIED RESEARCH, FEW DO THE BASIC WORK NECESSARY TO ADVANCE THE UNDERSTANDING OF THE COMPLEX PHENOMENA OCCURRING IN A NATURAL RIVER SYSTEM.

*RIVER, GENERAL + *SURFACE WATER, DISPOSAL MEDIA + *WASTE DISPOSAL, RIVER + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + CESIUM + DILUTION + DISPERSION + HAZARDS ANALYSIS + REGULATION, GENERAL + RIVER, CLINCH + STRONTIUM + SURFACE WATER, GENERAL + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, PROPERTY + SURFACE WATER, SEDIMENT + SURFACE WATER, SUSPENDED MATERIAL + SURFACE WATER, TRACER + TRACER, FLUORESCENT + TRACER, RADIOACTIVE

14-13874 MAYBERRY BD

DIFFERENTIAL ABSORPTION OF STRONTIUM BY PLANTS. FINAL REPORT

TUSKEGEE INSTITUTE, ALA.

TID-23052 +. 19 PAGES, REFERENCES, MARCH 23, 1966

ACCESSION NUMBER 14-13810 TO 14-13874

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13874 *CONTINUED*

THE FACTORS WHICH INFLUENCE THE ACCUMULATION OF STRONTIUM IN EDIBLE PLANT PARTS WERE STUDIED. LIMA BEANS, SQUASH, POTATOES, AND TOMATOES WERE GROWN IN THE GREENHOUSE AND IN THE GROWTH CHAMBER. THE GROWING MEDIUM WAS NORFOLK LOAMY SAND OF LOW (5.7) INITIAL PH. PLANT NUTRIENTS, OTHER THAN CALCIUM, WERE ADDED IN CALCULATED OPTIMUM AMOUNTS. THE PLANTS WERE GROWN UNDER THESE CONDITIONS TO THE STAGE OF HARVEST FOR COMMERCIAL PURPOSES. THE PRACTICE OF SUCCESSION CROPPING DID NOT SIGNIFICANTLY DECREASE STRONTIUM ABSORPTION. THE UPTAKE OF STRONTIUM BY PLANTS, IRRESPECTIVE OF SPECIES, WAS DECREASED WITH INCREASE IN CALCIUM CONTENT OF THE ACID SOIL UP TO THE POINT OF 100% OF BASE SATURATION. THE TOTAL UPTAKE OF STRONTIUM BY PLANTS DIFFERED WITH THE SPECIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50, MN.

*BIOLOGICAL CONCENTRATION, VEGETATION + *SORPTION + *STRONTIUM + BIOLOGICAL CONCENTRATION, FOOD + ECOLOGICAL CONSIDERATION + SOIL, PROPERTY

14-13875 OREN OH

STUDY OF THE PHYSICO-CHEMICAL-BIOLOGICAL PROCESSES AFFECTING THE DISPERSION OF RADIONUCLIDES. PART I AND II. REPORT NO. 4 (FINAL)
MINISTRY OF AGRICULTURE, HAIFA
NP-16179 +. 158 PAGES, JANUARY 1964

RESULTS ARE SUMMARIZED FROM STUDIES ON BIOLOGICAL, CHEMICAL, AND PHYSICAL PROCESSES THAT MAY AFFECT THE DISTRIBUTION OF RADIONUCLIDES IN THE EASTERN MEDITERRANEAN SEA, WITH EMPHASIS ON THE LEVANTIN BASIN AND THE COASTAL AREA OF ISRAEL. THE NILE RIVER IS THE ONLY SOURCE OF FRESH WATER AND NUTRIENTS IN THE AREA, AND THE INFLUENCE OF SEASONAL FLOODING OF THE NILE RIVER WAS STUDIED. DATA ARE PRESENTED ON THE TEMPERATURE, SALINITY, AND SILICATE, CALCIUM, AND MAGNESIUM CONTENTS OF THE WATER IN VARIOUS SEASONS OF THE YEAR. DATA ARE ALSO INCLUDED ON NUTRIENT CONTENT, FOOD CHAINS OF PHYTOPLANKTON, ZOOPLANKTON, BENTHIC MICRO- AND MACRO-COMMUNITIES, FISH OF ECONOMIC IMPORTANCE, AND ON PRIMARY PRODUCTION AS MEASURED BY THE C-14 METHOD, AND ON METEOROLOGICAL AND SOLAR FACTORS AFFECTING PRIMARY PRODUCTION IN THE EASTERN MEDITERRANEAN SEA.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*ECOLOGICAL CONSIDERATION + *OCEAN AND SEA + *SURFACE WATER, NUCLIDE OCCURRENCE + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + FALLOUT + ISRAEL + METEOROLOGY + RIVER, GENERAL + SURFACE WATER, PROPERTY + SURFACE WATER, SEDIMENT

14-13877 GILBERT GE + LAUGHLIN RL

BIOCLIMATIC AND SOILS INVESTIGATIONS IN FOREST ENVIRONMENTS. VIII. RADIOLOGICAL INVESTIGATIONS AT NEOTOMA OHIO STATE UNIVERSITY
TID-23036 +. 28 PAGES, REFERENCES, AUGUST 1964

DATA ARE PRESENTED ON THE CONTENT AND DISTRIBUTION OF SR-90 IN SOIL SAMPLES COLLECTED AT DEPTHS OF 1 TO 3 IN. OR 6 TO 9 IN. AT VARIOUS HABITATS OF NEOTOMA VALLEY, HOCKING COUNTY, OHIO, IN 1958, 1959, 1962, AND 1964. DATA ARE INCLUDED ON THE TOTAL GAMMA ACTIVITY AND CONTENT OF FALLOUT FISSION PRODUCTS IN SAMPLES OF LICHENS, HERBACEOUS PLANTS, WOODY PLANTS, FRUITS, AND LEAF LITTER COLLECTED IN 1962 AND 1964.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*BIOLOGICAL CONCENTRATION, VEGETATION + *ECOLOGICAL CONSIDERATION + BIOLOGICAL CONCENTRATION, ALGAE + BIOLOGICAL CONCENTRATION, FOOD + FALLOUT + GROSS GAMMA + SOIL, NUCLIDE OCCURRENCE + STRONTIUM

14-13878 BHAT IS + KHAN AA + KAMATH PR

PREOPERATIONAL ENVIRONMENTAL SURVEY FOR TARAPUR ATOMIC POWER PROJECT. PROGRESS REPORT, 1964-65.
ATOMIC ENERGY ESTABLISHMENT, TROMBAY
AEET-242 +. 71 PAGES, FIGURES, TABLES, 1965

ROUTINE MONITORING SITES WERE CHOSEN AND A STUDY OF RADIOACTIVITY CONTENT IN ENVIRONMENTAL SAMPLES WAS INITIATED. FORTY-FIVE SAMPLING STATIONS WERE LOCATED IN THE 32 KM REGION ROUND THE SITE AND 558 ENVIRONMENTAL SAMPLES WERE COLLECTED. FALLOUT LEVELS, TRACE ELEMENTS, AND NATURAL RADIOACTIVITY CONTENT ARE DETERMINED IN THESE SAMPLES. A DESCRIPTION OF THIS WORK IS PRESENTED.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*MONITOR, RADIATION, ENVIRONMENTAL + *SURVEY, RADIATION, ENVIRONMENTAL + FALLOUT + INDIA + METEOROLOGY + RADIATION SAFETY AND CONTROL + SAMPLING

14-13879 JACKSON WA + CRAIG DL

ANNUAL PROGRESS REPORT (ON CESIUM AND STRONTIUM UPTAKE AND ASSIMILATION BY HIGHER PLANTS) MAY 1, 1965 - FEBRUARY 1, 1966
NORTH CAROLINA STATE UNIVERSITY
ORD-2410-1 +. 46 PAGES, JANUARY 1966

PROGRESS IS REPORTED IN TRACER STUDIES OF FACTORS INFLUENCING THE UPTAKE OF CS AND SR BY PLANTS. DATA ARE INCLUDED FROM STUDIES IN WHEAT SEEDLINGS. EMPHASIS WAS PLACED ON THE EFFECTS OF NITROGEN ON THE UPTAKE AND TRANSPORT OF CS AND SR. DATA ARE INCLUDED FROM A

ACCESSION NUMBER 14-13874 TO 14-13879

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-13879 *CONTINUED*

COMPARATIVE STUDY OF THE EFFECTS OF CA AND K ON NITRATE UPTAKE AND REDUCTION IN SEEDLINGS AND THE EFFECTS OF PHOSPHATES, CARBOHYDRATE LEVEL, NH₄, AND SELECTED CATIONS ON THE UPTAKE OF NITRATE NITROGEN AND CS AND SR. THE CHANGES IN METABOLIC PATTERNS WITHIN SHORT TIME PERIODS INDICATE A LARGE NUMBER OF WAYS IN WHICH PLANT METABOLISM IS ALTERED WHEN EXPOSED TO AMMONIUM OR NITRATE NITRO NITROGEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD VA., \$2.00 CY, \$0.50 MN

*BIOLOGICAL CONCENTRATION, FOOD + *ECOLOGICAL CONSIDERATION + CESIUM + SOIL, PROPERTY + STRONTIUM

14-13881 THOMAS KT + KHAN AA + AMALRAJ RV
INCINERATION OF LOW-LEVEL RADIOACTIVE SOLID WASTES AND GAS CLEANING. SOME OPERATIONAL EXPERIENCES ATOMIC ENERGY ESTABLISHMENT, TROMBAY
AEET-243 +. 20 PAGES, 1966

A 54-LB/HR ACTIVE WASTE INCINERATOR HAS BEEN IN USE SINCE 1963 FOR THE TREATMENT OF ALPHA-CONTAMINATED WASTE. A 100-LB/HR INCINERATOR PLANT OF IMPROVED DESIGN WAS SET UP IN 1965. BOTH PLANTS HAVE GAS-FILTERING SYSTEMS. THE DESIGNS AND OPERATIONAL DETAILS OF THE PLANTS ARE DISCUSSED.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*INCINERATION + *WASTE DISPOSAL, SOLID + GROSS ALPHA + INDIA + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, GAS + WASTE TREATMENT, SOLID

14-14426 WILLINGHAM WE + JANSEN G
HEAT TRANSFER FROM SOLIDIFIED WASTES IN UNDERGROUND STORAGE TANKS
PACIFIC NORTHWEST LABORATORY
BNWL-262 +. 75 PAGES, OCTOBER 1966

STEADY-STATE TEMPERATURE DISTRIBUTIONS IN AND AROUND BURIED RADIOACTIVE WASTE STORAGE TANKS WERE CALCULATED FOR SOLIDIFIED CAKES CONTAINING HEAT-GENERATING FISSION PRODUCTS. THE MOST IMPORTANT FACTORS INFLUENCING THE MAXIMUM CAKE AND WALL TEMPERATURES WERE THE QUANTITY OF HEAT GENERATED, THE SOIL THERMAL CONDUCTIVITY, AND THE SOIL COVER DEPTH, WITH THE HEAT TRANSFER CONDITIONS INSIDE THE TANK OF SECONDARY IMPORTANCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*HEAT TRANSFER + HEAT CONDUCTION + MATHEMATICAL STUDY + SOIL, PROPERTY

14-14429 HENDERSON RW
ANALYSIS OF UNDERGROUND WEAPON TEST EFFLUENT SAMPLES
LOS ALAMOS SCIENTIFIC LABORATORY
LA-3420 +. 17 PAGES, SEPTEMBER 1966

DURING UNDERGROUND WEAPONS TESTING, ACCIDENTAL RELEASES OF MATERIAL TO THE ATMOSPHERE MAY OCCUR. THE COMPOSITION OF THIS MATERIAL VARIES DEPENDING ON THE AGE OF THE FISSION PRODUCTS AT THE TIME OF THE RELEASE AND THE STATUS OF THE OPERATION. THIS REPORT GIVES THE METHODS AND PROCEDURES USED BY GROUP H-8 TO DERIVE THE ISOTOPIC COMPOSITION OF THE RELEASED MATERIAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*NUCLEAR EXPLOSION DEBRIS + *TEST, WEAPONS (HP ASPECTS) + FISSION PRODUCT RELEASE, GENERAL + IODINE + KRYPTON + RADIOCHEMICAL ANALYSIS + XENON

14-14433 COSTA RODRIGUES JM
WASTE DISPOSAL PROBLEMS AT THE INSTITUTO DE ENERGIA ATOMICA
INSTITUTO DE ENERGIA ATOMICA, SAO PAULO, BRAZIL
IEA-102 + CONF-631104-9 +. 28 PAGES, AUGUST 1965, PRESENTED AT MEETING ON UTILIZATION OF RESEARCH REACTORS, SAO PAULO, BRAZIL

A PRELIMINARY EVALUATION OF THE RADIOACTIVE LIQUID WASTE PROBLEM AT THE INSTITUTO DE ENERGIA ATOMICA IS HEREBY PRESENTED. SEVERAL TYPES OF WASTES PRODUCED AT PRESENT, OR EXPECTED IN THE NEAR FUTURE, ARE HEREIN DESCRIBED OR TENTATIVELY EVALUATED. THE NATURAL DRAINAGE SYSTEM OF THIS AREA IS ALSO BRIEFLY DESCRIBED AND THE ANNUAL FLOWRATES INDICATED. DISPERSION OF RADIOACTIVE LIQUID WASTES INTO THE AVAILABLE NEARBY STREAMS IS EXAMINED, AND THE CONSTRUCTION OF A TREATMENT PLANT SUGGESTED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BRAZIL + *WASTE MANAGEMENT + WASTE DISPOSAL, RIVER + WASTE TREATMENT, LIQUID

14-14438 MCCAULEY JE + JOHNSON VG
RETENTION OF ZINC-65 BY COLUMBIA RIVER SEDIMENT. ECOLOGICAL STUDIES OF RADIOACTIVITY IN THE COLUMBIA RIVER ESTUARY AND ADJACENT PACIFIC OCEAN. PROGRESS REPORT. JULY 1, 1965 - JUNE 30, 1966

ACCESSION NUMBER 14-13879 TO 14-14438

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-14438 *CONTINUED*
OREGON STATE UNIVERSITY
RLO-1750-8(VOL.2) +. 138 PAGES, 1966

THE RELATIVE IMPORTANCE OF ION-EXCHANGE AND SPECIFIC SORPTION AS MECHANISMS OF RETENTION OF ZINC-65 BY COLUMBIA RIVER SEDIMENT WERE INVESTIGATED WITH AN ELUTION TECHNIQUE. THE EXCHANGEABLE ZN-65 FRACTION AND THE EFFECT OF SEA WATER PER SE ON SEDIMENT-SORBED GAMMA EMITTERS WERE DETERMINED SIMULTANEOUSLY BY ELUTION WITH SYNTHETIC SEA WATER IN THE FIELD IMMEDIATELY UPON COLLECTION OF THE SAMPLES, USING A PORTABLE LAB. SPECIFICALLY SORBED RADIOZINC WAS DETERMINED BY ELUTION WITH A DILUTE SOLUTION OF COPPER SULFATE. LESS THAN 5 PERCENT OF THE SEDIMENT-SORBED ZINC-65 WAS FOUND TO BE EXCHANGEABLE WHILE FROM 35 TO 54 PERCENT WAS DISPLACEABLE WITH CuSO_4 . ION-EXCHANGE IS UNIMPORTANT IN RETENTION OF ZN-65 BY COLUMBIA RIVER SEDIMENT. A CONSIDERABLE PORTION OF THE SEDIMENT-SORBED RADIOZINC IS BOUND BY A MORE SPECIFIC ION-PARTICLE INTERACTION THAN ION-EXCHANGE. SEA WATER SHOULD HAVE A NEGLIGIBLE EFFECT ON SEDIMENT-SORBED GAMMA EMITTERS IN THE COLUMBIA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*MINERAL EXCHANGE + *ZINC + ION EXCHANGE + RIVER, COLUMBIA + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, SEDIMENT

14-14472 LINTZ DO
ENVIRONMENTAL RADIOACTIVE BACKGROUND SURVEY FOR THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY. FINAL REPORT, JUNE 1, 1957-JUNE 30, 1959
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
AD-630605 + AFOL-TR-65-185 +. 62 PAGES, DECEMBER 1965

THIS ENVIRONMENTAL RADIOACTIVE BACKGROUND SURVEY WAS AN ATTEMPT TO ESTABLISH A BASE LINE OF THE NORMALLY OCCURRING RADIOACTIVITY IN THE FAUNA AND FLORA OF A PARTICULAR AREA SUBSEQUENT TO THE OPERATION OF A REACTOR WHICH WILL RELEASE ADDITIONAL RADIOACTIVITY TO THE ENVIRONMENT. THE HEALTH PHYSICS OFFICE OF THE AF NETF HAS COLLECTED SAMPLES OF WATER, SOIL, AIR, SEWAGE, MILK, BIOLOGICAL LIFE, AND VEGETATION IN A 20-MILE RADIUS OF THE AF NETF SITE AND ANALYZED THE SAMPLES FOR ALPHA, BETA, AND GAMMA ACTIVITY. THE RESULTS OF THE ANALYSES OVER THE PERIOD OF THE REPORT ARE GIVEN IN GRAPHIC FORM TO FACILITATE COMPARISON OF THE FLUCTUATIONS IN THE NORMAL BACKGROUND.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + FALLOUT + MONITOR, RADIATION, AIR + RADIATION SAFETY AND CONTROL + RAINOUT + SAMPLING + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, NUCLIDE OCCURRENCE

14-14474 MISKEL JA
RELEASE OF RADIOACTIVITY FROM NUCLEAR CRATERING EXPERIMENTS
LAWRENCE RADIATION LABORATORY
UCRL-14778 + CONF-660920-6 +. 12 PAGES, AUGUST 26, 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME ITALY, SEPTEMBER 5-10, 1966

DATA FROM THE EXCAVATION EXPERIMENTS TO DATE INDICATE THAT THE CLOSE-IN FALLOUT DEPENDS PRIMARILY ON THE CHEMICAL SPECIES INVOLVED. THE LONG-RANGE CONCENTRATIONS APPEAR TO BE INDEPENDENT OF THE DETAILED NATURE OF THE SOURCE BUT DEPEND PRIMARILY ON THE ATMOSPHERIC DISSIPATIVE PROCESSES ONCE THE EARLY FALLOUT HAS OCCURRED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*FALLOUT + *PLOWSHARE PROGRAM + DEPOSITION + NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL

14-14475 RODEAN HC
EFFECTS OF UNDERGROUND NUCLEAR EXPLOSIONS ON NATURAL GAS WELL PERFORMANCE
LAWRENCE RADIATION LABORATORY
UCRL-12229 +. 17 PAGES, JUNE 23, 1965

IT IS SHOWN THAT A CHIMNEY AND FRACTURED ZONE (WITH THE DIMENSIONS AND PROPERTIES MEASURED IN AND NEAR THE HARDHAT CHIMNEY) INCREASE THE EFFECTIVE WELL RADIUS TO SUCH AN EXTENT THAT THE GAS FLOW RATE AT EARLY TIMES MAY BE INCREASED APPROXIMATELY TEN TIMES. THE RUBBLE-FILLED CHIMNEY AND ADJACENT FRACTURED ZONE ALSO ADD SIGNIFICANT CAPABILITY TO A WELL IN MEETING INTERMITTENT PEAK-LOAD DEMANDS, AND MAY BE USED AS A GAS-STORAGE RESERVOIR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*NUCLEAR DETONATION + *RADIATION SAFETY AND CONTROL + GEOLOGICAL CONSIDERATION, GENERAL + PLOWSHARE PROGRAM

14-14477 SCHEEL H + KUNERT J
THE SR-90 CONTENT OF SOIL AND PLANTS IN THE TERRITORY OF THE GDR (GERMAN DEMOCRATIC REPUBLIC) 1964
STAATLICHE ZENTRALE FUER STRAHLENSCHUTZ, BERLIN, EAST GERMANY
SZS-7/66 +. 20 PAGES, AUGUST 1966

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-14477 *CONTINUED*

THE SR-90 CONTAMINATION OF SOIL WAS DETERMINED TO BE ABOUT 30 NCI/SQ. METER. THUS, IN COMPARISON WITH 1963, THE INCREASE WAS ABOUT 7.5 NCI/SQ. METER. WITH THE EXCEPTION OF RYE GRAIN AND CABBAGE NO APPRECIABLE DECREASE OF THE SR-90 CONTENT COULD BE OBSERVED IN DRIED PLANT MATERIALS. AS TO BE EXPECTED, NO CHANGE OF THE SR-90 CONTENT COULD BE DETECTED IN POTATOES, WHEREAS IN BEETS EVEN AN INCREASE OF THE SR-90 CONCENTRATION WAS OBSERVED. FOR GRASS, GREEN MAIZE, AND BEET TOPS, THE RATIO OF SR-90 SURFACE CONTAMINATION TO SR-90 TOTAL CONTAMINATION WAS ESTIMATED TO BE 69, 33, AND 51 PERCENT, RESPECTIVELY. THE RATIOS CORRESPOND TO A FALLOUT RETENTION OF 17, 8, AND 6 PERCENT. THE UPTAKE OF SR-90 FROM SOIL BY GRASS AND GREEN MAIZE WAS 0.6 AND 1.1 PERCENT.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, VEGETATION + *SOIL, NUCLIDE OCCURRENCE + *STRONTIUM + FALLOUT + GERMANY

14-14479 THOMPSON JT + MORGAN JM

NUCLEAR TRANSPORTATION. PART I. RESEARCH AND ITS COORDINATION. PART II. PROBLEMS ASSOCIATED WITH RESEARCH

JOHNS HOPKINS UNIVERSITY

TID-23390 +. 91 PAGES, DECEMBER 1965

THE SCOPE AND STATUS OF RESEARCH IN TRANSPORTATION OF NUCLEAR MATERIALS IS COVERED AS AN EVALUATION OF THE OVERALL PROGRAM. STRENGTHS AND WEAKNESSES OF THE RESEARCH EFFORT ARE HIGHLIGHTED. PROBLEMS ASSOCIATED WITH RESEARCH ARE MENTIONED AS - THE IMPORTANCE OF NUCLEAR TRANSPORTATION, MODES OF TRANSPORTATION, THE RELATION OF SAFETY VERSUS COST, INSURANCE, THE INTERRELATED WEIGHT-COST PROBLEM, STANDARDIZATION-INTERCHANGEABILITY, SPECIALIZED TRANSPORTATION SERVICES, CRITICALITY CONTROL, RELATION WITH TOLL AND OTHER TRANSPORTATION GROUPS, AND THE DEVELOPMENT OF REGULATIONS. APPENDICES DISCUSS THE POSSIBLE ROLE OF A COORDINATOR OF TRANSPORTATION RESEARCH AND A DATA-BANK INFORMATION-RETRIEVAL SYSTEM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*TRANSPORTATION AND HANDLING + ECONOMICS + RADIATION SAFETY AND CONTROL + THERMAL CONSIDERATION

14-14482 KHITROV LM + KOTLYAROV KA

THE USE OF A DEEP-WATER GAMMA RADIOMETER FOR THE MEASUREMENT OF RADIOACTIVITY IN THE OCEAN ACADEMY OF SCIENCES, USSR

AD-629672 + TT-66-60744 +. 11 PAGES, TRANSLATED FROM RADIOACTIVE CONTAMINATION OF OCEANS AND SEAS, PAGES 170-182 (1964)

AN ORIGINAL, AUTOMATIC, DEEP-WATER GAMMA-RADIOMETER WITH A SENSITIVITY THRESHOLD OF 2×10 CURIES, INTENDED FOR THE MEASUREMENT OF R/A AT THE MAXIMUM DEPTHS OF THE OCEANS OF THE WORLD, WAS CREATED. DURING MEASUREMENTS OF THE GAMMA BACKGROUND OF THE DEPTHS OF THE CENTRAL AND NORTHERN PARTS OF THE INDIAN OCEAN IN 1960, THERE WAS NOT FOUND ANY INCREASE IN THE R/A LEVEL EXCEEDING THE NATURAL LEVEL BY MORE THAN 2-3 TIMES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*INSTRUMENTATION, RADIATION MONITORING + *OCEAN AND SEA + *SURFACE WATER, NUCLIDE OCCURRENCE + GROSS GAMMA

14-14485 RASTOGI RC + SEHGAL JD + THOMAS KT

INVESTIGATION OF MATERIALS AND METHODS FOR FIXATION OF LOW AND MEDIUM LEVEL RADIOACTIVE WASTE IN STABLE SOLID MEDIA. PROGRESS REPORT (NOVEMBER 1, 1965-JULY 31, 1966)

ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA

IAEA-3431-3 + AEFT-266 +. 43 PAGES, 1966

THIS REPORT DESCRIBES METHODS FOR PREVENTING RUTHENIUM VOLATILITY DURING THE GLASS-FIXATION PROCESS FOR SLUDGE AND VERMICULITE-TYPE OF WASTES, USING DIFFERENT REDUCING AGENTS AND TRAPPING VOLATILIZED RUTHENIUM IN IRON-OXIDE-COATED SILICIOUS BED MATERIAL UP TO A COLUMN TEMPERATURE OF 350 C AND AIR FLOW RATE OF 0.15 FT/SEC WITH AN EFFICIENCY NEAR 99.9 PERCENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*WASTE TREATMENT, FIXATION + ANALYTICAL TECHNIQUE, GENERAL + CESIUM + RUTHENIUM + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID + WASTE TREATMENT, SOLID

14-14487 BLUME W

ANALYSIS PROCEDURES FOR DETERMINATION OF SR-90 AND SR-89 VALUES IN FALLOUT, WATER, SOIL, PLANTS, MILK, FOOD, BONE, AND URINE SAMPLES

STAATLICHE ZENTRALE FUER STRAHLENSCHUTZ, BERLIN, EAST GERMANY

SZS-2(1966) +. 36 PAGES, FEBRUARY 1966, ENGLISH ABSTRACT

METHODS ARE OUTLINED FOR DETERMINING SR-89 AND SR-90 IN SEVERAL MATERIALS. THESE INCLUDE FALLOUT, RAIN WATER, FRESH WATER, PLANTS, MILK, BONES, TOTAL DIET, AND URINE. THE SEPARATION OF CALCIUM FROM CARRIER STRONTIUM IS ACCOMPLISHED BY A NEWLY DEVELOPED METHOD WHICH DEPENDS ON THE DIFFERENT SOLUBILITIES OF $\text{Sr}(\text{NO}_3)_2$ IN ABSOLUTE N-BUTANOL. PROCEDURES ARE PRESENTED IN DETAIL.

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-14487 *CONTINUED*

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*ANALYTICAL TECHNIQUE, FOOD + *ANALYTICAL TECHNIQUE, VEGETATION + *ANALYTICAL TECHNIQUE, WATER + ANALYTICAL TECHNIQUE, MILK + ANALYTICAL TECHNIQUE, SOLID + ANALYTICAL TECHNIQUE, URINE + CALCIUM + FALLOUT + STRONTIUM

14-14492 SCHREIBER B

ECOLOGY OF ACANTHARIA IN RELATION TO SR CIRCULATION IN THE SEA. PROGRESS REPORT, JULY 30-DECEMBER 1, 1965
PARMA UNIVERSITY, ITALY
TID-22837 +. 22 PAGES, DECEMBER 1965.

PROGRESS IS REPORTED ON THE FOLLOWING - ECOLOGY AND SYSTEMATICS OF ACANTHARIA, MEASUREMENTS OF RADIOACTIVITY AND PRESENCE OF RADIONUCLIDES IN PLANKTON AND BENTHONIC ORGANISMS, THE RADIOACTIVITY OF COASTAL MARINE SEDIMENTS, A MICROPALAEONTOLOGIC STUDY OF THE SYSTEMATICS, THE ECOLOGY OF THE FORAMINIFERA IN A CORE OF THE ADRIATIC SEA, AND MINERALOGIC AND PETROGRAPHIC RESEARCH BY MEANS OF X-RAY DIFFRACTOMETRY ON THE SEDIMENTS OF THE TYRRHENIAN SEA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ECOLOGICAL CONSIDERATION + *STRONTIUM + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + GEOLOGICAL CONSIDERATION, GENERAL + GEOLOGICAL CONSIDERATION, GEOCHEMICAL + GROSS BETA + OCEAN AND SEA + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, SEDIMENT

14-14493 RYAN JT

RADIOLOGICAL RECOVERY REQUIREMENTS, STRUCTURES, AND OPERATIONS RESEARCH. INTRODUCTION AND SUMMARY. FINAL REPORT
RESEARCH TRIANGLE INSTITUTE, DURHAM, N.C.
AD-635820 + USNRDL-TRC-16(SUMMARY) +. 20 PAGES, JUNE 6, 1966

THE PRIMARY OBJECTIVE OF THIS STUDY WAS TO DETERMINE COST AND EFFECTIVENESS INFORMATION RELATING TO THE APPLICATION OF DECONTAMINATION AND THE EXTENT OF ITS UTILITY WHEN APPLIED TO THE RECOVERY OF EXTENSIVE CITY AREAS IN A POSTATTACK ENVIRONMENT. THE RESULTS OF THE REAL-CITIES ANALYSES SHOWED THAT ROOF DECONTAMINATION IS AN IMPORTANT PART OF MOST COMBINED STRATEGIES OF DECONTAMINATION. THESE RESULTS ALSO SHOWED THAT THE RECOVERY OF SUBSTANTIAL CITY AREAS AND MULTIBUILDING COMPLEXES COULD BE ACCELERATED APPRECIABLY BY PRACTICABLE DECONTAMINATION PROCEDURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*CIVIL DEFENSE + *DECONTAMINATION + ECONOMICS + FALLOUT

14-14749 PATHFINDER - OFFGAS SYSTEM DIFFICULTIES

NORTHERN STATES POWER COMPANY
NSP-6603 +. 2 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 61 AND 76, JANUARY 9, 1967, DOCKET NO. 50-130

THE RECOMBINER LOW EFFICIENCY ALLOWED HYDROGEN LEVELS TO APPROACH 3 PERCENT, REQUIRING CONTROLLED CONDENSER AIR INLEAKAGE. THE CATALYST WAS CLEANED AND ITS CASING INSULATED AND STEAM-HEATED. NOT FULLY SATISFACTORY. ABOVE 40 MWTH, THE CATALYST EFFICIENCY INCREASES. ***OFF-GAS FLOW SURGES WHEN PULLING THE CONDENSER VACUUM (OR CHANGING AUXILIARIES) WITH THE WET AIR HAVE LOADED THE FIRST ABSOLUTE FILTER, BLOWING IT OUT FROM HIGH PRESSURE DROP. A SECOND FILTER, DOWNSTREAM OF THE HOLDUP TANKS MAINTAINS THE SYSTEM INTEGRITY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*FILTER, DAMAGED + *REACTOR OFFGAS + FILTER, HIGH EFFICIENCY + OPERATING EXPERIENCE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

14-14876 BACKGROUND FOR MILK RADIOACTIVITY REPORTS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PRESS REL. HEW-034 +. 6 PAGES, TABLES, DECEMBER 24, 1966

THIS REPORT IS ONE OF A SERIES OF PRESS RELEASES TABULATING THE LATEST AVAILABLE DATA ON RADIOACTIVITY IN MILK SAMPLES. THE RELEASES GIVE AVERAGE DAILY CONCENTRATIONS OF I-131, SR-90, SR-89, AND 12-MONTH TOTALS FOR THESE RADIONUCLIDES.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C.

*RADIOLOGICAL CONCENTRATION, MILK + *IODINE + *STRONTIUM

14-14877 BACKGROUND FOR MILK RADIOACTIVITY REPORTS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PRESS REL. HEW-01 +. 6 PAGES, TABLES, DECEMBER 1, 1966

THIS REPORT IS ONE OF A SERIES OF PRESS RELEASES TABULATING THE LATEST AVAILABLE DATA ON

ACCESSION NUMBER 14-14487 TO 14-14877

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-14877 *CONTINUED*
RADIOACTIVITY IN MILK SAMPLES. THE RELEASES GIVE AVERAGE DAILY CONCENTRATIONS OF I-131, SR-90, SR-89, AND 12-MONTH TOTALS FOR THESE RADIONUCLIDES.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C.

*BIOLOGICAL CONCENTRATION, MILK + *IODINE + *STRONTIUM

14-14879 BACKGROUND FOR MILK RADIOACTIVITY REPORTS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PRESS REL. HEW-M95 +. 6 PAGES, TABLES, SEPTEMBER 3, 1966

THIS REPORT IS ONE OF A SERIES OF PRESS RELEASES TABULATING THE LATEST AVAILABLE DATA ON RADIOACTIVITY IN MILK SAMPLES. THE RELEASES GIVE AVERAGE DAILY CONCENTRATION OF I-131, SR-90, SR-89, AND 12-MONTH TOTALS FOR THESE RADIONUCLIDES.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C.

*BIOLOGICAL CONCENTRATION, MILK + *IODINE + *STRONTIUM

14-14880 PLATT AM
FIXATION OF RADIOACTIVE RESIDUES. RESEARCH AND DEVELOPMENT ACTIVITIES QUARTERLY PROGRESS REPORT, APRIL-JUNE 1966
BATTELLE-NORTHWEST, RICHLAND, WASH.
BNWL-306 +. 31 PAGES, 2 FIGURES, 4 TABLES, AUGUST 1966

THIS REPORT DISCUSSES THE MOST RECENT DEVELOPMENTS IN SOLIDIFICATION AND FIXATION OF RADIOACTIVE WASTES AT BNWL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*WASTE TREATMENT, FIXATION + CALCINATION + HEAT TRANSFER + WASTE STORAGE + WASTE TRANSPORTATION

14-14982 SIEMASZKO A
THE INFLUENCE OF SURFACE-ACTIVE AGENTS ON THE EFFECT OF DECONTAMINATION
INSTITUTE OF NUCLEAR RESEARCH, WARSAW, POLAND
INR-725/XXII/C +. 67 PAGES, MAY 1966, IN POLISH

THE EFFECTS OF SURFACE-ACTIVE AGENTS ON THE DECONTAMINATION OF SURFACES OF DIFFERENT PLANT MATERIALS WERE EXAMINED. IT WAS ESTABLISHED THAT THIS EFFECT IS PRINCIPALLY THE RESULT OF INHIBITION OF IONS BY DETERGENT MOLECULES (SORPTION ON MICELLAE, ION EXCHANGE, AND COMPLEX FORMATION). THIS STOPPING, ALONG WITH OTHER INTERACTIONS, DECREASES CONSIDERABLY THE SORPTION AND IS THE CAUSE OF THE DETACHMENT OF THE ADSORBED IONS ON THE DECONTAMINATED SURFACE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*DECONTAMINATION + ADSORPTION + DESORPTION + ION EXCHANGE + SORPTION + THEORETICAL INVESTIGATION

14-14983 BARBOUR RA + HENWOOD RF + DIEPERINK HB
PRELIMINARY REPORT ON THE DEVELOPMENT OF A METHOD FOR THE SOLIDIFICATION OF PROCESS CONCENTRATES FROM THE RADIOACTIVE WASTE TREATMENT PLANT AT PELINDABA
ATOMIC ENERGY BOARD, PELINDABA, SOUTH AFRICA
PEL-102 +. 6 PAGES, FIGURES, TABLES, DECEMBER 1965

A PROCESS IS DESCRIBED FOR THE STORAGE AND DISPOSAL OF AN ALKALINE AQUEOUS CONCENTRATE OF MEDIUM-LEVEL LIQUID WASTE. THE PROCESS CONSISTS OF FILLING A 24-GAL STEEL DRUM WITH A PREMIXED BLEND OF PORTLAND CEMENT AND FINELY GROUND EXFOLIATED VERMICULITE. THE DRUM IS SEALED AND CAST IN A BLOCK OF CLEAN CONCRETE FITTED WITH LIFTING LUGS. A 1-IN.-ØJRE THREADED PIPE LINKS THE LID OF THE DRUM TO THE TOP OF THE CONCRETE BLOCK. THE WASTE LIQUID IS TRANSFERRED TO THE DRUM. WHEN THE OPERATION IS COMPLETE, THE CONNECTOR CAP IS SEALED. SOLUTIONS CONTAINING SOLIDS IN THE ORDER OF 6% BY WEIGHT MAY BE SOLIDIFIED BY THIS TECHNIQUE.

AVAILABILITY - MICROCARD EDITIONS, INC., ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISCONSIN 54669

*WASTE DISPOSAL, LIQUID + *WASTE TREATMENT, FIXATION + SOUTH AFRICA + WASTE STORAGE + WASTE TREATMENT, ECONOMICS + WASTE TREATMENT, EQUIPMENT + WASTE TREATMENT, LIQUID

14-14984 BLUMENFELD SN
NUCLEAR WAR AND SOIL MICROFLORA
RAND CORP.
RM-4827-TAB +. 44 PAGES, REFERENCES, AUGUST 1966

THE POSSIBILITY OF A PRONOUNCED, LONG-TERM REDUCTION OR MODIFICATION OF MICROBIAL FLORA AS A RESULT OF NUCLEAR BOMBARDMENT, CAUSING A DERANGEMENT THAT WOULD AFFECT THE ABILITY OF THE SOIL TO SUPPORT THE GROWTH OF CROPS, COULD HAVE SERIOUS IMPLICATIONS FOR AGRICULTURE. THERE ARE TWO NUCLEAR-BOMBARDMENT PHENOMENA THAT COULD CONCEIVABLY AFFECT THE SOIL MICROFLORA - IGNITION OF EXTENSIVE FIRES IN FORESTS AND CROPS, AND ACUTE AND CHRONIC IRRADIATION BY

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-14984 *CONTINUED*

FALLOUT. IT IS VERY UNLIKELY THAT EVEN A MAJOR NUCLEAR WAR COULD SUFFICIENTLY DISRUPT THE SOIL ECOLOGY TO AN EXTENT THAT WOULD CURTAIL THE SOILS PRODUCTIVITY OR ENDANGER THE POPULATION DEPENDENT ON IT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*CIVIL DEFENSE + *ECOLOGICAL CONSIDERATION + *FALLOUT + *NUCLEAR DETONATION + *THERMAL CONSIDERATION + DOSE + FIRE + RADIATION DAMAGE + RADIATION EFFECT + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY

14-14985 TUREKIAN KK

TRACE ELEMENTS IN SEA WATER AND OTHER NATURAL WATERS. ANNUAL PROGRESS REPORT
YALE UNIVERSITY, NEW HAVEN, CONN.

YALE-2917-12 1. 60 PAGES, TABLES, REFERENCES, AUGUST 31, 1966

A NEUTRON-ACTIVATION TECHNIQUE FOR THE ANALYSIS OF STEAM WATERS FOR TRACE ELEMENTS WAS DEVELOPED. A DETAILED ANALYSIS OF THE VARIATION OF TRACE ELEMENT CONCENTRATIONS DOWN THE NEUSE RIVER (NORTH CAROLINA), A RELATIVELY INDUSTRIALLY UNPOLLUTED STREAM PASSING OVER SEVERAL DIFFERENT GEOLOGIC TERRAINS, INDICATES THAT A SINGLE SAMPLE GIVES A FAIR REPRESENTATION OF THE COMPOSITION OF THE WHOLE STREAM. ON THE BASIS OF THESE OBSERVATIONS A SYSTEMATIC SAMPLING AND ANALYSIS PROGRAM OF THE WORLD'S MAJOR STREAMS FOR TRACE ELEMENTS HAS BEEN INITIATED TO STUDY THE MARINE GEOCHEMISTRY OF THE TRACE ELEMENTS AS FAR AS STREAM SUPPLY IS CONCERNED. A SYSTEMATIC STUDY OF THE TRACE-ELEMENT CHEMISTRY OF LONG ISLAND SOUND IS ON ITS WAY TOWARDS COMPLETION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL TECHNIQUE, WATER + *OCEAN AND SEA + *SURFACE WATER, NUCLIDE OCCURRENCE + GEOLOGICAL CONSIDERATION, GEOCHEMICAL + HYDROLOGICAL CONSIDERATION, GENERAL + SAMPLING + SURFACE WATER, PROPERTY

14-14987 OVERSTREET R

DECONTAMINATION OF SOILS CONTAINING SALT AND RADIOACTIVE ELEMENTS
UNIVERSITY OF CALIFORNIA, BERKELEY

UCB-34P23-1 +. 71 PAGES, SEPTEMBER 1966

STUDIES OF TWO ORGANIC SOILS SHOWED THAT THE EXCHANGE COMPLEX IS EASILY SATURATED WITH DIVALENT CATIONS SUCH AS CA AND SR. A STUDY OF THE VARIATION OF THE CA EXCHANGE CAPACITY OF PEAT SOIL WITH PH INDICATES THAT SITES READILY AVAILABLE TO CA AND SR BUT NOT TO NA ARE ALSO READILY AVAILABLE TO H. IN A GREENHOUSE EXPERIMENT, SR-85 WAS PAINTED ON THE LEAVES OF CHAMISE, BUCKBRUSH, AND OAK PLANTS. THE AMOUNTS OF THE ISOTOPE APPEARING IN THE SUBSEQUENT NEW GROWTH (6 WEEKS) WERE MEASURED. SIGNIFICANT TRANSLOCATION OF SR-85 OCCURRED IN BUCKBRUSH, WHERE THE FINAL CONCENTRATION IN THE NEW GROWTH WAS APPROXIMATELY 10% OF THAT IN THE TREATED OLD GROWTH. THE COMPARABLE TRANSLOCATION IN CHAMISE WAS ABOUT ONE TENTH OF THAT FOUND IN BUCKBRUSH. THE SMALLEST TRANSLOCATION OF SR-85 OCCURRED IN OAK, WHERE THE CONCENTRATION IN THE NEW GROWTH WAS QUITE LOW.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ECOLOGICAL CONSIDERATION + *ION EXCHANGE + CALCIUM + CESIUM + DECONTAMINATION + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY + STRONTIUM

14-14988 PURPURA JA + THORNTON EB

TRACING OF SPECIAL MATERIAL TRANSPORT IN THE OCEAN AT CAPE KENNEDY. PROGRESS REPORT
UNIVERSITY OF FLORIDA, GAINESVILLE

ORO-3298-2 +. 32 PAGES, TABLES, JUNE 1966

THE USE OF FLUORESCENT ORGANIC PIGMENTS AND DYES AS TRACERS TO SIMULATE THE MOVEMENT OF WASTE PRODUCTS IN THE OCEAN AT CAPE KENNEDY IS DESCRIBED. THE TRACER WAS MIXED WITH CEMENT AND ALLOWED TO SET. THE SET TRACER WAS THEN BROKEN UP WITH A HAMMER-MILL HAVING EXCHANGEABLE SCREENS AND VARIABLE SPEED PROVISIONS FOR SIZE CONTRAST OF THE TRACER. THE TRACER WAS INJECTED INTO THE OCEAN TO SIMULATE THE MOVEMENT OF FISSIONABLE MATERIAL. THE AVERAGE PARTICLE VELOCITY WAS 408 FT/DAY. THE DISTRIBUTION OF PARTICLES AT VARIOUS POSITIONS ON THE BEACH IS ALSO DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*SURFACE WATER, TRACER + OCEAN AND SEA + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, PROPERTY + TRACER, GENERAL

14-14990 MORRISON CE

AN INVESTIGATION OF THE DISTRIBUTION OF NEPHTYS CAECIDIIDS IN YAQUINA BAY
OREGON STATE UNIVERSITY, CORVALLIS

RLO-1750-8(VOL.3), (PAPER 1) +. 33 PAGES, 5 FIGURES, 7 TABLES, FROM ECOLOGICAL STUDIES OF RADIOACTIVITY IN THE COLUMBIA RIVER ESTUARY AND ADJACENT PACIFIC OCEAN. PROGRESS REPORT, JULY 1, 1965 - JUNE 30, 1966, J.C. MCCAULEY-EDITOR, 1965

A STUDY WAS UNDERTAKEN IN YAQUINA BAY, OREGON, DURING THE SUMMER OF 1964 TO DETERMINE THE

ACCESSION NUMBER 14-14984 TO 14-14990

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-14990 *CONTINUED*

DISTRIBUTION AND THE FACTORS AFFECTING THE DISTRIBUTION OF THE POLYCHAETE WORM, NEPHTYS CAECOIDES, HARTMAN, 1938, IN THE ESTUARY. THIS ORGANISM HAS A CONTINUOUS DISTRIBUTION FROM OFFSHORE TO A POINT ABOUT EIGHT KILOMETERS INTO THE BAY. ENVIRONMENTAL FACTORS CONSIDERED WERE SALINITY, TEMPERATURE, AND SEDIMENT COMPOSITION. THE RESULTS OF THIS STUDY DO NOT SINGLE OUT A FACTOR AS THE ONE LIMITING THE DISTRIBUTION OF N. CAECOIDES IN YAQUINA BAY. DURING SUMMER MONTHS, IT IS POSSIBLE THAT SEDIMENT POROSITY, ORGANIC CONTENT, AND TEMPERATURE OPERATE TOGETHER TO FORM AN UNFAVORABLE ENVIRONMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ECOLOGICAL CONSIDERATION + OCEAN AND SEA + SURFACE WATER, PROPERTY

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-08813 SHERWOOD RJ
RECENT DEVELOPMENTS IN DETERMINING THE RELATIONSHIP OF AIR SAMPLE MEASUREMENTS AND PERSONAL EXPOSURE TO AIRBORNE RADIOACTIVE PARTICLES
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4738 +. 22 PAGES, 2 PLATES, 1 FIGURE, 10 TABLES, 9 REFERENCES, SEPTEMBER 1964, UKAEA

A BRIEF REVIEW IS MADE OF STUDIES UNDERTAKEN AT AERE INTO THE INTERPRETATION OF AIR SAMPLING RESULTS. MOST OF THESE HAVE BEEN CONCERNED WITH THE MEASUREMENT OF PLUTONIUM IN GLOVE BOX AREAS, BUT MORE RECENTLY, INVESTIGATIONS HAVE BEEN MADE IN AREAS WHERE IRRADIATED FUEL IS HANDLED AND WHERE DECONTAMINATION IS UNDERTAKEN. THE RADIOACTIVITY ON A SAMPLING FILTER MAY BE ATTRIBUTABLE TO A SINGLE PARTICLE, SO THAT THE FILTER IS NOT A SAMPLE IN A STATISTICAL SENSE AND CANNOT THEREFORE REPRESENT THE EXPOSURE OF ANY INDIVIDUAL. IT IS SIMPLY A MEASURE OF THE MOST ACTIVE PARTICLE COLLECTED BY THE SAMPLER. EVEN SAMPLES THAT DO REPRESENT A CLOUD OF RADIOACTIVE PARTICLES MAY NOT INDICATE AN EXPOSURE TO AN INDIVIDUAL AS (AT LEAST FOR THE AREAS AND OPERATIONS SO FAR STUDIED) THIS IS A HIGHLY PERSONAL MATTER. SUCH MARKED VARIATIONS OF CONCENTRATIONS MAY EXIST IN TIME AND SPACE THAT, EVEN AVERAGED OVER PERIODS OF MONTHS, EXPOSURE CANNOT EASILY BE ASSESSED WITHIN A FACTOR OF TEN.

*POPULATION EXPOSURE + MONITOR, RADIATION, AIR + PARTICULATE + PLUTONIUM

15-09406 STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
21 PAGES, MARCH 1965

ACTIVITIES FOR MARCH 1965 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

*FALLOUT + AIR + ANTIMONY + CADMIUM + CESIUM + DEPOSITION + DOSIMETRY, GENERAL + GROSS GAMMA + INHALATION + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, RADIATION MONITORING + IRON + MANGANESE + MONITOR, RADIATION, AIR + PARTICLE SIZE + PLUTONIUM + PROMETHIUM + RADON + RAINOUT + SAMPLING + STRONTIUM + SURVEY, RADIATION, ENVIRONMENTAL + TRITIUM + URANIUM + YTTRIUM + ZIRCONIUM

15-10468 ENGELKE MJ + HENKEL RL + HIEBERT RD + JENNINGS HK + LANG HJ
AREA RADIATION MONITOR SYSTEM WITH LOGARITHMIC INDICATION AND AUDIOVISUAL WARNING
LOS ALAMOS SCIENTIFIC LABORATORY
LA-DC-6790 + CONF-650306-63 +. 13 PAGES, 1965, PARTICLE ACCELERATOR CONFERENCE, WASHINGTON, D.C., CFSTI,
\$1.00 CY, \$0.50 MN

NEUTRON DETECTION SYSTEM AT A LARGE VAN DE GRAAFF ACCELERATOR WAS REDESIGNED TO GIVE A MORE BELIEVABLE MEASURE OF BIOLOGICAL DAMAGE OR FIRST-COLLISION TISSUE DAMAGE. DETECTOR USES A LITHIUM-IODIDE CRYSTAL SURROUNDED BY A SPHERE OF POLYETHYLENE. A LOGARITHMIC COUNT-RATE METER WAS DEVELOPED TO COVER FOUR DECADES.

*INSTRUMENTATION, RADIATION MONITORING + *MONITOR, RADIATION, BACKGROUND +
*MONITOR, RADIATION, ENVIRONMENTAL + EQUIPMENT DESIGN + GAMMA + NEUTRON

15-10502 BUKOWIECKI B
ALPHA CONTAMINATION LOCATOR WITH JUNCTION RADIATION DETECTOR
CENTRALNE LABORATORIUM OCHRONY RADIOLOGICZNEJ, WARSAW, POLAND
CLOR-39/D +. 5 PAGES, 1965, DEP.MN

PROBLEM - DEVELOP A MEANS FOR PRECISE LOCATION OF CONTAMINATION, PARTICULARLY ON THE HUMAN BODY. APPROACH - DEVELOPMENT OF A RADIOLOGICAL PROTECTION ALPHA CONTAMINATION LOCATOR. THIS CONSISTS OF A SEMICONDUCTOR RADIATION DETECTOR, PROBE EXTENSION, AND A SMALL, PORTABLE TRANSISTORIZED AMPLIFIER THAT GIVES AN AUDIBLE SIGNAL FOR EACH ALPHA PARTICLE THAT LOSES AT LEAST 600 KEV OF ITS ENERGY WITHIN THE DETECTOR.

*INSTRUMENTATION, RADIATION MONITORING + *SOLID STATE DEVICE + ALPHA EMITTER + EQUIPMENT DESIGN +
MONITOR, RADIATION, SURFACE

15-11635 SOUDAIN G
CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE GASES)
COMMISSARIAT A L'ENERGIE ATOMIQUE, CENTRE ETUDES NUCLEAIRES, FONTENAY-AUX-ROSES
CEA-R-2841 +. 60 PAGES, 21 FIGURES, 3 TABLES, 1966, THESIS PRESENTED TO TOULOUSE UNIVERSITY (FRANCE)
FACULTE DES SCIENCES, MARCH 16, 1965, DEP. MN.

TRITIUM IS A DANGEROUS GAS FOR MAN, AND THE MAXIMUM ADMISSIBLE DOSES IN THE ATMOSPHERE ARE SUFFICIENTLY LOW FOR THE DOSAGE TO BE FAIRLY DIFFICULT. WE HAVE DEVELOPED AN APPARATUS FOR MEASURING SELECTIVELY THE CONTAMINATION OF AIR BY THIS GAS WHEN ALONE OR WHEN ASSOCIATED WITH OTHER GASEOUS CONTAMINANTS. THE DIFFERENTIAL APPARATUS USING TWO IONIZATION CHAMBERS MAKES IT POSSIBLE TO ELIMINATE A PARASITIC GAMMA-RADIATION FIELD. IN A FEW PARTICULAR CASES, THE PRESENCE OF THE RADIOACTIVE GAS HAS BEEN STUDIED. FROM THE PRACTICAL POINT OF VIEW, THE USE OF THESE CHAMBERS (MADE OF STAINLESS STEEL) MAKES FOR EASIER USE SINCE THE PROBLEMS CONNECTED WITH WALL ADSORPTION HAVE BEEN SATISFACTORILY RESOLVED. THE METHOD CAN BE APPLIED WITHOUT RESTRICTION AND VERY EASILY TO THE DETERMINATION OF TRACES OF TRITIUM IN AIR OR IN THE FORM OF TRITIATED WATER OR STEAM IN THE ATMOSPHERE.

*ANALYTICAL TECHNIQUE, GAS + *TRITIUM + COUNTER + DOSE MEASUREMENT, EXTERNAL +

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-11635 *CONTINUED*
MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + MAXIMUM PERMISSIBLE DOSE (MPD) + SAMPLING

15-11636 SALMON RJ
FINAL REPORT. ENVIRONMENTAL HEALTH PLANNING FOR POSTATTACK CONDITIONS. SOME PROBLEMS, PROGRAMS, AND PRIORITIES
RESEARCH TRIANGLE INSTITUTE, OPERATIONS RESEARCH AND ECONOMICS DIVISION, DURHAM
RTI-OU-197 +. 73 PAGES, 1 TABLE, 1 FIGURE, 71 REFERENCES, APRIL 1966, DOD

CONDITIONS IMPOSED BY MASSIVE NUCLEAR ATTACK WILL DISRUPT NORMAL ENVIRONMENTAL HEALTH SERVICES OF COMMUNITIES THROUGHOUT THE UNITED STATES THREATEN THE HEALTH OF SURVIVING POPULATION. THIS STUDY DEVELOPS A FRAMEWORK TO EVALUATE POSTATTACK CONDITIONS RELATIVE TO ENVIRONMENTAL HEALTH. REVIEW AND ANALYSIS OF EXISTING INFORMATION ON PROBABLE POSTATTACK CONDITIONS OF LOCAL HEALTH DEPARTMENTS, PUBLIC HEALTH ORGANIZATIONS, AND RESOURCE MANAGEMENT PRACTICES IS PRESENTED. ANTICIPATED POSTATTACK ENVIRONMENTAL HEALTH PROBLEMS ARE IDENTIFIED, AND PRIORITY JUDGMENTS ARE MADE ON A COMPARATIVE BASIS IN TERMS OF LEVEL OF GRAVITY. RATIONALE SUPPORTING THE JUDGMENTS IS INCLUDED, AND BOTH ACTION AND RESEARCH PROGRAMS TO IMPROVE PREPAREDNESS ARE RECOMMENDED. IMPORTANT SOURCES OF DATA PRESCRIBED FOR THIS STUDY WERE THE REPORTS AND WORKING PAPERS OF AN EARLIER U. S. PUBLIC HEALTH SERVICE PROJECT, OCD-OS-62-254 (ENVIRONMENTAL HEALTH PROBLEMS IN THE POST SHELTER PERIOD). IN ADDITION, FOUR CITY HEALTH DEPARTMENTS WERE VISITED TO ASSIST IN ANALYSIS OF NORMAL ENVIRONMENTAL HEALTH CONDITIONS RELATIVE TO THOSE EXPECTED IN A POSTATTACK RECOVERY PERIOD AND OF THE ABILITY OF A LOCAL HEALTH AGENCY TO COPE WITH PROJECTED CONDITIONS.

*CIVIL DEFENSE + *RECOVERY PROCESS + FALLOUT + NUCLEAR DETONATION + POPULATION EXPOSURE + RECOVERY FACTOR + WATER, DRINKING + WATER, GENERAL

15-11637 HENDERSON RW + FULTYN RV
RADIATION MEASUREMENTS OF THE EFFLUENT FROM THE KIWI B4D-202 AND B4E-301 REACTORS
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-3397-MS +. 91 PAGES, 18 TABLES, 57 FIGURES, FEBRUARY 3, 1966 (WRITTEN AUGUST 12, 1965), CFSTI \$3.00 CY, \$0.75 MN.

PRESENTED ARE THE RESULTS OF DOCUMENTATION STUDIES ON THE EFFLUENT FROM THE KIWI B4D-202 AND B4E-301 REACTORS DURING FULL-POWER TESTS. A DESCRIPTION OF PROCEDURES AND EQUIPMENT IS ALSO GIVEN. AN ANALYSIS OF THE ENVIRONMENTAL EFFECTS DUE TO THE PASSAGE AND DEPOSITION OF RELEASED MATERIAL IS GIVEN AS WELL AS DEPOSITION VELOCITIES MEASURED AT VARIOUS LOCATIONS.

*EFFLUENT + *ROVER PROGRAM + AEROSOL + ATMOSPHERIC DIFFUSION + DEPOSITION + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + IODINE + PARTICLE SIZE + SAMPLING

15-11775 VOLCHOK HL
THE GLOBAL STRONTIUM 90 BUDGET
HEALTH AND SAFETY LABORATORY, USAEC
4 PAGES, 1 TABLE, 1 FIGURE, 19 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(6), PAGES 1515-1518 (MARCH 15, 1966)

INVENTORIES OF SR-90 IN THE ENVIRONMENT OF THE EARTH HAVE BEEN MADE FOR A SERIES OF DATES BETWEEN AUGUST 1961 AND MARCH 1965. ON EVERY DATE TESTED THESE INVENTORIES ARE FOUND TO BE DEFICIENT WHEN COMPARED WITH THE AMOUNT OF SR-90 EXPECTED TO BE PRESENT, ON THE BASIS OF NUCLEAR WEAPONS TESTS CONDUCTED IN THE ATMOSPHERE. THE MAJOR PORTION OF THIS DEFICIENCY IS ATTRIBUTED TO A 33 PERCENT ERROR IN THE INVENTORY OF SR-90 DEPOSITED AND IS CAUSED BY ASSUMING THAT THE OBSERVED FALLOUT ON LAND IS EQUIVALENT TO THAT ON THE OCEANS, PER UNIT AREA. IT IS SUGGESTED THAT WATER BODIES COLLECT FALLOUT 1.5 TIMES MORE EFFICIENTLY THAN LAND. APPLYING THIS FACTOR TO THE WORLDWIDE SR-90 DEPOSITION INVENTORY RESULTS IN GOOD AGREEMENT BETWEEN STRATOSPHERIC DEPLETION AND WORLDWIDE DEPOSITION, IN ADDITION TO ACCOUNTING FOR THE APPARENT BUDGET DEFICIENCY.

*FALLOUT + *STRONTIUM + DEPOSITION + OCEAN AND SEA + STRATOSPHERE + SURVEY, RADIATION, ENVIRONMENTAL + TROPOSPHERE

15-11776 BECK JN + KURODA PK
RADIOSTRONTIUM FALLOUT FROM THE NUCLEAR EXPLOSION OF OCTOBER 16, 1964
UNIVERSITY OF ARKANSAS, FAYETTEVILLE
6 PAGES, 1 TABLE, 3 FIGURES, 9 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(10) PAGES 2451-2456 (MAY 15, 1966)

THE RADIOSTRONTIUM DATA OBTAINED AT FAYETTEVILLE, ARKANSAS, SHOW THAT A CONSIDERABLE FRACTION OF THE DEBRIS FROM THE OCTOBER 16, 1964, NUCLEAR EXPLOSION HAS ENTERED THE STRATOSPHERE. IT IS ESTIMATED THAT THE STRATOSPHERIC SR-90 INVENTORY HAS INCREASED BY 0.38 PERCENT AND THE TROPOSPHERIC SR-90 INVENTORY BY 4.0 PERCENT AS A RESULT OF THE CHINESE NUCLEAR EXPLOSION. THE MEAN RESIDENCE TIME OF SR-90 IN THE TROPOSPHERE WAS CALCULATED TO BE 30 DAYS, ACCORDING TO THE TWO-COMPARTMENT MODEL OF THE ATMOSPHERE.

*FALLOUT + *STRONTIUM + DEPOSITION + MATHEMATICAL STUDY + NUCLEAR DETONATION + NUCLEAR EXPLOSION DEBRIS + STRATOSPHERE + TROPOSPHERE

15-11784 HASKELL EE + LEVENTHAL JS + BIANCHI WC
THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-11784 *CONTINUED*

U. S. DEPARTMENT OF AGRICULTURE, FRESNO + UNIVERSITY OF CALIFORNIA, LOS ANGELES
11 PAGES, 5 FIGURES, 3 TABLES, 21 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(16) PAGES 3849-59 (AUGUST 15, 1966)

THE TRITIUM CONTENT OF WATER FROM IRRIGATION WELLS ALONG TWO EAST-WEST TRAVERSE LINES WAS USED IN ESTIMATING GROUNDWATER VELOCITIES IN THE SAN JOAQUIN VALLEY. TRITIUM PEAKS DUE TO NUCLEAR WEAPONS TESTS WERE IDENTIFIED WITHIN THE GROUNDWATER BODY. THE ESTIMATED VELOCITIES WERE COMPARABLE WITH VELOCITIES EXPECTED IN THE COARSE PARTS OF THE AQUIFERS. THE RATIO OF TRITIUM IN THE WELL WATER TO THAT IN THE RAIN WAS INCONSISTENT WITH PREDICTED RECHARGE, INDICATING THAT RECHARGE WAS LOCALIZED AND THAT WATER FLOWED TO THE SAMPLED WELLS THROUGH THE COARSE AQUIFERS.

*GROUND WATER, TRACER + *HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + *TRITIUM + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + NUCLEAR DETONATION + RAINOUT

15-11833 TAMPLIN AR + FISHER HL
ESTIMATION OF DOSAGE TO THYROIDS OF CHILDREN IN THE U. S. FROM NUCLEAR TESTS CONDUCTED IN NEVADA DURING 1952 THROUGH 1955
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-14,707 +. 50 PAGES, 4 TABLES, 4 FIGURES, 38 REFERENCES, MAY 10, 1966, CFSTI \$3.00 CY, \$0.50 MN.

THIS REPORT PRESENTS ESTIMATES OF THE THYROID DOSAGE ACCUMULATED BY CHILDREN UP TO 5 YEARS OF AGE IN THE UNITED STATES AS A RESULT OF NUCLEAR WEAPONS TESTS IN NEVADA DURING 1952 THROUGH 1955. THE ESTIMATES ARE BASED UPON THE ASSUMPTION THAT THE CHILDREN WERE CONSUMING 1 LITER OF MILK PER DAY FROM COWS ON PASTURE. IT IS NOT KNOWN TO WHAT EXTENT THIS ASSUMPTION IS VALID. THE DATA, THE ANALYTICAL APPROACH, AND THE ASSUMPTIONS INHERENT TO THE ANALYSIS ARE PRESENTED, TOGETHER WITH THE ESTIMATES.

*DOSE CALCULATION, INTERNAL + *FISSION PRODUCT, IODINE + ANALYTICAL TECHNIQUE, AIR + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + ECOLOGICAL CONSIDERATION + NUCLEAR DETONATION + SAMPLING

15-11834 COLLINS DA + MCINTOSH AE + TAYLOR R + YUILIE WD
EXPERIMENTS RELATING TO THE CONTROL OF FISSION-PRODUCT RELEASE FROM ADVANCED GAS-COOLED REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINDSCALE
27 PAGES, 8 FIGURES, 7 TABLES, 11 REFERENCES, JOURNAL OF NUCLEAR ENERGY 20(2), PAGES 97-122 (FEBRUARY 1966)

IT HAS BEEN SHOWN THAT IODINE RELEASED FROM IRRADIATED AGR FUEL ELEMENTS, MAY BE PRESENT IN THREE FORMS - ELEMENTAL IODINE VAPOUR, IODINE CARRIED ON SOLID PARTICLES, AND VAPOUR COMPOUNDS OF IODINE, PRINCIPALLY METHYL IODIDE. OTHER FISSION PRODUCTS, SPECIFICALLY TELLURIUM, CAESIUM, BARIUM/LANTHANUM, STRONTIUM AND RUTHENIUM ARE PRESENT ENTIRELY AS SOLID PARTICLES. THE RELATIVE AMOUNTS OF THE THREE FORMS OF IODINE DEPEND ON SUCH FACTORS AS THE FUEL-ELEMENT TEMPERATURE AND IRRADIATION LEVEL, THE GAS COMPOSITION AND TEMPERATURE AND THE ADSORPTION/DESORPTION HISTORY OF THE IODINE ON SURFACES. METHYL IODIDE CAN COMPRISE AN APPRECIABLE PERCENTAGE OF THE TOTAL IODINE RELEASED. A TRAPPING SYSTEM CONSISTING OF A COMBINATION HIGH-EFFICIENCY FILTERS AND ACTIVATED CARBON BEDS CAN PROVIDE ADEQUATE PROTECTION AGAINST THE ESCAPE OF THE RELEASED FISSION PRODUCTS (APART FROM THE RARE GASES) PROVIDED THAT THE CAPACITY OF THE CARBON FOR METHYL IODIDE IS NOT EXCEEDED. A COCONUT-SHELL-BASED CARBON (TYPE SC 11), CHOSEN FOR ITS PERFORMANCE AGAINST ELEMENTAL IODINE WILL RETAIN METHYL IODIDE WITH HIGH EFFICIENCY ONLY UP TO A LOADING OF ABOUT 5 G/TE CARBON AT 100 C AND MUCH LESS AT ROOM TEMPERATURE. AN ALTERNATIVE COAL-BASED CARBON (TYPE 207 B) HAS EXCELLENT PERFORMANCE IN RELATIVELY DRY GAS UP TO A LOADING OF ABOUT 500 G/TE CARBON BOTH AT ROOM TEMPERATURE AND AT 100 C. THE PERFORMANCE OF SCALED-DOWN TRAPPING PLANTS CONTAINING EACH OF THESE TYPES OF CARBON HAS BEEN DEMONSTRATED AGAINST THE FISSION PRODUCTS RELEASED FROM OVERHEATED AGR FUEL SPECIMENS IN LABORATORY-SCALE EXPERIMENTS.

*FILTER, EFFICIENCY OF + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT, IODINE + ADSORPTION + AGR (ADVANCED GASCOOLED REACTOR, WINDSCALE, UK) + BARIUM + CESIUM + CHARCOAL + FILTER CHARACTERISTICS + FISSION GAS RELEASE + REACTOR, GAS COOLED + RUTHENIUM + STRONTIUM + TELLURIUM

15-11835 ABRAHAMS JH + JOHNSON RH
SOIL AND SEDIMENT ANALYSIS - PREPARATION OF SAMPLES FOR ENVIRONMENTAL RADIATION SURVEILLANCE
U. S. PUBLIC HEALTH SERVICE
PHS-999-RH-19 +. 25 PAGES, 3 TABLES, 6 FIGURES, 28 REFERENCES, JUNE 1966, SOURCE, FREE

SOIL SAMPLES WERE SEPARATED INTO SIZE FRACTIONS TO DETERMINE THOSE IN WHICH UPTAKE WAS GREATEST FOLLOWING THE ADDITION OF DIFFERENT CONCENTRATIONS OF ZINC-65 TRACER IN AQUEOUS SUSPENSIONS, AND TO EVALUATE SEVERAL METHODS OF FRACTIONATION. ACTIVITY PER GRAM FOR PARTICLES LESS THAN 43 MICRONS WAS 7 TO 8 TIMES GREATER THAN FOR 43 TO 250 MICRON PARTICLES. THIS FACTOR INCREASED AS THE PARTICLE SIZES DECREASED. ACTIVITY ON EACH SIZE FRACTION INCREASED WITH INCREASING CONCENTRATIONS OF THE ZINC-65 TRACER IN AQUEOUS SUSPENSIONS, AS WELL AS WITH INCREASING ORGANIC CONTENT. WET SIEVING WITH MILD PHYSICAL DISPERSION WAS A MORE CONVENIENT AND REPRODUCIBLE METHOD OF SEPARATING THE FINE AND COARSE FRACTIONS THAN SEDIMENTATION AND ELUTRIATION.

*PARTICLE SIZE DISTRIBUTION + ANALYTICAL TECHNIQUE, SOLID + MINERAL EXCHANGE + PARTICLE SIZE + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY + ZINC

15-11836 BEACH SA + DOLPHIN GW + DUNCAN KP + DUNSTER HJ
A BASIS FOR ROUTINE URINE SAMPLING OF WORKERS EXPOSED TO PLUTONIUM-239
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-11836 *CONTINUED*
AHSB(RP)R-68 +. 14 PAGES, 2 FIGURES, 2 TABLES, 16 REFERENCES, FEBRUARY 1966, UKAEA

A ROUTINE PROGRAM FOR THE MEASUREMENT OF PLUTONIUM IN URINE IS DISCUSSED IN RELATION TO THE OTHER METHODS OF CONTROLLING THE INTERNAL RADIATION DOSE OF THOSE WORKING WITH PLUTONIUM. THE URINARY EXCRETION PATTERN FOLLOWING INTAKES OF PLUTONIUM COMPOUNDS IS CONSIDERED AND A VALUE FOR Q, THE MAXIMUM BODY CONTENT APPLICABLE TO ALL COMPOUNDS OF PLUTONIUM, IS PROPOSED. A REFERENCE LEVEL AND AN ACTION LEVEL FOR URINARY EXCRETION RATES ARE SUGGESTED. FACTORS INFLUENCING THE CHOICE OF SAMPLING PROCEDURE AND FREQUENCY ARE DISCUSSED. AN EXAMPLE IS GIVEN SHOWING HOW THE REFERENCE LEVEL AND ACTION LEVEL ARE USED IN A TYPICAL SAMPLING PROGRAM. SPECIAL MENTION IS MADE OF THE MANAGERIAL ACTIONS TAKEN WHEN THE URINARY EXCRETION RATE OF A WORKER EXCEEDS THE REFERENCE LEVEL AND THE ACTION LEVEL.

*ANALYTICAL TECHNIQUE, URINE + *MAXIMUM PERMISSIBLE BODY BURDEN + *PLUTONIUM +
PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SAMPLING

15-11911 RADIUM CAPSULE RUPTURE AT CHARLOTTE, NORTH CAROLINA MEDICAL CENTER, OCTOBER 12, 1966
PROVIDENCE MEDICAL CENTER
1 PAGE, NUCLEONICS WEEK 7(42), PAGE 3, OCTOBER 20, 1966

DECONTAMINATION OPERATIONS ARE BEING CONCLUDED AT THE PROVIDENCE MEDICAL CENTER IN CHARLOTTE, N. C., CLOSED DOWN OCTOBER 12, 1966, AFTER DISCOVERY OF A RUPTURED MONEL NASOPHARYNGEAL APPLICATOR CONTAINING 50 MG OF RADIUM SULFATE. THE CLOSING WAS ORDERED BY THE STATE BOARD OF HEALTH WHEN 0.002 OUNCE OF THE SULFATE HAS BEEN TRACKED OUT OF AN OFFICE WHERE THE APPLICATOR WAS USED FOR EAR, NOSE AND THROAT THERAPY. SIX-HUNDRED PERSONS WERE CHECKED BY A MOBILE LAB SET UP BY THE STATE RADIATION UNIT, SEVEN WERE SLATED FOR FURTHER EXAMINATION. HOMES OF AN ADDITIONAL 60 WERE TO BE CHECKED.

*INCIDENT, ACTUAL, NONREACTOR + *RADIUM + CONTAMINATION

15-11917 GARNIER A
ESSAI D EVALUATION DU DEPOT CUMULATIF DE STRONTIUM 90 DANS PLUSIEURS STATIONS FRANCAISES (ATTEMPT TO EVALUATE THE CUMULATIVE DEPOSIT OF SR-90 IN SEVERAL FRENCH CENTERS)
CENTRE D ETUDES NUCLEAIRES, DE FONTENAY-AUX-ROSES, FRANCE
CEA-R-2930 +. 14 PAGES, 4 FIGURES, 4 TABLES, 9 REFERENCES, MARCH 1966, IN FRENCH DEP. MV

THE ESTIMATION OF SR-90 FALLOUT WHICH OCCURRED LOCALLY IN THE YEARS BEFORE SYSTEMATIC CONTROLS WERE ESTABLISHED CAN BE MADE BY ASSUMING THAT THE CONCENTRATION IN RAIN VARIES LITTLE FROM ONE PLACE TO ANOTHER (IF THEY ARE FAIRLY CLOSE) AND THAT THE DEPOSIT CAN BE DEDUCED FROM THAT MEASURED IN A SINGLE STATION BY MAKING CORRECTIONS FOR DIFFERENCES IN THE RAINFALL. THIS ASSUMPTION IS CONFIRMED BY APPLYING THE METHOD TO THE CALCULATION OF FALLOUT AT ISPRA, MOL, AND AT SEVERAL FRENCH CENTRES. THE VALUES CALCULATED ARE COMPARED TO THOSE OBTAINED BY MEASUREMENTS CARRIED OUT SINCE 1958 IN SOME CASES, AND SINCE 1960 IN OTHERS. THE RESULTS SHOW THAT THE METHOD IS VALID FOR CALCULATING FALLOUT PRIOR TO 1960 (IN THE ABSENCE OF INFORMATION) AND TO DEDUCE WITH SUFFICIENT APPROXIMATION THE SUBSEQUENT CUMULATIVE DEPOSITS IN THE FRENCH CENTRES UNDER CONSIDERATION.

*FALLOUT + *FRANCE + *STRONTIUM + RAINOUT

15-11918 HENDERSON RW + LARSON DW
RADIATION MEASUREMENT OF THE EFFLUENT FROM THE NRX A-2 AND NRX A-3 REACTORS
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-3394 +. 51 PAGES, 31 FIGURES, 4 TABLES, 4 REFERENCES, JANUARY 1966, CFSTI \$3.00 CY, \$0.50 MN

COMPILATION OF DATA RESULTING FROM THE COLLECTION OF SAMPLES OF THE EFFLUENT CLOUDS FROM THE NRX A-2 AND A-3 REACTORS DURING FULL-POWER OPERATION IS PRESENTED. DATA ARE PRESENTED CONCERNING THE MAGNITUDE AND ISOTOPIC COMPOSITION OF THE AIRBORNE AND GROUND-DEPOSITED MATERIAL. THE ENVIRONMENTAL IMPACT OF THESE TESTS HAS BEEN CALCULATED FOR HYPOTHETICAL CONDITIONS OF LAND USE AND OCCUPANCY, AND THESE DATA ARE INCLUDED. A BRIEF DESCRIPTION OF EQUIPMENT AND TECHNIQUES IS ALSO GIVEN.

*EFFLUENT + *REACTOR, AIRCRAFT + DEPOSITION + FALLOUT + METEOROLOGY + NUCLEAR ROCKET + PARTICULATE +
SAMPLING

15-11919 COWPER G + KNIGHT GB + ROWE PC
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2540 +. 16 PAGES, 8 FIGURES, 3 TABLES, FEBRUARY 1966, AECL \$0.50 CY

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1965 HAS BEEN CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

*CANADA + *PERSONNEL EXPOSURE, RADIATION + DOSE MEASUREMENT, EXTERNAL + TRITIUM

15-11920 OPHEL IL + JUDD JM
EFFECTS OF INTERNALLY DEPOSITED RADIONUCLIDES ON THE THERMAL TOLERANCE OF FISH
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2409 +. 12 PAGES, 1 TABLES, 3 FIGURES, 9 REFERENCES, APRIL 1966, AECL \$0.50 CY

A WIDE RANGE OF CONCENTRATIONS OF SR-90 AND I-131 WAS USED IN A SERIES OF EXPERIMENTS TO

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-11920 *CONTINUED*

DETERMINE THE EFFECTS OF INTERNALLY DEPOSITED RADIONUCLIDES ON THE THERMAL TOLERANCE OF GOLDFISH. THE BODY BURDENS OF RADIONUCLIDES PRESENT IN THE FISH DID NOT IMPAIR THEIR ABILITY TO WITHSTAND A LETHAL TEMPERATURE.

*ECOLOGICAL CONSIDERATION + *RADIATION EFFECT + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + IODINE + STRONTIUM

15-11922 LANGHAM WH + HARRIS PS + SHIPMAN TL
PLUTONIUM DISPERSAL BY ACCIDENTAL OR EXPERIMENTAL LOW-ORDER DETONATION OF ATOMIC WEAPONS
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-1981(REV) +. 40 PAGES, 6 FIGURES, DECEMBER 1955 (REVISED FEBRUARY 1966), CFSTI \$2.00 CY, \$0.50 MN

ACCIDENTAL OR EXPERIMENTAL DETONATION OF ATOMIC WEAPONS THAT CONTAIN PLUTONIUM UNDER CONDITIONS SUCH THAT THE DEGREE OF CRITICALITY PRODUCED IS INSIGNIFICANT MAY CREATE AN IMMEDIATE AND A RESIDUAL OR DELAYED PLUTONIUM HEALTH HAZARD. URANIUM IS NOT A RADIOACTIVE HEALTH HAZARD. THE IMMEDIATE HAZARD IS ASSOCIATED WITH THE INHALATION OF PLUTONIUM DURING CLOUD PASSAGE AND ON THE BASIS OF THEORETICAL CONSIDERATIONS APPEARS TO BE RELATIVELY INSIGNIFICANT. THE DELAYED HAZARD RESULTS FROM RESIDUAL PLUTONIUM DEPOSITED IN THE FALL-OUT PATTERN, WHICH MAY PRODUCE CHRONIC CONTAMINATION. SUGGESTIONS ARE MADE AS TO THE COURSE OF ACTION THAT SHOULD BE FOLLOWED IN THE EVENT OF AN ACCIDENTAL DETONATION OF THE TYPE UNDER CONSIDERATION.

*NUCLEAR DETONATION + *PLUTONIUM + BIOLOGICAL CONCENTRATION, MAN + FALLOUT + HAZARD, RELATIVE + INHALATION + MAXIMUM PERMISSIBLE BODY BURDEN

15-11923 EDVARDSSON KA + WAHLBERG T
PLANNED PROCEDURES FOR FAST DETERMINATION OF RADIATION LEVELS AND PERSONNEL DOSIMETRY IN CONNECTION WITH RADIOLOGICAL ACCIDENTS
A B ATOMENERGI, SWEDEN
STI/PUB/99 +. 8 PAGES, 4 FIGURES, 1 REFERENCES, PAGES 665-672 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12-1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IAEA \$7.00

AB ATOMENERGI, SWEDEN, HAS AN EMERGENCY ORGANIZATION WHICH STARTS TO FUNCTION AS SOON AS AN ALARM INDICATES THAT AN EXTRAORDINARY SITUATION WITH CONSIDERABLE RADIATION HAZARDS HAS OCCURRED. THIS ORGANIZATION IS OPERATING FROM A HEADQUARTERS WHERE EQUIPMENT IS STORED AND DIFFERENT TYPES OF INTERNAL AND EXTERNAL COMMUNICATIONS ARE AVAILABLE. AS TO DETERMINATION OF EXPOSURES, IT IS DESIRABLE BOTH TO OBTAIN ROUGH PRELIMINARY VALUES FOR EXTERNAL AND INTERNAL EXPOSURE RATES AS SOON AS POSSIBLE AND TO GET FAIRLY ACCURATE VALUES FOR THE EXPOSURE OF EACH INDIVIDUAL INVOLVED IN THE ACCIDENT WITHIN REASONABLE TIME.

*EMERGENCY PROCEDURE + *RADIATION PROTECTION, ORGANIZATION + ACCIDENT, RADIOISOTOPE + DOSE MEASUREMENT, EXTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SURVEY, RADIATION, EMERGENCY + SWEDEN

15-11924 JEANMAIRE I.
ROLE OF THE LABORATORY AND THE METHODS TO BE USED IN THE EVENT OF AN ACCIDENT
CENTRE D ETUDES NUCLEAIRES DE FONTENAY, AUX-ROSES, FRANCE
STI/PUB/99 +. 6 PAGES, PAGES 413-418 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIAE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12-1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IN FRENCH IAEA \$7.00

THE LABORATORY WHICH MEASURES THE RADIOACTIVITY OF PERSONNEL AFTER A CONTAMINATION OR RADIATION ACCIDENT HAS A VERY IMPORTANT PART TO PLAY. FOR THE MEASUREMENT TO BE EFFECTIVE, DIRECT OR INDIRECT CTION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THONTAMINATION OF THE LABORATORY MUST AS FAR AS POSSIBLE BE AVOIDED. IN VIEW OF THE IMPOSSIBILITY OF DRAWING UP A VALID GENERAL PLAN FOR ALL THE MEASUREMENT METHODS TO BE EMPLOYED IN THE EVENT OF AN ACCIDENT, THE AUTHOR ONLY GIVFS INDICATIONS REGARDING THE PRINCIPLES TO BE FOLLOWED.

*EMERGENCY PROCEDURE + *RADIATION PROTECTION, ORGANIZATION + INCIDENT, EXPOSURE + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL

15-11925 OBATUROV GM
DETERMINATION OF TOTAL ABSORBED DOSE FOLLOWING ACCIDENTAL AND CHRONIC EXPOSURE
FIZIKO - ENERGETICHESKII INSTITUT, OBNINSK, SSSR
STI/PUB/99 +. 19 PAGES, 5 TABLES, 5 REFFRNCES, PAGES 329-347 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12-1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IN RUSSIAN IAEA \$7.00

THE PAPER PROPOSES METHODS AND FORMULAE FOR CALCULATING THE DOSE ABSORBED BY THE CRITICAL ORGANS FOLLOWING ACCIDENTAL AND CHRONIC (EXTERNAL AND INTERNAL) EXPOSURE. THE DOSES ABSORBED BY THE CRITICAL ORGANS UPON EXTERNAL EXPOSURE ARE CALCULATED ON THE BASIS OF THE FOLLOWING MEASUREMENTS OF INTERNAL EXPOSURE DOSES - (1) CONCENTRATION OF RADIOACTIVE AEROSOLS AND PERIOD OF TIME DURING WHICH THEY ENTER THE BODY, (2) ACTIVITY OF THE EXCRETA, (3) ACTIVITY OF THE BODY. FINALLY, AN EXAMPLE IS GIVEN ILLUSTRATING THE SUMMATION OF ABSORBED DOSES ACCRUING FROM EXTRNAL AND INTERNAL EXPOSURE.

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-11925 *CONTINUED*

*DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + BIOLOGICAL CONCENTRATION, MAN + INGESTION + INHALATION

15-11926 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS

STI/PUB/99 +. 714 PAGES, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12, 1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, JUNE 1965, IAEA \$7.00

PROVISION OF GOOD PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE IS IN MANY CASES AN ESSENTIAL PART OF EMERGENCY PLANNING BECAUSE THE INFORMATION PROVIDED MAY INFLUENCE EMERGENCY AND RESCUE OPERATIONS, AND CAN LEAD TO IMPROVED ACCIDENT PREPAREDNESS. ACCORDINGLY, THE IAEA AND THE WORLD HEALTH ORGANIZATION JOINTLY ORGANIZED THE SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION FOR THE DISCUSSION OF SUCH METHODS AND FOR A CRITICAL REVIEW OF THE PROCEDURES ADOPTED IN SOME OF THE RADIATION ACCIDENTS THAT HAVE ALREADY OCCURRED. THE MEETING WAS ATTENDED BY 179 PARTICIPANTS FROM 34 COUNTRIES AND FROM FIVE OTHER INTERNATIONAL ORGANIZATIONS. THE PAPERS PRESENTED AND THE ENSUING DISCUSSIONS ARE PUBLISHED IN THESE PROCEEDINGS. MAJOR SUBDIVISION OF THE BOOK ARE TITLED - MEASUREMENT TECHNIQUES FOR EXTERNAL RADIATION, DETERMINATION OF INTERNAL CONTAMINATION AND SPECIAL TOPICS, ASSESSMENT OF DOSE, EXPERIENCE AND PRACTICE IN 11 CENTERS.

*DOSE CALCULATION, EXTERNAL + *DOSE MEASUREMENT, EXTERNAL + *DOSIMETRY, GENERAL + EMERGENCY PROCEDURE + IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + INCIDENT, EXPOSURE + INGESTION + INHALATION + RADIATION INJURY, TREATMENT OF + RADIATION SAFETY AND CONTROL

15-11927 PUTZIER EA + LAGERQUIST CR + HAMMOND SE + MANN JR + PILTINGSRUD CW

EVALUATION AND TREATMENT OF AN ACUTE INTERNAL EXPOSURE TO PLUTONIUM

THE DOW CHEMICAL COMPANY, ROCKY FLATS DIVISION, GOLDEN, COLORADO

STI/PUB/99 +. 18 PAGES, 4 TABLES, 12 FIGURES, 2 REFERENCES, PAGES 549-566 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, JUNE 1965, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12, 1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IAEA \$7.00

AFTER DROPPING BURNING PLUTONIUM INTO CARBON TETRACHLORIDE, AN INDIVIDUAL WAS CONTAMINATED, WOUNDED, AND ALSO HAD INHALED PLUTONIUM. AFTER DECONTAMINATION, DTPA TREATMENT BEGAN, AND RAPID URINE RADIOANALYSIS VERIFIED ITS EFFECTIVENESS. A WHOLE-BODY COUNTER CHECKED THE DISTRIBUTION OF THE PU. DATA SUGGEST THAT THE DOSE FREQUENCY OF DTPA MAY AFFECT ITS EFFECTIVENESS.

*PLUTONIUM + *RADIATION INJURY, TREATMENT OF + ANALYTICAL TECHNIQUE, URINE + DOSE MEASUREMENT, INTERNAL + EXPLOSION + GLOVE BOX + INCIDENT, ACTUAL, GENERAL

15-11928 PARKER HM + NEWTON CE

THE HANFORD CRITICALITY ACCIDENT - DOSIMETRY TECHNIQUES INTERPRETATIONS AND PROBLEMS

GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS, RICHLAND, WASHINGTON

STI/PUB/99 +. 16 PAGES, 7 TABLES, 17 REFERENCES, PAGES 567-582 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, JUNE 1965, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12, 1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IAEA \$7.00 CY

TECHNIQUES USED FOR 22 PERSONS WERE UNUSUALLY COMPLETE - QUICK-SORT PROCEDURES (NA-24 IN VIVO) SEGREGATED EXCESSIVELY EXPOSED PERSONS, WITH CLOSE CORRELATION TO LATER LABORATORY TECHNIQUES. PRIMARY RELIANCE WAS PLACED ON FILM BADGES. THE SIMPLE GM COUNTER IN CONTACT WITH THE STOMACH SHOWED ABOUT 65 CPM PER RAD OF NEUTRON DOSE, AS VERIFIED BY WHOLE-BODY COUNTER. (IRONICALLY, NEW FILM BADGES WITH BETTER DOSIMETERS HAD BEEN ORDERED EARLIER BUT WERE DELIVERED THREE MONTHS AFTER THE ACCIDENT.) PROBLEMS IN THE VARIOUS TECHNIQUES FOR DOSE DETERMINATION ARE DISCUSSED. RELIANCE ON FIXED DETECTORS IS DISCOUNTED.

*DOSE MEASUREMENT, EXTERNAL + ACCIDENT, CRITICALITY + EMERGENCY PROCEDURE + HANFORD SITE + INCIDENT, ACTUAL, GENERAL + PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING

15-11936 BACKGROUND FOR MILK RADIOACTIVITY REPORTS

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PRESS REL. HEW-12 +. 5 PAGES, 1 TABLE, DECEMBER 16, 1965, DPI

THIS REPORT IS ONE OF A SERIES OF PRESS RELEASES TABULATING LATEST AVAILABLE DATA ON RADIOACTIVITY IN MILK SAMPLES. THE RELEASES GIVE AVERAGE DAILY CONCENTRATIONS OF I-131, SR-90, SR-89, AND 12-MONTH TOTALS FOR THESE RADIONUCLIDES.

*BIOLOGICAL CONCENTRATION, MILK + *IODINE + *STRONTIUM

15-12121 INMAN JE + KNOWLES DJ

DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION ALARM SYSTEMS INSTALLED IN THE HIGH RADIATION LEVEL EXAMINATION LABORATORY BUILDING. 3525

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE

ORNL-TM-1251 +. 21 PAGES, 3 TABLES, AUGUST 26, 1965, CFSTI \$1.00 CY, \$0.50 MN

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12121 *CONTINUED*

FACILITY RADIATION AND CONTAMINATION ALARM SYSTEMS WERE INSTALLED IN THE HIGH RADIATION LEVEL EXAMINATION LABORATORY (BUILDING 3525) TO CONTINUOUSLY AND AUTOMATICALLY MONITOR THE BETA-GAMMA RADIATION LEVEL, AIR-CONTAMINATION LEVEL, AND NEUTRON LEVEL IN THE ENTIRE FACILITY AND TO REPORT THE INFORMATION TO A CENTRAL CONTROL PANEL IN THE FIRST-LEVEL OPERATING AREA. WARNING AND EVACUATION SYSTEMS GIVE VISUAL AND AUDIBLE NOTICE OF DETECTED INCIDENTS.

*MONITOR, RADIATION, AIR + *MONITOR, RADIATION, ENVIRONMENTAL + *PERSONNEL PROTECTIVE DEVICE + CHAMBER, ION + DOSE MEASUREMENT, EXTERNAL + MONITOR, RADIATION, BACKGROUND

15-12182 KOENIG LA + ZEHME S

THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. PART II SC-T-66-0712 +. 10 PAGES, TABLES, 1965, TRANSLATED FROM ATOMPRAXIS 11, PAGES 268-70 (1965), JCL \$1.10 FS, \$0.80 MF

THE MAXIMALLY ADMISSABLE ACTIVITY CONCENTRATIONS OF SEVERAL RADIONUCLIDES IN AIR ARE GIVEN IN A SUMMARIZING TABLE AS AN ANNUAL MEAN DURING CONTINUAL EXPOSURE AND AS A FUNCTION OF AGE. PARENTHETIC VALUES ARE GIVEN THAT APPLY WHEN THERE IS A POSSIBILITY OF INCORPORATING NUCLIDES AS CONTAMINATION THROUGH FOOD INTAKE. THE METHOD OF CALCULATION OF THESE NUMBERS IS EXPLAINED. THE LOWEST VALUES FOR VARIOUS AGE GROUPS ARE GIVEN. THE INFLUENCE OF AGE IS NOT GREAT UNDER THE ASSUMPTIONS IMPOSED.

*AIR + *MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *RADIOACTIVITY, RELEASE + *SOURCE, CONTINUOUS + *STACK

15-12196 CHANGE REQUEST 8 - REVISED PLANT PARTICULATE MONITOR ALARM SETTING
RURAL COOPERATIVE POWER ASSOCIATION
2 PAGES, OCTOBER 5, 1966, DOCKET NO. 115-1, PDR

UNDER EXISTING CONDITIONS (RADON AND FISSION-GAS DAUGHTERS), THE PLANT AIR-PARTICULATE MONITOR IS NEARLY ALWAYS IN THE ALARM CONDITION. SINCE THE MAJOR ACTIVITIES ARE CONSIDERED KNOWN (RB-88 AND CS-138) THE REQUEST IS MADE TO CHANGE THE SETTING SO THAT THE INSTRUMENT MAY WARN OF INCREASED ACTIVITY LEVELS. DETAILED INFORMATION IN NUS-TM-S-35.

*MONITOR, RADIATION, AIR + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ELK RIVER + REACTOR, BOILING WATER

15-12197 SMITH ER

CONTAINMENT AIR PARTICULATE ACTIVITY IN ELK RIVER REACTOR
RURAL COOPERATIVE POWER ASSOCIATION
3 PAGES, AUGUST 6, 1966, DOCKET NO. 115-1, PDR

THE PLANT PARTICULATE AIR MONITOR USES A MOVING FILTER PAPER, WITH DETECTORS PLACED FOR INSTANTANEOUS AND FOR 6-HOUR-DECAY ALARMS. THE INSTANTANEOUS DETECTOR IS NEARLY ALWAYS ALARMING BECAUSE ITS SETTING IS 3 TIMES 10(MINUS 10TH) MICRO C/CC, THE MPC FOR UNIDENTIFIED BETA-GAMMA EMITTERS. SINCE THE OBSERVED FILTER PAPER HALF-LIFE FOR THE FIRST FOUR HOURS IS 22 MIN, AND SPECTRUM ANALYSIS SHOWS PREDOMINANTLY KR-88 AND CS-138 IN THE AIR, THE ALARM SETTING SHOULD BE CHANGED TO 6 TIMES 10 (MINUS 8TH) MICRO C/CC (1/10TH THE MPC FOR KR-88 AND CS-138) SO THE ALARM WILL MEAN SOMETHING.

*MONITOR, RADIATION, AIR + *OPERATING EXPERIENCE + AIRBORNE RELEASE + CONTAINMENT, GENERAL + ELK RIVER + NOBLE GAS + REACTOR, BOILING WATER

15-12241 SELECTED OPERATING EXPERIENCES

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT
20 PAGES, 10 TABLES, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 23, PAGES 15-21, AND A.1-A.13, FEBRUARY 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - (SECT. VI). USE OF A SMALL BYPASS CHARCOAL FILTER ARRANGEMENT IN THE REACTOR OFF-GAS SYSTEM, INTENDED TO STUDY EFFECT OF MOISTURE ON I-131 RETENTION, SHOWED THE IODINE UNDETECTABLE, AND SR-91 AND BA-LA-140 PRESENT. ON FEBRUARY 21, THE STACK RELEASE RATES AT 50 MW(TH) WERE LESS THAN 2 MICROCURIES/SEC FISSION GASES, AND 200 MICROCURIES/SEC ACTIVATION GASES. (APPENDIX A). DURING VARIOUS PHASES OF SCRAM RECOVERY, LEAKING STEAM VALVES REQUIRE OPERATORS TO WEAR FACE MASKS. SEVERAL SUCH INCIDENTS ARE REVIEWED.

*OPERATIONS SUMMARY FOR AEC + AIRBORNE RELEASE + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTAINMENT, LOW PRESSURE + REACTOR OFFGAS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + TEST, FILTER SYSTEM

15-12263 WESLEY EJ + HOPTON RL

RADIOLOGICAL SEARCH INSTRUMENTATION, TRIESTE I
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA
USNRDL-TR-805 +. 20 PAGES, 1 TABLE, 8 FIGURES, 6 REFERENCES, JANUARY 6, 1965, NUCLEAR INSTRUMENTS AND METHODS 37, PAGES 281-287 (1965), DDC

A GROSS COUNTING SYSTEM FOR MEASURING RADIOACTIVITY IN THE OCEAN, CONSISTING OF A LOG-RATEMETER, RECORDER AND A NAI(T1) SCINTILLATION DETECTOR, HAS BEEN DEVELOPED AND INSTALLED ON TRIESTE I FOR OPERATION TO A MAXIMUM DEPTH OF 16,000 FEET. ALL PULSES FROM THE DETECTOR EQUIVALENT TO 45 KEV GAMMA-RAY OR MORE GAMMA-RAY ENERGY ARE COUNTED. STATISTICAL FLUCTUATION IN THE BACKGROUND COUNTING RATE FROM NORMAL SEA WATER AND DETECTOR ASSEMBLY COMPONENTS LIMIT THE SENSITIVITY. WITH AN INTEGRATING TIME CONSTANT OF 3.5 SEC AND USING 3

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12263 *CONTINUED*

TIMES 10(11TH) CURIE/LITER AS THE GAMMA RAY ACTIVITY IN SEA WATER (K-40), THE MINIMUM DETECTABLE INCREASE IN ACTIVITY FOR 1.47 MEV GAMMA RAYS IS 1.36 TIMES 10(11TH) CURIE/LITER. A PERMANENT RECORD OF THE COUNTING RATE WHICH CAN INDICATE TWO DECADES ABOVE THIS LIMIT IS OBTAINED ON THE STRIP CHART RECORDER.

*MONITOR, RADIATION, LIQUID + *OCEAN AND SEA + INSTRUMENTATION, NUCLEAR

15-12305 LARTY JE

RADIOGRAPHY INCIDENT AT B AND W PLANT, OCTOBER 10, 1966

BABCOCK AND WILCOX COMPANY

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 15-16 (NOVEMBER 21, 1966)

THE RADIOGRAPHER ENTERED THE WORK AREA PAST THE REMOTE SOURCE-CRANKING DEVICE WITHOUT CRANKING IN THE SOURCE OR MAKING A RADIATION SURVEY AND RECEIVED AN EXPOSURE OF 3.69 R (GAMMA). THE RADIOGRAPHER HAD 2 YEARS OF EXPERIENCE WITH X-RAY EQUIPMENT AND 6 MONTHS WITH THIS 150-CURIE CO-60 DEVICE. THE REASON GIVEN FOR THESE ACTIONS WAS PREOCCUPATION WITH PERSONAL PROBLEMS. AFTER HIS DOSE-RESTRICTION PERIOD IS COMPLETED, HE WILL BE GIVEN A REFRESHER COURSE IN SAFE PRACTICES.

*FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + *RADIOGRAPHY + COBALT + PERSONNEL EXPOSURE, RADIATION

15-12306 PALACIOS DE LOZANO MM

RADIATION OVEREXPOSURE AT GONZALES HOSPITAL, SAN JUAN, PUERTO RICO

GONZALES ONTOLOGICAL HOSPITAL, SAN JUAN, PUERTO RICO

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 16-17 (NOVEMBER 21, 1966)

THE SEPTEMBER FILM BADGE OF A WORKER READ 4.2 REMS. IN AUGUST, THE FILM SUPPLIER FAILED TO DELIVER FILM ON TIME, SO THE JULY FILMS WERE NOT DEVELOPED UNTIL THE END OF AUGUST. THE JULY-AUGUST FILM BADGE HOLDER OF THE WORKER WAS FOUND EMPTY, BUT DURING THOSE TWO MONTHS HE HAD BEEN ASSIGNED TO THE CO-60 AND CESIUM UNITS, WHERE HE WOULD NOT LIKELY HAVE RECEIVED AN APPRECIABLE EXPOSURE. IN SEPTEMBER, HE WORKED IN THE RADIUM AREA, WHERE THE OTHER TWO WORKERS RECEIVED SEPTEMBER DOSES OF 130 AND 110 REMS. THIS WORKER WORE HIS BADGE AT COLLAR-BONE LEVEL, WHERE THE LEAD-BRICK SHIELDING WAS NOT EFFECTIVE, BUT MEASUREMENTS AT THIS LEVEL DID NOT ACCOUNT FOR THE DOSE.

*INCIDENT, ACTUAL, GENERAL + *PERSONNEL EXPOSURE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL

15-12307 SMITH JA

OVEREXPOSURE AT HITTMAN ASSOCIATES

HITTMAN ASSOCIATES, BALTIMORE, MARYLAND

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 17 (NOVEMBER 21, 1966)

ON OCTOBER 17, 1966, HITTMAN ASSOCIATES CONTENDED THAT THE NEW YORK OFFICE COMPLIANCE REPORT WAS WRONG AND THAT AN INDIVIDUAL WHO HAD BEEN MAKING A 250-CURIE PM-147-ACTIVATED LIGHT SOURCE HAD NOT RECEIVED AN OVEREXPOSURE OF LOW ENERGY RADIATION TO HIS HANDS. SEVEN ENCLOSURES (INCLUDING FILM-BADGE REPORTS, DETAILED PROCEDURES, AND DOSE-RATE MEASUREMENTS) SUPPORTED THIS CONTENTION.

*PERSONNEL EXPOSURE, RADIATION + ACCIDENT ANALYSIS + INSPECTION AND COMPLIANCE + RADIATION SAFETY AND CONTROL

15-12309 POTENTIAL OVEREXPOSURE AT NUCLEAR FUEL SERVICES DURING DECONTAMINATION

NUCLEAR FUEL SERVICES, WEST VALLEY, NEW YORK

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 18 (NOVEMBER 21, 1966) DOCKET NO. 50-201

ON SEPTEMBER 29-30 AND OCTOBER 3, 1966, TWO SUBCONTRACTOR EMPLOYEES SANDBLASTED THE INTERIOR OF A CONCRETE WASTE-STORAGE TANK INTERIOR WHILE WEARING DUST HOODS INSTEAD OF ASSAULT MASKS, AS INSTRUCTED BY THEIR FOREMAN. ON OCTOBER 12, NFS COUNTED THE CHEST AREA OF THE MEN AND TWO CONTROLS WITH A THYROID MONITOR AND FOUND NO SIGNIFICANT DIFFERENCE. BEFORE THE SANDBLASTING, CHEMICAL STRIPPING HAD REDUCED THE SURFACE ACTIVITY OF THE CONCRETE TO 23 MR/HR. EFFECTIVE IMMEDIATELY, ALL SUBCONTRACT WORK WITHIN RESTRICTED AREAS WILL REQUIRE A SPECIAL WORK PERMIT (SWP).

*DECONTAMINATION + *FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + CONCRETE + FAILURE, ADMINISTRATIVE CONTROL + NFS (NUCLEAR FUEL SERVICES) + WASTE STORAGE

15-12310 KING JH

RADIATION OVEREXPOSURE AT OHMART CORPORATION

OHMART CORPORATION, CINCINNATI, OHIO

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 20 (NOVEMBER 21, 1966)

OHMART REPORTS THAT ONE EMPLOYEE RECEIVED 1-83 REMS IN THE THIRD QUARTER OF 1966 BECAUSE THE RADIATION-PATTERN CHECKING OF CERTAIN SPECIAL GAUGES REQUIRES THAT TOO MUCH TIME BE SPENT IN LOW-DOSE-RATE FIELDS.

*FAILURE, ADMINISTRATIVE CONTROL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12311 FORSCHER F
EXPOSURES TO AIRBORNE RADIOACTIVITY AT NUMEC
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION, APOLLO, PENNSYLVANIA
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 19-20 (NOVEMBER 21, 1966)

NUMEC REPORTS 2 INSTANCES.- (1) BETWEEN FEBRUARY 15, 1966 (WHEN NUMEC REQUESTED CREDIT FOR RESPIRATOR PROTECTION) AND JUNE 8, 1966 (WHEN AEC ALLOWED CREDIT), VARIOUS WORKERS WORE MASKS IN AIR ABOVE MPC LEVELS AND WERE THUS TECHNICALLY OVEREXPOSED. DETAILS GIVEN. (2) ON SEPTEMBER 27 THROUGH 29, THREE TECHNICIANS WERE EXPOSED TO PLUTONIUM UP TO 193 MPC (AIR) HOURS IN SCRAP RECOVERY DUE TO GLOVE-BOX GLOVE FAILURE, LEAKING PLASTIC BAG, AND INADEQUATE RETRAINING AFTER THE RETURN FROM SIX MONTHS OF MILITARY SERVICE.

*AIRBORNE RELEASE + *FAILURE, ADMINISTRATIVE CONTROL + *INHALATION +
ADMINISTRATIVE CONTROLS AND PRACTICES + PLUTONIUM + RADIATION SAFETY AND CONTROL

15-12318 RUSSELL JA
DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION SYSTEM INSTALLED IN OAK RIDGE RESEARCH REACTOR
BUILDING 3042
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-943 +. 22 PAGES, 2 TABLES, SEPTEMBER 15, 1964, CFSTI \$1.00 CY

A FACILITY RADIATION AND CONTAMINATION SYSTEM WAS INSTALLED IN THE OAK RIDGE RESEARCH REACTOR BUILDING 3042 TO CONTINUOUSLY AND AUTOMATICALLY MONITOR THE BETA-GAMMA RADIATION LEVEL AND AIR-CONTAMINATION LEVEL IN THE ENTIRE FACILITY AND TO REPORT THIS INFORMATION TO A CENTRAL CONTROL PANEL IN THE REACTOR OPERATION CONTROL ROOM. FIFTEEN MONITRONS AND NINE AIR MONITORS ARE CONNECTED IN THE INSTRUMENT NETWORK. A BUILDING EVACUATION SYSTEM AUTOMATICALLY OPERATES WHEN TWO OR MORE MONITRONS OR TWO OR MORE AIR MONITORS DETECT HIGH LEVEL RADIATION OF AIR CONTAMINATION.

*INSTRUMENTATION, PROTECTIVE + *MONITOR, RADIATION, AIR + *ORR (OAK RIDGE RESEARCH REACTOR) +
INSTRUMENTATION, RADIATION MONITORING + REACTOR, GENERAL + REACTOR, TEST +
RESEARCH AND DEVELOPMENT PROGRAM

15-12320 WHICKER FW
FACTORS INFLUENCING THE ACCUMULATION OF FALLOUT IN MULE DEER
COLORADO STATE UNIVERSITY
COO-1156-11 +. 238 PAGES, MAY 1965, CFSTI \$6.00 CY, \$1.25 MN

THIS INVESTIGATION WAS CONCERNED WITH FACTORS INFLUENCING THE ACCUMULATION OF FALLOUT CESIUM-137 IN A WILD POPULATION OF MULE DEER IN THE CACHE LA POUDE DRAINAGE OF NORTH-CENTRAL COLORADO. AIR, PRECIPITATION, SOILS, TWELVE DEER-FORAGE SPECIES, AND DEER WERE SAMPLED PERIODICALLY FROM VARIOUS ELEVATIONS WITHIN THE STUDY AREA OVER A THREE-YEAR PERIOD. AIR CONCENTRATIONS OF CS-137 WERE MAXIMAL IN 1963. CONCENTRATIONS WERE SIGNIFICANTLY HIGHER DURING SPRING AND EARLY SUMMER MONTHS OF EACH YEAR. THE MAJORITY OF CS-137 IN SOILS WAS LOCATED IN THE 0- TO 1-IN. LAYER. SOIL RADIOACTIVITY GENERALLY INCREASED WITH ELEVATION AND ASSOCIATED HIGHER AVERAGE PRECIPITATION RATES. MAXIMUM VEGETATIONAL LEVELS OF CS-137 WERE OBSERVED IN 1963. MAXIMUM LEVELS OF CS-137 IN DEER WERE OBSERVED IN 1963. IT WAS CONCLUDED THAT THE DEGREE OF FOLIAGE CONTAMINATION AND FOOD HABITS WERE THE MOST IMPORTANT FACTORS CONTRIBUTING TO CS-137 BURDENS IN DEER. INHALATION, THE DRINKING OF SURFACE WATERS, AND THE INGESTION OF SNOW WERE MINOR SOURCES OF CS-137 INTAKE BY DEER, COMPARED WITH INGESTION OF FORAGE.

*CESIUM + *ECOLOGICAL CONSIDERATION + *FALLOUT + BIOLOGICAL CONCENTRATION, ANIMAL +
BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, VEGETATION + DEPOSITION + INGESTION +
INHALATION + RAINOUT + SOIL, NUCLIDE OCCURRENCE + WATER, DRINKING

15-12321 FARRIS GC
SR-90 IN ANTLERS AND SELECTED BONES OF COLORADO MULE DEER
COLORADO STATE UNIVERSITY
COO-1156-12 +. 91 PAGES, MAY 1965, CFSTI \$3.00 CY, \$0.75 MN

LEVELS OF STRONTIUM-90 IN ANTLERS AND VARIOUS BONES OF COLORADO MULE DEER IN THE CACHE LA POUDE DRAINAGE OF NORTH-CENTRAL COLORADO WERE INVESTIGATED FROM JULY 1961 THROUGH DECEMBER 1964. FOR THE SEVEN-TO EIGHTEEN-MONTH-OLD DEER, THE ANTLER-FEMUR RATIO WAS 0.9, COMPARED WITH THE ADULT DEER RATIO OF 1.5. THE LARGER RATIO FOR THE ADULT DEER MAY INDICATE A LOWER SKELETAL DEMAND FOR STRONTIUM AND CALCIUM. WITH THE RESUMPTION OF NUCLEAR TESTING IN SEPT. 1961 THE FEMUR BONES OF SEVEN-TO EIGHTEEN-MONTH-OLD DEER SHOWED A FACTOR-OF-FIVE INCREASE IN STRONTIUM-90 DURING THE REMAINDER OF THE STUDY PERIOD. STRONTIUM BODY BURDENS OF SIX AGE CLASSES OF DEER COLLECTED IN OCT. 1962 WERE SIGNIFICANTLY DIFFERENT. HOWEVER, THE HIGHEST LEVELS OF ACTIVITY WERE IN THE YOUNGER DEER. SEX DID NOT INFLUENCE THE STRONTIUM BODY BURDENS IN DEER UP TO 17 MONTHS OLD.

*BIOLOGICAL CONCENTRATION, ANIMAL + *ECOLOGICAL CONSIDERATION + *STRONTIUM + FALLOUT

15-12322 WHICKER FW + FARRIS GC + DAHL AH
CONCENTRATION PATTERNS OF SR-90, CS-137 AND I-131 IN A WILD DEER POPULATION AND ENVIRONMENT
COLORADO STATE UNIVERSITY
COO-1156-13 + CONF-660405-2 +. 30 PAGES, 1966, FROM SYMPOSIUM ON RADIOECOLOGICAL CONCENTRATION PROCESSES, STOCKHOLM, CFSTI \$2.00 CY, \$0.50 MN

THIS INVESTIGATION WAS CONCERNED WITH CONCENTRATIONS OF SR-90, CS-137, AND I-131 FROM FALLOUT IN WILD MULE DEER. OF PARTICULAR INTEREST WAS THE VARIABILITY IN RADIONUCLIDE BURDENS AMONG

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15-12322 *CONTINUED*

INDIVIDUAL DEER AND THE FACTORS RESPONSIBLE FOR PRODUCING THE VARIATIONS. FREQUENCY DISTRIBUTIONS OF LEVELS OF SR-90 IN BONE, CS-137 IN MUSCLE AND I-131 IN THYROIDS WERE CONSTRUCTED AND STATISTICALLY CHARACTERIZED AS LOG-NORMAL. THE FACTORS WHICH WERE SHOWN TO AFFECT THE SHAPES OF THE DISTRIBUTIONS WERE TIME AND TIME-ASSOCIATED PHENOMENA, AGE, FOOD HABITS, ELEVATION OF RESIDENCE AND ASSOCIATED CLIMATIC AND VEGETATIVE DIFFERENCES, AND THE ACTUAL STRUCTURE OF THE POPULATION SAMPLED. THE IMPORTANCE OF EACH FACTOR WAS QUANTITATIVELY ESTIMATED AND FOUND TO VARY CONSIDERABLY AMONG THE THREE RADIONUCLIDES STUDIES. THE DISTRIBUTION PATTERNS INDICATED THAT A SMALL PERCENTAGE OF THE POPULATION COULD ACCUMULATE RADIONUCLIDE BODY BURDENS SEVERAL TIMES GREATER THAN THOSE OF THE MAJORITY OF INDIVIDUALS. SIMPLE CONCENTRATION FACTORS FOR PREDICTING AVERAGE TISSUE LEVELS AND DOSES FROM VEGETATIVE CONCENTRATIONS WERE CALCULATED FOR SR-90 AND CS-137 AND COMPARED WITH THE OBSERVED VALUES.

*BIOLOGICAL CONCENTRATION, ANIMAL + *CESIUM + *IODINE + *STRONTIUM +
BIOLOGICAL CONCENTRATION, ANIMAL FEED + DOSE CALCULATION, INTERNAL + ECOLOGICAL CONSIDERATION + FALLOUT +
SAMPLING

15-12323 LONGHURST WM + GOLDMAN M + DELLA ROSA RJ
COMPARISON OF THE ENVIRONMENTAL AND BIOLOGICAL FACTORS AFFECTING THE ACCUMULATION OF SR-90 AND CS-137 IN
DEER AND SHEEP
CALIFORNIA UNIVERSITY
SAN-34-2 + CONF-660405-4 +. 30 PAGES, 1966, FROM SYMPOSIUM ON RADIOECOLOGICAL CONCENTRATION PROCESSES,
STOCKHOLM, CFSTI \$2.00 CY, \$0.50 MN

FACTORS AFFECTING THE ACCUMULATION OF STRONTIUM-90 AND CESIUM-137 IN DEER AND SHEEP, ON CONTRASTING NATURAL DIETS HAVE BEEN UNDER INVESTIGATION SINCE 1951. THESE TWO RUMINANTS HAVE SHOWN THAT ALTHOUGH THEY OCCUPY THE SAME AREA, THEY ARE SEPARATED ECOLOGICALLY BY THEIR FOOD PREFERENCE. DEER ARE PRIMARILY BROWSERS, WITH 70 PERCENT OF THEIR INTAKE CONSISTING OF THE LEAVES AND TWIGS OF WOODY FORAGE PLANTS, WHILE THE DIET OF SHEEP IS ABOUT 80 PERCENT GRASS. A NUMBER OF OTHER ENVIRONMENTAL AND SPECIES-SPECIFIC BIOLOGICAL FACTORS HAVE BEEN STUDIED. A MODEL OF SR-90 ACCUMULATION IN THE TWO ANIMALS IS PRIMARILY A FUNCTION OF THE TIMING OF RADIONUCLIDE INTAKE IN RELATION TO THE RATE OF SKELETAL GROWTH. IN THE CASE OF CS-137, WHICH HAS A RELATIVELY RAPID TURNOVER TIME, ANIMAL SOFT TISSUES PRIMARILY REFLECT INTAKE LEVELS OVER A SHORT TIME (ABOUT 1 TO 2 MONTHS) PRIOR TO SAMPLING.

*BIOLOGICAL CONCENTRATION, ANIMAL + *CESIUM + *ECOLOGICAL CONSIDERATION + *STRONTIUM +
BIOLOGICAL CONCENTRATION, ANIMAL FEED

15-12324 FEIGE Y + GAIRON P
RELATIVE TOXICITY OF RADIONUCLIDES
ISRAEL ATOMIC ENERGY COMMISSION, YAVNE
IA-989 +. 24 PAGES, REFERENCES, AUGUST 1965, DEP. MN

A METHOD FOR DETERMINING THE RELATIVE TOXICITY OF RADIONUCLIDES IS PRESENTED, WHICH IS BASED ON THE COMPARISON OF THE TOXICITY ACCORDING TO BOTH THE WEIGHT AND THE ACTIVITY CLASSIFICATIONS. THE METHOD UTILIZES A COLOUR CODE COMBINED WITH A TWO-DIMENSIONAL GRAPHICAL REPRESENTATION OF THE TOXICITY. TOXIC STABLE ELEMENTS CAN ALSO BE INCLUDED.

*HAZARD, RELATIVE + ICRU (INT. COMM. RAD. UNITS AND MEASUREMENTS) + MAXIMUM PERMISSIBLE BODY BURDEN +
MAXIMUM PERMISSIBLE CONCENTRATION (MPC)

15-12325 COWAN RD
CALCULATION OF RETINAL DOSE DUE TO VISIBLE RADIATION FROM NUCLEAR EXPLOSIONS
LOS ALAMOS SCIENTIFIC LAB.
LA-3204 +. 101 PAGES, FIGURES, REFERENCES, OCTOBER 6, 1964, CFSTI \$4.00 CY, \$2.00 MN

CALCULATION OF THE MAXIMUM ENERGY DENSITY RECEIVED BY ANY PORTION OF THE RETINA DUE TO RADIATION FROM AN INCOMPLETELY RESOLVED SOURCE REQUIRED KNOWLEDGE OF THE POINT-SOURCE RETINAL-IMAGE-SPREAD FUNCTION. THE DOSE FROM A HYPOTHETICAL HIGH-ALTITUDE EXPLOSION IS CALCULATED TO ILLUSTRATE USE OF THE RESULTS.

*DOSE CALCULATION, EXTERNAL + DOSE MEASUREMENT, EXTERNAL

15-12326 PECCI J + DREVINSKY PJ + COUBLE E + DIMOND NA + KALKSTEIN MI
RADIOCHEMICAL PROCEDURES FOR SELECTED RADIONUCLIDES IN ENVIRONMENTAL SAMPLES
AIR FORCE CAMBRIDGE RESEARCH LABS
AD-620219 + AFCL-65-410 + IP-68 +. 73 PAGES, REFERENCES, JUNE 1965, CFSTI \$3.00, \$0.75 MN

METHODS ARE PRESENTED FOR THE RADIOCHEMICAL ANALYSIS OF PRECIPITATION, AIR-FILTER, AND IMPACTOR-FILTER SAMPLES FOR (1) FISSION PRODUCTS (SR-89, SR-90, ZR-95, BA-140, CE-141, AND CE-144), (2) INDUCED RADIOACTIVITIES (MN-54, AG-110, W-181, AND W-185), (3) HIGH-ALTITUDE TRACERS (RH-102 AND CD-109), (4) COSMIC-RAY SPALLATION PRODUCTS (BE-7, NA-22, P-32, P-33, AND S-34, AND (5) NATURAL RADIOACTIVITY (PB-210).

*ANALYTICAL TECHNIQUE, AIR + *ANALYTICAL TECHNIQUE, GENERAL + *ANALYTICAL TECHNIQUE, SOLID +
*ANALYTICAL TECHNIQUE, WATER + *RADIOCHEMICAL ANALYSIS + ION EXCHANGE + LEAD + PHOSPHORUS + SODIUM +
STRONTIUM + SULFUR + TRACER, RADIOACTIVE + ZIRCONIUM

15-12335 FAUST LG
MEASURED AND CALCULATED SURFACE DOSE RATES OF PLUTONIUM AND PLUTONIUM OXIDES

ACCESSION NUMBER 15-12322 TO 15-12335

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12335 *CONTINUED*

PACIFIC NORTHWEST LABORATORY, BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-22 +. 16 PAGES, JUNE 7, 1965, CFSTI \$1.00 CY, \$0.50 MN

AN EXTRAPOLATION CHAMBER WAS USED TO MEASURE THE X-RAY AND GAMMA-RAY SURFACE DOSE RATES OF METALLIC PLUTONIUM, PUO₂, AND PUO₂-UO₂ MIXTURES. DATA ARE PRESENTED SHOWING THE CHANGES IN THE SURFACE DOSE RATES OF METALLIC PLUTONIUM WITH CHANGES IN THE PLUTONIUM ISOTOPIC COMPOSITION. THE SURFACE DOSE RATE OF PLUTONIUM METAL WAS COMPARED TO THE DOSE RATE AFTER THE METAL WAS OXIDIZED. SURFACE DOSE RATE VALUES ARE PRESENTED FOR DIFFERENT WEIGHT PERCENTS OF PUO₂ IN PUO₂-UO₂ MIXTURES. MEASURED AND CALCULATED SURFACE DOSE RATES FOR PLUTONIUM METAL WERE IN EXCELLENT AGREEMENT. AN EQUATION TO CALCULATE THE SURFACE DOSE RATE OF PLUTONIUM DUE TO NEUTRONS IS PRESENTED. ATTENUATION FACTORS ARE PRESENTED FOR PLASTIC TRANSFER-BAGGING MATERIAL AND HOOD GLOVES IN USE AT PACIFIC NORTHWEST LABORATORY.

*DOSE CALCULATION, EXTERNAL + *PLUTONIUM + BATTELLE NORTHWEST + DOSE MEASUREMENT, EXTERNAL + URANIUM

15-12336 BRACKENBUSH LW + BAUMGARTNER WV
DETECTION OF PLUTONIUM IN BIOASSAY PROGRAMS USING NONELECTRICAL FISSION FRAGMENT TRACK DETECTORS
PACIFIC NORTHWEST LABORATORY, BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-58 +. 11 PAGES, JUNE 7, 1965, CFSTI \$1.00 CY, \$0.50 MN

A BIOASSAY PROGRAM FOR PLUTONIUM OR OTHER FISSIONABLE MATERIALS MAY FIND NONELECTRICAL SOLID-STATE FISSION-FRAGMENT-TRACK DETECTORS USEFUL. THIS METHOD OF FISSIONABLE MATERIAL ANALYSIS IS VERY SENSITIVE, RAPID, AND REASONABLY ACCURATE. LEXAN PLASTIC DISKS PLACED UPON ELECTRODEPOSITED BIOASSAY DISKS, EXPOSED TO AN INTEGRATED THERMAL NEUTRON FLUX OF 10¹⁵TH, AND ETCHED IN A CAUSTIC SOLUTION ARE USED TO DETECT LESS THAN 0.01 DIS/MIN OF PLUTONIUM ALPHA ACTIVITY. THIS IS FIVE TIMES LOWER THAN THE PRESENT HANFORD DETECTION LIMIT OF 0.05 DIS/MIN USING NTA EMULSION. THE METHOD CAN BE EXTENDED TO EVEN SMALLER QUANTITIES BY USING A HIGHER NEUTRON FLUX OR LARGER TRACK-COUNTING AREAS. THE USE OF THESE NONELECTRIC FISSION-FRAGMENT DETECTORS WITH OTHER FISSIONABLE MATERIALS OFFERS UNIQUE AND PRACTICAL SOLUTIONS TO MANY HEALTH PHYSICS PROBLEMS.

*ANALYTICAL TECHNIQUE, URINE + *PLUTONIUM

15-12337 DISTENFELD C + BISHOP W + COLVETT D
A THERMOLUMINESCENT NEUTRON DOSIMETRY SYSTEM
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
BNL-9605 +. 18 PAGES, 1965, CFSTI \$1.00 CY, \$0.50 MN

A NEUTRON DOSIMETRIC SYSTEM WAS DEVELOPED BY USING LITHIUM FLUORIDE PHOSPHORS WITHIN A BONNER SPHERE. USE IS MADE OF THE LARGE DIFFERENCE IN NEUTRON ABSORPTION CHARACTERISTICS BETWEEN LI-6 AND LI-7 FLUORIDE TO PERMIT EVALUATION OF THE NEUTRON AND GAMMA DOSAGES FOR MIXED FIELDS. NEUTRON RESPONSE WAS EVALUATED BY USING A POSITIVE-ION VAN DE GRAAFF GENERATOR TO PRODUCE MONOENERGETIC NEUTRONS. PROTONS ON LITHIUM, PROTONS ON TRITIUM, DEUTERONS ON DEUTERONS, AND DEUTERONS ON TRITIUM ALLOWED COVERAGE OF THE RANGE BETWEEN 150 KEV AND 18 MEV. SENSITIVITY OF THE SPHERE TO 1.5-MEV NEUTRONS IS ABOUT 10 CO-60 ROETGEN EQUIVALENTS PER NEUTRON RAD.

*DOSIMTRY, THERMOLUMINESCENCE + LITHIUM + NEUTRON

15-12338 PALMER HE + BEASLEY TM
FE-55 IN HUMANS AND THEIR FOODS
HEALTH AND SAFETY LABORATORY, NEW YORK OPERATIONS OFFICE USAEC, NEW YORK
CONF-650616-27 +. 9 PAGES, 1965, FROM HEALTH PHYSICS SOCIETY ANNUAL MEETING, LOS ANGELES, CFSTI \$1.00 CY, \$0.50 MN

MEASURABLE QUANTITIES OF FE-55 ARE PRESENT IN PEOPLE, ANIMALS AND FOOD. THE AMOUNT IN ESKIMOS AND CARIBOU AT ANAKTUVUK, ALASKA, IS ABOUT 8 TIMES THAT IN RESIDENTS AND CATTLE NEAR RICHLAND, WASHINGTON. MEAT AND GRAINS ARE THE FOODS THAT CONTRIBUTE MOST TO THE HUMAN FE-55 BODY BURDENS.

*IRON + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + DIETARY HABIT

15-12339 HEATHERTON RC + BOBACK MW
THORIUM AND ITS MPCs
NATIONAL LEAD COMPANY OF OHIO, CINCINNATI
NLCO-962 + CONF-651008-3 +. 15 PAGES, SEPTEMBER 1, 1965, FROM ANNUAL BIO-ASSAY MEETING ALBUQUERQUE, NEW MEXICO, CFSTI \$1.00 CY, \$0.50 MN

MAXIMUM PERMISSIBLE CONCENTRATION (MPC) VALUES FOR THORIUM ARE DISCUSSED FROM THE VIEWPOINT OF AN AEC CONTRACTOR. INCONSISTENCIES PRESENTLY FOUND IN THE OFFICIAL PUBLICATIONS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION (ICRP), THE NATIONAL COMMITTEE ON RADIATION PROTECTION (NCRP), AND THE USAEC ARE CONFUSING AND REQUIRE CLARIFICATION. IN ADDITION, IT HAS BEEN REPORTED UNOFFICIALLY THAT THE ICRP, IN THE NEXT REVISION OF ITS TABLES, WILL PROBABLY EXCLUDE OR MAKE MORE RESTRICTIVE THE PROVISIONAL STATEMENT REGARDING THE MAXIMUM PERMISSIBLE CONCENTRATION IN AIR FOR LONG-LIVED THORIUM ISOTOPES. THE AUTHORS FEEL THAT, IN VIEW OF AVAILABLE INFORMATION, SUCH ACTION BY THE ICRP IS QUESTIONABLE AND SHOULD BE RECONSIDERED.

*MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *THORIUM + ICRU (INT. COMM. RAD. UNITS AND MEASUREMENTS) + NCRP (NATIONAL COMMITTEE RADIATION PROTECTION)

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12340 CASTREN O
GAMMA-SPECTROMETRIC DETERMINATIONS OF CS-131 AND POTASSIUM IN FINNISH MILK
INSTITUTE OF RADIATION PHYSICS, HELSINKI, FINLAND
SFL-A2 +. 26 PAGES, APRIL 1966, DEP. MN

THIS REPORT IS A PRESENTATION OF THE METHODS USED AND RESULTS OBTAINED IN A GAMMA-SPECTROMETRIC MILK-SURVEILLANCE PROGRAM. SPECIAL EMPHASIS HAS BEEN GIVEN TO THE ESTIMATION OF ERROR IN THE LARGE VOLUME GAMMA-SPECTROMETRIC ASSAY. AN ATTEMPT HAS BEEN MADE TO DIVIDE THE ERROR INTO COMPONENTS AND TO ESTIMATE THE MAXIMUM VALUES OF THE COMPONENTS. THE AVERAGE POTASSIUM CONCENTRATION IN FINNISH MILK HAS BEEN CALCULATED ON THE BASIS OF DETERMINATIONS OF POTASSIUM DRIED MILK. A VALUE OF 1.58 PLUS-OR-MINUS 0.05 GK/1 WAS OBTAINED. ON THE BASIS OF THE RESULTS, ANNUAL CONTRYWIDE PRODUCTION-WEIGHTED MEANS FOR THE CONCENTRATION OF CESIUM-137 IN FINNISH MILK HAS BEEN CALCULATED. THE FOLLOWING RESULTS WERE OBTAINED - 1960 (87), 1961 (58), 1962 (142), 1963 (243), 1964 (252), 1965 (190 PCI/1).

*BIOLOGICAL CONCENTRATION, MILK + *CESIUM + FINLAND + POTASSIUM + SAMPLING + SPECTROMETRY, GAMMA

15-12358 JONES TH
A PREDICTION SYSTEM FOR THE NEUTRON-INDUCED ACTIVITY CONTRIBUTION TO FALLOUT EXPOSURE RATES
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA
USNRDL-TR-1056 + AD-639,446 +. 60 PAGES, 1 FIGURE, 4 TABLES, 12 REFERENCES, AUGUST 12, 1966, DDC, CFSTI \$3.00 CY, \$0.50 MN.

A SYSTEM HAS BEEN DEvised TO PREDICT THE NEUTRON-INDUCED ACTIVITY CONTRIBUTION TO FALLOUT EXPOSURE RATES. THE SYSTEM USES THE SIMPLIFYING ASSUMPTIONS OF (1) A SEMI-EMPIRICAL FORMULA TO DETERMINE THE SOIL CAPTURE FRACTION AND (2) THERMAL NEUTRON CROSS SECTIONS TO REPRESENT WEAPON-NEUTRON CROSS SECTIONS. RESULTS, USING THESE ASSUMPTIONS, AGREE WITH THOSE OF ANOTHER COMPLETE SYSTEM FOR PREDICTING THE NEUTRON-INDUCED ACTIVITY CONTRIBUTION TO FALLOUT EXPOSURE RATES. IN ADDITION, RESULTS FROM VARIOUS PORTIONS OF THE SYSTEM AGREE WITH RESULTS OBTAINED BY MORE COMPLICATED METHODS.

*ACTIVATION PRODUCT + *COMPUTER PROGRAM + *FALLOUT + DOSE + NEUTRON + NUCLEAR EXPLOSION DEBRIS

15-12360 POLLOCK JS + JONES IS
HEALTH PHYSICS CONTROL OF BERYLLIUM AT A.E.R.E., HARWELL
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, ENGLAND
AERE-R-5106 +. 34 PAGES, 8 FIGURES, 5 TABLES, 10 REFERENCES, JULY 1966, BIS \$1.80 CY

WORK ON BERYLLIUM AND ITS COMPOUNDS HAS BEEN CARRIED OUT AT AERE HARWELL FOR ABOUT 15 YEARS. UP TO ABOUT TWO YEARS AGO SMEAR AND AIR SAMPLES TAKEN IN THE BERYLLIUM AREAS WERE EVALUATED BY SPECTROGRAPHIC MEANS. WITH THE DEVELOPMENT OF THE GAMMA-NEUTRON COUNTER IT HAS BEEN POSSIBLE TO UNDERTAKE A MORE COMPREHENSIVE ROUTINE SAMPLING PROGRAM OF THE BREATHING AIR AND SURFACE CONTAMINATION MEASUREMENTS IN BERYLLIUM PROCESS AREAS. THIS REPORT PRESENTS THE RESULTS OF THIS MONITORING PROGRAM OVER A PERIOD OF ABOUT 18 MONTHS. ON THE BASIS OF THE WORK CARRIED OUT RECOMMENDATIONS ARE MADE CONCERNING THE DEMARCATION OF BERYLLIUM AREAS AT AERE AND ON THE DERIVED WORKING LIMIT FOR SURFACE CONTAMINATION AT THIS ESTABLISHMENT.

*BERYLLIUM + *RADIATION SAFETY AND CONTROL + CONTAMINATION + INHALATION + MONITOR, RADIATION, AIR + SAMPLING

15-12362 OPHEL IL
ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVE WASTE DISPOSAL
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
AECL-2478 + CONF-661015-1 +. 12 PAGES, 2 TABLES, 11 REFERENCES, AUGUST 1966, FROM NATIONAL CONFERENCE ON POLLUTION AND OUR ENVIRONMENT, MONTREAL, CANADA

THE DIRECT MEASUREMENT OF RADIONUCLIDES IN ENVIRONMENTAL MATERIALS, SUCH AS AIR, DRINKING WATER AND MILK, ENSURE THAT PERMISSIBLE RADIATION DOSES ARE NOT EXCEEDED. ESTIMATES OF PUBLIC EXPOSURE DUE TO WASTE DISPOSAL OPERATIONS AT THE CHALK RIVER NUCLEAR LABORATORIES HAVE BEEN MADE. THEY SHOW THAT, EVEN UNDER THE MOST UNFAVOURABLE CIRCUMSTANCES, THE MAXIMUM EXPOSURE OF ANY PERSON IS LESS THAN ONE PERCENT OF THE PERMISSIBLE AMOUNT.

*ATMOSPHERIC POLLUTION + CHALK RIVER + DOSE + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + RADIATION SAFETY AND CONTROL + WASTE DISPOSAL, GENERAL

15-12363 BURTON CA
A GRAPHICAL METHOD FOR CALCULATING THE DOSE IN MAN FROM INDIVIDUAL RADIONUCLIDES IN FALLOUT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-14922 +. 20 PAGES, 3 FIGURES, JUNE 3, 1966, CFSTI \$2.00 CY, \$0.50 MN

THE FALLOUT DEPOSITION REQUIRED TO DELIVER A SPECIFIC INTEGRATED 30-YR DOSE TO ANY TISSUE IN MAN, FOR ANY AND ALL RADIONUCLIDES IN A SINGLE EVENT, IS PRESENTED IN GRAPHICAL AS WELL AS ANALYTICAL FORM. THE MODEL IS CONSISTENT WITH THE DATA AVAILABLE TO THIS PROBLEM AT PRESENT. A TABLE OF EFFECTIVE TISSUE HALF-LIVES FOR GIVEN RADIOLOGICAL AND BIOLOGICAL HALF-LIVES IS GIVEN FOR USE WITH THE GRAPHS. SAMPLE CALCULATIONS ARE ALSO INCLUDED.

*DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION; INTERNAL + *FALLOUT + BIOLOGICAL CONCENTRATION, VEGETATION + DOSE + EQUATION, GENERAL + MATHEMATICAL STUDY + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12364 SAYEG JA
NEUTRON AND GAMMA DOSIMETRY MEASUREMENTS AT THE AFRRRI-DASA TRIGA REACTOR
EDGERTON, GERMESHAUSEN AND GRIER, INC., GOLETA, CALIF.
AFRRRI-CP-65-6 + AD-635819 +. 169 PAGES, 51 FIGURES, 43 TABLES, 54 REFERENCES, NOVEMBER 1965, CFSTI \$5.00
CY, \$1.00 MN

THIS REPORT SUMMARIZES THE EXPERIMENTAL WORK INITIATED TO DETERMINE THE CURRENT AND PREDICTED
DOSIMETRY REQUIREMENTS OF THE ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE IN THE LIGHT OF
ITS STATED PROGRAM GIVING FULL CONSIDERATION TO STATE-OF-THE-ART METHODS AND INTERCALIBRATION
WITH ACCEPTED DOSIMETRY STANDARDS OF THE NATIONAL LABORATORIES AND THE NATIONAL BUREAU OF
STANDARDS. IT DESCRIBES THE CALIBRATION AND EVALUATION PROCEDURES USED FOR DETERMINING
NEUTRON FLUX SPECTRUM, AND NEUTRON AND GAMMA TISSUE DOSE FOR RADIOBIOLOGICAL INVESTIGATIONS.

*DOSIMETRY, GENERAL + DOSE + FAST NEUTRON + GROSS GAMMA + REACTOR, PULSED + THERMAL NEUTRON +
TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

15-12365 BOYD AW + CONNOR HW
DECAY OF THE GAMMA RAY DOSE RATE FOLLOWING A SHUTDOWN IN THE NRX REACTOR
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
AECL-2563 +. 11 PAGES, 5 FIGURES, 4 REFERENCES, MARCH 1966, AECL \$0.50 CY

THIS REPORT GIVES THE RESULTS OF MEASUREMENTS OF THE DECAY OF THE GAMMA RAY DOSE RATE AFTER
SHUTDOWN IN THE CENTRE OF ANNULAR URANIUM RODS, IN AN EMPTY LATTICE POSITION AND IN THE
REFLECTOR OF NRX. THESE MEASUREMENTS WERE MADE WITH GRAPHITE-CO₂ ION CHAMBERS OVER TIMES
FROM ONE SECOND TO SEVERAL DAYS AFTER SHUTDOWN. THIS WORK WAS DONE BECAUSE OF OUR INTEREST
IN THE REACTOR AS A SOURCE FOR RADIATION CHEMISTRY STUDIES.

*CANADA + *DOSE + *NRX (CANADIAN NATURAL U-HEAVY WATER REACTOR) + GAMMA

15-12366 CROCKER GR + TURNER T
CALCULATED ACTIVITIES, EXPOSURE RATES, AND GAMMA SPECTRA FOR UNFRACTIONATED FISSION PRODUCTS
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO
USNRDL-TR-1009 +. 194 PAGES, 26 FIGURES, 6 TABLES, 22 REFERENCES, DECEMBER 28, 1965, CFSTI \$5.00 CY,
\$1.00 MN

ACTIVITIES, EXPOSURE RATES, AND GAMMA-EMISSION SPECTRA HAVE BEEN CALCULATED FOR UNFRACTIONATED
FISSION PRODUCTS FROM THERMAL-NEUTRON, FISSION-SPECTRUM NEUTRON, AND 14-MEV NEUTRON FISSION
OF U-235 FROM FISSION-SPECTRUM NEUTRON FISSION OF U-233, U-238, AND PU-239, AND FROM
THERMONUCLEAR-SPECTRUM NEUTRON FISSION OF U-238. THE ACTIVITIES AND EXPOSURE RATES AT 29
TIME-POINTS HAVE BEEN ANALYZED, AND THE CONTRIBUTIONS OF THE PRINCIPAL NUCLIDES ARE PRESENTED
GRAPHICALLY. THE GAMMA-EMISSION SPECTRA FOR SEVERAL FISSION CASES AT SEVERAL DIFFERENT TIMES
ARE COMPARED GRAPHICALLY. THE APPENDIX PRESENTS ALL THE DATA IN TABULAR FORM.

*DOSE + *FISSION PRODUCT ACTIVITY, GROSS + *GAMMA EMITTER + ACTIVITY BUILDUP + GAMMA + NEUTRON +
PLUTONIUM + THERMAL NEUTRON + URANIUM

15-12367 JONES GE + KLEPPE LM
A SIMPLE AND INEXPENSIVE SYSTEM FOR MEASURING CONCENTRATIONS OF ATMOSPHERIC RADON-222
LAWRENCE RADIATION LABORATORY, BERKELEY
UCRL-16952 +. 21 PAGES, 1 FIGURE, 2 TABLES, 10 REFERENCES, JUNE 27, 1966, CFSTI \$2.00 CY, \$0.50 MN

A RADON-222 SAMPLING SYSTEM HAS BEEN DESIGNED AND BUILT WHICH USES A CHARCOAL ADSORPTION
TECHNIQUE FOR COLLECTING AND ANALYZING THAT GAS IN A SIMPLE, INEXPENSIVE, RELIABLE WAY.
RESULTS OF MEASUREMENTS MADE WITH THE SYSTEM, ALTHOUGH ONLY PRELIMINARY, ARE IN AGREEMENT
WITH DATA OBTAINED BY OTHER INVESTIGATORS.

*INSTRUMENTATION, RADIATION MONITORING + *MONITOR, RADIATION, GAS + RADON + SAMPLING

15-12369 DE LAGUNA W
BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES
OAK RIDGE NATIONAL LABORATORY
4 PAGES, JANUARY 1965, BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES BY C. A. MAWSON

THE COMBINATION OF TERSE EXPOSITION AND CAREFULLY SELECTED REFERENCES WILL BE EQUALLY
INVALUABLE TO THE NOVICE AND TO THE EXPERIENCED PRACTITIONER BECAUSE NO OTHER BOOK ON THE
SUBJECT SO CLEARLY AND IMPARTIALLY EXPLAINS THE STATE OF THE ART AND THE RESEARCH IN
PROGRESS, WHILE SERVING ALSO AS A BAEDER FOR THOSE WHO WOULD THOROUGHLY EXPLORE SOME
SPECIAL TOPIC.

*REVIEW + *WASTE MANAGEMENT + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, GENERAL

15-12370 BRADSHAW RL
BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES
OAK RIDGE NATIONAL LABORATORY
2 PAGES, 1965, BOOK REVIEW OF MANAGEMENT OF RADIOACTIVE WASTES BY C. A. MAWSON

THIS BOOK SHOULD BE A VALUABLE ADDITION TO THE LIBRARY OF THOSE PROFESSIONALLY INTERESTED IN
SOME ASPECT OF RADIOACTIVE WASTE MANAGEMENT, INCLUDING THOSE ENGAGED IN DESIGN AND OPERATION
OF WASTE DISPOSAL FACILITIES, AS WELL AS THOSE WHO ARE INVOLVED WITH THE DESIGN OR OPERATION
OF FACILITIES WHICH PRODUCE RADIOACTIVE WASTES.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12370 *CONTINUED*
*REVIEW + *WASTE MANAGEMENT + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, GENERAL

15-12372 ENVIRONMENTAL RADIOACTIVITY IN NEW ZEALAND. QUARTERLY REPORT, OCTOBER-DECEMBER 1965
NATIONAL RADIATION LABORATORY, NEW ZEALAND
NP-16015 + NRL-F19 +. 34 PAGES, REFERENCES, DECEMBER 1965, DEP. MN

IN GENERAL, AVERAGE ANNUAL FALLOUT DEPOSITION WAS SLIGHTLY LESS IN 1965 THAN IN 1964.
STRONTIUM-90 MEASUREMENTS IN MILK DECREASED THROUGHOUT THE LATTER HALF OF 1965 TO A LOW OF
8.7 SR UNITS IN THE FOURTH QUARTER, BUT THE ANNUAL LEVEL WAS HIGHER FOR 1965. DATA FOR
CESIUM-137 CONTENT IN MILK SHOWED SLIGHT INCREASES IN ANNUAL AND QUARTERLY RESULTS.
STRONTIUM-90 AND PB-210 WERE MEASURED IN RAINFALL SAMPLES AND PO-210 WAS DETERMINED IN
TOBACCO.

*NEW ZEALAND + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, MILK +
BIOLOGICAL CONCENTRATION, VEGETATION + CESIUM + DEPOSITION + FALLOUT + GROSS BETA + GROSS GAMMA + LEAD +
POLONIUM + RAINOUT + SOIL, NUCLIDE OCCURRENCE + STRONTIUM

15-12392 OWEN FE
RECYCLED THORIUM DOSE RATES
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND
HW-81933 +. 11 PAGES, MAY 15, 1964, CFSTI \$1.00 CY

THE DOSE RATES WHICH ONE CAN EXPECT TO ENCOUNTER IN HANDLING RECYCLED THORIUM TARGET ELEMENTS
FROM THE PRODUCTION OF U-233 ARE SUMMARIZED ALONG WITH THE ACTIVITIES OF THE VARIOUS DOSE
CONTRIBUTORS AND HOW THEY CHANGE WITH TIME AFTER PROCESSING.

*DOSE + *RADIATION SAFETY AND CONTROL + *THORIUM + PERSONNEL EXPOSURE, RADIATION + URANIUM

15-12393 PERKINS RW
THE DIRECT MEASUREMENT OF RADIONUCLIDES IN BIOASSAY SAMPLES BY MULTI-DIMENSIONAL GAMMA-RAY SPECTROMETRY
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND
HW-SA-3641 + CONF-727-2 +. 17 PAGES, SEPT. 23, 1964 FROM 10TH ANNUAL BIOASSAY AND ANALYTICAL CHEMISTRY
MEETING, CINCINNATI, OCTOBER 1964, CFSTI \$1.00 CY.

THE DIRECT BIOASSAY MEASUREMENT OF RADIONUCLIDES IN URINE SAMPLES BY NEWLY DEVELOPED
MULTIDIMENSIONAL GAMMA-RAY SPECTROMETRIC TECHNIQUES HAS PROVEN TO BE AN EXTREMELY SENSITIVE
METHOD FOR ESTIMATING RADIONUCLIDE BODY BURDENS. THROUGH USE OF THESE TECHNIQUES THE
MOVEMENT OF MANY RADIONUCLIDES AT THEIR PRESENT LEVEL CAN BE TRACED THROUGH THE FOOD CHAIN TO
MAN AND THEIR UPTAKE AND EXCRETION RATES CAN BE MEASURED. RESULTS ARE REPORTED FROM
MEASUREMENTS OF CU-64, NA-24, AS-76, SC-46, ZN-65, CO-60, NA-22, CS-134, AND CS-137 IN ASHED
URINE SAMPLES.

*COUNTER + *SPECTROMETRY, GAMMA + BIOLOGICAL CONCENTRATION, MAN + INSTRUMENTATION, RADIATION MONITORING

15-12394 PERKINS RW + NIELSEN JM
MULTIDIMENSIONAL GAMMA-RAY SPECTROMETRY AND ITS USE IN HEALTH PHYSICS
BATTELLE-NORTHWEST, RICHLAND
BNWL-SA-51 + CONF-650616-7 +. 28 PAGES, 1965, FROM HEALTH PHYSICS SOCIETY ANNUAL MEETING, LOS ANGELES,
CFSTI \$2.00 CY, \$0.50 MN

RECENT DEVELOPMENTS IN MULTIDIMENSIONAL GAMMA-RAY SPECTROMETRY ALLOW THE DIRECT INSTRUMENTAL
ANALYSIS OF COMPLEX RADIONUCLIDE MIXTURES. THIS HAS BEEN ACCOMPLISHED BY A COMBINATION OF
ANTICOINCIDENCE SHIELDING AND COINCIDENCE TECHNIQUES. THE DETECTOR SYSTEMS AND THEIR
RESPONSES ARE DESCRIBED, AND SOME OF THE APPLICATIONS OF THE SPECTROMETRY ARE SUMMARIZED.

*COUNTER + *SPECTROMETRY, GAMMA + ANALYTICAL TECHNIQUE, GENERAL + INSTRUMENTATION, RADIATION MONITORING +
MONITOR, RADIATION, GENERAL

15-12395 LINCOLN TA
ACTION LEVELS IN MEDICAL TREATMENT OF RADIATION AND RADIOACTIVITY EXPOSURE
OAK RIDGE NATIONAL LABORATORY
4 PAGES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL 26(4), PAGES 400-403, (JULY-AUGUST 1965).

SPECIAL MEDICAL PROBLEMS FOR WHICH ACTION LEVELS MIGHT BE CONSIDERED INCLUDE THE HANDLING OF
THE PREGNANT EMPLOYEE WHO WORKS IN A RADIATION AREA, THE HANDLING OF CASES OF SKIN AND WOUND
CONTAMINATION, WORK RESTRICTIONS ON INDIVIDUALS WITH INTERNAL CONTAMINATION, AND THE NEED FOR
SLIT-LAMP BIOMICROSCOPY TO DETECT LENS OPACITIES. THE MEDICAL JUSTIFICATIONS FOR ACTION
LEVELS ARE BRIEFLY REVIEWED, AND THE GENERAL PRACTICES OF MEDICAL DEPARTMENTS IN 17 AEC
CONTRACTOR INSTALLATIONS ARE REPORTED. IN GENERAL, AEC CONTRACTOR PHYSICIANS RESISTED THE
IDEA OF USING A PRESCRIBED EXPOSURE LEVEL TO DETERMINE A MEDICAL DECISION.

*BIOMEDICAL + *RADIATION INJURY, TREATMENT OF + INCIDENT, EXPOSURE + PERSONNEL EXPOSURE, RADIATION

15-12397 PALMER HE + GRIFFIN BI + FLEMING DM + BRABY LA
WHOLE-BODY COUNTING STUDIES OF CS-137 IN ALASKAN ESKIMOS
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND
HW-SA-3689 + CONF-747-2 +. 12 PAGES, SEPT. 18, 1964 FROM 4TH SYMPOSIUM ON RADIOACTIVITY IN SCANDINAVIA,

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-12397 *CONTINUED*
RISO, DENMARK, OCTOBER 1964, CFSTI \$1.00 CY

DATA ARE PRESENTED ON THE CONTENT OF CS-137 IN ALASKAN ESKIMOS AS DETERMINED BY WHOLE-BODY COUNTING FROM JULY 1962 THROUGH AUGUST 1964. THE DATA SHOW A CONTINUED INCREASE IN THE CS-137 BODY BURDENS DURING THIS TIME. RESIDENTS OF ANAKTUVUK PASS SHOWED THE LARGEST INCREASE WITH AN AVERAGE OF 1280 NCI IN JULY 1964, WHICH IS 206 PERCENT HIGHER THAN THE AVERAGE IN THE SUMMER OF 1962 AND 104 PERCENT HIGHER THAN IN 1963. THE POSSIBLE RELATION TO THE CONTENT OF CARIBOU IN THE DIET TO CS-137 CONTENT IN MAN IS DISCUSSED.

*BIOLOGICAL CONCENTRATION, MAN + *COUNTER, WHOLE BODY + ALASKA + BIOLOGICAL CONCENTRATION, ANIMAL + CESIUM + ECOLOGICAL CONSIDERATION

15-12409 COWSER KE + SNYDER WS + MCCAMMON CP + STRAUB CP + KOCHTITZKY OW + HERVIN RL + STRUXNESS EG + MORTON RJ
EVALUATION OF RADIATION DOSE TO MAN FROM RADIONUCLIDES RELEASED TO THE CLINCH RIVER
OAK RIDGE NATIONAL LABORATORY + U.S. PUBLIC HEALTH SERVICE + TENNESSEE VALLEY AUTHORITY
SM-72-41 + ORNL-P-2021 + CONF-660507-4 +. 23 PAGES, 26 REFERENCES, 7 FIGURES, 13 TABLES, MAY 1966,
PRESENTED AT THE SYMPOSIUM ON DISPOSAL OF RADIOACTIVE WASTES INTO SEAS, OCEANS, AND SURFACE WATERS,
SPONSORED BY THE INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA, MAY 16-20, 1966, SOURCE

LOW-LEVEL CONTAMINATED WASTE WATER, GENERATED BY THE OPERATIONS AT ORNL, HAS BEEN RELEASED TO THE CLINCH RIVER NEAR OAK RIDGE FOR THE PAST 20 YEARS UNDER CONDITIONS CONSISTENT WITH THE RECOMMENDATIONS OF ICRP AND NCRP. EVALUATION OF RADIATION DOSE EQUIVALENTS TO POPULATIONS DOWNSTREAM WAS THE PRINCIPAL OBJECTIVE OF THE CLINCH RIVER STUDY. THE MAJOR SOURCES OF EXPOSURE WERE DUE TO THE INGESTION OF CONTAMINATED WATER AND FISH. MATHEMATICAL MODELS HAVE BEEN DEVELOPED FOR INTERNAL DOSE CALCULATIONS WHICH INCLUDE THE DIFFERENCES IN INTAKE AND SIZE OF THE CRITICAL ORGAN AS A FUNCTION OF THE AGE OF THE INDIVIDUAL. AFTER 20 YEARS OF DRINKING RIVER WATER (1944-1963), THE SKELETON OF MAN RECEIVED THE LARGEST EXPOSURE. STRONTIUM-90 IS RESPONSIBLE FOR MORE THAN 99 PERCENT OF THE SKELETON DOSE. CONSUMPTION OF 37 LB/YEAR OF THE FLESH OF CLINCH RIVER FISH (BOTTOM FEEDERS) CONTRIBUTED ABOUT THE SAME ANNUAL INTAKE OF SR-90 AS DRINKING WATER.

*DOSE CALCULATION, INTERNAL + *RIVER, CLINCH + DIETARY HABIT + DOSE CALCULATION, EXTERNAL + ECOLOGICAL CONSIDERATION + FALLOUT + HAZARDS ANALYSIS + ICRU (INT. COMM. RAD. UNITS AND MEASUREMENTS) + INGESTION + MAXIMUM PERMISSIBLE DOSE (MPD) + NCRP (NATIONAL COMMITTEE RADIATION PROTECTION) + POPULATION EXPOSURE + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, RIVER + WATER, DRINKING

15-13093 MANNESCHMIDT JF
RECENT ADVANCES IN MONITORING OF RADIOACTIVE GASEOUS WASTES AT ORNL
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1569 +. 37 PAGES, 19 FIGURES, 6 REFERENCES, OCTOBER 13, 1966

MANY ACTIVITIES AT THE OAK RIDGE NATIONAL LABORATORY ARE CONCERNED WITH THE CHEMICAL PROCESSING OF RADIOACTIVE MATERIALS. GASEOUS EFFLUENTS FROM THESE OPERATIONS ARE TREATED TO REMOVE DANGEROUS CONTAMINANTS PRIOR TO RELEASE TO THE ATMOSPHERE. ROUTINE MONITORING OF SUCH EMISSIONS WAS STARTED IN 1956 WHEN MANUALLY OPERATED PARTICULATE MONITORS WERE INSTALLED AT EACH OF THREE PROCESS STACKS. SINCE THAT DATE, COVERAGE HAS BEEN EXTENDED TO SIX STACKS, THE SAMPLE WITHDRAWAL SYSTEM HAS BEEN REBUILT, AND THE DETECTION EQUIPMENT HAS BEEN ADDED TO AND MODERNIZED. THE INTENSIVE MONITORING HAS LEAD TO PROCESS IMPROVEMENTS WHICH HAVE REDUCED THE ENVIRONMENTAL RELEASES OF RADIOACTIVITY IN THE LABORATORY'S GASEOUS WASTE EFFLUENTS BY A FACTOR OF THREE SINCE 1962.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*MONITOR, RADIATION, GAS + *MONITOR, RADIATION, STACK + *ORNL (OAK RIDGE NATIONAL LABORATORY) + PARTICULATE + RADIATION SAFETY AND CONTROL + RADIOACTIVITY, RELEASE + SAMPLING + WASTE DISPOSAL, GAS

15-13201 MONTHLY AVERAGES OF GROSS BETA RADIOACTIVITY IN AIR IN THE WESTERN HEMISPHERE, SEPTEMBER 1961-AUGUST 1965.
PUBLIC HEALTH SERVICE, WASHINGTON
NP-15678 +. 83 PAGES, OCTOBER 20, 1965, CFSTI

THE MONTHLY AVERAGES OF GROSS BETA RADIOACTIVITY FOR 75 RADIATION SURVEILLANCE NETWORK STATIONS AND 6 PAN AMERICAN HEALTH ORGANIZATION STATIONS ARE PRESENTED IN BOTH TABULAR AND GRAPHICAL FORM FOR THE PERIOD SEPTEMBER 1961 THROUGH AUGUST 31, 1965. THE SAMPLING PROCEDURE USED IS DESCRIBED.

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + FALLOUT + GROSS BETA + SAMPLING

15-13202 CARVER KB
TRITIUM HAZARDS ASSOCIATED WITH NEUTRON GENERATORS. TECHNICAL BULLETIN NO. 105
KAMAN NUCLEAR, COLORADO SPRINGS
NP-15632 +. 7 PAGES, NOVEMBER 1964, CFSTI

A POTENTIAL TRITIUM HAZARD EXISTS IN HIGH OUTPUT NEUTRON GENERATORS USING A DEUTERIUM-TRITIUM REACTION. TARGET REPLENISHING AND STRATEGICALLY PLACED ISOLATION VALVES, AS PROVIDED IN THE KAMAN NUCLEAR DRIFT TUBE NEUTRON GENERATOR SERIES A-900 AND A-1000, WERE FOUND TO GREATLY REDUCE THE REQUIREMENT FOR OPENING THE SYSTEM. THEREFORE, THE TRITIUM HAZARD IS SIGNIFICANTLY LESSENED.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13202 *CONTINUED*
*HAZARDS ANALYSIS + *TRITIUM + ACCELERATOR + NEUTRON

15-13203 SAMUELS ER
SR-90 IN CANADIAN WHEAT FROM THE 1963 CROP YEAR
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15641 +. 6 PAGES, APRIL 1965, PAGES 3-8 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 4, CFSTI

THE RESULTS OF MEASUREMENTS MADE ON CANADIAN HARD RED SPRING WHEAT GROWN AND HARVESTED DURING 1963 ARE REPORTED. THE RESULTS SHOWED SIGNIFICANT VARIATIONS IN THE SR-90 LEVELS OF WHEAT GROWN IN DIFFERENT GEOGRAPHICAL AREAS. THE LOWEST LEVELS WERE FOUND IN MANITOBA AND THE HIGHEST LEVELS IN CENTRAL ALBERTA. THE AVERAGE CONCENTRATION OF SR-90 IN CANADIAN WHEAT GROWN DURING 1963 INCREASED BY A FACTOR OF ABOUT 3 OVER THAT OBSERVED IN 1962. IT WAS ALSO ESTABLISHED THAT SR-90 ENTERS THE WHEAT GRAIN EITHER THROUGH ROOT UPTAKE FROM THE SOIL OR THROUGH DIRECT DEPOSITION OF FALLOUT ON THE FOLIAR SURFACES.

*BIOLOGICAL CONCENTRATION, FOOD + *CANADA + FALLOUT + STRONTIUM

15-13204 SAMUELS ER + MOHINDRA VK
CANADIAN FALLOUT DATA FOR MARCH 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE
NP-15641 +. 13 PAGES, APRIL 1965, PAGES 9-21 OF DATA FROM RADIATION PROTECTION PROGRAMS VOLUME 3, NO. 4, CFSTI

THE RESULTS OF FALLOUT MONITORING ON AIR, PRECIPITATION, AND MILK IN MARCH, 1965, ARE REPORTED. THE RESULTS SHOWED A GENERAL BUT SLIGHT, DECREASE IN FALLOUT LEVELS FOR MOST ASPECTS OF THE MONITORING PROGRAM. DATA ARE TABULATED.

*FALLOUT + AIR + BIOLOGICAL CONCENTRATION, MILK + CESIUM + GROSS BETA + PRECIPITATION + RAINOUT + STRONTIUM + SURVEY, RADIATION, ENVIRONMENTAL

15-13205 SAMUELS ER + MOHINDRA VK
REACTOR ENVIRONMENT MONITORING FOR MARCH 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15641 +. 8 PAGES, APRIL 1965, PAGES 22-29 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 4, CFSTI

THE RESULTS OF MONITORING STUDIES ON SURFACE WATERS NEAR THE SITES OF THE CHALK RIVER REACTORS, NUCLEAR POWER DEMONSTRATION REACTOR NEAR ROLPHTON, AND THE DOUGLAS POINT REACTOR ARE REPORTED. SAMPLES OF RABBITS AND FISH WERE ALSO MONITORED. THE RADIOISOTOPES DETERMINED WERE SR-89, SR-90, AND CS-137.

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + CANADA + CESIUM + GROSS ALPHA + GROSS BETA + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE

15-13206 KOSTYRKO A
STUDY ON REMOVAL OF SOME RADIONUCLIDES FROM SEWAGE WATER SOLUTIONS BY SORPTION ON PEAT
INSTITUTE OF NUCLEAR RESEARCH, WARSAW
INR-609/XIX/D +. 45 PAGES, 10 REFERENCES, FEBRUARY 1965, DEP.

STUDIES WERE MADE ON THE INTERACTION BETWEEN PEAT MOSS AND THE FOLLOWING CATIONS - NA, CA, CO, ZN, SR, Y, RU, CS, CE, EU, TI, HG, AND PB. SOME COMPARATIVE TESTS WERE PERFORMED ALSO WITH HUMUS-RICH PEAT SPECIMENS, AS WELL AS WITH PEAT MOSS PRETREATED WITH IN HCL. PEAT MOSS WAS FOUND TO BE HYDRAULICALLY SUITABLE AS A COLUMN MATERIAL. AS WAS EXPECTED, DISTRIBUTION COEFFICIENTS FOR PEAT MOSS WERE LESS PH DEPENDENT THAN THOSE FOR HUMUS-RICH PEATS. TOTAL SORPTION CHARACTERISTICS WERE DISTINGUISHED FROM ION EXCHANGE CAPACITIES, AND THE ORDER OF SELECTIVE AFFINITY BY PEAT FOR THESE NUCLIDES WAS CHECKED.

*WASTE TREATMENT, LIQUID + DECONTAMINATION + POLAND + SOIL, PROPERTY + SORPTION + WASTE DISPOSAL, GENERAL + WATER TREATMENT

15-13207 FALLOUT IN NEW ZEALAND. QUARTERLY REPORT APRIL-JUNE 1965
NATIONAL RADIATION LABORATORY
NP-15639 + NRL-F17 +. 20 PAGES, FIGURES, JUNE 1965, DEP. MN

DATA ARE GIVEN FOR MEASUREMENTS OF TOTAL BETA AND GAMMA ACTIVITY IN ATMOSPHERE AND DEPOSITION ON GROUND AND STRONTIUM-90 IN MILK AND RAIN AND CESIUM-137 IN MILK. METHOD OF MEASUREMENT AND SAMPLE COLLECTION ARE DISCUSSED.

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + ANALYTICAL TECHNIQUE, GENERAL + BIOLOGICAL CONCENTRATION, MILK + CESIUM + DEPOSITION + GROSS BETA + GROSS GAMMA + HAZARDS ANALYSIS + NEW ZEALAND + SAMPLING + STRONTIUM

15-13208 PLUTONIUM ABSTRACTS. VOLUME 5, NUMBER 8. A METHOD TO COMPENSATE THE NATURAL AIR-RADIOACTIVITY BY MEANS OF BETA-ALPHA-PSEUDOCOINCIDENCES
4 PAGES, KERNTECHNIK 7(7), PAGES 322-325, (JULY 1965).

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13208 *CONTINUED*

A DESCRIPTION IS GIVEN OF AN APPARATUS WHICH MAKES THE COMPENSATION OF THE NATURAL AIR-RADIOACTIVITY POSSIBLE BY MEANS OF BETA-ALPHA PSEUDOCOINCIDENCES. A FLAT METHANE-FLOW COUNTER IS USED AS DETECTOR. TO GIVE A PRACTICAL EXAMPLE THE CONTROL OF THE PU-239 ACTIVITY CONCENTRATION IN A HOT LABORATORY IS DISCUSSED.

*RADIATION SAFETY AND CONTROL + AIR + COUNTER + GERMANY + INSTRUMENTATION, RADIATION MONITORING + PLUTONIUM

15-13209 FINN RJ + LECUYER DW + DANCEY ME
FALLOUT CS-137 BODY BURDENS OF 63 ADULT RESIDENTS OF OTTAWA
DEPT. OF NATIONAL HEALTH AND WELFARE, OTTAWA

NP-15642 +. 10 PAGES, SEPTEMBER 1965, PAGES 3-12 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 9, DEP. MN

WHEN BODY COUNTS WERE MADE ON ADULT RESIDENTS OF OTTAWA (18 YEARS OF AGE AND OLDER), OF WHOM 44 WERE MEN AND 19 WOMEN. IT WAS FOUND THAT IN ALL CASES THE ONLY ISOTOPES PRESENT WERE CS-137 AND K-40. THE RESULTS SHOWED THAT THE AVERAGE CS-137 BODY BURDEN FOR THE MEN (26 NC) WAS GREATER THAN FOR THE WOMEN (14 NC) AS WAS CS-137/K (183 TO 138 PC/GK).

*BIOLOGICAL CONCENTRATION, MAN + *CESIUM + *FALLOUT + CANADA + COUNTER, WHOLE BODY

15-13210 GHOSH SK
THE RPD NEUTRON DOSIMETRY SERVICE
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA

NP-15642 +. 7 PAGES, TABLES, SEPTEMBER 1965, PAGES 13-20 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 9, DEP. MN.

THE PURPOSE OF THIS ARTICLE IS TO DESCRIBE BRIEFLY THE ESSENTIAL FEATURES OF A NEUTRON DOSIMETRY SERVICE AND THE CHARACTERISTICS OF THE DOSIMETER USED. A BRIEF DISCUSSION OF THE COMMONLY USED NEUTRON SOURCES OF THE VARIOUS SYSTEMS OF NEUTRON DOSIMETRY IS ALSO INCLUDED.

*NEUTRON + *RADIATION SAFETY AND CONTROL + CANADA + DOSIMETRY, GENERAL + PERSONNEL EXPOSURE, RADIATION + SOURCE, NEUTRON

15-13211 SAMUELS ER + MOHINDRA VK
CANADIAN FALLOUT DATA FOR AUGUST, 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA

NP-15642 +. 4 PAGES, 2 REFERENCES, SEPT. 1965, PAGES 20-23 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 9, DEP. MN

THE RESULTS OF FALLOUT MONITORING ON AIR, PRECIPITATION, AND MILK IN AUGUST 1965 ARE REPORTED. THE RESULTS SHOWED A DECREASE IN THE RADIOACTIVITY LEVELS FOR ALL PARTS OF THE FALLOUT PROGRAM. DATA ARE TABULATED.

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, MILK + CANADA + CESIUM + GROSS BETA + PRECIPITATION + RAINOUT + STRONTIUM

15-13212 SAMUELS ER + MOHINDRA VK
REACTOR ENVIRONMENT MONITORING FOR AUGUST 1965
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA

NP-15642 +. 13 PAGES, SEPTEMBER 1965, PAGES 33-45 OF DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 9, DEP. MN

THE RESULTS OF MONITORING STUDIES NEAR THE SITES OF THE CHALK RIVER REACTORS, THE NUCLEAR POWER DEMONSTRATION REACTOR NEAR ROLPHTON, AND THE DOUGLAS POINT REACTOR ARE REPORTED. SOME MILK AND ATMOSPHERE SAMPLES WERE ALSO MONITORED. ALL THE DATA ARE IN GENERAL AGREEMENT WITH OBSERVATIONS MADE IN THE FALLOUT PROGRAM. THEY DO NOT SHOW ANY ANOMALIES THAT COULD BE ATTRIBUTED TO A RELEASE OF CONTAMINATION FROM THE REACTORS. DATA ON TOTAL ALPHA AND BETA ACTIVITY, SR-98, SR-90, AND CS-137 ARE TABULATED.

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, MILK + CANADA + CESIUM + FALLOUT + GROSS ALPHA + GROSS BETA + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE

15-13218 DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 4, NO. 1
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15921 +. 47 PAGES, JANUARY 1966

ION EXCHANGE COLUMN AND FUMING NITRIC ACID PRECIPITATION PROCEDURES FOR THE SEPARATION OF SR FROM CA IN LIQUID MILK WERE COMPARED. IT WAS CONCLUDED THAT SR-90 CAN BE DETERMINED BY EITHER PROCEDURE WITH COMPARABLE PRECISION. DATA ARE PRESENTED ON RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIR PARTICLES, PRECIPITATION, MILK, WATER, SOIL, WHEAT, AND HUMAN BONE COLLECTED IN CANADA IN DEC. 1964. DATA ARE INCLUDED ON THE ENVIRONMENTAL RADIOACTIVITY IN THE ENVIRONS OF CANADIAN REACTORS DURING DEC. 1965.

AVAILABILITY MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN, 54669

*ANALYTICAL TECHNIQUE, MILK + *STRONTIUM + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + CANADA + FALLOUT + PARTICULATE + RAINOUT +

ACCESSION NUMBER 15-13208 TO 15-13218

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13218 *CONTINUED*
SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, NUCLIDE OCCURRENCE

15-13226 ENGEL RE
POTENTIAL HAZARDS AS A RESULT OF INHALATION OF RADIOIODINES- A LITERATURE SURVEY
PUBLIC HEALTH SERVICE, LAS VEGAS
TID-22693 + SWRHL-13R +. 95 PAGES, TABLES, REFERENCES, JAN. 5, 1966, CFSTI \$3.00 CY, \$0.75 MN

A BRIEF SURVEY WAS MADE ON THE POTENTIAL HAZARDS TO MAN WHICH MIGHT RESULT FROM RELEASES OF RADIOIODINES INTO THE BIOSPHERE. THE RELATED TOPIC OF POTENTIAL HAZARDS FROM INGESTION OF RADIOIODINE IS ALSO CONSIDERED SINCE THE DETERMINATION OF TOTAL HAZARD TO MAN MUST BE THE ULTIMATE GOAL OF ANY RESEARCH PROGRAM WHICH HAS BEEN DESIGNED TO ASSESS THE OVERALL PUBLIC HEALTH SIGNIFICANCE OF ANY RADIOIODINE RELEASES. RESEARCH PROBLEMS ARE ALSO SUGGESTED.

*FISSION PRODUCT RELEASE, GENERAL + *INHALATION + *IODINE + BIOLOGICAL CONCENTRATION, MAN + DEPOSITION + FISSION PRODUCT TRANSPORT + FISSION PRODUCT, AIRBORNE + FISSION PRODUCT, IODINE + HAZARDS ANALYSIS

15-13227 GREATOREX JL + GLASS W
ADVANCED STUDY OF MILK DECONTAMINATION BY ELECTRODIALYSIS
IONICS, INC., WATERTOWN
AD-626210 +. 27 PAGES, OCTOBER 1965, CFSTI \$2.00 CY, \$0.50 MN

A FIVE GPH ELECTRODIALYTIC MILK DECONTAMINATION TEST PLANT WAS BUILT AND OPERATED. PREVIOUS RESEARCH HAD ESTABLISHED THAT RADIOACTIVE CONTAMINATION CAN BE REMOVED BY FLUSHING CATIONS THROUGH A LAYER OF MILK. APPROXIMATELY 8,000 LBS OF MILK WERE TREATED. DECONTAMINATION AVERAGED 90 PERCENT. THE ION-SELECTIVE MEMBRANES SHOWED NO DECREMENT IN PERFORMANCE FOLLOWING AN INITIAL DROP FROM 90 PERCENT CURRENT EFFICIENCY TO 82 PERCENT DURING THE FIRST 60 HOURS OF OPERATION. A SUITABLE IN SITU METHOD OF CLEANING THE MEMBRANE STACK WAS DEVELOPED. THE CHEMICAL COSTS OF THIS CLEANING METHOD CAME TO ABOUT 0.03 CENTS/GALLON MILK.

*ANALYTICAL TECHNIQUE, MILK + CESIUM + CIVIL DEFENSE + DECONTAMINATION + STRONTIUM

15-13241 PATHFINDER ALLOWED PROTECTION FACTORS FOR RESPIRATORY EQUIPMENT
DIVISION OF REACTOR LICENSING
5 PAGES, 1 TABLE, NOVEMBER 14, 1966, DOCKET NO. 50-130

AEC ALLOWS PATHFINDER OPERATING CREW TO TAKE CREDIT, AS PROVIDED FOR IN 10 CFR 20, FOR RESPIRATORY EQUIPMENT IN COMPUTING INHALATION DOSES. NO PROTECTION FACTOR IS GREATER THAN 1000, TRITIUM OXIDE FACTOR IS 2, FULL FACE MASK IS 100, AND AIR-SUPPLY DEVICES RANGE FROM 100 TO 1000.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*INHALATION + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *PERSONNEL PROTECTIVE DEVICE + PATHFINDER + RADIATION SAFETY AND CONTROL + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SAFETY EVALUATION

15-13242 AEC CONSIDERING REVISION TO 10 CFR 20, SETTING PROTECTION FACTORS FOR RESPIRATORY EQUIPMENT
DIVISION OF REACTOR LICENSING
5 PAGES, 1 TABLE, NOVEMBER 14, 1966, DOCKET NO. 50-130

IN A LETTER ALLOWING PATHFINDER OPERATING PERSONNEL TO TAKE CREDIT FOR RESPIRATORY EQUIPMENT IN COMPUTING AIRBORNE-CONTAMINATION EXPOSURE, AEC NOTED THAT VARIOUS STUDY CONTRACTS AND COMMITTEES HAVE INDICATED STANDARD RESPIRATORY PROTECTION FACTORS SHOULD BE INCORPORATED IN 10 CFR 20. AEC IS CONSIDERING SUCH AN AMENDMENT TO 10 CFR 20.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL + *REGULATION, AEC + INHALATION

15-13251 HAINES A + MUSGRAVE B
CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF TRITIATED METHANE
UNIVERSITY OF ARKANSAS, FAYETTEVILLE
CONF-765 +. 6 PAGES, 1 TABLE, 3 FIGURES, PAGES 144-149 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE T/H RATIOS IN ATMOSPHERIC HYDROGEN AND METHANE ARE DISCUSSED IN RELATION TO SOME OF THE AVAILABLE INFORMATION ON THE AMOUNTS OF TRITIUM RELEASED BY THE NUCLEAR INDUSTRY. THE INCREASE IN THE T/H RATIO IN ATMOSPHERIC HYDROGEN PRIOR TO 1952 CAN BE ATTRIBUTED TO THIS SOURCE. FROM THE RATE OF TRITIUM RELEASE, AN ESTIMATE OF THE PRODUCTION OF TRITIATED METHANE CAN BE MADE. SUCH AN ESTIMATE GIVES REASONABLE AGREEMENT WITH THE OBSERVED T/H VALUES.

*TRITIUM + FISSION PRODUCT RELEASE, GENERAL

15-13252 DREVINSKY PJ + PECCI J
SIZE AND VERTICAL DISTRIBUTIONS OF STRATOSPHERIC RADIOACTIVE AEROSOLS
U.S. AIR FORCE CAMBRIDGE RESEARCH LABORATORIES, BEDFORD
CONF-765 +. 25 PAGES, 8 FIGURES, 6 TABLES, 11 REFERENCES, PAGES 158-182 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13252 *CONTINUED*
NOVEMBER 1964, CFSTI \$6.50 CY.

FOUR BALLOON FLIGHTS WERE MADE OVER MINNEAPOLIS, MINN., DURING 1962 AND 1963 TO COLLECT RADIOACTIVE AEROSOLS FOR THE DETERMINATION OF SIZE AND VERTICAL DISTRIBUTIONS OVER THE ALTITUDE RANGE OF 9 TO 30 KM. ALL SAMPLES WERE MEASURED FOR TOTAL BETA RADIOACTIVITY, SR-90, AND CE-144. FOR THE 1963 SAMPLES, ZR-95 WAS ALSO DETERMINED. WITH FEW EXCEPTIONS MOST OF THE ACTIVITY IS CARRIED BY PARTICLES OF ABOUT 0.02 TO 0.15 MICRON IN RADIUS AND SHOWS A PEAK CONCENTRATION AT ALTITUDES BETWEEN 15 AND 21 KM. LIMITED DATA FOR TOTAL GAMMA ACTIVITY, MN-54, AND BA-140 WERE ALSO OBTAINED.

*AEROSOL + *FALLOUT + *PARTICLE SIZE DISTRIBUTION + ATMOSPHERIC POLLUTION + BARIUM + CESIUM + GROSS BETA + GROSS GAMMA + MANGANESE + SAMPLING + STRONTIUM + ZIRCONIUM

15-13253 FOOTE RS
FALLOUT MEASUREMENTS BY TOTAL-ABSORPTION GAMMA-RAY SPECTROSCOPY
TEXAS INSTRUMENTS INC., DALLAS
CONF-765 +. 15 PAGES, 20 FIGURES, 1 TABLE, 2 REFERENCES, PAGES 183-197 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE GROWTH AND THE DECAY OF GAMMA-RAY-PRODUCING NUCLIDES IN THE FIELD NEAR DALLAS, TEX., HAVE BEEN MEASURED SINCE DEC. 22, 1962. ALL DATA HAVE BEEN RESOLVED TO PROVIDE THE EFFECTIVE SURFACE AMOUNTS OF THE FISSION-PRODUCED RADIONUCLIDES AS WELL AS THE NATURAL GAMMA-RAY EMITTERS. A DISCUSSION OF THE DATA-REDUCTION PROCEDURES IS INCLUDED WHICH SHOWS THE CAPABILITY OF THE METHOD TO ACCOUNT FOR THE ENTIRE FIELD GAMMA-RAY SPECTRUM. INITIAL FALLOUT MEASUREMENTS OF FISSION DEBRIS FROM THE 1964 TEST BY COMMUNIST CHINA ARE INCLUDED.

*FALLOUT + *SPECTROMETRY, GAMMA + NUCLEAR DETONATION

15-13254 PERKINS RW + THOMAS CW + NIELSEN JM
MEASUREMENTS OF AIRBORNE RADIONUCLIDES AND DETERMINATION OF THEIR PHYSICAL CHARACTERISTICS
HANFORD LABORATORIES, RICHLAND
CONF-765 +. 24 PAGES, 14 FIGURES, 7 TABLES, 12 REFERENCES, PAGES 198-221 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

NEWLY DEVELOPED COUNTING TECHNIQUES THAT EMPLOY MULTIDIMENSIONAL GAMMA-RAY SPECTROMETRY WERE EMPLOYED FOR THE DIRECT MEASUREMENT OF A LARGE GROUP OF RADIONUCLIDES IN FALLOUT SAMPLES. THESE TECHNIQUES MADE IT POSSIBLE TO STUDY THE DISTRIBUTION OF MANY OF THE TRACE CONSTITUENTS OF FALLOUT AND ALSO TO IMPROVE THE PRECISION FOR THE MEASUREMENT OF THE MORE ABUNDANT RADIONUCLIDES. THE CONCENTRATIONS OF BE-7, NA-22, MN-54, CO-60, Y-88, ZR-95, NB-95, RU-106, SB-124, SB-125, CS-134, CS-137, AND CE-144 CAN BE MEASURED DIRECTLY. THEIR CONCENTRATIONS IN AIR DURING THE PAST 33 MONTHS ARE REPORTED. THE MEASURED SOLUBILITY OF THE FALLOUT RADIONUCLIDES IS REPORTED, AND THEIR DEPOSITION AS DRY FALLOUT AND AS RAINOUT IN THE AREA OF RICHLAND, WASH., IS COMPARED. THE DISTRIBUTION AND MOVEMENT OF THE TRACER RADIONUCLIDES Y-88 AND SB-124 AND OF PU-239 BOTH IN THE STRATOSPHERE AND THE TROPOSPHERE ARE DISCUSSED. THE COSMIC-RAY-PRODUCED RADIONUCLIDES CL-38 AND S-38 ARE MENTIONED, AND THEIR APPLICATION ALONG WITH OTHER COSMIC-RAY-PRODUCED RADIONUCLIDES IN ATMOSPHERIC RESEARCH IS CONSIDERED.

*AIR + *TRACER, RADIOACTIVE + CESIUM + DEPOSITION + ECOLOGICAL CONSIDERATION + FALLOUT + IODINE + PLUTONIUM + RAINOUT + SODIUM + SPECTROMETRY, GAMMA

15-13255 FRIEDLANDER SK + PASCERI RE
MEASUREMENTS OF THE PARTICLE SIZE DISTRIBUTION OF THE TROPOSPHERIC AEROSOL WITH A ROTATING-DISK SAMPLER
JOHNS HOPKINS UNIVERSITY, BALTIMORE
CONF-765 +. 11 PAGES, 6 FIGURES, 1 TABLE, 13 REFERENCES, PAGES 222-232 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, \$6.50 CY.

MEASUREMENTS WERE MADE OF THE PARTICLE-SIZE DISTRIBUTION OF THE AEROSOL AT BALTIMORE, MD. PARTICLES SMALLER THAN A FEW TENTHS OF A MICRON IN DIAMETER WERE SAMPLED BY DIFFUSION FROM ROOM AIR TO A ROTATING DISK WITH AN ELECTRON-MICROSCOPE GRID ATTACHED. THE ROTATING DISK PROVIDES A KNOWN CONVECTIVE FLOW WITH A NUMBER OF DESIRABLE CHARACTERISTICS. SIZE DISTRIBUTIONS WERE CALCULATED FROM THE DISTRIBUTION MEASURED ON THE DISK GRID.

*AEROSOL + *PARTICLE SIZE DISTRIBUTION + SAMPLING

15-13256 LOWDER WM + BECK HL + CONDON WJ
DOSIMETRIC INVESTIGATIONS OF ENVIRONMENTAL GAMMA RADIATION FROM DEPOSITED FISSION PRODUCTS
HEALTH AND SAFETY LABORATORY, NEW YORK
CONF-765 +. 12 PAGES, 4 FIGURES, 4 TABLES, 10 REFERENCES, PAGES 233-244 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE PRESENCE OF SIGNIFICANT QUANTITIES OF GAMMA-EMITTING FISSION PRODUCTS IN THE ENVIRONMENT AS A RESULT OF NUCLEAR-WEAPONS TESTING HAS MADE NECESSARY THE DEVELOPMENT OF TECHNIQUES FOR DIFFERENTIATING BETWEEN THE NATURAL- AND THE FALLOUT-GAMMA COMPONENTS OF THE TOTAL ENVIRONMENTAL RADIATION FIELD. THIS HAS BEEN ACHIEVED BY THE USE IN THE FIELD OF A GAMMA-SPECTROMETER SYSTEM WITH A 5- BY 3-IN. NaI(Tl) DETECTOR. OVER 300 GAMMA-ENERGY SPECTRA HAVE BEEN OBTAINED AT MORE THAN 200 DIFFERENT LOCATIONS THROUGHOUT THE UNITED STATES. MOST OF THE INFERRED NATURAL-GAMMA DOSE RATES WERE IN THE RANGE OF 5 TO 9 MICRORONTGEN/HR.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13256 *CONTINUED*

OPEN-FIELD-FALLOUT DOSE RATES BETWEEN JULY 1962 AND SEPTEMBER 1963 RANGED BETWEEN 2 AND 6 MICROROENTGEN/HR, EXCEPT IN AREAS HAVING VERY LITTLE RAINFALL. BY THE END OF 1963, DOSE RATES IN THE EASTERN U.S. HAD DECLINED TO APPROXIMATELY 1 MICROROENTGEN/HR, MAINLY FROM CS-137 AND HAVE SINCE REMAINED CLOSE TO THAT VALUE. NO INCREASED GAMMA RADIATION HAS BEEN NOTED IN NEW YORK FROM FALLOUT FROM THE 1964 CHINESE TEST.

*DOSE CALCULATION, EXTERNAL + *FALLOUT + DEPOSITION + SPECTROMETRY, GAMMA

15-13257 FRIEDLANDER SK

THEORY OF SELF-PRESERVING SIZE DISTRIBUTIONS IN A COAGULATING DISPERSION
CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA

CONF-765 +. 7 PAGES, 4 REFERENCES, PAGES 253-259 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

A REDUCED FORM OF THE PARTICLE-SIZE-DISTRIBUTION FUNCTION, DESIGNATED SELF-PRESERVING, SATISFIES SMOLUCHOWSKIS EQUATION OF COAGULATION BY BROWNIAN MOTION. BOTH THEORY AND EXPERIMENT INDICATE THAT THE SELF-PRESERVING FORM IS APPROACHED BY COAGULATING SYSTEMS HAVING A WIDE VARIETY OF INITIAL DISTRIBUTIONS. THIS EFFECT OFFERS AN EXPLANATION FOR THE REGULARITIES OBSERVED IN THE SIZE DISTRIBUTION OF THE ATMOSPHERIC AEROSOL.

*AEROSOL + *PARTICLE SIZE DISTRIBUTION

15-13258 LIU BY + WHITBY KT

PARTICLE CHARGING AT LOW PRESSURES
UNIVERSITY OF MINNESOTA

CONF-765 +. 21 PAGES, 18 FIGURES, 15 REFERENCES, PAGES 260-280 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE ELECTRIC CHARGE IMPARTED TO PARTICLES AT REDUCED PRESSURES HAS BEEN MEASURED FOR PARTICLES RANGING FROM 0.02 TO 2.0 MICRONS AND FOR PRESSURES RANGING FROM 0.01 TO 1.0 ATM WITH AN IMPROVED PARTICLE-MOBILITY ANALYZER OF CYLINDRICAL SHAPE. THE SOLID SPHERICAL PARTICLES OF METHYLENE BLUE DYE ARE CHARGED BY POSITIVE IONS IN ELECTRIC FIELDS OF VARIOUS INTENSITIES. THE MEASURED PARTICLE CHARGE IS GENERALLY HIGHER THAN THE VALUES PREDICTED BY WHITES EQUATIONS, AND THE DIFFERENCE INCREASES WITH DECREASING PRESSURE. TYPICALLY, THE MEASURED CHARGE AT 0.01 ATM IS 100 PERCENT HIGHER THAN THE VALUES PREDICTED BY THE DIFFUSION-CHARGING EQUATION AND IS SLIGHTLY LESS THAN ONE ORDER OF MAGNITUDE HIGHER THAN WHAT THE FIELD-CHARGING EQUATION PREDICTS.

*ELECTROSTATIC CHARGE + *FALLOUT + *PARTICULATE + AEROSOL

15-13259 BERG TG + GAUKLER TA + SQUIER LA

KINETICS OF WETTING IN WASHOUT OF DUST
AEROJET-GENERAL CORP., DOWNEY

CONF-765 +. 20 PAGES, 16 FIGURES, 4 TABLES, 16 REFERENCES, PAGES 281-300 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE RATES OF WETTING OF SOLIDS BY WATER WERE MEASURED UNDER CONDITIONS SIMULATING THOSE IN WASHOUT OF DUST BY A WATER SPRAY AND OF RADIOACTIVE DEBRIS BY RAIN. THE SOLID WAS PRESSED AGAINST A WATER DROP, AND THE EVENT WAS FOLLOWED BY HIGH-SPEED PHOTOGRAPHY AT 26,000 FRAMES/SEC. A VOLTAGE WAS APPLIED BETWEEN THE SOLID AND THE WATER DROP SO AS TO SIMULATE AN ELECTROSTATIC CHARGE. THE DELAY BETWEEN CONTACT AND WETTING DEPENDS UPON THE WETTABILITY OF THE SOLID AND THE VOLTAGE APPLIED. WETTING IS THE FORMATION OF HYDROGEN BONDS BETWEEN H₂O MOLECULES IN THE WATER DROP AND OH ON THE SURFACE OF THE SOLID. THIS PROCESS REQUIRES THE REORIENTATION OF BONDS IN THE DROP BY AN ELECTRIC FIELD OPERATING ON THE DIPOLE MOMENT OF THE DROP. WETTING IN COLLISION REQUIRES THAT WETTING OCCUR RAPIDLY ENOUGH, I.E., BEFORE REBOUND. IN THE CASE OF MILD STEEL, WETTING IS PROMOTED BY HYDROGEN IN THE STEEL AND DOES NOT OCCUR IF HYDROGEN IS NOT PRESENT.

*PARTICULATE + DEPOSITION + RAINOUT

15-13260 FEELY HW + BAZAN F

STRATOSPHERIC DISTRIBUTION OF NUCLEAR DEBRIS IN 1962, 1963, AND 1964
ISOTOPES, INC.

CONF-765 +. 22 PAGES, 19 FIGURES, 1 TABLE, 9 REFERENCES, PAGES 301-322 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

AN ESTIMATE MAY BE MADE OF THE STRATOSPHERIC DISTRIBUTION OF NUCLEAR DEBRIS BY USING A COMBINATION OF DATA FROM THE BALLOON SAMPLING PROGRAM AND THE WU-2 AIRCRAFT SAMPLING PROGRAM. THE STRATOSPHERIC SR-90 DISTRIBUTIONS FROM JANUARY 1962 THROUGH MAY 1964 HAVE BEEN ESTIMATED, AND FROM THEM THE STRATOSPHERIC BURDENS (RANGING FROM 0.9 MEGACURIES BEFORE THE 1961 U.S.S.R TESTS TO PERHAPS OVER 7 BY EARLY 1963 AND THEN FALLING TO ABOUT 4.4 IN LATE 1963) HAVE BEEN CALCULATED.

*NUCLEAR DETONATION + AIR POLLUTION + ATMOSPHERIC CIRCULATION, GLOBAL + MANGANESE + STRATOSPHERE + STRONTIUM + TRACER, RADIOACTIVE

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13261 KNOX JB
PREDICTION OF FALLOUT FROM SUBSURFACE NUCLEAR DETONATIONS
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
CONF-765 +. 23 PAGES, 12 FIGURES, 1 TABLE, 13 REFERENCES, PAGES 331-353 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY.

A NUMERICAL SIMULATION MODEL HAS BEEN DEVELOPED FOR THE PREDICTION OF FALLOUT FROM SUBSURFACE
NUCLEAR DETONATIONS THAT PRODUCE CRATERS THROUGH SPALL AND THE ACTION OF THE CAVITY GAS. THE
PHYSICAL PROCESSES MODELED ARE ATMOSPHERIC TRANSPORT, LATERAL EDDY DIFFUSION, AND
GRAVITATIONAL SEDIMENTATION OF RADIOACTIVE PARTICULATES. THIS CRATERING FALLOUT MODEL IS
NORMALIZED TO THE OBSERVED EXTERNAL GAMMA-DOSE-RATE FIELDS OF THE SEDAN (100 KT) AND THE
DANNY BOY (0.43 KT) CRATERING SHOTS CONDUCTED AT THE NEVADA TEST SITE. CALCULATIONS OF THE
FALLOUT PATTERNS FOR ADDITIONAL SHOTS, USED FOR TESTING THE PREDICTION CAPABILITY OF THE
CRATERING FALLOUT MODEL, INDICATE THAT THE MODEL GIVES ESTIMATES OF THE EXTERNAL GAMMA DOSE
RATE AT H PLUS 1 HR WITH A MAXIMUM ERROR OF A FACTOR OF 2 TO 3 IN THE GAMMA DOSE RATE VS.
DISTANCE ALONG THE HORIZONTAL LINE OF THE PATTERN.

*FALLOUT + COMPUTER PROGRAM + DOSE CALCULATION, EXTERNAL + NUCLEAR DETONATION + PARTICLE SIZE DISTRIBUTION

15-13262 LIST RJ + MACHTA L + ALEXANDER LT + ALLEN JS + MEYER MW + VALASSIS VT + HARDY EP
STRONTIUM-90 ON THE EARTH'S SURFACE. III
U.S. WEATHER BUREAU + U.S. DEPARTMENT OF AGRICULTURE + NEW YORK OPERATIONS OFFICE, USAEC, HEALTH AND
SAFETY LAB.
CONF-765 +. 10 PAGES, 7 FIGURES, 1 TABLE, 6 REFERENCES, PAGES 359-368 OF RADIOACTIVE FALLOUT FROM NUCLEAR
WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964,
CFSTI \$6.50 CY.

A WORLDWIDE SOIL-SAMPLING PROGRAM WAS CONDUCTED IN LATE 1963 AND EARLY 1964. IT WAS
CONTINUATION OF EARLIER PROGRAMS CARRIED OUT IN 1956, 1958, 1959, AND 1960 TO STUDY THE TOTAL
DEPOSITION AND DISTRIBUTION OF SR-90 OVER THE SURFACE OF THE EARTH. IT IS ESTIMATED ON THE
BASIS OF THE DATA OBTAINED THAT 7.6 MEGACURIES OF SR-90 WERE ON THE SURFACE OF THE EARTH IN
LATE 1963. SOME POSSIBLE SOURCES OF ERROR IN THIS ESTIMATE ARE DISCUSSED.

*SOIL, NUCLIDE OCCURRENCE + *STRONTIUM + ANALYTICAL TECHNIQUE, SOLID + DEPOSITION + FALLOUT + SAMPLING

15-13263 MACHTA L
STATUS OF GLOBAL RADIOACTIVE-FALLOUT PREDICTIONS
U.S. WEATHER BUREAU
CONF-765 +. 23 PAGES, 13 FIGURES, 4 TABLES, 16 REFERENCES, PAGES 369-391 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY.

THE ATMOSPHERE TRANSPORTS, DILUTES, AND REMOVES RADIOACTIVE CONTAMINANTS. CONTAMINANTS ADDED
ALMOST ANYWHERE IN THE ATMOSPHERE CAN BE BROUGHT TO OUR ENVIRONMENT OR FOOD. THE DETAILS OF
INDIVIDUAL TRAJECTORIES AND PRECIPITATION-SCAVENGING AREAS PLAY PROMINENT ROLES FOR
TROPOSPHERIC SOURCES, AND THE STATISTICAL BEHAVIOR OF THE STRATOSPHERE CONTROLS THE LONG-TERM
TRANSPORT AND DILUTION OF RADIOACTIVE MATERIAL AT HIGHER LEVELS. THE OBJECTIVE OF THIS PAPER
IS TO SUMMARIZE CERTAIN ASPECTS OF PREDICTIONS OF RADIOACTIVE FALLOUT. INCLUDED IS A
DISCUSSION OF THE FATE OF RADIOACTIVE GASES AND PARTICLES INJECTED INTO BOTH THE TROPOSPHERE
AND THE STRATOSPHERE.

*ATMOSPHERIC CIRCULATION, GLOBAL + *FALLOUT + ATMOSPHERIC DIFFUSION, GLOBAL + METEOROLOGY

15-13264 NEWELL RE + MILLER AJ
SOME ASPECTS OF THE GENERAL CIRCULATION OF THE LOWER STRATOSPHERE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
CONF-765 +. 13 PAGES, 2 FIGURES, 3 TABLES, 40 REFERENCES, PAGES 392-404 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY.

A REVIEW IS PRESENTED OF THE TEMPERATURE AND WIND STRUCTURE OF THE LOWEST 80 KM OF THE
ATMOSPHERE. THE INTERACTION BETWEEN RADIATIVE AND DYNAMIC PROCESSES TO PRODUCE THE OBSERVED
TEMPERATURE DISTRIBUTION IS DISCUSSED. IT IS CONCLUDED THAT THE LOWER STRATOSPHERE AND THE
MESOSPHERE RECEIVE ENERGY FROM THE REGIONS IMMEDIATELY BELOW. VARIOUS TERMS IN THE ENERGY
BUDGET OF THE LOWER STRATOSPHERE ARE PRESENTED AND DISCUSSED FOR THE PERIOD OF THE
INTERNATIONAL GEOPHYSICAL YEAR.

*ATMOSPHERIC CIRCULATION, GLOBAL + METEOROLOGY + STRATOSPHERE

15-13265 KALKSTEIN MI + THOMASIAN A + NIKULA JV
CADMIUM-109 RESULTS FOR UP TO 20 KM
U.S. AIR FORCE CAMBRIDGE RESEARCH LABORATORIES, BEDFORD
CONF-765 +. 4 PAGES, 1 FIGURE, 7 REFERENCES, PAGES 405-408 OF RADIOACTIVE FALLOUT NUCLEAR WEAPONS TESTS,
PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

ABOUT 0.25 MC OF CD-109 WAS PRODUCED AS A UNIQUE TRACER IN THE U.S. STARFISH TEST OF JULY 9,
1962, DETONATED AT 400 KM ABOVE JOHNSTON ISLAND. SUBSEQUENT MEASUREMENTS OF SAMPLES
COLLECTED UP TO ABOUT 20 KM REVEALED AN INCREASE IN CONCENTRATIONS AT HIGH LATITUDES IN THE
SOUTHERN HEMISPHERE IN THE SPRING OF 1963. THIS INCREASE WAS COINCIDENT IN TIME WITH THE
USUAL WARMINGS IN THE SOUTHERN-HEMISPHERE POLAR STRATOSPHERE. THE INCREASE IN THE NORTHERN
HEMISPHERE OCCURRED LATE IN THE WINTER OF 1963-1964 AND DID NOT REACH THE VALUES MEASURED IN

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13265 *CONTINUED*

THE SOUTHERN HEMISPHERE. METEOROLOGICAL OBSERVATIONS INDICATE THAT THE WINTER WAS QUITE MILD IN TERMS OF DISTURBANCES IN THE POLAR REGION, WITH THE PRINCIPAL DISTURBANCES OCCURRING LATE IN THE WINTER. STRATOSPHERIC CONCENTRATIONS MEASURED THUS FAR CORRESPOND TO ROUGHLY ONE-HALF OF WHAT WAS EXPECTED ON THE BASIS OF THE RH-102 EXPERIMENT.

*TRACER, RADIOACTIVE + ATMOSPHERIC CIRCULATION, GLOBAL + CADMIUM + METEOROLOGY + STRATOSPHERE

15-13267 YOUNG JA + ERICKSON NE + FAIRHALL AW

TROPOSPHERIC ¹⁴C VALUES IN THE PACIFIC NORTHWEST AND THE ARCTIC BASIN DURING 1964
UNIVERSITY OF WASHINGTON, SEATTLE

CONF-765 +. 6 PAGES, 3 FIGURES, 5 REFERENCES, PAGES 422-427 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

SAMPLES OF ATMOSPHERIC CO₂ WERE COLLECTED BY USING A MOLECULAR SIEVE AND COUNTED FOR THEIR C-14 CONTENT. TAKING 0.95 OF THE NATIONAL BUREAU OF STANDARDS OXALIC ACID STANDARD AS THE PRE-1945 LEVEL OF C-14 IN THE ATMOSPHERE, THE RESULTS ARE EXPRESSED AS PERCENT ABOVE NORMAL. DURING THE SUMMER OF 1963, TROPOSPHERIC LEVELS REACHED ABOUT 115 PERCENT ABOVE NORMAL, FOLLOWED BY A RAPID DROP TO ABOUT 88 PERCENT ABOVE NORMAL IN THE EARLY FALL OF 1963, A LEVEL WHICH WAS MAINTAINED UNTIL MAY 1964, WHEN A NEW SUMMER RISE WAS NOTED. THE SUDDEN DROP IN C-14 SPECIFIC ACTIVITY IS ATTRIBUTED TO EXCHANGE OF ATMOSPHERIC CO₂ WITH DISSOLVED CO₂ IN THE OCEAN. INCREASES IN THE TROPOSPHERIC C-14 CONCENTRATION IS ATTRIBUTED TO INJECTION OF CO₂ OF HIGH SPECIFIC ACTIVITY FROM THE STRATOSPHERE. SAMPLES OF CO₂ TAKEN DURING THE PASSAGE OF STORM FRONTS GIVE EVIDENCE OF THIS INJECTION, AS WELL AS EVIDENCE OF EXCHANGE WITH OCEANIC CO₂.

*TROPOSPHERE + CARBON + METEOROLOGY

15-13268 GUDIKSEN PH + JONES GL + SCHELL WR + SWANSON CA

FISSION-PRODUCT CONCENTRATIONS IN THE TROPOSPHERE AND LOWER STRATOSPHERE OVER THE PACIFIC NORTHWEST SINCE 1962

UNIVERSITY OF WASHINGTON, SEATTLE

CONF-765 +. 8 PAGES, 7 FIGURES, PAGES 428-435 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE CONCENTRATION OF FISSION PRODUCTS INJECTED INTO THE ATMOSPHERE BY NUCLEAR-WEAPONS DETONATIONS WAS STUDIED BY AIRCRAFT SAMPLING IN THE LOWER STRATOSPHERE AND UPPER TROPOSPHERE OVER THE PACIFIC NORTH-WEST SINCE 1962. THE INDIVIDUAL ACTIVITIES OF MN-54, ZR-95--NB-95, CS-137, RU-106--RH-106, SB-125, AND CE-144 WERE DETERMINED BY GAMMA-RAY SPECTROMETRY AND SUBSEQUENT COMPUTER ANALYSIS. IN GENERAL, A DIRECT CORRELATION BETWEEN STRATOSPHERIC AND TROPOSPHERIC ACTIVITY LEVELS AT ANY GIVEN TIME IS OBSERVED. THIS CORRELATION INDICATED THAT RAPID DIFFUSION MAY BE TAKING PLACE ACROSS THE TROPOPAUSE.

*FISSION PRODUCT RELEASE, GENERAL + *NUCLEAR DETONATION + ANTIMONY + CERIUM + CESIUM +
FISSION PRODUCT, AIRBORNE + MANGANESE + RUTHENIUM + STRATOSPHERE + TROPOSPHERE + ZIRCONIUM

15-13269 DANELSEN EF

RADIOACTIVITY AND POTENTIAL VORTICITY

PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK

CONF-765 +. 14 PAGES, 11 FIGURES, 1 REFERENCE, PAGES 436-449 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

CONTINUOUS RECORDS OF RADIOACTIVITY, WIND, AND TEMPERATURE MADE BY WB50 AIRCRAFT DURING PROJECT SPRINGFIELD SUBSTANTIATE THE TRANSFER OF RADIOACTIVITY FROM THE STRATOSPHERE TO THE TROPOSPHERE BY TROPOPAUSE FOLDING. THE CONTINUOUS RECORDS ARE SUPPORTED BY FILTER SAMPLES OF RADIOACTIVITY TAKEN BY BOTH WB50 AND RB57 AIRCRAFT AT CRITICAL POSITIONS RELATIVE TO THE FOLD. AS EXPECTED THE RADIOACTIVITY CORRELATES POSITIVELY WITH THE POTENTIAL VORTICITY, THUS, THE LATTER CAN BE USED AS A METEOROLOGICAL TRACER OF STRATOSPHERIC AIR. IT CAN ALSO SERVE AS AN INDICATOR OF RADIOACTIVITY CONCENTRATIONS WHEN DIRECT MEASUREMENTS ARE NOT AVAILABLE.

*ATMOSPHERIC CIRCULATION, GLOBAL + TRACER, RADIOACTIVE

15-13270 REITER ER + MAHLMAN JD

ATMOSPHERIC TRANSPORT PROCESSES LEADING TO RADIOACTIVE FALLOUT OVER THE UNITED STATES IN NOVEMBER 1962
COLORADO STATE UNIVERSITY, FORT COLLINS

CONF-765 +. 14 PAGES, 9 FIGURES, 2 TABLES, 11 REFERENCES, PAGES 450-463 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

RADIOACTIVE FALLOUT IN EXCESS OF 320 PC/CU. METER OF AIR WAS OBSERVED OVER THE SOUTH CENTRAL UNITED STATES NOVEMBER 24 TO 27, 1962. ATMOSPHERIC TRANSPORT PROCESSES LEADING TO THESE ABNORMALLY HIGH VALUES OF FALLOUT WERE STUDIED IN DETAIL. IT WAS ESTIMATED THAT 0.6 TIMES 10(12TH) METRIC TONS OF AIR WERE INVOLVED IN THE RAPID SINKING PROCESS THAT TRANSPORTED AIR FROM THE TROPOPAUSE LEVEL TO THE GROUND IN A MATTER OF APPROXIMATELY TWO DAYS. WET WASHOUT PROCESSES ALSO REMOVE SOME RADIOACTIVE DEBRIS FROM THE ATMOSPHERE.

*ATMOSPHERIC CIRCULATION, GLOBAL + *FALLOUT + RAINOUT

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13271 MAHLMAN JD
RELATION OF UPPER AIR HEMISPHERIC INDEX PATTERNS TO SEASONAL FALLOUT FLUCTUATIONS
COLORADO STATE UNIVERSITY, FORT COLLINS
CONF-765 +. 13 PAGES, 3 FIGURES, 2 TABLES, 20 REFERENCES, PAGES 464-476 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY

THE DOWNWARD TRANSPORT OF RADIOACTIVE DEBRIS FROM THE STRATOSPHERE, IN CONNECTION WITH
TROPOPAUSE-LEVEL CYCLOGENESIS, IS CONSIDERED AS A POSSIBLE PHYSICAL EXPLANATION FOR THE
SPRING FALLOUT MAXIMUM. TO EXAMINE THIS POSSIBILITY, AN INDEX DESIGNED TO MEASURE THE
RELATIVE AMOUNT OF CYCLONIC ACTIVITY IN THE ATMOSPHERE IS DERIVED AND THEN COMPARED WITH
SEASONAL VARIATIONS IN MEAN FALLOUT INTENSITY. IT IS ESTABLISHED FROM THE ANALYSES THAT THE
SPRING FALLOUT PEAK CANNOT BE ADEQUATELY EXPLAINED BY AN INCREASE OF CYCLONIC ACTIVITY AT
THIS TIME OF YEAR. IT APPEARS, HOWEVER, THAT SHORTER PERIOD FALLOUT PEAKS, SUPERIMPOSED UPON
THE MEAN SEASONAL CURVE, ARE RELATED TO THE OCCURRENCE OF CYCLOGENESIS IN THE UPPER
TROPOSPHERE.

*ATMOSPHERIC CIRCULATION, GLOBAL + *FALLOUT + ATMOSPHERIC CIRCULATION, CYCLONIC

15-13272 LOCKHART LB + PATTERSON RL + SAUNDEPS AW + BLACK RW
ATMOSPHERIC RADIOACTIVITY ALONG THE 80TH MERIDIAN (WEST)
U.S. NAVAL RESEARCH LABORATORY, WASHINGTON
CONF-765 +. 20 PAGES, 11 FIGURES, 31 REFERENCES, PAGES 477-496 OF RADIOACTIVE FALLOUT FROM NUCLEAR
WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964,
CFSTI \$6.50 CY.

OPERATION OF THE NAVAL RESEARCH LABORATORY (NRL) 80TH MERIDIAN AIR SAMPLING PROGRAM, FROM MAY
1956 THROUGH DECEMBER 1962, TOOK PLACE DURING AN INTERESTING PERIOD IN THE NUCLEAR AGE AND
THE DEVELOPMENT OF NUCLEAR WEAPONRY AND COVERED THE NEARLY THREE-YR MORATORIUM ON NUCLEAR
TESTING AS WELL AS THE EPISODES OF INTENSIVE TESTING OF HIGH-YIELD DEVICES BOTH BEFORE AND
AFTER THE MORATORIUM. DATA COLLECTED DURING THIS PROGRAM HELPED SUBSTANTIATE A NUMBER OF
CONCEPTS REGARDING ATMOSPHERIC MIXING PROCESSES AND RESIDENCE TIMES OF RADIOACTIVE
PARTICULATE MATTER IN THE ATMOSPHERE. THIS PAPER SUMMARIZES MEASUREMENTS OF THE
CONCENTRATIONS OF BOTH GROSS BETA ACTIVITY AND SR-90 ACTIVITY IN THE AIR AT GROUND LEVEL
ALONG THE 80TH MERIDIAN (WEST) DURING THE PERIOD 1957 TO 1962. MORE-DETAILED RESULTS AND
INTERPRETATIONS ARE GIVEN FOR COLLECTIONS OF RADIOACTIVITY MADE IN 1962.

*SURVEY, RADIATION, AERIAL + GROSS BETA + STRONTIUM

15-13273 GUSTAFSON PF + BRAR SS + MUNIAK SE
VARIATION OF FISSION PRODUCTS AND NATURAL RADIOACTIVITY IN SURFACE AIR
ARGONNE NATIONAL LABORATORY
CONF-765 +. 9 PAGES, 6 FIGURES, 12 REFERENCES, PAGES 497-506 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS
TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI
\$6.50 CY

COLLECTION OF PARTICLES IN SURFACE AIR BY AIR FILTERS HAS BEEN IN PROGRESS AT ARGONNE, ILL.,
FOR A NUMBER OF YEARS. MEASUREMENT OF THE RADIOACTIVITY IN THESE FILTERS HAS BEEN DONE BY
GAMMA-RAY SPECTROMETRY WITH THE USE OF LARGE NAI CRYSTALS. THE CONCENTRATIONS OF VARIOUS
FISSION AND ACTIVATION PRODUCTS AS WELL AS BE-7 WERE DETERMINED BY COMPUTER ANALYSIS OF THE
COMPLEX SPECTRA. VARIATIONS IN THE CONCENTRATION OF VARIOUS NUCLIDES, PARTICULARLY OF CS-137
AND MN-54, AS WELL AS IN THE RATIO BETWEEN NUCLIDES, ARE USED TO DETERMINE THE SOURCES OF
DEBRIS OBSERVED IN SURFACE AIR. THE DIFFERENCES IN DISTRIBUTION AS A FUNCTION OF TIME ARE
DISCUSSED FOR VARIOUS SOURCES.

*SAMPLING + AIR + PARTICULATE + SURVEY, RADIATION, ENVIRONMENTAL

15-13274 HUFF FA
RADIOACTIVE RAINOUT RELATIONS ON DENSELY GAUGED SAMPLING NETWORKS
ILLINOIS STATE WATER SURVEY, URBANA
CONF-765 +. 16 PAGES, 4 FIGURES, 5 TABLES, 9 REFERENCES, PAGES 507-522 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY

STUDIES HAVE BEEN MADE OF THE RELATION BETWEEN THE RAINOUT OF RADIOACTIVITY IN CONVECTIVE
STORMS AND THE THREE RAINFALL FACTORS OF VOLUME, INTENSITY, AND DURATION. DATA WERE USED
FROM FOUR DENSELY GAUGED SAMPLING NETWORKS OPERATED DURING THE 1962 AND 1963 SPRING AND
SUMMER SEASONS IN CENTRAL ILLINOIS. THE NETWORK AREAS RANGED FROM 10 TO 6000 SQUARE MILES
AND PROVIDED DATA ON BOTH MICROSCALE AND MESOSCALE RELATIONS. ANALYSES OF SPATIAL
VARIABILITY SHOWED A TREND FOR THE RELATIVE VARIABILITY OF RADIOACTIVE RAINOUT TO (1) EXCEED
THE STORM-RAINFALL VARIABILITY, (2) DECREASE WITH INCREASING RAINFALL VOLUME AND STORM
DURATION, AND (3) INCREASE WITH INCREASING NETWORK SIZE. INVESTIGATION OF THE POINT
REPRESENTATIVENESS OF SINGLE MEASUREMENTS OF RADIOACTIVE RAINOUT IN A 15-STORM SAMPLE
INDICATED THAT AN AVERAGE ERROR OF 20 TO 25 PERCENT IS INTRODUCED WHEN A SINGLE OBSERVATION
IS ASSUMED TO REPRESENT THE MEAN RAINOUT OVER AREAS OF 10 TO 12 SQUARE MILES. CORRELATION
ANALYSES INDICATED THAT AT A GIVEN POINT THE RAINFALL IS NOT STRONGLY RELATED TO THE
RADIOACTIVE RAINOUT. HOWEVER, WHEN AREAL PATTERNS OF RAINFALL AND RAINOUT ARE COMPARED AND
ALLOWANCE IS MADE FOR DISPLACEMENT OF HIGH AND LOW CENTERS DUE TO VARIOUS METEOROLOGICAL
INFLUENCES, A STRONG ASSOCIATION IS INDICATED BETWEEN THE MAJOR FEATURES OF THE PATTERNS IN
MOST STORMS.

*RAINOUT + METEOROLOGY + SAMPLING

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13275 SAUCIER WJ + HALL SJ + NELSON RY
UNIVERSITY OF OKLAHOMA PROGRAM FOR STUDIES OF CONVECTIVE STORMS AND SCAVENGING OF RADIOACTIVE PARTICLES
UNIVERSITY OF OKLAHOMA, NORMAN
CONF-765 +. 9 PAGES, 5 FIGURES, PAGES 523-531 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS,
PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE BROAD OBJECTIVES OF THE UNIVERSITY OF OKLAHOMA PROGRAM ARE (1) TO EXAMINE THUNDERSTORM CONVECTION AS A MECHANISM FOR FALLOUT OF NONAQUEOUS PARTICULATES, ESPECIALLY RADIOACTIVE PARTICLES, AND (2) TO ADD TO THE KNOWLEDGE OF THE PHYSICS OF CLOUD GROWTH AND PRECIPITATION OF SUCH STORMS BY THE USE OF IDENTIFIABLE PARTICULATES SUCH AS RADIONUCLIDES AS TRACERS. THE SECOND OBJECTIVE IS REALLY A BY-PRODUCT OF THE FIRST. AT PRESENT WE WISH TO DETERMINE THE RADIOACTIVE FALLOUT AND THE VARIATIONS IN THIS FALLOUT IN THUNDERSTORM RAINFALL, TO DETERMINE THE DISTRIBUTIONS OF RADIOACTIVITY IN THE THUNDERSTORM ENVIRONMENTS, AND TO OBSERVE AND MEASURE THE THUNDERSTORM CONVECTION BY MEANS OF RAINFALL RECORDS, GROUND METEOROLOGICAL RECORDS, WEATHER RADAR SURVEILLANCE, AND ROUTINE METEOROLOGICAL DATA.

*FALLOUT + *RAINOUT + SAMPLING

15-13276 HALL SJ
RADIOACTIVITY IN PRECIPITATION. CASE STUDIES FROM THE 1964 SPRING SEASON
UNIVERSITY OF OKLAHOMA, NORMAN
CONF-765 +. 34 PAGES, 38 FIGURES, 3 TABLES, 2 REFERENCES, PAGES 532-565 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

FOUR CASE STUDIES ARE PRESENTED OF CONVECTIVE STORMS IN WHICH TIME SAMPLES OF RAINFALL WERE COLLECTED. THE PROFILES OBTAINED FROM THESE COLLECTIONS ARE ANALYZED SHOWING TIME VARIATIONS OF TOTAL BETA-RADIOACTIVITY CONTENT, RAINFALL RATE, AND RATIO OF PARTICULATE TO DISSOLVED BETA ACTIVITY. THESE DATA, WITH THEIR RESPECTIVE RADAR DATA ANALYSES, INDICATE THE TEMPORAL CHANGES OF BETA CONCENTRATION AS WELL AS AREAL BETA DISTRIBUTIONS IN CONVECTIVE STORMS. FOR MATURE STORMS A MINIMUM OF BETA CONCENTRATION IS ASSOCIATED WITH MAXIMUM RAINFALL RATES. FOR DISSIPATING STORMS A MAXIMUM OF BETA CONCENTRATION IS ASSOCIATED WITH MAXIMUM RAINFALL RATES.

*RAINOUT + GROSS BETA + PARTICULATE

15-13277 GATZ DF + DINGLE AN
AIR CLEANSING BY CONVECTIVE STORMS
UNIVERSITY OF MICHIGAN, ANN ARBOR
CONF-765 +. 16 PAGES, 8 FIGURES, 1 TABLE, 7 REFERENCES, PAGES 566-581 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

DATA RELATING TO RAIN CLEANSING OF THE ATMOSPHERE HAVE BEEN GATHERED THROUGHOUT FIVE CONVECTIVE RAIN-PRODUCING WEATHER SYSTEMS AND ANALYZED WITH RESPECT TO THE CONCENTRATIONS OF RADIOACTIVITY IN SEQUENTIAL SAMPLES OF RAIN. FOR SOME OF THE RAINS, ANALYSES OF THE POLLEN CONTENT OF SEQUENTIAL SAMPLES WERE ALSO MADE. A CONSISTENT PATTERN OF TEMPORAL VARIATION OF CONCENTRATION OF BOTH CONTAMINANTS WAS OBSERVED IN THE THREE RAINS OF HIGHEST RAINFALL RATE. THIS PATTERN, A RAPID DECREASE OF CONCENTRATION WITH TIME DURING THE FIRST PORTIONS OF THE RAIN, WAS ABSENT IN THE TWO RAINS OF LOWEST RAINFALL RATE. THE FACT THAT RAPID DECREASES IN CONCENTRATION OCCURRED SIMULTANEOUSLY FOR BOTH RADIOACTIVITY AND POLLENS IS TAKEN AS EVIDENCE THAT BOTH CONTAMINANTS WERE REMOVED FROM THE SAME AIR. SINCE POLLENS HAVE THEIR SOURCE AT THE EARTH'S SURFACE, IT IS CONCLUDED THAT BOTH RADIOACTIVITY AND POLLENS ENTERED THE CONVECTIVE SYSTEM FROM LOW LEVELS VIA THE CONVECTIVE UPDRAFT. IT SEEMS POSSIBLE THAT THE ABSENCE OF THE RAPID TEMPORAL DECREASE OF CONCENTRATION IN THE RAINS OF LOW INTENSITY MAY BE DUE TO THE LACK OF A PERSISTENT ORGANIZED UPDRAFT IN THESE SYSTEMS.

*RAINOUT + AIR POLLUTION + PARTICULATE

15-13278 KURGER P + HOSLER CL + MILLERS A
METEOROLOGICAL INFLUENCES UPON SR-90 FALLOUT CONCENTRATION IN PRECIPITATION. PART 2. CONVECTIVE ACTIVITY AND EXTRATROPICAL CYCLONES
HAZELTON-NUCLEAR SCIENCE CORP., PALO ALTO
CONF-765 +. 20 PAGES, 7 FIGURES, 2 TABLES, 27 REFERENCES, PAGES 582-601 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE METEOROLOGICAL EFFECTS UPON SR-90 FALLOUT DEPOSITION FROM CONVECTIVE ACTIVITY AND FROM EXTRATROPICAL CYCLONES WERE EXAMINED IN SEVERAL LOCATIONS. DATA FROM 14 CONVECTIVE SHOWER STORMS IN PENNSYLVANIA SHOWED THAT THE CHANGES IN SR-90 CONCENTRATION IN THE PRECIPITATION WERE IN ACCORD WITH THE LIFE CYCLE OF CONVECTIVE CELLS, THE TIME OF PEAK CONCENTRATION COINCIDED WITH THE TIME OF MAXIMUM RADAR-ECHO CLOUD-TOP HEIGHTS. FOR THE LARGE-SCALE UPLIFT ASSOCIATED WITH EXTRATROPICAL CYCLONES, THE SLOWER CHANGING SR-90 CONCENTRATIONS WERE ASSOCIATED WITH EVAPORATION EFFECTS UPON THE RAINFALL, THE PRECIPITATION-GROWTH MECHANISM, THE PASSAGE OF FRONTS AND TROUGH LINES, AND THE STRATIFICATION OF NUCLEAR DEBRIS IN THE ATMOSPHERE.

*FALLOUT + *RAINOUT + *STRONTIUM + ATMOSPHERIC CIRCULATION, CYCLONIC + METEOROLOGY

15-13279 KURODA PK + KAURANEN P + PALMER BD + MENON KK + FRY LM
FISSION PRODUCTS IN THE ATMOSPHERE AND IN RAIN
UNIVERSITY OF ARKANSAS, FAYETTEVILLE
CONF-765 +. 14 PAGES, 7 FIGURES, 3 TABLES, 25 REFERENCES, PAGES 602-615 OF RADIOACTIVE FALLOUT FROM

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13279 *CONTINUED*

NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

THE CONCENTRATIONS OF SR-89, SR-90, BA-140, CE-141, AND CE-144 IN INDIVIDUAL SAMPLES OF RAIN AND SNOW HAVE BEEN MEASURED RADIOCHEMICALLY AT FAYETTEVILLE, ARK., FOR THE PAST SEVERAL YEARS. CERTAIN FEATURES OF THE ISOTOPIC RATIO DATA MAY BE EXPLAINED AS BEING DUE TO ATMOSPHERIC FRACTIONATION OF NUCLEAR DEBRIS TAKING PLACE ON A GLOBAL SCALE. HIGH CONCENTRATIONS OF MN-54, SB-124, AND SB-125 WERE OBSERVED IN THE AIR-FILTER SAMPLES COLLECTED IN CONNECTION WITH PROJECT STAR DUST IN 1962 AND 1963. THE SB-125/SR-90 RATIO IN 1963 SAMPLES WAS FOUND TO CORRESPOND TO VALUES REPORTED FOR THE PRODUCTION RATIO IN THERMONUCLEAR EXPLOSIONS, BUT SOME SAMPLES COLLECTED AT HIGH NORTHERN ALTITUDES IN 1962 SHOWED AN EXCESS OF SB-125. IT APPEARS THAT SB-125 WAS PARTLY PRODUCED THROUGH SECOND-ORDER NEUTRON CAPTURE IN SB-123. A SUDDEN INCREASE OF MN-54 CONCENTRATION WAS OBSERVED IN APRIL 1963 AT AN ALTITUDE RANGE OF 30,000 TO 35,000 FT.

*RADIOCHEMICAL ANALYSIS + *RAINOUT + ANTIMONY + BARIUM + CERIUM + MANGANESE + STRATOSPHERE + STRONTIUM

15-13280 VOLCHOK HL

CHARACTERISTICS OF RELATIVE SR-90 CONCENTRATIONS IN SURFACE AIR
NEW YORK OPERATIONS OFFICE, USAEC HEALTH AND SAFETY LABORATORY
CONF-765 +. 13 PAGES, 9 FIGURES, 4 REFERENCES, PAGES 616-628 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

SINCE TAKING OVER THE 80TH MERIDIAN (WEST) AIR SAMPLING PROGRAM AT THE BEGINNING OF 1963, THE HEALTH AND SAFETY LAB. HAS SLIGHTLY ENLARGED THE SCOPE OF THE PROGRAM BY THE ADDITION OF A NUMBER OF SITES AND HAS EFFECTED SOME MINOR OPERATIONAL CHANGES. THE 1963 DATA OF AIR CONCENTRATION OF SR-90 AT GROUND LEVEL ALONG THE 80TH MERIDIAN ARE PRESENTED ALONG WITH THE NAVAL RESEARCH LAB. DATA COVERING THE PERIOD 1957 AND 1962. ALMOST ALL SITES IN 1963 EXHIBITED HIGHER CONCENTRATIONS THAN AT ANY PREVIOUS TIME. THE SR-89/SR-90 RATIO INDICATED THAT THE NUCLEAR DEBRIS IN THE NORTHERN HEMISPHERE WAS RELATIVELY WELL MIXED COMPARED TO THAT IN THE SOUTHERN HEMISPHERE WHICH SHOWED OLDER DEBRIS. WHEN THE 1962 AND 1963 DATA ARE NORMALIZED AND AVERAGED, VERY SYSTEMATIC SEASONAL CHANGES, LARGELY UNAFFECTED BY THE TESTING PROGRAM ARE OBSERVED. SYMMETRY BETWEEN THE HEMISPHERES IS VERY CLEARLY SHOWN WHEN A FOUR-MONTH OFFSET IN TIME IS ASSUMED, THUS, PEAK VALUES IN THE NORTH OCCUR IN MARCH AND APRIL AND IN THE SOUTH, IN NOVEMBER AND DECEMBER. A QUALITATIVE RELATION BETWEEN CONCENTRATION OF SR-90 IN AIR AND CONCENTRATION OF SR-90 IN PRECIPITATION IS DESCRIBED.

*STRONTIUM + AIR + RAINOUT

15-13281 FERBER GJ

DISTRIBUTION OF RADIOACTIVITY WITH HEIGHT IN NUCLEAR CLOUDS
U.S. WEATHER BUREAU, WASHINGTON
CONF-765 +. 17 PAGES, 7 FIGURES, 1 TABLE, 12 REFERENCES, PAGES 629-645 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

DURING OPERATION DOMINIC I AT CHRISTMAS ISLAND IN 1962, AIRCRAFT SAMPLING OF NUCLEAR CLOUDS WAS DONE SOON AFTER CLOUD STABILIZATION TO INVESTIGATE THE AMOUNT OF RADIOACTIVE DEBRIS THAT STABILIZED IN THE TROPOSPHERE AND ITS DISTRIBUTION WITH HEIGHT. THE DETONATIONS STUDIED WERE ALL AIR BURSTS OVER WATER. SOME DATA FOR SURFACE BURSTS OBTAINED DURING OPERATION REDWING IN 1956 ARE USED FOR COMPARISON. RESULTS INDICATE THAT FOR AIR BURSTS LESS THAN 1 PERCENT OF THE TOTAL RADIOACTIVITY IS PRESENT IN THE STEM OF THE NUCLEAR CLOUD. IT IS ESTIMATED THAT ABOUT ONE-THIRD OF THE TOTAL DEBRIS FROM THE CHRISTMAS ISLAND CLOUDS INITIALLY STABILIZED IN THE TROPOSPHERE.

*TROPOSPHERE + NUCLEAR DETONATION + SURVEY, RADIATION, AERIAL

15-13282 THATCHER LL + PAYNE BR + CAMERON JF
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA

CONF-765 +. 29 PAGES, 13 FIGURES, 8 TABLES, 9 REFERENCES, PAGES 646-674 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

TRITIUM LEVELS ROSE FROM AN AVERAGE BASE OF 80 TRITIUM UNITS (T.U.) FOR CONTINENTAL SITES IN THE NORTHERN HEMISPHERE TO AVERAGE PEAKS OF 2000 T.U. IN 1962 AND 4000 TO 5000 IN 1963. INDIVIDUAL PEAKS WERE HIGHER, REACHING 10,000 IN NORTHERN CANADA. LEVELS IN PRECIPITATION WERE LOWER IN 1964. THE PEAK YEAR APPEARS TO HAVE BEEN 1963. THE RATE OF DECREASE FROM 1963 TO 1964 IS LESS THAN THE COMPARABLE PERIOD 1959 TO 1961, POSSIBLY REFLECTING THE HIGHER ALTITUDES INVOLVED IN THE LAST TESTING. TRITIUM AND SR-90 DEPOSITION VALUES OVER THE GLOBE SHOW INTERESTING CONSISTENCIES THAT MAY PERMIT THE ESTIMATION OF TRITIUM CONCENTRATION FOR UNSAMPLED AREAS. THE HTO/SR-90 RATIO INCREASES TOWARD THE HIGH MID-LATITUDES IN THE NORTHERN HEMISPHERE. THE SOUTHERN-HEMISPHERE PRECIPITATION AVERAGED ONLY 15 T.U. IN 1963 COMPARED TO SEVERAL THOUSAND TRITIUM UNITS FOR THE NORTHERN HEMISPHERE. IT IS ESTIMATED THAT IN 1962 AND 1963 THE DEPOSITION OF TRITIUM HAD BEEN APPROXIMATELY 44 OR 96 KG, DEPENDING ON WHETHER OR NOT OCEANIC EXCHANGE WAS INCLUDED IN THE CALCULATION. THIS WOULD LEAVE EITHER 124 OR 72 KG IN THE STRATOSPHERE BASED ON THE ASSUMPTION OF A 168-KG PRODUCTION IN 1961 AND 1962.

*TRITIUM + ATMOSPHERIC CIRCULATION, GLOBAL + FALLOUT + RAINOUT + STRATOSPHERE + STRONTIUM

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13283 ERIKSSON E + BOLIN B
OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER
INTERNATIONAL METEOROLOGICAL INSTITUTE, STOCKHOLM
CONF-765 +. 12 PAGES, 4 FIGURES, 9 REFERENCES, PAGES 675-686 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS
TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI
\$6.50 CY.

THE OCCURRENCE OF THE NUCLIDES O-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS IS DISCUSSED ON
THE BASIS OF THE GENERAL CIRCULATION OF WATER DERIVED FROM STANDARD METEOROLOGICAL
OBSERVATIONS OF HUMIDITY, PRECIPITATION, AND EVAPORATION. IF THE ESTABLISHMENT OF A
CHARACTERISTIC VERTICAL DISTRIBUTION OF MOISTURE, DEUTERIUM, AND O-18 IS RAPID (A FEW DAYS)
IN COMPARISON WITH THE LARGE-SCALE HORIZONTAL TRANSFER RATES OF MOISTURE OVER THE OCEANS, ONE
CAN RELATE THE VERTICAL DISTRIBUTION OF DEUTERIUM AND O-18 IN AIR MOISTURE AND THE CONTENT OF
THESE NUCLIDES IN PRECIPITATION TO THE HUMIDITY DISTRIBUTION, THE ISOTOPIC COMPOSITION OF SEA
WATER, AND THE CHARACTERISTIC FRACTIONATION FACTOR FOR CONDENSATION-EVAPORATION.

*TRITIUM + *WATER, GENERAL + ATMOSPHERIC CIRCULATION, GLOBAL + DEUTERIUM + FALLOUT + OXYGEN

15-13284 WARD GM + JOHNSON JE + STEWART HF
CESIUM-137 PASSAGE FROM PRECIPITATION TO MILK
COLORADO STATE UNIVERSITY, FORT COLLINS
CONF-765 +. 8 PAGES, 1 FIGURE, 3 TABLES, 6 REFERENCES, PAGES 703-710 OF RADIOACTIVE FALLOUT FROM NUCLEAR
WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964,
CFSTI \$6.50 CY.

ONE OF THE PRINCIPAL OBJECTIVES OF THIS CS-137 STUDY AT COLORADO STATE UNIVERSITY WAS TO
ESTABLISH USEFUL RATIOS FOR THE PASSAGE OF CS-137 THROUGH THE FOOD CHAIN TO MAN. THIS PAPER
PRESENTS COEFFICIENTS CALCULATED FOR THE TRANSFER OF CS-137 FROM PRECIPITATION TO FORAGE
PLANTS AND FROM FORAGE PLANTS AND OTHER FEEDS TO MILK.

*AGRICULTURAL CONSIDERATION + *CESIUM + *ECOLOGICAL CONSIDERATION + BIOLOGICAL CONCENTRATION, ANIMAL FEED +
BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION

15-13285 HAWTHORNE HA
FISSION-PRODUCT CYCLES IN AN AGRICULTURAL SYSTEM. I. SAMPLE HETEROGENEITY
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-765 +. 12 PAGES, 9 FIGURES, 3 TABLES, 5 REFERENCES, PAGES 711-722 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY.

THE DISPERSION OF SR-90 AND CS-137 WITHIN THE COMPONENTS OF A DAIRY FARM WERE EXAMINED AS A
PRELIMINARY STEP IN DEVELOPING MATHEMATICAL MODELS OF THE SYSTEM. THE HIGH VARIABILITY IN
MASS OF THE MATRIXES AND IN THE CONCENTRATIONS OF SR-90 AND CS-137 NULLIFIED ANY ASSUMPTION
OF GENERAL HOMOGENEITY WITHIN THE SYSTEM. VARIATIONS IN MATRIX MASS OF FISSION-PRODUCT
VECTORS WERE CONSISTENTLY SMALLER THAN VARIATIONS IN SR-90 AND CS-137 CONCENTRATIONS WITHIN
THE MATRIXES, SOIL, PLANTS, AND MILK. MODELS REPRESENTING THE MOVEMENTS OF FISSION PRODUCTS
AMONG THE COMPONENTS OF A FOOD CHAIN MUST ACCOUNT FOR FISSION-PRODUCT DISPERSION WITHIN
MATRIXES AND FOR VARIATIONS IN MATRIX MASS.

*AGRICULTURAL CONSIDERATION + *CESIUM + *STRONTIUM + BIOLOGICAL CONCENTRATION, ANIMAL FEED +
BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + SAMPLING +
SOIL, NUCLIDE OCCURRENCE

15-13286 PELLETIER CA + WHIPPLE GH + WEDLICK HI
USE OF SURFACE-AIR CONCENTRATION AND RAINFALL MEASUREMENTS TO PREDICT DEPOSITION OF FALLOUT RADIONUCLIDES
THE UNIVERSITY OF MICHIGAN, ANN ARBOR
CONF-765 +. 14 PAGES, 9 FIGURES, 3 TABLES, 11 REFERENCES, PAGES 723-736 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY.

AN EMPIRICAL MODEL RELATING DEPOSITION AND AIR CONCENTRATION OF GROSS BETA RADIOACTIVITY IS
PRESENTED. BASED ON MEASUREMENTS IN THE WESTERN LAKE ERIE AREA BETWEEN JANUARY 1963 AND JUNE
1964. THE MEANING AND THE APPLICABILITY OF THE MODEL ARE DISCUSSED. THE MODEL IS USED TO
PREDICT THE DEPOSITION OF GROSS BETA RADIOACTIVITY AT A SINGLE LOCATION IN SOUTHEASTERN
MICHIGAN.

*FALLOUT + *MATHEMATICAL STUDY + *WASHOUT + DEPOSITION + RAINOUT

15-13287 RIVERA J
RADIATION TO BONE FROM SR-90 IN NEW YORK CITY RESIDENTS
NEW YORK OPERATIONS OFFICE, USAEC HEALTH AND SAFETY LABORATORY
CONF-765 +. 6 PAGES, 2 FIGURES, 2 TABLES, 7 REFERENCES, PAGES 737-742 OF RADIOACTIVE FALLOUT FROM NUCLEAR
WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964,
CFSTI \$6.50 CY

FROM MEASUREMENTS OF THE SR-90 CONTENT OF THE DIET IN NEW YORK CITY, CHICAGO, AND SAN
FRANCISCO MADE EVERY THREE MONTHS SINCE 1960, AND FROM MEASUREMENTS OF THE SR-90 CONTENT OF
THE VERTEBRAE OF ACCIDENT VICTIMS OBTAINED AT THE THREE CITIES SINCE 1961, PARAMETERS
DESCRIBING THE BONE METABOLISM OF SR-90 BY INDIVIDUALS OF AGES FROM BIRTH TO 20 YEARS HAVE
BEEN INFERRED. THE RADIATION DOSE TO NEW YORK CITY RESIDENTS FROM SR-90 RECEIVED TO DATE HAS
BEEN CALCULATED.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13287 *CONTINUED*
*DOSE CALCULATION, INTERNAL + *STRONTIUM + POPULATION EXPOSURE

15-13288 HARDY EP + RIVERA J + CONARD RA
CESIUM-137 AND STRONTIUM-90 RETENTION FOLLOWING AN ACUTE INGESTION OF RONGELAP FOOD
NEW YORK OPERATIONS OFFICE, USAEC HEALTH AND SAFETY LABORATORY + BROOKHAVEN NATIONAL LABORATORY
CONF-765 +. 15 PAGES, 6 FIGURES, 3 TABLES, 26 REFERENCES, PAGES 743-757 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY

MARINE AND PLANT FOODS USED BY NATIVES LIVING ON RONGELAP IN THE MARSHALL ISLANDS CONTAIN HIGHER LEVELS OF BORN-LIVED FISSION-PRODUCT RADIONUCLIDES THAN DO DIETS OF PEOPLE LIVING IN THE U.S. DUE TO RESIDUAL CONTAMINATION FROM FALLOUT IN 1954. DURING THE 1963 MEDICAL SURVEY OF THE RONGELAP POPULATION, THREE FOOD ITEMS INDIGENOUS TO THE RONGELAP DIET WERE BROUGHT BACK TO THE U.S. AND CONSUMED OVER A SEVEN-DAY PERIOD BY A MEMBER OF THE MEDICAL TEAM. THE INGESTION OF THESE FOODS INTRODUCED LEVELS OF SR-90 AND CS-137 WHICH WERE 20 AND 60 TIMES HIGHER, RESPECTIVELY, THAN IN THE NORMAL DIET. URINARY AND FECAL COLLECTIONS WERE ANALYZED SEPARATELY, AND WHOLE-BODY CS-137 MEASUREMENTS WERE MADE. THE URINE WAS THE PRINCIPAL EXCRETORY ROUTE FOR THE CS-137, WHEREAS THE FECES WAS THE MAIN REMOVAL MEANS FOR THE SR-90. THE RETENTION OF SR-90 COULD BE REPRESENTED BY A SERIES OF EXPONENTIALS, WHEREAS THE RETENTION OF CESIUM AS DETERMINED BY WHOLE-BODY COUNTING INDICATED THAT A SINGLE LONG-TERM COMPONENT WITH A BIOLOGICAL HALF-LIFE OF 74 DAYS DESCRIBES THE REMOVAL PROCESS. REASONABLY GOOD AGREEMENT WAS OBTAINED BETWEEN RETENTION AS DETERMINED BY WHOLE-BODY COUNTING AND BY EXCRETION MEASUREMENTS. IT IS ESTIMATED THAT ABOUT 25 PERCENT OF THE SR-90 FROM THE RONGELAP FOOD WAS RETAINED BY THE BODY AT THE END OF 190 DAYS. THE AVERAGE URINARY-TO-FECAL EXCRETION RATIO WAS 3.5 FOR CS-137 AND 0.06 FOR SR-90. THESE FINDINGS ARE IN AGREEMENT WITH OTHER STUDIES DURING WHICH SR-90 AND CS-137 WERE INGESTED UNDER A VARIETY OF EXPERIMENTAL AND ACCIDENTAL CONDITIONS.

*CESIUM + *STRONTIUM + BIOLOGICAL CONCENTRATION, MAN + DIETARY HABIT + INGESTION

15-13289 MARTIN WE
EARLY FOOD-CHAIN KINETICS OF RADIONUCLIDES FOLLOWING CLOSE-IN FALLOUT FROM A SINGLE NUCLEAR DETONATION
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-765 +. 25 PAGES, 8 FIGURES, 6 TABLES, 39 REFERENCES, PAGES 758-782 OF RADIOACTIVE FALLOUT FROM
NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD.,
NOVEMBER 1964, CFSTI \$6.50 CY

PLANT SAMPLES AND RABBITS WERE COLLECTED FROM REPRESENTATIVE LOCATIONS IN THE SEDAN FALLOUT FIELD BEFORE AND AT VARIOUS TIMES AFTER THE DETONATION. THE EFFECTIVE HALF-LIVES OF SR-89 AND I-131 ON FALLU-CONTAMINATED PLANTS WERE APPROXIMATELY 18 AND 5.0 TO 5.5 DAYS, RESPECTIVELY. MAXIMUM CONCENTRATIONS OF SR-89 IN RABBIT-BONE ASH OCCURRED ABOUT 30 DAYS AFTER THE DETONATION AND REMAINED HIGH FOR AT LEAST 60 DAYS, BUT MAXIMUM CONCENTRATIONS OF I-131 IN RABBIT THYROID OCCURRED BY OR BEFORE FIVE DAYS AND THEN DECLINED TO PRE-SEDAN LEVELS IN LESS THAN 60 DAYS AFTER THE DETONATION. DETERMINISTIC EXPONENTIAL MODELS WERE FORMULATED AND FUNCTIONED SATISFACTORILY. MAJOR SOURCES OF ERROR IN THE ESTIMATION OF INPUT-PARAMETER VALUES AND IN THE USE OF SUCH MODELS TO MAKE PREDICTIONS ARE DESCRIBED AND DISCUSSED. SIMILAR MODELS WERE PROPOSED FOR THE STUDY OF RADIONUCLIDE KINETICS IN HUMAN FOOD CHAINS (PASTURE PLANTS, COW MILK, AND HUMAN TISSUES OR ORGANS) FOLLOWING ENVIRONMENTAL CONTAMINATION BY A SINGLE FALLOUT EVENT. THE RESULTS OF HYPOTHETICAL CALCULATIONS WERE COMPARED WITH THE RADIATION PROTECTION GUIDES RECOMMENDED BY THE FEDERAL RADIATION COUNCIL.

*ECOLOGICAL CONSIDERATION + *FALLOUT + *MATHEMATICAL STUDY + BIOLOGICAL CONCENTRATION, GENERAL + IODINE + STRONTIUM

15-13290 GUSTAFSON PF + BRAR SS + MUNIAK SE
FISSION-PRODUCT DEPOSITION AND DIETARY LEVELS IN THE CHICAGO AREA
ARGONNE NATIONAL LABORATORY
CONF-765 +. 26 PAGES, 6 FIGURES, 11 REFERENCES, PAGES 783-790 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS
TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

MEASUREMENTS OF GAMMA-EMITTING FISSION PRODUCTS IN SOIL-CORE SAMPLES HAVE BEEN MADE BY GAMMA-RAY SPECTROMETRY SINCE 1957. THESE PROVIDE A RUNNING INVENTORY OF GROUND DEPOSITION AND ACCUMULATION OF A NUMBER OF RADIONUCLIDES. CONCURRENT MEASUREMENTS OF FISSION PRODUCTS IN AIR AND IN PRECIPITATION HAVE MADE IT POSSIBLE TO RELATE AIRBORNE ACTIVITY TO DEPOSITION. THE ONLY GAMMA-EMITTING FISSION PRODUCT PRESENT IN SOIL WHICH IS OF BIOLOGICAL IMPORTANCE IS CS-137. THE OTHER GAMMA EMITTERS CONSTITUTE A SOURCE OF EXTERNAL RADIATION OF A VARYING MAGNITUDE BUT ARE NOT METABOLICALLY ACTIVE. QUARTERLY FOOD SAMPLING IN THE CHICAGO AREA HAS BEEN CONDUCTED IN CONJUNCTION WITH THE HEALTH AND SAFETY LAB. TRI-CITY SAMPLING PROGRAM SINCE APRIL 1961. THESE SAMPLES HAVE BEEN ANALYZED FOR CS-137 LEVEL IN THE DIET WITH TIME HAVE BEEN COMPARED WITH WHOLE-BODY MEASUREMENTS OF CS-137 IN CHICAGO RESIDENTS. THE CONCENTRATION OF CS-137 IN HUMAN RIB BONE WAS DETERMINED IN 1961 PRIOR TO THE RESUMPTION OF NUCLEAR TESTING AND IN SPECIMENS COLLECTED IN 1962 - 1963.

*BIOLOGICAL CONCENTRATION, FOOD + CESIUM + DEPOSITION + INGESTION + SOIL, NUCLIDE OCCURRENCE

15-13291 ROSER FX + CULLEN TL
SOME ASPECTS OF FALLOUT IN BRAZIL
PONTIFICIA UNIVERSIDADE CATOLICA, RIO DE JANEIRO
CONF-765 +. 9 PAGES, 4 FIGURES, 1 TABLE, PAGES 791-799 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS,
PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

ACCESSION NUMBER 15-13287 TO 15-13291

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13291 *CONTINUED*

THE BRAZILIAN NETWORK OF FALLOUT STATIONS RANGES FROM THE EQUATOR TO APPROXIMATELY 30 DEGREES S AND IS COMPOSED OF 10 ION-EXCHANGE COLUMN AND POT-COLLECTION STATIONS. AT RIO DE JANEIRO THE SURFACE-AIR CONTAMINATION IS MEASURED WITH FILTERS. THREE EFFECTS ARE DISCUSSED IN THIS PAPER - THE SPRING MAXIMUM, THE OCEAN-CONTINENT EFFECT, AND THE CORRELATION BETWEEN FILTER AND ION-EXCHANGE-COLUMN DATA. THE SPRING MAXIMUM DOES NOT OCCUR AT EQUATORIAL STATIONS WHERE THERE ARE ONLY WET AND DRY SEASONS. IT EMERGES SLOWLY WITH INCREASING LATITUDE AND IS WELL MARKED IN SOUTHERN BRAZIL, BUT THE EFFECT IS LESS PRONOUNCED THAN IN THE NORTHERN HEMISPHERE. DATA FROM OCEAN, COASTAL, AND INTERIOR STATIONS DO NOT SUPPORT THE OCEAN-CONTINENT-EFFECT HYPOTHESIS. COMPARISON OF COLUMN AND FILTER DATA FOR RIO DE JANEIRO SHOWS A POSITIVE CORRELATION, BUT DEFINITE CONCLUSIONS CAN BE DRAWN ONLY FROM A STUDY OF MANY STATIONS.

*BRAZIL + *FALLOUT

15-13292 TURNER FB

UPTAKE OF FALLOUT RADIONUCLIDES BY MAMMALS AND A STOCHASTIC SIMULATION OF THE PROCESS
UNIVERSITY OF CALIFORNIA, LOS ANGELES

CONF-765 +. 21 PAGES, 8 FIGURES, 7 TABLES, 39 REFERENCES, PAGES 800-820 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

A DETERMINISTIC MODEL, DESIGNED TO PREDICT TIME-SPECIFIC LEVELS OF I-131 IN THE THYROID OF HERBIVORES AS A FUNCTION OF I-131 ON VEGETATION, WAS REVISED AS A PROBABILISTIC SIMULATION OF THE EXPERIENCE OF A CONSUMER IN A FALLOUT FIELD. THE STOCHASTIC MODEL WAS USED TO GENERATE SYNTHETIC POPULATIONS OF UP TO 1000 INDIVIDUALS. THE FREQUENCY DISTRIBUTIONS OF THYROIDAL I-131 IN 24 OF THESE HYPOTHETICAL POPULATIONS WERE ANALYZED IN TERMS OF THE RECOMMENDED ASSUMPTION OF THE FEDERAL RADIATION COUNCIL, NAMELY, THAT THE MAJORITY OF INDIVIDUALS IN A POPULATION DOES NOT VARY FROM THE AVERAGE BY A FACTOR GREATER THAN 3. IN ONLY TWO OF THE DISTRIBUTIONS DID MORE THAN 2 PERCENT OF THE POPULATION EXCEED THREE TIMES THE MEAN.

*ECOLOGICAL CONSIDERATION + *IODINE + BIOLOGICAL CONCENTRATION, ANIMAL +
BIOLOGICAL CONCENTRATION, VEGETATION

15-13293 HAWLEY CA + MARKEE EH

CONTROLLED ENVIRONMENTAL RADIOIODINE TESTS

IDAHO OPERATIONS OFFICE, USAEC + U.S. WEATHER BUREAU, IDAHO FALLS

CONF-765 +. 15 PAGES, 11 FIGURES, 2 TABLES, 1 REFERENCE, PAGES 821-835 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

THE CONTROLLED ENVIRONMENTAL RADIOIODINE TESTS PROJECT CONSISTS IN A SERIES OF PLANNED ATMOSPHERIC RELEASES OF I-131 UNDER VARYING WEATHER CONDITIONS AND IN VARYING CHEMICAL FORMS. THE PRIMARY OBJECTIVE OF THE PROJECT IS TO DETERMINE THE QUANTITATIVE BEHAVIOR OF I-131 AS IT PASSES THROUGH THE AIR-VEGETATION-COW-MILK-HUMAN CHAIN. SO FAR, TWO RELEASES HAVE BEEN MADE, A PRELIMINARY ONE OVER A NATURAL-GRASS OPEN-RANGE AREA AND THE OTHER OVER AN ESTABLISHED IRRIGATED PASTURE. MEASUREMENTS INCLUDED DEPOSITION VELOCITIES, MILK-TO-GRASS-ACTIVITY RATIOS, HALF-LIVES ON GRASS, HALF-LIVES IN MILK, PORTABLE-INSTRUMENT READINGS RELATIVE TO CONTAMINATION LEVELS, AND HUMAN-THYROID UPTAKE FRACTIONS. THIS PAPER COMPARES SOME OF THE RESULTS OF THE TWO RELEASES. DETAILS OF THE PRELIMINARY TEST HAVE BEEN PUBLISHED. DETAILS OF THE SECOND TEST HAVE NOT YET BEEN PUBLISHED.

*ECOLOGICAL CONSIDERATION + *IODINE + BIOLOGICAL CONCENTRATION, ANIMAL FEED +
BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION +
DEPOSITION + DISPERSION + FALLOUT + IDAHO FALLS

15-13294 TAMPLIN AR + MINKLER JL

INFORMATION INTEGRATION PROJECT OF THE LAWRENCE RADIATION LABORATORY - LIVERMORE PROGRAM ON MAN-MADE RADIATION IN THE BIOSPHERE

LAWRENCE RADIATION LABORATORY

CONF-765 +. 14 PAGES, 3 FIGURES, 1 TABLE, 1 REFERENCE, PAGES 836-849 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

LAWRENCE RADIATION LAB.-LIVERMORE PROGRAM OBJECTIVES INCLUDE (1) MORE-ADEQUATE PREDICTIVE MODELS TO ALLOW PREDICTION OF THE DISTRIBUTION OF RADIONUCLIDES WITHIN THE BIOSPHERE SUBSEQUENT TO THEIR RELEASE UNDER ANY CREDIBLE CIRCUMSTANCES REGARDLESS OF THE LOCATION AND (2) COUNTERMEASURES THAT WILL PREVENT EITHER THEIR ACCESS TO MAN OR THEIR ACCUMULATION OR RETENTION IN THE VITAL ORGANS AND TISSUES OF THE BODY. TO ACCOMPLISH THE OBJECTIVES, THREE SEPARATE, YET NECESSARILY CLOSELY INTEGRATED, PROJECTS HAVE BEEN ESTABLISHED WITHIN THE LAWRENCE RADIATION LAB.-LIVERMORE (LRL-L) PROGRAM - EXPERIMENTAL, THEORETICAL, AND INFORMATION INTEGRATION. THIS PAPER IS CONCERNED WITH THE INFORMATION INTEGRATION PROJECT.

*INFORMATION RETRIEVAL + *LRL (LAWRENCE RADIATION LABORATORY) + ECOLOGICAL CONSIDERATION + FALLOUT +
FISSION PRODUCT RELEASE, GENERAL

15-13295 BENINSON D + RAMOS E + TOUZET R

STUDIES OF SR-90 AND STABLE STRONTIUM IN DIET AND BONE IN ARGENTINA

ARGENTINE COMISION NACIONAL DE ENERGIA ATOMICA, BUENOS AIRES

CONF-765 +. 9 PAGES, 7 TABLES, 12 REFERENCES, PAGES 850-858 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13295 *CONTINUED*

RESULTS OF SR-90 AND STABLE-STRONTIUM MEASUREMENTS IN BONE SAMPLES FROM CHILDREN AND IN FOODS OF THE CORRESPONDING DIETS ARE PRESENTED AND DISCUSSED. SR-90/CALCIUM RATIOS IN TOTAL DIET ARE VERY CLOSE TO THOSE OF THE MILK LEVEL FOR CHILDREN DURING THE FIRST YEAR OF LIFE. TYPICAL INTAKES FOR VERY YOUNG CHILDREN IN THE PAST THREE YEARS ARE A FEW PICOGRAMS OF SR-90 AND ABOUT 1 MG OF NATURAL STRONTIUM PER DAY.

*ARGENTINA + *BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, MAN + *STRONTIUM + BIOLOGICAL CONCENTRATION, MILK + CALCIUM + DIETARY HABIT + FALLOUT + INGESTION

15-13296 STROMME A

CESIUM-137 BODY BURDENS AND THEIR VARIATIONS IN NORWEGIAN SCHOOL BOYS
STATE INSTITUTE FOR RADIATION HYGIENE AND THE NORWEGIAN RADIUM HOSPITAL, NORWAY
CONF-765 +. 6 PAGES, 5 FIGURES, 6 TABLES, PAGES 859-864 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

THE GLOBAL DISTRIBUTION OF FALLOUT OF RADIONUCLIDES FROM NUCLEAR-WEAPON TESTS HAS NOT BEEN UNIFORM. IT HAS BEEN ESPECIALLY HIGH IN NORWAY. THEREFORE, DETERMINATIONS OF THE LEVEL OF FALLOUT HAVE BEEN OF PARTICULAR INTEREST. AS A PART OF THE INVESTIGATIONS REPORTED, CS-137 BODY BURDENS AND POTASSIUM LEVELS WERE STUDIED IN 22 SCHOOLBOYS FROM A SCHOOL IN OSLO WITH A WHOLE-BODY COUNTER AT THE NORSK HYDROS INSTITUTE FOR CANCER RESEARCH. EXAMINATIONS WERE MADE IN MARCH 1963, OCTOBER 1963, MARCH 1964, AND OCTOBER 1964.

*BIOLOGICAL CONCENTRATION, MAN + *CESIUM + FALLOUT + NORWAY + POTASSIUM

15-13297 MADSHUS K + STROMME A

CORRELATION BETWEEN PRECIPITATION AND AMOUNT OF CS-137 IN MILK IN NORWAY
NORSK HYDROS INSTITUTE FOR CANCER RESEARCH, OSLO
CONF-765 +. 13 PAGES, 11 FIGURES, 2 TABLES, 6 REFERENCES, PAGES 865-876 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

PREVAILING WINDS IN NORWAY BLOW FROM WEST TO EAST. ALONG THE WEST COAST, THE PECULIAR TOPOGRAPHICAL CONDITIONS FAVOR A GREATER PRECIPITATION AND THUS A GREATER DEPOSITION OF RADIOACTIVE FALLOUT THAN IN THE EAST. THE PRECIPITATION IN SEVERAL DISTRICTS IN NORWAY WAS ESTIMATED FOR THREE CONSECUTIVE YEARS (1961, 1962, AND 1963), AND THE CONCENTRATION OF CS-137 IN MILK FROM ABOUT 90 PERCENT OF THE DAIRIES IN NORWAY WAS MEASURED DURING THE FOLLOWING SPRING OF EACH YEAR. ALONG THE COAST, A STATISTICALLY SIGNIFICANT CORRELATION BETWEEN THE PRECIPITATION ONE YEAR AND THE AMOUNT OF CS-137 IN THE MILK THE FOLLOWING SPRING WAS DEMONSTRATED FOR THREE CONSECUTIVE YEARS. IN THE EASTERN PART OF NORWAY, NO SUCH SYSTEMATION CORRELATION WAS FOUND. NEITHER WAS ANY SUCH CORRELATION FOUND BETWEEN THE PRECIPITATION DURING THE MONTHS WHEN GRASS FOR STORAGE IS GROWN (MAY, JUNE, JULY) AND THE AMOUNT OF CS-137 IN THE MILK THE FOLLOWING SPRING.

*BIOLOGICAL CONCENTRATION, MILK + *CESIUM + *NORWAY + FALLOUT + RAINOUT

15-13298 THOMPSON JC + LENGEMANN FW

DIETARY INTAKE OF RADIONUCLIDES. EFFECT OF CONSUMPTION PATTERNS AND EVALUATION BY USE OF INTEGRATING SAMPLES
CORNELL UNIVERSITY
CONF-765 +. 18 PAGES, 10 FIGURES, 4 TABLES, 16 REFERENCES, PAGES 877-894 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI \$6.50 CY.

MUCH OF THE METHODS FOR ESTIMATING ANNUAL RADIONUCLIDE-INTAKE LEVELS MUST USE FOOD-CONSUMPTION DATA. HOWEVER, THE ESTIMATES HAVE NOT MATCHED THE PRECISION OF RADIONUCLIDE DETERMINATIONS. THUS MUCH OF THE ACCURACY IN ESTIMATING RADIONUCLIDE INTAKE MAY BE LOST BECAUSE OF THE INADEQUACY OF FOOD-CONSUMPTION DATA. ESTIMATES MAY VARY BY MORE THAN 75 PERCENT SIMPLY BY THE USE OF ONE ESTIMATE INSTEAD OF ANOTHER. TO CIRCUMVENT THE DIFFICULTIES OF ESTIMATING DIETARY RADIONUCLIDE INTAKE, THE USE OF AN INDICATOR PRODUCT HAS BEEN ADVANCED. EXPERIMENTAL EVIDENCE SHOWED THAT IT MAY BE POSSIBLE TO USE URINE AS AN INDICATOR FOR DIETARY LEVELS OF SR-90. STUDIES HAVE SHOWN THAT THE OBSERVED RATIO BASED ON URINE/DIET LEVELS, OR SR-90 PER GRAM OF CALCIUM IN THE URINE/SR-90 PER GRAM OF CALCIUM IN THE DIET, AVERAGED 0.97 PLUS-OR-MINUS 0.08 FOR A GROUP OF NORMAL SUBJECTS ON NORMAL DIETS FOR A 17-DAY PERIOD. ACCURATE ESTIMATES OF RADIONUCLIDE-INTAKE LEVELS IS OF VITAL IMPORTANCE IF WE ARE TO DETERMINE THE HAZARD.

*STRONTIUM + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CALCIUM + DIETARY HABIT + INGESTION

15-13299 STIGALL GE + LEARY AG

PREDICTION OF I-131 IN MILK FOR PROTECTIVE-ACTION PLANNING
PUBLIC HEALTH SERVICE
8 PAGES, 1 FIGURE, 1 TABLE, 9 REFERENCES, NUCLEAR SAFETY 7(3), PAGES 364-370, (SPRING 1966)

MATHEMATICAL EQUATIONS WERE DEVELOPED FOR USE IN PREDICTIONS OF THE ATMOSPHERIC DISPERSION, GROUND DEPOSITION, AND CONCENTRATION IN MILK OF I-131 THAT MIGHT BE RELEASED TO THE ENVIRONMENT. CALCULATIONS OF ATMOSPHERIC DISPERSION AND GROUND DEPOSITION OF I-131 BASED ON THE WORK OF SUTTON AND CHAMBERLAIN ARE PRESENTED, AND SUBSEQUENT DISCUSSIONS DEAL WITH GROUND DEPOSITION, THE CONCENTRATION OF I-131 IN MILK, AND THE RESULTING THYROID DOSE TO A ONE-YEAR-OLD RECEPTOR. THE USE OF MATHEMATICAL EQUATIONS PRESENTED TO EVALUATE ACTUAL

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13299 *CONTINUED*

EMERGENCY SURVEILLANCE TECHNIQUES WOULD POINT OUT SOME OF THE PRESENT INADEQUACIES IN
PREDETERMINATION OF A PROPER RESPONSE TO AN ACCIDENT AT A NUCLEAR FACILITY AND THE PITFALLS
OF THE USE OF RATIOS IN PREDICTIONS OF ESTIMATED THYROID DOSES TO PEOPLE.

*BIOLOGICAL CONCENTRATION, MILK + *IODINE + *MATHEMATICAL STUDY + ATMOSPHERIC DIFFUSION + DEPOSITION +
DOSE CALCULATION, INTERNAL + INGESTION + SURVEY, RADIATION, EMERGENCY

15-13300 MAWSON CA + COWSER KE

REVIEW OF HEALTH PHYSICS SOCIETY PAPERS ON ENVIRONMENTAL MONITORING, HAZARDS ANALYSIS, AND WASTE DISPOSAL
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER + OAK RIDGE NATIONAL LABORATORY
5 PAGES, 23 REFERENCES, NUCLEAR SAFETY 7(3), PAGES 370-374, (SPRING 1966)

A REVIEW IS PRESENTED OF PAPERS ON THREE TOPICS DISCUSSED AT THE TENTH ANNUAL MEETING OF THE
HEALTH PHYSICS SOCIETY (JUNE 14 TO 17, 1965, AT LOS ANGELES, CALIF.) - ENVIRONMENTAL
MONITORING, HAZARDS ANALYSIS, AND WASTE DISPOSAL. IN THIS REVIEW, PAPERS ON RADIATION
EXPOSURES IN THE VICINITIES OF NUCLEAR OPERATIONS AT OAK RIDGE, HANFORD, AND SAVANNAH RIVER,
WHICH WERE PRESENTED IN THE SESSION ON ENVIRONMENTAL MONITORING, ARE DISCUSSED. ALSO,
PROBLEMS IN ENVIRONMENTAL MONITORING DEALING WITH ECONOMY, PRACTICE AND THEORY, CLOUD
DISPERSION, DIETARY SURVEYS, UNDERGROUND EXPLOSIONS, TRITIUM IN JAPAN, AND THE CONVERSION OF
LIQUID WASTE TO SOLIDS ARE COVERED. FOR THE SESSION ON HAZARDS ANALYSIS, SEVERAL PAPERS ON
INTERNAL AND EXTERNAL DOSE ESTIMATES AND EXPOSURES FOLLOWING THE RELEASE OF RADIONUCLIDES ARE
SUMMARIZED. WITH REGARD TO WASTE DISPOSAL, SOME RECENT TESTS CONCERNING THE ULTIMATE
DISPOSAL OF LIQUID WASTE BY THE HYDRAULIC-FRACTURING TECHNIQUE ARE DESCRIBED BRIEFLY, AND
STUDIES OF LIQUID-WASTE DISPOSAL AT OAK RIDGE AND HANFORD ARE REVIEWED. A BRIEF COMMENT ON
U.S. AND SOVIET WASTE-DISPOSAL STANDARDS IS ALSO GIVEN.

*RADIATION PROTECTION, ORGANIZATION + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL +
DOSIMETRY, GENERAL + HAZARDS ANALYSIS + PERSONNEL EXPOSURE, RADIATION + POPULATION EXPOSURE +
SURVEY, RADIATION, ENVIRONMENTAL + WASTE DISPOSAL, GENERAL + WASTE TREATMENT, GENERAL

15-13302 RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT. JULY 1964 THROUGH JUNE 1965

ARGONNE NATIONAL LABORATORY

ANL-7060 +. 137 PAGES, 72 FIGURES, 40 TABLES, REFERENCES, JUNE 1965, CFSTI \$4.00 CY

ARGONNE NATIONAL LABORATORY RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT FOR FY 1964. THIS
REPORT IS ONE OF A SERIES OF REPORTS ON SUBJECTS ENUMERATED BELOW. A BRIEF REVIEW OF MAJOR
RESEARCH EFFORTS IS GIVEN. TOPICS COVERED IN THIS REPORT ARE - (1) RADIATION EFFECTS, (2)
DOSIMETRY, (3) SPECTRAL ANALYSIS OF RADIATION, (4) RADIOBIOLOGY, AND (5) ENVIRONMENTAL
RADIATION PROBLEMS.

*DOSIMETRY, GENERAL + AIR POLLUTION + BARIUM + BIOLOGICAL CONCENTRATION, MAN + CALCIUM + METEOROLOGY +
RADIATION EFFECT + RADON + SPECTROMETRY, GAMMA + STRONTIUM + THORIUM + URANIUM

15-13303 IVANOV VN

ACCUMULATION OF SR-90, Y-90, CE-144, RU-106, FE-59 AND S-35 IN MELANOGRAMMUS AEGLEFINUS DEVELOPING SPAWN
INSTITUTE OF BIOLOGICAL PHYSICS ACADEMY OF SCIENCES, USSR
AEC-TR-6598 +. 256 PAGES, FIGURES, TABLES, REFERENCES, 1965, FROM RADIOBIOLOGIYA 5, PGS, 57-60

DATA SHOW THE ABILITY OF PELAGIC SPAWN OF BLACK SEA FISH TO ACCUMULATE SR-90, Y-90, CE-144,
RU-106, FE-59, AND S-35 OR THEIR DAUGHTER PRODUCTS, WITH THE EXCEPTION OF S-35.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

*BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + CESIUM + IRON + RUTHENIUM + STRONTIUM + SULFUR + YTTRIUM

15-13304 ANNUAL REPORT- FISCAL YEAR 1966

UNIVERSITY OF CALIFORNIA, DAVIS, SCHOOL OF VETERINARY MEDICINE

UCD-472-113 +. 69 PAGES, FIGURES, TABLES, JUNE 1966

PROGRESS IS REPORTED ON RADIOBIOLOGICAL EXPERIMENTS BEING CONDUCTED AT THE UNIVERSITY OF
CALIFORNIA, DAVIS. MAJOR PROGRAMS ARE DIRECTED AT DETERMINING X-IRRADIATION EFFECTS AND
RADIONUCLIDE TOXICITY USING DOGS. INGESTION EXPERIMENTS RESULTED IN CONTAMINATED EXCRETA
WHICH REQUIRES DECONTAMINATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, V., \$3.00 CY, \$0.75 MN.

*RADIATION EFFECT + *X-RAY + BIOLOGICAL CONCENTRATION, ANIMAL + INGESTION + RADIUM + STRONTIUM +
WASTE TREATMENT, LIQUID + ZINC

15-13305 SHAMOV VP

THE PROBLEM OF PERMISSIBLE URANIUM CONCENTRATIONS IN WATER AND AIR

THE LENINGRAD SCIENTIFIC RESEARCH INSTITUTE OF RADIATION HYGIENE

NP-TR-1329 +. 8 PAGES, 3 TABLES, HYGIENE AND SANITATION 29(2), PAGES 118-125, NOVEMBER 1964, CFSTI \$5.00
CY, \$1.00 MN.

IN DETERMINING THE PERMISSIBLE CONCENTRATIONS OF THE SOLUBLE FORMS OF URANIUM IN AIR THE
INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION CONSIDERED THIS ELEMENT FROM THE

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13305 *CONTINUED*

VIEWPOINT OF ITS RADIOACTIVE CHARACTERISTICS AND ITS TOXICITY. RADIOACTIVE PROPERTIES WERE MADE THE BASIS OF THE PERMISSIBLE CONCENTRATION FOR THE MAJORITY OF URANIUM ISOTOPES (U-230--U-236). CHEMICAL TOXICITY WAS THE LIMITING FACTOR FOR THE PARTICULARLY LONG-LIVED ISOTOPE, U-238, AS WELL AS FOR THE NATURAL MIXTURE OF URANIUM ISOTOPES (U-SUB-I-238--U-SUB-II-234). THE LOAD ON THE KIDNEYS, EQUAL TO 1 MG OF URANIUM FOR WORKERS ENGAGED IN OCCUPATIONS DEALING WITH THIS SUBSTANCE, WAS MADE THE BASIS OF THE NUMERICAL FIGURES FOR THE PERMISSIBLE CONCENTRATIONS OF SOLUBLE COMPOUNDS OF U-238 AND NATURAL URANIUM. FOR THE OTHER URANIUM ISOTOPES THE LIMITING FACTOR WAS THE DOSE LOAD.

*MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *URANIUM + AIR + BIOLOGICAL CONCENTRATION, MAN + CHEMICAL TOXICITY + ICRU (INT. COMM. RAD. UNITS AND MEASUREMENTS) + WATER, DRINKING

15-13319 SUNDERMAN DN + HOWES JE + ROSENBERG HS
THE DEVELOPMENT OF AN IMPROVED METHOD OF SAMPLING AND ANALYSIS FOR ATMOSPHERIC IODINE
BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO
BMI-X-10137 +. 17 PAGES, JULY 22, 1965, CFSTI \$1.00 CY, \$0.50 MN

THE RESULTS INDICATE THAT THE PROPOSED IODINE SAMPLING TECHNIQUE IS FEASIBLE AND, INDEED, IT SHOULD BE A CONSIDERABLE IMPROVEMENT OVER EXISTING METHODS. THE EXPERIMENTS SHOW THAT THE SEPARATION OF THE VARIOUS FORMS OF IODINE BY THE PROPOSED METHOD ARE DISTINCT AND QUANTITATIVE. ELEMENTAL IODINE AND METHYL IODIDE WILL DISSOLVE IN THE STATIONARY LIQUID PHASE. METHYL IODIDE WILL REMAIN IN STATIONARY LIQUID, WHILE THE ELEMENTAL IODINE WILL BE REDUCED TO THE IODIDE BY SOLID NAHSO₃, THE SOLID SUPPORT MATERIAL. GLC STUDIES INDICATE THAT WITH A RELATIVELY SMALL COLUMN REASONABLE SAMPLE VOLUME MAY BE OBTAINED. ADDITIONAL WORK WILL BE NECESSARY TO DETERMINE THE OPTIMUM SAMPLER DESIGN, AND OPTIMUM OPERATION CONDITIONS PRIOR TO CONSTRUCTION OF AN ACTUAL SAMPLER.

*IODINE + ANALYTICAL TECHNIQUE, GAS + MONITOR, RADIATION, SAMPLING + RADIOCHEMICAL ANALYSIS + SAMPLING

15-13321 CHARALAMBUS S + BAARLI J
EXTRAPOLATION CHAMBER FOR SURFACE DOSE MEASUREMENTS
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH, SWITZERLAND
CERN-65-25 +. 20 PAGES, JUNE 28, 1965, DEP.MN

A PORTABLE EXTRAPOLATION CHAMBER TO MEASURE THE DOSE-RATE AT THE SURFACE OF PIECES OF RADIOACTIVE MATERIALS IS DESCRIBED. THE PROBLEMS CONNECTED WITH THE COMPUTATION OF DOSE-RATE FROM THE CAVITY IONIZATION, THE OPERATION AND SOME CHARACTERISTICS OF THE CHAMBER ARE ALSO DISCUSSED. EXPERIMENTAL RESULTS FROM MEASUREMENTS OF SURFACE DOSE-RATES OF MATERIALS EXPOSED TO THE HIGH-ENERGY RADIATION OF CERN ACCELERATORS ARE PRESENTED.

*DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL + INSTRUMENTATION, RADIATION MONITORING + MONITOR, RADIATION, SURFACE

15-13322 WARD GM + JOHNSON JE
THE CESIUM-137 CONTENT OF BEEF FROM DAIRY AND FEED-LOT CATTLE
COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO
6 PAGES, 2 TABLES, 10 REFERENCES, JUNE 11, 1964 HEALTH PHYSICS 11(2) PAGES 95-100 (FEBRUARY 1965)

SAMPLES OF MEAT WERE COLLECTED FROM PRODUCING DAIRY COWS, DRY COWS, YOUNG CALVES AND FEED-LOT FATTENED CATTLE AND ANALYZED FOR CS-137, POTASSIUM, FAT AND MOISTURE. THE DIETS, WHICH WERE CONTAMINATED WITH VARYING LEVELS OF FALLOUT CS-137, WERE ANALYZED TO ESTIMATE DAILY INTAKE OF THE NUCLIDE. THE CS-137 LEVELS PER KG OF EDIBLE MEAT LEVELED OFF AT LESS THAN 1 PER CENT OF THE DAILY INTAKE IN MATURE DAIRY CATTLE, AT 3 PER CENT IN FEED-LOT CATTLE AND AT 15 PER CENT IN CALVES. IT IS NOT CLEAR WHETHER DIFFERENCES ARE DUE TO AGE OR THE DIET OF THE ANIMALS. THE RATIO OF ACTIVITY MEAT/MILK PER KG RANGED FROM 1.2 TO 4.9. IT IS ESTIMATED THAT THE AVERAGE CONSUMER WILL OBTAIN MORE CS-137 FROM MILK THAN BEEF, ALTHOUGH UNDER CERTAIN CONDITIONS THE REVERSE COULD EASILY OCCUR.

*CESIUM + *INGESTION + BIOLOGICAL CONCENTRATION, ANIMAL FEED + FALLOUT + MONITOR, RADIATION, ENVIRONMENTAL + POTASSIUM

15-13339 PROGRESS IN RADIOLOGICAL PHYSICS. A SUMMARY OF HANFORD LABORATORIES ACHIEVEMENTS IN THESE PROGRAMS UNDER GENERAL ELECTRIC, 1947-1964
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND
HW-83605 +. 88 PAGES, 25 FIGURES, 139 REFERENCES, SEPTEMBER 1964

WORK ACCOMPLISHED FROM 1947 THROUGH 1964 IN THE IMPROVEMENT OF THE QUALITY AND REDUCTION OF THE EXPENSE OF RADIATION PROTECTION AT HANFORD LABORATORIES IS SUMMARIZED. TOPICS DISCUSSED INCLUDE THE DEVELOPMENT OF NEW INSTRUMENTS AND TECHNIQUES AND THE RESULTS OF THEORETICAL AND RESEARCH STUDIES. DATA ARE INCLUDED ON THE DEVELOPMENT OF WHOLE-BODY COUNTERS, THE DEVELOPMENT OF NEUTRON DOSIMETERS, THE DEVELOPMENT OF RADIATION CALORIMETERS, THE DEVELOPMENT OF GAMMA AND BETA DOSIMETERS, RESULTS OF STUDIES ON THE DOSIMETRY OF RADIATION ACCIDENTS AND THE RADIOSENSITIVITY OF GONADS, AND RESULTS OF STUDIES OF RADIATION DAMAGE IN GRAPHITE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY

*RADIATION PROTECTION, ORGANIZATION + BIOLOGICAL CONCENTRATION, MAN + CESIUM + COUNTER, WHOLE BODY + DOSIMETRY, GENERAL + HANFORD SITE + IODINE + PERSONNEL EXPOSURE, RADIATION + PHOSPHORUS + PLUTONIUM + RADIATION SAFETY AND CONTROL + SODIUM + URANIUM

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13343 SHEEN EM + RATCLIFFE CA + ZUERNER LV
ADVANCED ALPHA-BETA-GAMMA HAND AND SHOE CONTAMINATION MONITOR
BATTELLE-NORTHWEST, RICHLAND
BNWL-250 +. 25 PAGES, 8 FIGURES, AUGUST 1966

THE COMBINATION ALPHA-BETA-GAMMA HAND AND SHOE CONTAMINATION MONITOR INCORPORATES LOW-NOISE MULTIPLIER PHOTOTUBES, SPECIAL LIGHT PIPES, PROBE-CONTAINED PREAMPLIFIERS TO PROVIDE A SATISFACTORY SIGNAL-TO-NOISE RATIO, AND ALL SOLID-STATE CIRCUITRY WITH NO RELAYS. THE MAIN CHASSIS CONTAINS POWER SUPPLIES, INDICATING REGISTERS, ALL CIRCUITRY EXCEPT THAT USED IN THE PROBES, AND ADJUSTMENT CONTROLS THAT ARE INCORPORATED IN A PRINTED-CIRCUIT CARD FILE. SOLID-STATE CIRCUITS WERE DEVELOPED AND FABRICATED ON PRINTED-CIRCUIT CARDS THAT WERE SIZE-COMPATIBLE WITH COMMERCIAL CARD FILES. THESE CIRCUITS, COMBINED WITH COMMERCIAL LOGIC UNITS, PROVIDED AN INSTRUMENT THAT REDUCED BOTH CAPITAL AND MAINTENANCE COSTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

*MONITOR, RADIATION, PERSONNEL + GROSS ALPHA + GROSS BETA + GROSS GAMMA + INSTRUMENTATION, NUCLEAR

15-13344 BERTON M
SCIENTIFIC APPLICATIONS OF NUCLEAR EXPLOSIONS. PART 2. GEOLOGY - SEISMOLOGY, SOIL STUDIES, ROCK FISSURING
COMMISSARIAT A L ENERGIE ATOMIQUE, CENTER D ETUDES NUCLEAIRES DE SACLAY
CEA-BIB-66 +. 158 PAGES, DECEMBER 1965

THIS BIBLIOGRAPHY CONSISTS OF 700 REFERENCES TO DOCUMENTS DATING MAINLY FROM 1960-1965, FOUND IN NUCLEAR SCIENCE ABSTRACTS (N.S.A.) - 1961 TO 1965, BULLETIN SINGNALETIQUE DU C.N.R.S. (EARTH PHYSICS SECTION)-1963 THROUGH 1965, U.S. GOVERNMENT RESEARCH REPORTS (U.S.G.R.D.R.)-1962 THROUGH 1965, REPORTS AND BOOKS FROM THE SACLAY CENTRAL LIBRARY, SEDOCAR REPORTS, THE REVUE JOURNAL OF GEOPHYSICAL RESEARCH. THE REFERENCES HAVE BEEN CLASSIFIED INTO TWO MAIN GROUPS - FIRST, SEISMOLOGY, THEN STUDIES CONCERNING THE BEHAVIOR OF SOILS, GROUNDS, AND SUBTERRANEAN WATERS WHEN ROCKS ARE CRACKED DURING NUCLEAR EXPLOSIONS. IN EACH GROUP, THE REFERENCES ARE PRESENTED IN THE FOLLOWING ORDER - BIBLIOGRAPHIES, CONGRESSES, REPORTS, PERIODICALS, AND BOOKS.

AVAILABILITY - DOCUMENTATION FRANCAISE, SECRETARIAT GENERAL DU GOVERNMENT, DIRECTION DE LA DOCUMENTATION, 16 RUE LORD BYRON, PARIS VIIIEME.

*BIBLIOGRAPHY + *GEOLOGICAL CONSIDERATION, GENERAL + *NUCLEAR DETONATION + SEISMOLOGY + SOIL

15-13345 ADAMS PC + ANDERSON HF
ENVIRONMENTAL MONITORING REPORT. JULY-DECEMBER 1965 AND 1965 SUMMARY
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1335 +. 18 PAGES, 5 TABLES, FEBRUARY 28, 1966

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO IS PRESENTED FOR THE SECOND HALF OF 1965 AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR WAS WITHIN THE RADIOACTIVITY CONCENTRATION GUIDES RECOMMENDED BY THE FEDERAL RADIATION COUNCIL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

*MOUND LABORATORY + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + PLUTONIUM + POLONIUM + ROVER PROGRAM + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + TRITIUM

15-13352 VELA UNIFORM PROJECT SHOAL
NEVADA BUREAU OF MINES + UNIVERSITY OF NEVADA
VUF-1001 (FINAL REPORT) +. 369 PAGES, 17 FIGURES, 5 TABLES, APRIL 26, 1965

THIS FINAL REPORT COVERS GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS ASSOCIATED WITH THE EXPLORATORY AND OPERATIONAL STAGES OF PROJECT SHOAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$7.00 COPY

*GEOLOGICAL CONSIDERATION, GENERAL + *GEOLOGICAL CONSIDERATION, GEOCHEMICAL + *GEOLOGICAL CONSIDERATION, GEOPHYSICAL + *HYDROLOGICAL CONSIDERATION, GENERAL + *VELA UNIFORM PROGRAM, PROJECT SHOAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + HYDROLOGICAL CONSIDERATION, QUALITY OF WATER + METEOROLOGY + NEVADA TEST SITE + NUCLEAR DETONATION + SEISMOLOGY + TOPOGRAPHY

15-13366 BRYANT PM
DERIVATION OF WORKING LIMITS FOR CONTINUOUS RELEASE RATES OF SR-90 AND CS-137 TO ATMOSPHERE IN A MILK PRODUCING AREA
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
13 PAGES, 3 FIGURES, 5 TABLES, 23 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1393-1405 OCTOBER 1966

THIS ASSESSMENT IS BASED ON INFORMATION GAINED MAINLY BY ANALYSIS OF FALLOUT DATA ON THE TRANSFER TO MILK OF SR-90 AND CS-137 DEPOSITED ON GRASS. THE AMOUNT OF EACH NUCLIDE TRANSFERRED IS RELATED TO THE CURRENT RATE OF DEPOSITION AND TO THE CUMULATIVE DEPOSIT IN SOIL. THESE RELATIONSHIPS ARE EXPRESSED PRIMARILY IN TERMS OF ANNUAL AVERAGE VALUES

ACCESSION NUMBER 15-13343 TO 15-13366

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13366 *CONTINUED*

APPLICABLE TO THE UNITED KINGDOM AS A WHOLE. THESE VALUES ARE USED TO DERIVE BASIC WORKING LIMITS FOR CONTINUOUS RELEASE RATES CORRESPONDING TO WORKING LIMITS IN MILK OF 800 PC SR-90/SR/G CA AND 20,000 PC CS-137/L. THE FORMER IS BASED ON THE LIMIT, SPECIFIED BY THE BRITISH MEDICAL RESEARCH COUNCIL, OF 200 PC SR-90/G CA IN BONE AS AN ANNUAL AVERAGE, AND THE LATTER ON A MAXIMUM PERMISSIBLE ANNUAL DOSE OF 0.5 REM. BASIC WORKING LIMITS FOR RELEASE RATES ARE SUBJECT TO MODIFYING FACTORS, WHICH ARE DISCUSSED. MODIFIED WORKING LIMITS SUGGESTED AS PROVISIONAL GUIDES FOR PURPOSES OF PLANNING AND DESIGN, ARE 0.4 C SR-90/WEEK AND 10 C CS-137/WEEK FOR A STACK OF 50 M EFFECTIVE HEIGHT AT 300 M FROM THE NEAREST PASTURE IN A GIVEN SITUATION OF EXTREME (OR UNKNOWN) AGRICULTURAL CHARACTERISTICS IN GREAT BRITAIN. BASIC WORKING LIMITS FOR A NUMBER OF STACK HEIGHTS AND DISTANCES ARE SHOWN GRAPHICALLY.

*AGRICULTURAL CONSIDERATION + *CESIUM + *STRONTIUM + BIOLOGICAL CONCENTRATION, MILK + DEPOSITION + FALLOUT + UNITED KINGDOM

15-13367 LEGRAND JL + DOUSSET M

EVOLUTION DU DEBIT D EQUIVALENT DE DOSE DELIVREE A LA GLANDE THYROIDE APRES INHALATION INSTANTANEE DE TELLURE-132

COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE

8 PAGES, 4 FIGURES, NUCLEAR PHYSICS 12(10), PAGES 1407-1414, (OCTOBER 1966)

AFTER A STATEMENT OF THE SIMPLIFYING ASSUMPTIONS NEEDED TO ESTABLISH RATHER SIMPLE MODELS FOR THE MECHANISMS OF THE ROUTES OF ENTRANCE AND FOR THE COMPARTMENTS WITHIN THE BODY, THIS STUDY DEVELOPS THE FOLLOWING - (1) KINETICS OF THE ABSORPTION OF TELLURIUM AND IODINE THROUGH THE LUNG AND DIGESTIVE TRACT AS ROUTES OF ENTRANCE. (2) SETS UP AND SOLVES THE DIFFERENTIAL EQUATIONS CORRESPONDING TO THE KINETICS OF THE FOUR-COMPARTMENT MODEL ADOPTED FOR TELLURIUM AND IODINE IN THE BODY. (3) ESTIMATES THE DOSE-EQUIVALENT RATE DELIVERED TO THE THYROID BY IODINE-132 ORIGINATING FROM INHALED TELLURIUM-132. VARIATION OF THIS DOSE-RATE AS A FUNCTION OF TIME, ITS GRAPHIC REPRESENTATION ARE DETERMINED ALSO. THE DOSE-RATE PASSES THROUGH A MAXIMUM VALUE EQUAL TO 0.004 REM/HR PER MICROCURIE OF INHALED TELLURIUM-132, APPROXIMATELY 13 HR AFTER INHALATION. THE ACCUMULATED DOSE REACHES A VALUE OF SOME 0.25 REM/MICROCURIE AND HALF THE DOSE IS DELIVERED DURING THE FIRST 60 HR.

*DOSE CALCULATION, INTERNAL + *IODINE + *TELLURIUM + INHALATION

15-13368 PETERSEN NJ + SAMUELS LD

DECIDUOUS TEETH AS INDICATORS OF RA-226 EXPOSURE

PUBLIC HEALTH SERVICE

8 PAGES, 4 FIGURES, 5 TABLES, 13 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1453-1460, OCTOBER 1966

DECIDUOUS TEETH, WHEN ANALYZED BY TOOTH TYPE, APPEARED TO BE VALID INDICATORS OF THE INGESTION OF WATER CONTAINING LOW LEVELS OF RA-226 DURING THE TIME OF TOOTH FORMATION. POOLS OF DECIDUOUS TEETH FROM LIFELONG RESIDENTS OF THIRTY-FIVE ILLINOIS AND IOWA COMMUNITIES SERVED BY PUBLIC WATER SUPPLIES WITH RA-226 LEVELS RANGING FROM 0.04 TO 20.0 PC/L WERE ANALYZED FOR RA-226. THE CORRELATION BETWEEN RA-226 LEVELS IN WATER AND DECIDUOUS TEETH WAS FOUND TO BE DIRECT, APPARENTLY LINEAR AND HIGHLY SIGNIFICANT FOR INCISORS, CUSPIDS, AND MOLARS. RA-226 LEVELS IN CUSPIDS AND MOLARS AVERAGED 80% OF THE LEVELS IN INCISORS. SOME POSSIBLE LIMITATIONS IN THE USE OF DECIDUOUS TEETH FOR ESTIMATING RA-226 LEVELS IN COMMUNITY WATER SUPPLIES AND WHOLE-BODY BURDENS OF RA-226 IN INDIVIDUALS WERE INVESTIGATED.

*BIOLOGICAL CONCENTRATION, MAN + *RADIUM

15-13369 MCCORMICK JF + GOLLEY FB

IRRADIATION OF NATURAL VEGETATION

UNIVERSITY OF NORTH CAROLINA + UNIVERSITY OF GEORGIA

8 PAGES, 6 FIGURES, 7 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1467-1474, (OCTOBER 1966)

A PORTABLE 9200-C CS-137 RADIATION SOURCE IS DESCRIBED WHICH MEETS THE REQUIREMENTS FOR ACUTE AND CHRONIC IRRADIATION OF NATURAL PLANT AND ANIMAL COMMUNITIES. IRRADIATION OF OLD FIELD AND FOREST COMMUNITIES HAS PROVIDED AN OPPORTUNITY TO TEST EXPERIMENTAL PROCEDURES AND TO COMPARE DOSE RATE DISTRIBUTION IN TWO CONTRASTING ECOLOGICAL SYSTEMS. RESULTS INDICATE THAT IN AN ECOLOGICALLY AND STRUCTURALLY COMPLEX COMMUNITY, SUCH AS A FOREST, THE PATTERN OF THE GAMMA FIELD IS LESS PREDICTABLE AND MORE VARIABLE ALONG BOTH HORIZONTAL AND VERTICAL TRANSECTS THAN IN A LESS COMPLEX SYSTEM, SUCH AS AN OLD FIELD. ALTHOUGH THE TYPE OF VEGETATION MAY GREATLY INFLUENCE EXPOSURE RATES WITHIN A SHORT DISTANCE OF A STRONG GAMMA SOURCE, AT DISTANCES BEYOND 100 M EXPOSURE RATES ARE LITTLE AFFECTED BY THE TYPE OF VEGETATION THROUGH WHICH THE RADIATION HAS PASSED. EXPOSURE OF GLASS ROD DOSIMETERS TO SUNLIGHT DURING IRRADIATION RESULTED IN A 24 PER CENT LOSS OF FLUORESCENCE. DOSE ESTIMATES WERE CORRECTED ACCORDINGLY.

*RADIATION EFFECT + CESIUM + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, GENERAL + ECOLOGICAL CONSIDERATION

15-13370 TADMOR J + GILAD Y + GALRON H

ON THE RADIATION DOSES FROM A RADIOACTIVE CLOUD AND FROM DEPOSITION OF FISSION PRODUCTS, IN THE HAZARDS EVALUATION OF NUCLEAR REACTORS

ISRAEL ATOMIC ENERGY COMMISSION

5 PAGES, 6 FIGURES, 1 TABLE, 8 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1489-1493, (OCT. 1966)

AS PART OF THE EVALUATION OF THE HAZARDS ARISING FROM AN ACCIDENT IN A NUCLEAR REACTOR, THE RADIATION DOSES CAUSED BY A RADIOACTIVE CLOUD AND BY DEPOSITION OF FISSION PRODUCTS WERE STUDIED. THE STUDY WAS BASED ON SUTTONS DIFFUSION EQUATIONS WITH CHAMBERLAIN'S DEPOSITION CORRECTION. IT WAS ASSUMED THAT (1) FOLLOWING A MELTDOWN ACCIDENT, 100 PERCENT OF THE NOBLE

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13370 *CONTINUED*

GASES, 25 PERCENT OF THE HALOGENS, 15 PERCENT OF THE VOLATILE FISSION PRODUCTS AND 1 PERCENT OF THE SOLID FISSION PRODUCTS ARE RELEASED FROM THE FUEL, AND THAT (2) AN INSTANTANEOUS SOURCE IS RELEASED INTO THE ENVIRONMENT FOLLOWING THE ACCIDENT.

*DOSE CALCULATION, EXTERNAL + *FISSION PRODUCT RELEASE, GENERAL + DEPOSITION + DILUTION + DISPERSION + FALLOUT + HAZARDOUS ANALYSIS

15-13371 MAGNO PJ + BARATTA EJ + LEONARD IE
STRONTIUM-90 IN HUMAN HAIR AND BLOOD
PUBLIC HEALTH SERVICE

4 PAGES, 10 REFERENCES, HEALTH PHYSICS 12(10), PAGES 1493-1496, (OCTOBER 1966)

THIS REPORT PRESENTS THE RESULTS OF A STUDY OF THE CONCENTRATION OF STRONTIUM-90 AND STABLE STRONTIUM IN HUMAN HAIR AND BLOOD PLASMA. IN GENERAL, THE SPECIFIC ACTIVITY OF STRONTIUM-90 IS HIGHER IN BLOOD PLASMA THAN IN HAIR.

*BIOLOGICAL CONCENTRATION, MAN + *STRONTIUM

15-13397 BLANCO RE + PARKER FL
WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT JULY-DECEMBER, 1965
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-1465 +. 95 PAGES, FIGURES, 22 TABLES, 30 REFERENCES, JUNE 1966

REPORTS PROGRESS IN ENGINEERING AND LABORATORY DEVELOPMENT OF THE SOLIDIFICATION OF HIGH-LEVEL WASTES ON LOW- AND INTERMEDIATE-LEVEL WASTE TREATMENT, ON ENGINEERING, ECONOMICS AND SAFETY EVALUATIONS, DISPOSAL BY HYDROFRACTURING, DISPOSAL IN NATURAL SALT FORMATIONS, SOIL STUDIES, BEHAVIOR OF RADIONUCLIDES IN THE GROUND, AND DISPOSAL OF GASES INTO PERMEABLE FORMATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$4.00 CY, \$0.75 MN

*WASTE TREATMENT, GENERAL + CESIUM + COMPUTER PROGRAM + RIVER, CLINCH + SAFETY STUDY + SOIL, NUCLIDE OCCURRENCE + SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GAS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, RIVER + WASTE DISPOSAL, SALT + WASTE TREATMENT, FIXATION + WASTE TREATMENT, LIQUID

15-13399 PHILLIPS LF + CHAMPAGNE RJ
CALIBRATION AND RESPONSE OF PERSONNEL MONITORING FILM DOSIMETERS TO SYNCHROTRON STRAY RADIATIONS
BROOKHAVEN NATIONAL LABORATORY
BNL-9665 + CONF-651109-7, 10 PAGES FROM 1ST SYMPOSIUM ON ACCELERATOR RADIATION DOSIMETRY AND EXPERIENCE, UPTON, NEW YORK, 1965, CFSTI \$1.00 CY, \$0.50 MN

TO DETERMINE EFFECTIVENESS OF PERSONNEL-MONITORING TECHNIQUES AT HIGH-ENERGY PROTON SYNCHROTRONS, A CAREFUL EVALUATION OF THE FILM-BADGE PERFORMANCE WAS MADE. THESE EVALUATION STUDIES WERE PERFORMED IN VARIOUS WORK AREAS AND UNDER A VARIETY OF EXPERIMENTAL CONDITIONS BECAUSE THE SYNCHROTRON PARAMETERS, SUCH AS SHIELDING AND EXPERIMENTAL ARRANGEMENTS, VARY GREATLY, THUS RADICALLY CHANGING THE QUALITY AND QUANTITY OF THE STRAY RADIATION FIELDS. AMONG THE DOSIMETERS EMPLOYED WERE THE BNL FILM BADGE AND SPECIALLY DESIGNED TISSUE-EQUIVALENT (TE) IONIZATION CHAMBERS.

*DOSIMETRY, PHOTOGRAPHIC + ACCELERATOR + DOSE + PERSONNEL EXPOSURE, RADIATION

15-13400 HARDY EP + RIVERA J
FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, JUNE 1-SEPTEMBER 1, 1966
NEW YORK OPERATIONS OFFICE USAEC, HEALTH AND SAFETY LABORATORY
HASL-173 + APPENDIX +. 472 PAGES, OCTOBER 1, 1966

THIS REPORT PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, ARGONNE NATIONAL LABORATORY, THE ARGENTINE ATOMIC ENERGY COMMISSION, THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH IN NEW ZEALAND, THE NATIONAL RADIATION LABORATORY IN NEW ZEALAND, EURATOM JOINT NUCLEAR RESEARCH CENTRE, AND ISOTOPE, INC. RADIONUCLIDE LEVELS IN FALLOUT, MILK, TAPWATER, DIET, SURFACE AND HIGH-ALTITUDE AIR, ARE GIVEN IN TABULAR FORM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$7.72 CY, \$2.00 MN

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + ARGENTINA + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + EURATOM + MONITOR, RADIATION, AIR + NEW ZEALAND + RAINOUT + SAMPLING + SOIL, NUCLIDE OCCURRENCE + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + WATER, DRINKING

15-13408 DYSON ED
A SPECIFIC ACTIVITY METHOD FOR DERIVED WORKING LIMITS OF PHOSPHORUS-32
UNITED KINGDOM ATOMIC ENERGY AUTHORITY
6 PAGES, 2 FIGURES, 25 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1521-1526, (1966)

BONE GROWTH IN CHILDREN IS DESCRIBED, AND THE SPECIFIC ACTIVITY OF P-32 IN THEIR METAPHYSES IS ESTIMATED. THE CARCINOGENIC EFFECT OF P-32 IN BONE AND ITS EFFECT ON BONE-CELL KINETICS, IN EXPERIMENTAL ANIMALS, IS COMPARED WITH THAT OF EXTERNAL X-AND GAMMA-IRRADIATION. SINCE THE

ACCESSION NUMBER 15-13370 TO 15-13408

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13408 *CONTINUED*

REPORTED EFFECTS, PER RAD, ARE SIMILAR, THE SAME MAXIMUM PERMISSIBLE DOSE RATE IN GROWING METAPHYSES IS USED FOR EACH RADIATION. THE RATIO BETWEEN P-32 SPECIFIC ACTIVITY IN GROWING BONE AND IN DIET IS CALCULATED, AND THE MAXIMUM PERMISSIBLE SPECIFIC ACTIVITY IN DIET IS FOUND TO BE 0.006 MICROCURIE/G PHOSPHORUS. THIS LEADS TO A DERIVED WORKING LIMIT OF P-32 IN MILK FOR YOUNG CHILDREN OF 6 MILLIONTH OF A MICROCURIE PER CC. MORE BIOLOGICAL DATA COULD LEAD TO A FURTHER RELAXATION OF THIS LIMIT.

*MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *PHOSPHORUS

15-13409 OSBORNE RV

ABSORPTION OF TRITIATED WATER VAPOUR BY PEOPLE
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER

11 PAGES, FIGURES, 8 TABLES, 19 REFERENCES, HEALTH PHYSICS, 12(11), PAGES 1527-1537, (1966)

PEOPLE WORKING NEAR HEAVY-WATER REACTORS MAY BE INTERNALLY CONTAMINATED BY TRITIUM ABSORBED THROUGH THE LUNGS AND SKIN FOLLOWING ACCIDENTAL RELEASE OF TRITIATED WATER. TO ESTABLISH THE POSSIBLE EXTENT OF THIS CONTAMINATION, VOLUNTEERS HAVE BEEN EXPOSED TO TRITIUM IN AIR CONCENTRATIONS 0.5-50 MICROCURIE/LITER FOR 1.5-60 MIN. TRITIUM UPTAKES WERE DETERMINED BY MEASURING THE CONCENTRATION OF TRITIUM IN URINE AND ESTIMATING THE VOLUME OF BODY WATER. TRITIUM WAS ALSO MEASURED IN EXHALED WATER VAPOUR. TRITIUM DISPERSED IN THE BODY FLUIDS WITH HALF-PERIODS BETWEEN 19 AND 55 MIN AND WAS ELIMINATED FROM THE BODY WITH HALF-LIVES BETWEEN 6.4 AND 14.4 DAYS.

*BIOLOGICAL CONCENTRATION, MAN + *TRITIUM

15-13410 VERNON PB + HALL RM + PODA GA

MONITORING DECONTAMINATION AND BIO-ASSAY OF A PLUTONIUM-CONTAMINATED INJURY
SAVANNAH RIVER LABORATORY

5 PAGES, 6 FIGURES, 3 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1539-1543, (1966)

A PLUTONIUM-CONTAMINATED PUNCTURE WOUND SUSTAINED IN A PROCESSING FACILITY NECESSITATED EXTENSIVE MONITORING AND BIO-ASSAY SURVEILLANCE TO DETERMINE THE EXTENT OF PLUTONIUM DEPOSITION AND THE EFFECTIVENESS OF DECONTAMINATION MEASURES. A GENERAL DESCRIPTION OF THE WOUND INCIDENT, THE MONITORING TECHNIQUES USED, A TABULATION OF DECONTAMINATION AND BIO-ASSAY DATA, AND SUGGESTIONS FOR FUTURE CONSIDERATION ARE PRESENTED IN THIS PAPER.

*PLUTONIUM + BIOLOGICAL CONCENTRATION, MAN + PERSONNEL EXPOSURE, RADIATION

15-13411 WEST CM + SCOTT LM

A COMPARISON OF URANIUM CASES SHOWING LONG CHEST BURDEN RETENTIONS
UNION CARBIDE CORP., NUCLEAR DIVISION, Y-12 PLANT

11 PAGES, 6 FIGURES, 9 TABLES, 8 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1545-1555, (1966)

ROUTINE IN-VIVO GAMMA SPECTRUM MEASUREMENTS HAVE BEEN MADE TO ESTIMATE INTERNAL EXPOSURE TO URANIUM FOR APPROXIMATELY 2500 PERSONS AT THE USAEC Y-12 PLANT. WITH ONLY FIVE EXCEPTIONS, ALL CASES EXHIBITED NORMAL ELIMINATION PATTERNS. THE FIVE EXCEPTIONS SHOWED EXTENDED BIOLOGICAL HALF-LIVES OF 380 TO 1470 DAYS. THE DETECTION OF THESE CASES WAS POSSIBLE BECAUSE OF THE USE OF THE DIRECT-MEASURING TECHNIQUE OF IN-VIVO SPECTROMETRY. IN-VIVO, URINE, AND FECAL DATA ON THESE PERSONS HAVE BEEN OBTAINED AND EVALUATED. THE URANIUM URINE EXCRETION RATE WAS FOUND TO DECREASE MORE RAPIDLY THAN THE CHEST BURDEN. THE URINE AND FECAL ELIMINATION RATE ON THESE EMPLOYEES AFTER THEIR REMOVAL FROM URANIUM EXPOSURE WAS DETERMINED TO BE ABOUT EQUAL.

*URANIUM + BIOLOGICAL CONCENTRATION, MAN + SPECTROMETRY, GAMMA

15-13412 EAKINS JD + GOMM PJ

A NEW METHOD FOR THE DETERMINATION OF RADIOSTRONTIUM IN URINE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL

7 PAGES, 2 FIGURES, 6 TABLES, 19 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1557-1563, (1966)

A NEW METHOD FOR DETERMINING RADIOSTRONTIUM IN URINE IS DESCRIBED. AFTER ADDING STRONTIUM CARRIER TO 300 ML OF URINE, A SINGLE PRECIPITATION OF STRONTIUM SULPHATE IS CARRIED OUT IN THE PRESENCE OF EDTA AT A CONTROLLED PH. THIS GIVES A GOOD SEPARATION FROM CALCIUM AND AVOIDS THE USE OF FUMING NITRIC ACID EMPLOYED IN THE USUAL METHOD. THE SUBSEQUENT SEPARATION OF STRONTIUM FROM BARIUM IS ALSO DISCUSSED, AND AN IMPROVED METHOD OF SEPARATION DESCRIBED. THE FULL PROCEDURE IS CONSIDERABLY QUICKER AND MORE CONVENIENT THAN THE CURRENT ONE AND COMPARES FAVOURABLY WITH OTHER PUBLISHED METHODS. IF ADDITIONAL SENSITIVITY IS REQUIRED, A MODIFICATION OF THE PROCEDURE IS AVAILABLE FOR THE ANALYSIS OF 1500-ML URINE SAMPLES. OVERALL RECOVERIES OF ABOUT 80 PERCENT ARE OBTAINED. THE CALCIUM CONTENT OF THE SEPARATED STRONTIUM CARRIER IS ABOUT 1 PERCENT FOR 300-ML SAMPLES AND LESS THAN 2 PERCENT FOR THE LARGER SAMPLES.

*ANALYTICAL TECHNIQUE, URINE + *STRONTIUM + RADIOCHEMICAL ANALYSIS

15-13413 JACOBS DG

AN INTERPRETATION OF CATION EXCHANGE BY ALUMINA
OAK RIDGE NATIONAL LABORATORY

6 PAGES, 2 FIGURES, 2 TABLES, 8 REFERENCES, HEALTH PHYSICS, 12(11), PAGES 1565-1570, (1966)

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13413 *CONTINUED*

RECENT DATA ON ION EXCHANGE BY ALUMINA PUBLISHED BY BELOT ET AL. WAS TREATED ON THE BASIS OF WEAK ACID EXCHANGE AND GOUY-CHAPMAN ELECTRIC DOUBLE LAYER THEORY. THE UNEXTENDED ELECTRIC DOUBLE LAYER THEORY PROVIDES A GOOD FRAMEWORK FOR DEPICTING THE CATION EXCHANGE BEHAVIOR OF ALUMINA. HOWEVER, ATTRACTIVE FORCES FOR ALKALINE EARTH CATIONS EXCEED THOSE PREDICTED BY THE GOUY-CHAPMAN THEORY. THE MAGNITUDE OF THE DIVALENT CATION ATTRACTION LIES OUTSIDE THE RANGE OF DEVIATION PREDICTED BY BOLT ON THE BASIS OF EXTENSIONS TO THE ELECTRIC-DOUBLE-LAYER THEORY. THIS SUGGESTS SPECIFIC ATTRACTIVE FORCES BETWEEN DIVALENT ALKALINE EARTH CATIONS AND THE ALUMINA SURFACE. ALUMINA BEHAVES LIKE A WEAK ACID EXCHANGER WITH AN EFFECTIVE ACID DISSOCIATION CONSTANT OF 2.0 TIMES 10(10 THE MINUS TEN) HAVING SURFACE IONOGENIC GROUPS TO THE EXTENT OF 4.5 TIMES 10(10 THE MINUS 7) M-EQUIV./SQ. CM.

*MINERAL EXCHANGE + CALCIUM + ION EXCHANGE + STRONTIUM

15-13414 SUNTHARALINGAM N + CAMERON JR
A COMPARISON OF TLD AND FILM FOR PERSONNEL DOSIMETRY
UNIVERSITY OF WISCONSIN
5 PAGES, 7 FIGURES, 11 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1595-1599, (1966)

THE FILM BADGE IS TODAY THE MOST WIDELY USED PERSONNEL-MONITORING DEVICE FOR WANT OF A MORE RELIABLE AND ACCURATE SYSTEM. RECENT EVALUATIONS OF THE PERFORMANCE OF COMMERCIAL FILM-BADGE SERVICES REPORT A WIDE VARIATION IN BOTH THE ACCURACY AND CONSISTENCY OF THE REPORTED EXPOSURES. THE BEST ACCURACY THAT ONE CAN OBTAIN FOR GAMMA AND X-RADIATION APPEARS TO BE MINUS 50 TO PLUS 200 PERCENT. THIS PAPER REPORTS THE FEASIBILITY OF USING THE THERMOLUMINESCENCE OF SINGLE CRYSTALS OF LIF (TLD-100) TO MEASURE EXPOSURE LEVELS OF GAMMA AND X-RADIATION ENCOUNTERED IN THE PERSONNEL DOSIMETRY RANGE. LIF SINGLE CRYSTALS IN LUCITE CAPSULES WERE ATTACHED TO FILM BADGE HOLDERS AND GIVEN KNOWN TEST EXPOSURES FROM GAMMA AND X-RAY SOURCES AND MIXTURES OF THESE RADIATIONS. THE PERFORMANCE OF THE TLD SYSTEM IS COMPARED WITH THE MEASURED VALUES REPORTED BY THE FILM BADGE SUPPLIERS. THE OVERALL ACCURACY OF THE TLD SYSTEM IS ABOUT PLUS-OR-MINUS 30 PERCENT FOR GAMMA AND X-RAY ENERGIES ABOVE 25 KEV EFFECTIVE.

*DOSIMETRY, PHOTOGRAPHIC + MONITOR, RADIATION, PERSONNEL + X-RAY

15-13415 CIPPERLEY FV
APPLICATION OF COMPUTERS TO RADIATION PROTECTION PROBLEMS
USAEC, HEALTH AND SAFETY DIVISION, IDAHO FALLS
8 PAGES, 9 FIGURES, HEALTH PHYSICS 12(11), PAGES 1601-1608, (1966)

THE USE OF COMPUTERS AND PERIPHERAL DATA PROCESSING EQUIPMENT IN THE HEALTH PROFESSIONS IS RAPIDLY INCREASING. SOME USES OF AUTOMATIC DATA PROCESSING IN THE MEDICAL FIELD ARE CITED, AND METHODS OF UTILIZING AUTOMATIC DATA PROCESSING ARE PRESENTED FOR THE NORMAL OPERATION OF THE HEALTH AND SAFETY PROGRAMS, THE RAPID EVALUATION OF DOSIMETRIC AND ANALYTICAL DATA IN EMERGENCY SITUATIONS, AND FOR ALL TYPES OF PROBLEM-SOLVING ENTAILLED IN THE PERFORMANCE OF THE VARIOUS RESEARCH PROGRAMS AT THE NATIONAL REACTOR TESTING STATION.

*RADIATION SAFETY AND CONTROL + COMPUTER, DIGITAL + DATA PROCESSING

15-13416 BLOCK S + BEARD E + BARLOW O
A SMALL CONTINUOUS AIR MONITOR FOR FIELD OR LABORATORY USE
LAWRENCE RADIATION LABORATORY
8 PAGES, 7 FIGURES, 3 TABLES, 6 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1609-1616, (1966)

PORTABLE ATMOSPHERIC MONITORING EQUIPMENT IS SOMETIMES REQUIRED IN REMOTE AREAS, WHERE A.C. POWER IS NOT AVAILABLE, TO CONTINUOUSLY MONITOR THE AIR FOR BETA-EMITTING ISOTOPES. A SYSTEM HAS BEEN DEVELOPED THAT IS BATTERY POWERED, SMALL AND LIGHTWEIGHT, AND CAN OPERATE AS A CONTINUOUS MONITOR AT 1 CU. FT/MIN FOR 8 HR. THE ELECTRONICS IS TRANSISTORIZED ON PRINTED CIRCUIT BOARDS. AN ALARM TRIP CIRCUIT CAN BE SET AT PREDETERMINED LEVELS ABOVE BACKGROUND. BETA SOURCES OF E-SUB-MAX FROM 0.3 TO 2.3 MEV AND BI-207 CONVERSION ELECTRON SOURCE WERE USED TO CALIBRATE THE SYSTEM. INTERFERENCE FROM CONCENTRATIONS OF 300 PC/CU. METER OF RADON-THORON DAUGHTER PRODUCTS HAVE BEEN CONSIDERED AND FOUND TO HAVE LITTLE EFFECT WHEN COMPARED TO MPC QUANTITIES OF I-131. USING CHARCOAL-IMPREGNATED GLASS-FIBER FILTER PAPER, THE MONITOR CAN DETECT 1 MPC OF I-131 IN 10 MIN.

*MONITOR, RADIATION, AIR + GROSS BETA + IODINE

15-13417 DOUVYOIANNIS I + MIMIKOS N
STRONTIUM-90 IN MILK IN GREECE FOR THE PERIOD 1962-1964
DEMOCRITUS NUCLEAR RESEARCH CENTER, ATHENS
5 PAGES, 8 FIGURES, 7 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1620-1624, (1966)

THE STRONTIUM-90 CONCENTRATION IN MILK IN GREECE FOR THE PERIOD 1962-1964 IS TABULATED.

*BIOLOGICAL CONCENTRATION, MILK + *STRONTIUM + GREECE

15-13418 LEVI H + LINDEMANN J + NIELSEN A
STRONTIUM-90 IN HUMAN BONE (DENMARK 1962-1964)
UNIVERSITY OF COPENHAGEN
3 PAGES, 1 FIGURE, 2 TABLES, 2 REFERENCES, HEALTH PHYSICS 12(11), PAGES 1635-1637, (1966)

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13418 *CONTINUED*
MEASUREMENTS OF STRONTIUM-90 IN HUMAN BONE SAMPLES FROM DENMARK ARE TABULATED.

*BIOLOGICAL CONCENTRATION, MAN + *DENMARK + *STRONTIUM + CALCIUM

15-13419 PASSY N
RADIOCHEMICAL PROCEDURES FOR ENVIRONMENTAL MEDIA
ISRAEL ATOMIC ENERGY COMMISSION, YAVNE
IA-849 +. 65 PAGES, DECEMBER 1964

A COMPILATION IS PRESENTED OF THE ANALYTICAL AND RADIOCHEMICAL PROCEDURES BEING USED TO DETERMINE SOME OF THE MORE HAZARDOUS RADIONUCLIDES IN THE ENVIRONMENT.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*ANALYTICAL TECHNIQUE, GENERAL + *RADIOCHEMICAL ANALYSIS + ANALYTICAL TECHNIQUE, FOOD + ANALYTICAL TECHNIQUE, MILK + ANALYTICAL TECHNIQUE, SOLID + ANALYTICAL TECHNIQUE, URINE + ANALYTICAL TECHNIQUE, VEGETATION + ANALYTICAL TECHNIQUE, WATER + BARIUM + CESIUM + GROSS BETA + IODINE + ISRAEL + PROMETHIUM + ZIRCONIUM

15-13420 KALMON B
ENVIRONMENTAL RADIATION LEVELS AND CONCENTRATIONS. FIRST HALF 1964
GOODYEAR ATOMIC CORP., PIKETON, OHIO
GAT-449 +. 10 PAGES, NOVEMBER 16, 1964

THE ENVIRONMENTAL RADIATION LEVELS AND CONCENTRATIONS IN THE VICINITY OF THE PORTSMOUTH AREA GASEOUS DIFFUSION PLANT DURING THE FIRST HALF OF CALENDAR YEAR 1964 ARE SUMMARIZED. THE AVERAGE CONCENTRATIONS FOR BOTH ALPHA AND BETA-GAMMA ACTIVITIES IN THE NEIGHBORING STREAMS, CREEKS, AND RIVER ALL INDICATED SIGNIFICANT DECREASES COMPARED TO THOSE PREVIOUSLY REPORTED. THE AIRBORNE ALPHA ACTIVITY REMAINED ESSENTIALLY CONSTANT, AT APPROXIMATELY THE LOWEST REPORTING VALUE, AT ABOUT 5 PERCENT OF THE MAXIMUM PERMISSIBLE CONCENTRATION FOR URANIUM ALPHA. THE BETA-GAMMA AIRBORNE ACTIVITY HAS INDICATED A SIGNIFICANT DECREASE. THE AVERAGE BACKGROUND EXPOSURE FOR THE FIRST HALF OF 1964 WAS 47 PERCENT OF THE MAXIMUM PERMISSIBLE EXPOSURE IF IT IS ASSUMED THAT ALL THE ACTIVITY WAS DUE TO PLANT OPERATIONS. IT HAS BEEN FOUND, HOWEVER, THAT THERE IS NO APPRECIABLE DIFFERENCE BETWEEN THE AVERAGES ON AND OFF PLANTSITE. THE EXPOSURE RATES ARE DUE TO NATURAL BACKGROUND AND FALL-OUT FROM PAST NUCLEAR TESTS. THE BACKGROUND INDICATED A LARGE DECREASE OVER THE PRECEDING REPORTING PERIODS. THE OVER-ALL AVERAGE CONCENTRATIONS FOR THIS PERIOD ARE COMPARED TO THOSE FOR THE CORRESPONDING PERIOD IN 1963, THE SECOND HALF OF 1963, AND FOR CALENDAR 1963.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY.

*PORTSMOUTH PLANT + *SURVEY, RADIATION, GENERAL + GROSS ALPHA + GROSS BETA + GROSS GAMMA

15-13421 WENDELL A + GARDINER DM
RADIOLOGICAL ASSISTANCE PLAN HANDBOOK
CHICAGO OPERATIONS OFFICE, USAEC
CON-281 +. 80 PAGES, FEBRUARY 1965

A NUCLEAR INCIDENT IS DEFINED AS ANY OCCURRENCE CAUSING BODILY INJURY, SICKNESS, DISEASE, DEATH, OR LOSS OF PROPERTY ARISING OUT OF OR RESULTING FROM THE RADIOACTIVE, TOXIC, EXPLOSIVE, OR OTHER HAZARDOUS PROPERTIES OF SOURCE, SPECIAL NUCLEAR, OR BY-PRODUCT MATERIAL. THE UNITED STATES IS DIVIDED INTO 8 REGIONS FOR PROVIDING RADIOLOGICAL ASSISTANCE IN THE EVENT OF A NUCLEAR INCIDENT. PROCEDURES ARE OUTLINED THAT ARE TO BE FOLLOWED WHEN THE CHICAGO OPERATIONS OFFICE OF THE AEC IS REQUESTED TO PROVIDE ASSISTANCE FOLLOWING A RADIOLOGICAL INCIDENT IN THE AREA DESIGNATED AS REGION 5. A TEAM OF SPECIALISTS WILL BE DISPATCHED IMMEDIATELY TO THE INCIDENT SITE WHERE THEY WILL EVALUATE THE HAZARD, TAKE ACTION TO COUNTERACT AND CONTROL ANY ACUTE HAZARD, AND ESTABLISH A LINE OF COMMUNICATION WITH LOCAL AUTHORITIES AND THE PRESS. THE PROCEDURES OUTLINED ARE INTENDED TO BE USED AS A GUIDE AND ARE DESIGNED FOR THE MOST PROBABLE SET OF CIRCUMSTANCES THAT MIGHT BE MET IN CONNECTION WITH INCIDENTS INVOLVING RADIOACTIVE MATERIALS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$3.00 CY

*EMERGENCY PROCEDURE + *RADIOLOGICAL ASSISTANCE

15-13422 BUNCH DF
DOSE TO VARIOUS BODY ORGANS FROM INHALATION OR INGESTION OF SOLUBLE RADIONUCLIDES.
IDAHO OPERATIONS OFFICE, USAEC
IDO-12054 +. 28 PAGES, 2 FIGURES, 5 REFERENCES, AUGUST 1966

THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION HAS PUBLISHED TWO REPORTS THAT PROVIDE BIOLOGICAL DATA ON THE RETENTION OF VARIOUS RADIONUCLIDES IN THE BODY. THESE DATA HAVE BEEN USED TO COMPILE A LIST OF DOSE CONVERSION FACTORS SO THAT RAPID APPROXIMATIONS OF DOSE FROM INHALATION OR INGESTION OF SOLUBLE RADIOACTIVE MATERIALS MAY BE MADE. INCLUDED ARE TABLES OF REM PER CURIE INHALED, REM PER CURIE-SEC/CU. METER (TIME INTEGRATED CONCENTRATION), REM PER CURIE IN THE ORGAN OF INTEREST, AND REM PER CURIE INGESTED. IN ADDITION, THE PARAMETERS AND VALUES USED TO DERIVE THESE FACTORS ARE PRESENTED AND DISCUSSED.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13422 *CONTINUED*

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*DOSE CALCULATION, INTERNAL + INGESTION + INHALATION

15-13423 PROSPERO JM

THE DETERMINATION OF MIXING AND CIRCULATION IN THE OCEAN WITH RADIOACTIVE TRACERS. FINAL REPORT
MIAMI UNIVERSITY, INSTITUTE OF MARINE SCIENCE
TID-22763 + ML-65853 +. 26 PAGES, OCTOBER 1965

IN AN ATTEMPT TO REDUCE THE K-40 BACKGROUND IN SEA WATER AND THEREBY INCREASE THE DETECTION SENSITIVITY, AN IN SITU COINCIDENCE-COUNTING GAMMA SPECTROMETER WAS DESIGNED AND CONSTRUCTED. STUDIES SHOWED THAT THERE WAS NO ADVANTAGE TO BE GAINED IN USING THE COINCIDENCE COUNTING TECHNIQUE. IN THE ENERGY INTERVAL OF 0.5 TO 1.6 MEV, THE INSTRUMENT HAS A K-40 COUNT RATE IN SEA WATER THAT IS APPROXIMATELY 8 TIMES THAT WHICH WOULD BE OBTAINED WITH A 5 X 4 IN. NAI(TL) DETECTOR IN THE ENERGY RANGE 0.25 TO 1.6 MEV. THE MAXIMUM SENSITIVITY TO BE OBTAINED FROM A 5 X 4 IN. NAI DETECTOR AND 16 X 12 IN. PLASTIC DETECTORS USED SEPARATELY AND IN PAIRS WAS DETERMINED FOR DIFFERENT CASES. THE SENSITIVITY OF THE TWO LARGE DETECTORS USED AS SINGLE DETECTORS IS APPROXIMATELY EQUAL TO THE COINCIDENCE COUNTING SENSITIVITY ASSUMING IN THE LATTER CASE THAT THE K-40 BACKGROUND IS LESS THAN ONE COUNT PER HOUR AND THAT THERE IS NO COSMIC RAY BACKGROUND.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$2.00 CY, \$0.50 MN

*COUNTER + DISPERSION + OCEAN AND SEA + POTASSIUM + SPECTROMETRY, GAMMA + TRACER, RADIOACTIVE

15-13424 RYDKII SG + KUZNETSOVA NN + ILINA GV

STUDY OF THE AFTER-EFFECTS OF RADIOACTIVE FISSION PRODUCTS ON THE HARVEST AND THE QUALITY OF THE GRAIN OF CERTAIN CROPS
JPRS-28977 + TT-65-30432 +. 13 PAGES, TRANSLATED FROM AGROKHIMIYA 5, PAGES 83-90 (MAY 1964)

RESULTS ARE REPORTED FROM FIELD AND GREENHOUSE EXPERIMENTS ON THE EFFECTS OF A MIXTURE OF FISSION PRODUCTS, IN WHICH SR-90 AND Y-90 PREDOMINATED, ADDED TO THE SOIL AT A DOSE OF 1.0 MICROCURIE/SQ.METER ON THE GROWTH AND YIELD OF OATS, MUSTARD, BUCKWHEAT AND MILLET DURING 3 GENERATIONS. AN INHIBITION OF GROWTH AND DEVELOPMENT WAS OBSERVED IN SOME FIRST GENERATION PLANTS, BUT NO CHANGES IN GROWTH, DEVELOPMENT, HARVEST YIELD, OR GRAIN QUALITY WERE NOTED IN SECOND AND THIRD GENERATION PLANTS GROWN FROM SEED OF THE PLANTS USED IN THE FIRST EXPERIMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY

*RADIATION EFFECT + AGRICULTURAL CONSIDERATION + ECOLOGICAL CONSIDERATION + STRONTIUM + YTTRIUM

15-13427 RADIOACTIVITY SURVEY DATA IN JAPAN NO. 4

NP-15278 +. 31 PAGES, AUGUST 1964

DATA ARE PRESENTED ON THE CONTENT OF CS-137 AND SR-90 IN SAMPLES OF ATMOSPHERIC DUSTS, PRECIPITATION, SURFACE WATERS, WATER SUPPLIES, SOIL, TOTAL DIET, FOOD, MILK, AND DECIDUOUS TEETH COLLECTED AT VARIOUS LOCATIONS IN JAPAN DURING AUGUST 1964.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*JAPAN, + *MONITOR, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CESIUM + FALLOUT + RAINOUT + SOIL, NUCLIDE OCCURRENCE + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + WATER, DRINKING

15-13428 DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 2 NUMBER 12

DEPARTMENT OF NATIONAL HEALTH AND WELFARE, CANADA

NP-14670 +. 87 PAGES, DECEMBER 1964

THE MOST RECENT ANALYTICAL RESULTS ON THE FALLOUT MONITORING PROGRAM ARE INCLUDED. DATA ARE PRESENTED ON ACTIVITY LEVELS IN AIR, PRECIPITATION AND IN MILK. IN ADDITION, INFORMATION IS PRESENTED ON THE REACTOR-ENVIRONMENT MONITORING PROGRAM, PERSONNEL DOSIMETRY, AND ISOTOPE SAFETY ASSESSMENTS.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*FALLOUT + AIR + BIOLOGICAL CONCENTRATION, MILK + CANADA + CESIUM + DOSIMETRY, GENERAL + MONITOR, RADIATION, PERSONNEL + RAINOUT + SURVEY, RADIATION, ENVIRONMENTAL

15-13431 RAB MOLLA MA + ABDULLAH SA + ISLAM KN

A REPORT ON THE ASSESSMENT OF RADIATION DOSES TO WORKING PERSONNELS OF VARIOUS ORGANIZATIONS OF EAST PAKISTAN BY FILM BADGE MONITORING TECHNIQUE
ATOMIC ENERGY CENTRE, DACCA, PAKISTAN
AECD-HP-5 +. 22 PAGES, REFERENCES, MARCH 1966

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13431 *CONTINUED*

ASSESSMENT OF RADIATION DOSES TO OCCUPATIONAL WORKERS OF VARIOUS ORGANIZATIONS IN AND OUTSIDE DACCIA DUE TO EXTERNAL RADIATION EXPOSURE WAS MADE BY FILM-BADGE MONITORING TECHNIQUE. THE RADIATION DOSES OF 94 WORKERS FROM SIX ORGANIZATIONS, INCLUDING THE ATOMIC ENERGY CENTRE, DACCIA HAVE BEEN ESTIMATED. OF 94 WORKERS, ONE RECEIVED 50', ANOTHER 30', AND TWO OTHER PERSONS 20' OF THE MAXIMUM PERMISSIBLE DOSES (MPD) DURING THE YEAR. THE EXPOSURE DOSES TO OTHER PERSONNEL WERE MUCH BELOW THE MPD LEVELS.

AVAILABILITY - MICROCARD EDITIONS, INC., ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*PAKISTAN + *PERSONNEL EXPOSURE, RADIATION + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, PHOTOGRAPHIC + MAXIMUM PERMISSIBLE DOSE (MPD) + MONITOR, RADIATION, PERSONNEL

15-13432 BAUM JW

DESIGN FEATURES OF A MIXED RADIATION REM RESPONDING RATE METER

BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK

BNL-10321 + CONF-660621-9 +. 20 PAGES, 1965, PAPER PRESENTED AT THE ANNUAL HEALTH PHYSICS SOCIETY MEETING, HOUSTON, TEXAS, JUNE 27-30, 1966

THE OBJECTIVE OF THIS WORK IS THE DEVELOPMENT OF A SURVEY INSTRUMENT SUITABLE FOR MEASUREMENTS IN MIXED RADIATION FIELDS AROUND NUCLEAR REACTORS AND ACCELERATORS. A FOUR-INCH DIAMETER ROSSI-TYPE TISSUE-EQUIVALENT SPHERICAL PROPORTIONAL COUNTER IS USED AS THE RADIATION DETECTOR. PULSES FROM THE COUNTER ARE AMPLIFIED BY A SPECIAL OPERATIONAL AMPLIFIER WHICH SERVES TO CONVERT THE DETECTOR OUTPUT INTO A PULSE SPECTRUM WHICH IS WEIGHTED FOR QUALITY FACTOR AND THUS REPRESENTS REM DOSE. THE REQUIRED GAIN CHARACTERISTICS OF THE NONLINEAR OPERATIONAL AMPLIFIER WERE DETERMINED BY CONSIDERING THEORETICAL PULSE HEIGHT SPECTRA EXPECTED FROM THE DETECTOR WHEN EXPOSED TO FIELDS OF RADIATION CONTAINING PARTICLES OF BOTH SINGLE AND MIXED LET. THE AMPLIFIER HAS A WIDE DYNAMIC RANGE, MAKING IT POSSIBLE TO MEASURE DOSE FROM PARTICLES HAVING LET FROM 0.2 KEV/MICRON OF TISSUE TO ABOUT 200 KEV/MICRON OF TISSUE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$0.50 MN

*MONITOR, RADIATION, GENERAL + DOSE MEASUREMENT, EXTERNAL + INSTRUMENTATION, RADIATION MONITORING

15-13438 BOOKER DR + HAMADA G + KRUGER P

RADIOACTIVE FALLOUT FROM TWO SEVERE STORMS IN OKLAHOMA DURING MAY 1963. PROGRESS REPORT

HAZELTON-NUCLEAR SCIENCE CORPORATION, PALU ALIO, CALIFORNIA

HNS-58 +. 56 PAGES, DECEMBER 31, 1964

A RADIOCHEMICAL AND METEOROLOGICAL STUDY OF TWO SEVERE STORMS IN OKLAHOMA DURING MAY 1963, BOTH OF WHICH ARE BELIEVED TO HAVE PENETRATED INTO THE STRATOSPHERE, REVEALED AN APPARENT LACK OF HIGH-LEVEL NUCLEAR DEBRIS IN THE GROUND-LEVEL PRECIPITATION. THE DATA FROM THESE TWO STORMS ARE COMPARED WITH CORRESPONDING DATA FROM CONTEMPORARY CONVECTIVE STORMS IN PENNSYLVANIA WHICH DID PENETRATE THE TROPOPAUSE. THE MARKED SIMILARITY IN SR-90 CONCENTRATIONS IN PRECIPITATION INDICATES THAT THE PRECIPITATION REACHING THE GROUND FROM THE SEVERE STORMS WERE OF ABOUT THE SAME ALTITUDE-ORIGIN AS THE CONVECTIVE SHOWERS AND MAY BE INDICATIVE OF THE RULE OF ENTRAINMENT AS A FUNCTION OF CONVECTIVE SEVERITY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA \$3.00 CY, \$0.50 MN

*RAINOUT + FALLOUT + METEOROLOGY + STRONTIUM

15-13440 AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS

UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

PRESS REL. J-81 +. 1 PAGE, APRIL 1, 1966

THE ATOMIC ENERGY COMMISSION IS AMENDING ITS REGULATIONS TO EXEMPT FROM LICENSING THE POSSESSION AND USE OF TRITIUM CONTAINED IN A NUMBER OF CONSUMER PRODUCTS. THE AMENDMENTS TO COMMISSION REGULATIONS PART 30 AND PART 32 EXEMPT THE USE OF TRITIUM CONTAINED IN LUMINOUS THERMOSTAT DIALS AND POINTERS, AUTOMOBILE SHIFT QUADRANTS, AND MARINE COMPASSES. THE MANUFACTURE OR IMPORT OF THESE ITEMS WILL REQUIRE A LICENSE FROM THE AEC, AS IS THE CASE WITH TIMEPIECES, AUTOMOBILE LOCK ILLUMINATORS, AND PRECISION BALANCES.

*TRITIUM

15-13442 CLANTON US + BRADLEY WF + GLOYNA EF

RADIOACTIVITY TRANSPORT IN WATER - SORPTION AND RELEASE OF RADIONUCLIDES BY SEDIMENTS OF THE GUADALUPE RIVER. TECHNICAL REPORT NO. 6

TEXAS UNIVERSITY, AUSTIN, TEXAS

TID-22872 + EHE-10-6404 +. 74 PAGES, JULY 1, 1964

STREAM TRANSPORT IS IMPORTANT IN THE DISPERSION OF RADIOACTIVE MATERIAL RELEASED INTO THE ENVIRONMENT. THE SORPTION OF CESIUM-137 AND STRONTIUM-89 BY SEDIMENTS IN FLUVIAL AND LAGOONAL ENVIRONMENTS IN A CLIMATE AND TOPOGRAPHY CHARACTERISTIC OF THE SOUTHWESTERN UNITED STATES HAS BEEN INVESTIGATED. CONTEMPORARY SEDIMENT SAMPLES FROM PRESELECTED LOCATIONS IN THE GUADALUPE RIVER DRAINAGE BASIN WERE ANALYZED FOR THEIR MINERAL COMPOSITION, ION EXCHANGE CAPACITY, AND RADIONUCLIDE SORPTION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF

ACCESSION NUMBER 15-13431 TO 15-13442

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13442 *CONTINUED*

STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA \$3.00 CY, \$0.75 MN

*RIVER, GUADALUPE + *SURFACE WATER, DISPOSAL MEDIA + CESIUM + DESORPTION + MINERAL EXCHANGE + SEDIMENT + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, PROPERTY + SURFACE WATER, SEDIMENT + SURFACE WATER, SUSPENDED MATERIAL

15-13444 FITZGERALD JJ

SKIN OVEREXPOSURE AT CAMBRIDGE NUCLEAR CORPORATION, OCTOBER 10, 1966

CAMBRIDGE NUCLEAR CORPORATION, CAMBRIDGE, MASSACHUSETTS

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGE 19 (DECEMBER 12, 1966)

A PERSON WORKING WITH RADIO-TRACER CHEMICALS RECEIVED A QUARTERLY SKIN EXPOSURE OF 9.234 REMS, JULY-SEPTEMBER 1966.

*PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + TRACER, RADIOACTIVE

15-13446 KILLIAN CB

TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966

NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGES 20-21 (DECEMBER 12, 1966)

(1) DURING THREE WEEKS IN EARLY OCTOBER 1966, A TECHNICIAN RECEIVED 0.4 REM INTERNAL EXPOSURE FROM TRITIUM DUE TO INADEQUATE AIR VELOCITY IN HOOD. THE RADIOLOGICAL SAFETY TECHNICIAN WILL NOW MEASURE AIR VELOCITY DURING ANY OPERATIONAL SURVEY. (2) DURING LATE OCTOBER, A JUNIOR CHEMIST RECEIVED AN INTERNAL TRITIUM EXPOSURE DUE TO IMPROPER DECONTAMINATION OF A VACUUM LINE BECAUSE HIS SUPERVISOR FAILED TO REVIEW THE OPERATION.

*PERSONNEL EXPOSURE, RADIATION + *TRITIUM + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

15-13448 MADSHUS K + STROEMME A + KOREN, K

CS-137 IN PEOPLE AND FOOD IN NORWAY

NORSK HYDROS INST. FOR CANCER RESEARCH, OSLO + NORSK RADIUM HOSPITAL, OSLO + STATENS RADIOLOGISK-FYSISKE LABORATORIUM, OSLO

TID-22655 +. 90 PAGES, 1966

DATA ARE PRESENTED ON THE CONTENT OF CS-137 IN PEOPLE AND FOOD IN NORWAY DURING 1963, 1964, AND 1965. EMPHASIS WAS PLACED ON THE POPULATION OF LAPPS IN SEVERAL AREAS OF NORWAY WHERE UNUSUALLY HIGH CS-137 BODY BURDENS WERE FOUND. THIS WAS ATTRIBUTED TO THE CONTENT OF REINDEER MEAT IN THE DIET AND TO THE UNUSUALLY LARGE DEPOSITION OF FALLOUT CAUSING A GENERALLY HIGH CONTAMINATION OF AGRICULTURAL FOODSTUFFS CONSUMED IN THESE AREAS. DATA ARE PRESENTED FROM A CORRELATION BETWEEN PRECIPITATION AND CS-137 CONTENT IN COW MILK, SEASONAL VARIATIONS IN THE CONTENT IN MILK, IN A GROUP OF NORWEGIAN SCHOOL CHILDREN, IN ADULTS, AND IN SELECTED FOODS SUCH AS BEEF, LAMB, CARROTS, POTATOES, AND BEER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.75 MN.

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, MAN + *CESIUM + *NORWAY + AGRICULTURAL CONSIDERATION + BIOLOGICAL CONCENTRATION, MILK + ECOLOGICAL CONSIDERATION + FALLOUT

15-13449 ACTIVITIES IN THE DIVISION OF HEALTH PHYSICS, APRIL 1, 1964 - MARCH 31, 1965

JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO

JAERI-5014 +. 187 PAGES, 1965

RESEARCH AND DEVELOPMENT PROGRESS IS REPORTED IN SECTIONS ON RADIATION CONTROL, METEOROLOGICAL AND OCEANOGRAPHICAL SURVEYS AND OBSERVATIONS, AND HEALTH PHYSICS. PAPERS AND INTERNAL REPORTS ARE LISTED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, SALEM, WISC.

*JAPAN + *RADIATION PROTECTION, ORGANIZATION + METEOROLOGY + MONITOR, RADIATION, GENERAL + MONITOR, RADIATION, PERSONNEL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SURVEY, RADIATION, ENVIRONMENTAL + WASTE DISPOSAL, GENERAL

15-13450 ISHIHARA T + SASAKI S + KATAGIRI H + TSUNOKAWA M

CONSTRUCTION AND OPERATION OF RADIOLOGICAL MONITORING STATION

JAPAN ATOMIC ENERGY RESEARCH INST.

JAERI-1098 +. 32 PAGES, REFERENCES, JULY 1965

CONSTRUCTION PROGRESS, EQUIPMENT, AND THE RADIOLOGICAL MONITORING PROGRAM AT JAERI ARE DESCRIBED. THE EIGHT MONITORING STATIONS IN THE SYSTEM COORDINATED DATA ON ALPHA, BETA, AND GAMMA ACTIVITIES IN THE ATMOSPHERE, DUSTS, AND FROM OTHER ENVIRONMENTAL PARAMETERS. COMMUNICATION BETWEEN THE COMPONENTS AND A CENTRAL RECEIVING STATION IS DISCUSSED, AND EFFICIENCY OF THE SYSTEM IS EVALUATED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISC.

*JAPAN + *MONITOR, RADIATION, ENVIRONMENTAL + GROSS ALPHA + GROSS BETA + GROSS GAMMA + MONITOR, RADIATION, GENERAL + MONITOR, RADIATION, TELEMETRY

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13451 DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 4, NUMBER 4
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-16124 +. 42 PAGES, REFERENCES, APRIL 1966

RESULTS OF CS-137 MEASUREMENTS IN THE CANADIAN NORTH FOR THE SECOND HALF OF 1965 ARE PRESENTED. THE CS-137 CONCENTRATIONS IN CARIBOU AND REINDEER MEAT AND IN URINE SAMPLES FROM THREE DIETARY GROUPS ARE REPORTED. FALLOUT MONITORING INCLUDING ANALYSES OF AIR PARTICULATES, PRECIPITATION, MILK, WATER, WHEAT, SOIL, AND HUMAN BONE, WAS CARRIED OUT AND RESULTS FOR MARCH, 1966, ARE GIVEN. RADIATION MONITORING DATA OBTAINED IN MARCH, 1966, NEAR THE SITES OF THE CHALK RIVER REACTORS, THE NPD REACTOR, THE CANDU REACTOR, AND THE WHITESHELL NUCLEAR RESEARCH ESTABLISHMENT SURFACE WATER SAMPLES, WHOLE MILK SAMPLES, AND AIR SAMPLES WERE ANALYZED FOR SR-89, SR-90, CS-137, AND TOTAL ACTIVITY.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISC.

*CANADA + *SURVEY, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CESIUM + FALLOUT + GROSS BETA + GROSS GAMMA + RADIOCHEMICAL ANALYSIS + SOIL, NUCLIDE OCCURRENCE + STRONTIUM + WATER, DRINKING

15-13452 EDVARSON K + EKMAN L + ERIKSSON A + FREDRIKSSON L + GREITZ U
STUDIES ON THE RELATIONSHIP BETWEEN I-131 DEPOSITED ON PASTURE AND ITS CONCENTRATION IN MILK
FORSVARETS FORSKNINGSANSTALT, STOCKHOLM
NP-15568 +. 14 PAGES, JULY 1965

AN EXPERIMENTAL STUDY WAS CARRIED OUT TO INVESTIGATE THE RELATIONSHIP BETWEEN A GIVEN DEPOSITION OF I-131 ON PASTURE AND THE SUBSEQUENT LEVELS OF RADIOIODINE IN FRESH MILK FROM COWS GRAZING ON CONTAMINATED PASTURE. THE RESULTS INDICATE THAT THERE IS A RELATIONSHIP BETWEEN THE NUTRITIVE QUALITY OF THE PASTURE AND THE LEVELS OF I-131 IN THE MILK. THE HIGHEST CONCENTRATION WAS REACHED WHEN THE QUALITY WAS LOWEST. IT WAS FOUND THAT THE RATIO OF THE DEPOSITION OF I-131 PER UNIT AREA, PCI/SQ. METER TO THE CONCENTRATION IN MILK, PCI/L, WAS ABOUT 10. THE RELATIONSHIP BETWEEN INTAKE AND MILK CONCENTRATION OF I-131 WAS ESTABLISHED. FROM THIS RELATION THE DAILY INTAKE PER COW WHEN GRAZING ON CONTAMINATED PASTURES FOR TWO DAYS COULD BE CALCULATED. IT COULD BE ASSESSED THAT ROUGHLY 10% OF THE DEPOSITED I-131 WAS CONSUMED BY THE COWS.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*BIOLOGICAL CONCENTRATION, MILK + *IODINE + AGRICULTURAL CONSIDERATION + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, VEGETATION + DEPOSITION

15-13453 DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 3, NO. 12
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA
NP-15914 +. 30 PAGES, DECEMBER 1965

DATA ARE PRESENTED ON RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIR PARTICULATES, PRECIPITATION, MILK, WATER, SOIL, WHEAT, AND HUMAN BONE COLLECTION IN CANADA IN NOVEMBER 1965. DATA ARE INCLUDED ON TOTAL BETA ACTIVITY AND CONTENT OF SR-89, SR-90, AND CS-137 IN FALLOUT AND MILK SAMPLES. DATA ARE INCLUDED ON THE ENVIRONMENTAL RADIOACTIVITY IN THE ENVIRONS OF CANADIAN REACTORS DURING NOVEMBER 1965.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*CANADA + *SURVEY, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, GENERAL + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CESIUM + FALLOUT + GROSS BETA + POPULATION EXPOSURE + RAINOUT + SAMPLING + SOIL, NUCLIDE OCCURRENCE + STRONTIUM

15-13454 MEASUREMENT OF AIRBORNE RADIOACTIVITY
PUBLIC HEALTH SERVICE, ROCKVILLE, MD.
NP-15898 +. 106 PAGES, FIGURES, TABLES, 1965

HAZARDS TO MAN FROM RADIOACTIVITY IN THE ATMOSPHERE ARE DISCUSSED, AND METHODS FOR AIR SAMPLING, INCLUDING GROSS ANALYSIS, SPECIFIC ANALYSIS, AND SURVEILLANCE PROGRAMS, ARE DESCRIBED.

AVAILABILITY - U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

*MONITOR, RADIATION, AIR + AIR + RADIOCHEMICAL ANALYSIS + SAMPLING + SURVEY, RADIATION, GENERAL

15-13455 HANSON WC + WATSON DG + PERKINS RW
CONCENTRATION AND RETENTION OF FALLOUT RADIONUCLIDES IN ALASKAN ARCTIC ECOSYSTEMS
BATTELLE-NORTHWEST, RICHLAND
BNWL-SA-556 + CONF-660405-3 +. 31 PAGES, FROM SYMPOSIUM ON RADIOECOLOGICAL CONCENTRATION PROCESSES, STOCKHOLM, FEB. 24, 1966

STUDIES ON THE RATES OF FALLOUT RADIONUCLIDES AND THE CYCLING OF FISSION PRODUCTS IN NORTHERN ALASKAN ECOSYSTEMS WERE CARRIED OUT IN 1964 AND 1965. RESULTS ARE REPORTED FROM MEASUREMENTS OF 16 FALLOUT RADIONUCLIDES, INCLUDING AG-110, CS-134, CS-137, NA-22, MN-54, CO-60, ZN-65, Y-88, ZR-95, NB-95, RU-106, SB-125, CE-144, RA-226, TH-228, AND FE-55, IN VARIOUS ECOLOGICAL COMPONENTS BY MULTIDIMENSIONAL AND CONVENTIONAL GAMMA SPECTROMETRY AND SR-90 ANALYSIS (WITH EMPHASIS ON THE LICHEN-CARIBOU-MAN FOOD CHAIN), RETENTION OF SR-85 AND CS-134 APPLIED TO NATURAL LICHEN COMMUNITIES, AND THE CS-137 BODY BURDENS OF ANAKTUVUK PASS RESIDENTS REMOVED

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13455 *CONTINUED*

FROM A CARIBOU MEAT DIET FOR 4 WEEKS. SEASONAL REDUCTIONS OF FALLOUT RADIONUCLIDE CONCENTRATIONS USUALLY COINCIDED WITH SNOW COVER THAT PREVENTED FALLOUT DEPOSITION ON MOST LICHEN SPECIES. CESIUM-137 CONCENTRATIONS INCREASED BY A FACTOR OF ABOUT TWO IN SUCCESSIVE TROPHIC LEVELS OF THE LICHEN-CARIBOU-WOLF FOOD CHAIN. STRONTIUM-85 APPLIED TO LICHENS WAS MORE MOBILE THAN WAS CS-134 SIMILARLY APPLIED. BIOLOGICAL HALF-TIMES FOR THESE TWO RADIONUCLIDES WERE 280 AND 1300 DAYS, RESPECTIVELY. STRONTIUM-90 CONTENT IN LICHENS WAS ABOUT THE SAME AS THAT OF MN-54 AND SR-90 BEHAVED SIMILARLY IN RESPONSE TO ENVIRONMENTAL FACTORS. THE INGESTION OF SR-90 VIA CARIBOU MEAT BY ANAKTUVUK PASS ADULT ESKIMOS DURING THE SUMMERS OF 1961 THROUGH 1965 WAS GENERALLY LESS THAN 20 PCI/DAY AND DECREASED BY 30% WHEN FALL-KILLED ANIMALS WERE UTILIZED. PRELIMINARY RESULTS OF CS-137 HALFTIME STUDIES IN ESKIMOS ON MODIFIED DIETS SHOWED A CONSISTENT RELATION OF HALF-TIME TO AGE AND WEIGHT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN.

*ECOLOGICAL CONSIDERATION + *FALLOUT + ANTIMONY + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, VEGETATION + CERIUM + CESIUM + COBALT + INGESTION + IRON + MANGANESE + NIOBIUM + RADIOCHEMICAL ANALYSIS + RADIUM + RUTHENIUM + SILVER + SODIUM + SPECTROMETRY, GAMMA + THORIUM + YTTRIUM + ZINC + ZIRCONIUM

15-13456 EDVARDSSON KA
REPORT ON THE PERSONNEL DOSIMETRY AT AB ATOMENERGI DURING 1964
AKTIEBOLAGET ATOMENERGI, STUDSVIK
AE-211 +. 16 PAGES, TABLES, REFERENCES, JANUARY 1966

RESULTS ARE REPORTED FROM THE RADIATION MONITORING OF PERSONNEL AT AB ATOMENERGI DURING 1964. NO DOSES EXCEEDING THE RECOMMENDATIONS OF ICRP WERE REPORTED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*RADIATION SAFETY AND CONTROL + *SWEDEN + DOSE MEASUREMENT, EXTERNAL + MONITOR, RADIATION, PERSONNEL + PERSONNEL EXPOSURE, RADIATION

15-13457 MAS R
DEVICE FOR RECOVERING RADIOACTIVE WASTE
CENTRE ETUDES NUCLEAIRES, SACLAY
CEA-R-2894 +. 9 PAGES, NOVEMBER 1965, IN FRENCH

A NEW SYSTEM IS PRESENTED, WHICH CONSISTS ESSENTIALLY OF A STANDARD RESERVOIR OF STAINLESS STEEL FIXED IN A CONCRETE WELL LINED WITH STAINLESS STEEL FIXED IN A CONCRETE WELL LINES WITH STAINLESS STEEL. EACH RESERVOIR HAS A STANDARD LID ON WHICH ARE PLACED ALL THE ACCESSORY DEVICES, WHICH ARE STANDARDIZED. THE NEW RESERVOIRS OFFER A GREAT DEGREE OF SECURITY AND ARE INTERCHANGEABLE. THE WELLS ARE EASY TO DECONTAMINATE, AND IT IS POSSIBLE TO WORK IN A WELL WITHOUT ANY DANGER OF IRRADIATION BY NEIGHBORING RESERVOIRS.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*FRANCE + *WASTE MANAGEMENT + WASTE STORAGE

15-13458 SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-640413 +. 138 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1964, IN FRENCH

THE 23 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

*TRITIUM + FISSION PRODUCT RELEASE, GENERAL

15-13459 MIYANAGA I + TANOOKA H + YAMAMOTO H + BINGO K + NISHI T
COMPARISON OF THE METHODS OF PERSONNEL-MONITORING DOSIMETRY PRACTISED IN NUCLEAR ESTABLISHMENTS OF DIFFERENT COUNTRIES.
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO
JAERI-4035 +. 25 PAGES, JULY 1965

METHODS OF PERSONNEL MONITORING DOSIMETRY, USED IN NUCLEAR ESTABLISHMENTS OF DIFFERENT COUNTRIES, ARE DESCRIBED, WITH EMPHASIS ON FILM BADGES. THESE METHODS USED IN OTHER COUNTRIES ARE COMPARED WITH THOSE DEVELOPED AND USED IN JAERI. DESIGN OF FILM-BADGES, METHODS OF DOSE EVALUATION, MONITORING SYSTEMS, ETC., ARE ALSO DISCUSSED. THE COMPARISON REVEALED MANY ADVANTAGES POSSESSED BY THE JAERI METHODS.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*DOSIMETRY, GENERAL + *MONITOR, RADIATION, PERSONNEL + *RADIATION SAFETY AND CONTROL + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, PHOTOGRAPHIC

15-13461 RADIUM AND MESOTHORIUM POISONING AND DOSIMETRY AND INSTRUMENTATION TECHNIQUES IN APPLIED

ACCESSION NUMBER 15-13455 TO 15-13461

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13461 *CONTINUED*
RADIOACTIVITY. ANNUAL PROGRESS REPORT
MASSACHUSETTS INST. OF TECH., CAMBRIDGE
MIT-952-2 +. 213 PAGES, MAY 1965

RESULTS OF STUDIES CONCERNING RA AND MESOTHORIUM TOXICITY IN HUMANS ARE REPORTED.
INVESTIGATIONS CONCERNING DIFFERENTIAL UPTAKE OF INJECTED RA AND TH IN HUMANS ARE DESCRIBED.
RESEARCH RESULTS ON RADIOBIOLOGY, NUCLEAR PHYSICS, INSTRUMENTATION TECHNIQUES, AND
RADIOCHEMISTRY ARE SUMMARIZED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$6.00 CY, \$1.25 MN.

*CHEMICAL TOXICITY + *RADIUM + *THORIUM + BIOLOGICAL CONCENTRATION, MAN

15-13464 KALMON B + HULETT SH
ENVIRONMENTAL RADIATION LEVELS AND CONCENTRATIONS. SECOND HALF AND ANNUAL SUMMARIES, 1965
GOODYEAR ATOMIC CORP., PIKETON, OHIO
GAT-506 +. 15 PAGES, TABLES, FEBRUARY 18, 1966

AVERAGE ENVIRONMENTAL RADIATION AND CONCENTRATION LEVELS IN AIR AND WATER IN THE VICINITY OF
PORTSMOUTH AREA GASEOUS DIFFUSION PLANT FOR THE SECOND HALF OF THE CALENDAR YEAR 1965, AND
FOR THE COMPLETE CALENDAR YEAR 1965 ARE SUMMARIZED. DURING THE LAST HALF OF 1965, THE
AVERAGE ALPHA CONCENTRATION IN THE WATER EFFLUENTS INCREASED WHILE THE BETA-GAMMA ACTIVITY
DECREASED. THE HIGHEST INDIVIDUAL RESULTS FOR ALPHA AND BETA-GAMMA WERE 12 AND 18% OF THE
MAXIMUM PERMISSIBLE CONCENTRATION. PENETRATING BACKGROUND EXPOSURE RATES CONTINUE TO
DECLINE FROM 1964 ANNUAL AVERAGE OF 48 TO 27.7% OF THE MAXIMUM PERMISSIBLE EXPOSURE (MPE) IN
1965.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN.

*PORTSMOUTH PLANT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + GROSS ALPHA + GROSS BETA + GROSS GAMMA +
WATER, GENERAL

15-13465 ANNUAL REPORT ON RESEARCH CONTRACT NO. 201/RR, JULY 1963-JUNE 1964
INSTITUT RUĐJER BOSKOVIĆ, ZAGREB, YUGOSLAVIA
NP-15915 +. 58 PAGES, JUNE 1964

PROGRESS IS REPORTED IN STUDIES ON THE BIOLOGICAL CONSEQUENCES OF THE DISPOSAL OF RADIOACTIVE
WASTES INTO THE ADRIATIC SEA. DATA ARE PRESENTED FROM LABORATORY STUDIES ON THE METABOLISM
OF NA-22, ZN-65, CO-56, CO-57, CO-58, SR-90, AND Y-90 IN FISHES, SHRIMPS, MUSSELS, AND OTHER
SELECTED MARINE INVERTEBRATES MAINTAINED IN STANDING OR RUNNING SEAWATER. THE CONCENTRATION
FACTOR FOR NA-22 IN SOME FISHES AND MUSSELS, WHEN PLOTTED AGAINST TIME, SHOWED EXPONENTIAL
RISE, INDICATING AN EXCHANGE OF NA-22 FROM SEAWATER WITH THE NA ATOMS AVAILABLE IN THE
ORGANISMS. THE PERIODIC SHEDDING OF THE OLD CUTICLE IN THE MOULTING CYCLE OF SOME
CRUSTACEANS AND THE FORMATION OF THE NEW ONE WAS FOUND TO INVOLVE EXTENSIVE CHANGES IN
MINERAL METABOLISM AND RESULT IN 20 TIMES THE AMOUNT OF CA OR SR IN HARD SHELL AS IN
RECENTLY MOULTED SPECIMENS. RESULTS ARE INCLUDED FROM PRELIMINARY STUDIES ON MECHANISMS
INVOLVED IN MINERAL METABOLISM, THE EFFECTS OF SALINITY OF EXTRACELLULAR FLUID ON MINERAL
UPTAKE, THE EFFECTS OF THE PHYSICO-CHEMICAL STATE OF FISSION PRODUCTS IN SEAWATER ON UPTAKE,
AND C-14 TRACER STUDIES OF THE RELATION BETWEEN HYDROCHEMICAL CONDITIONS AND PRIMARY PLANKTON
PRODUCTIVITY IN THE VICINITY OF ROVINJ.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST. SALEM, WISC.

*BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + *ECOLOGICAL CONSIDERATION + *OCEAN AND SEA +
*WASTE DISPOSAL, OCEAN + COBALT + SODIUM + STRONTIUM + YTTRIUM + YUGOSLAVIA + ZINC

15-13466 O'BRIEN MJ
HEALTH PHYSICS ASPECTS OF INSTALLATION AND TESTING OF A 3-MEV 10-MA ELECTRON ACCELERATOR
BROOKHAVEN NATIONAL LABORATORY
BNL-9663 + CONF-651109-11 +. 13 PAGES, 1ST SYMPOSIUM ON ACCELERATOR RADIATION DOSIMETRY AND EXPERIENCE,
UPTON, N. Y., NOVEMBER 3, 1965

A BRIEF DESCRIPTION OF THE DYNAMITRON ELECTRON ACCELERATOR IS PRESENTED. SHIELDING
CONSIDERATIONS IN THE DESIGN OF THE ACCELERATOR AND HEALTH PHYSICS ASPECTS OF OPERATION ARE
DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*ACCELERATOR + *SHIELDING + BNL (BROOKHAVEN NATIONAL LABORATORY) + DOSIMETRY, GENERAL +
RADIATION SAFETY AND CONTROL

15-13467 DATA FROM RADIATION PROTECTION PROGRAMS. VOLUME 4, NUMBER 2, FEBRUARY 1966
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA, ONTARIO, CANADA
NP-15911 +. 41 PAGES, FEBRUARY 1966

PROCEDURES USED BY THE RADIATION PROTECTION DIVISION TO ENSURE THAT EXPOSURE OF RADIATION
WORKERS AND OF THE GENERAL PUBLIC WILL REMAIN WITHIN THE ACCEPTABLE LIMITS AS DEFINED BY THE
GUIDES ARE DISCUSSED. GUIDE LEVELS IN RADIATION PROTECTION PROGRAMS ARE CONSIDERED. DATA

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13467 *CONTINUED*

ARE PRESENTED ON CANADIAN FALLOUT DATA FOR JANUARY 1966, CS-137 ACTIVITY IN SEAL SAMPLES, AND REACTOR ENVIRONMENT MONITORING FOR JANUARY 1966. A SELECTED LIST OF 10 DIVISIONAL REPORTS AND BULLETINS AVAILABLE TO THE PUBLIC ON REQUEST IS INCLUDED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN, 54669

*RADIATION SAFETY AND CONTROL + CANADA + CESIUM + FALLOUT + MONITOR, RADIATION, ENVIRONMENTAL + PERSONNEL EXPOSURE, RADIATION + RADIATION PROTECTION, ORGANIZATION

15-13470 ANAND SJ + CHANDRASEKARAN VR + HINGORANI SB + JOSHI LU + KHANDERKAR RN + LALIT BY SR-90 CONTENT OF FOOD SAMPLES IN INDIA--DATA SUMMARY THROUGH 1963
ATOMIC ENERGY ESTABLISHMENT, TROMBAY
AEET/AM/40 +. 16 PAGES, SEPTEMBER 1964

THIS REPORT GIVES A SUMMARY OF THE DATA ON STRONTIUM-90 IN LIQUID MILK SAMPLES COLLECTED FROM BOMBAY AND 27 OTHER STATIONS IN INDIA, AND FOOD GRAIN AND VEGETABLE SAMPLES COLLECTED FROM VARIOUS MARKETS IN BOMBAY THROUGH 1963.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*BIOLOGICAL CONCENTRATION, FOOD + *INDIA + *STRONTIUM + BIOLOGICAL CONCENTRATION, MILK + FALLOUT + RADIOCHEMICAL ANALYSIS + SAMPLING

15-13491 SHANNON RO + MCCLELLAND RO + WATSON CR + BUSTAD LK
PUBLIC HEALTH ASPECTS OF CS-137 IN RUMINANTS
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-282(REV.) +. J. AMER. VET. MED. ASS. 147(12) PAGES 1488-1491 (DECEMBER 15, 1965)

MEASUREMENTS OF RADIOACTIVE FALLOUT IN THE RICHLAND, WASHINGTON, ENVIRONS AND DIETARY STUDIES OF THE LOCAL POPULATION ARE BEING CONDUCTED. IN 1964, IT WAS ESTIMATED THAT THE AVERAGE RICHLAND ADULT RECEIVED 40 PERCENT OF DIETARY CS-137 FROM MEAT AND 35 PERCENT FROM MILK, WHEREAS THE AVERAGE YEAR-OLD CHILD RECEIVED 30 PERCENT FROM MEAT AND 60 PERCENT FROM MILK. PRESENT CS-137 LEVELS IN MEAT AND MILK ARE NOT A HAZARD TO HEALTH. MILK PRODUCED IN THE RICHLAND AREA IN 1964 AVERAGED 70 PC CS-137/LITER. THIS LEVEL IS ATTRIBUTABLE TO FALLOUT FROM PAST WEAPONS TESTS AND IS LITTLE INFLUENCED BY THE PROXIMITY OF THE ATOMIC ENERGY COMMISSIONS PLUTONIUM PRODUCTION OPERATIONS.

*CESIUM + AGRICULTURAL CONSIDERATION + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MILK + DIETARY HABIT + ECOLOGICAL CONSIDERATION + FALLOUT + NUCLEAR EXPLOSION DEBRIS

15-13493 SPLICHAL WF
BACKGROUND RADIATION MONITOR
E. I. DU PONT DE NEMOURS AND COMPANY, SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
DPSPU-64-30-17A +. 6 PAGES, APRIL 1965, HEALTH PHYS. 12, PAGES 99-101, (JANUARY 1966)

AN INEXPENSIVE YET ACCURATE RADIATION MONITOR IS DESCRIBED IN WHICH AN ELECTROSTATIC RELAY REPLACES THE VIBRATING REED ELECTROMETER ORDINARILY USED TO MEASURE THE OUTPUT FROM BACKGROUND RADIATION DETECTORS. ACCURACY OF THE MONITOR IS ESTIMATED TO BE PLUS OR MINUS 10 PERCENT. SENSITIVITY UNDER LABORATORY CONDITIONS IS ABOUT 39 MILIRODENTGENS FOR EACH REGISTERED UNIT. THE MONITOR IS NOT SIGNIFICANTLY AFFECTED BY NORMAL CHANGES IN TEMPERATURE, PRESSURE, AND HUMIDITY UNDER LABORATORY CONDITIONS, AND ITS COUNTING CIRCUIT IS NOT SUBJECT TO DRIFT.

*MONITOR, RADIATION, BACKGROUND + INSTRUMENTATION, NUCLEAR

15-13494 CHHABRA AS + KAMATH PR
ENVIRONMENTAL STUDIES IN SOME MONAZITE PLACER AREAS IN SOUTHERN INDIA. PART I. PRELIMINARY SURVEY
ATOMIC ENERGY ESTABLISHMENT, TROMBAY, INDIA
AEET/HP/ENVIRON/4 +. 10 PAGES, NOVEMBER 1964

MEASUREMENTS WERE MADE ON RADIOACTIVITY OF ENVIRONMENTAL SAMPLES FROM KAYANKULAM TO CAPE COMORIN IN INDIA DURING NOVEMBER 1963. THE SAMPLES WERE MONITORED FOR RA-224, RA-226, RA-228, TH-232, AND NATURAL URANIUM BY STANDARD ANALYTICAL METHODS. THE DATA INDICATE THE TRENDS IN UPTAKE AND DISPERSION OF DAUGHTER PRODUCTS ACTIVITY IN SOILS, VEGETATION, FOOD, AND WATER.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*INDIA + *SURVEY, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, VEGETATION + DISPERSION + ECOLOGICAL CONSIDERATION + RADIUM + SOIL, NUCLIDE OCCURRENCE + THORIUM + URANIUM

15-13498 FUQUAY JJ + SIMPSON CL + HINDS WT
ESTIMATES OF GROUND-LEVEL AIR EXPOSURES RESULTING FROM PROTRACTED EMISSIONS FROM 70-METER STACKS AT HANFORD GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-80204 +. 29 PAGES, JANUARY 2, 1964

ACCESSION NUMBER 15-13467 TO 15-13498

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13498 *CONTINUED*

DATA FROM THEORETICAL AND EXPERIMENTAL STUDIES OF ATMOSPHERIC DIFFUSION WERE USED FOR ESTIMATING THE CONSEQUENCES OF DISCHARGING RADIOACTIVE AND CHEMICALLY TOXIC MATERIALS FROM 70-M STACKS AT HANFORD ON ENVIRONMENTAL EXPOSURE AT GROUND LEVEL. HANFORD DIFFUSION DATA OBTAINED IN FIELD EXPERIMENTS WERE USED TO DETERMINE THE PARAMETERS OF THE TAYLOR EQUATION FOR LATERAL GROWTH. IT WAS FOUND THAT THE LATERAL GROWTH OF A PLUME COULD BE EXPRESSED SOLELY IN TERMS OF WIND OBSERVATIONS TAKEN NEAR THE SOURCE. THIS RESULT LED TO THE DERIVATION OF AIR EXPOSURE VALUES FROM THE BIVARIATE NORMAL MODEL ACCOUNTING FOR THE WIND VARIABILITY CHARACTERISTIC TO THE HANFORD SITE. THE AIR EXPOSURES EXPECTED FROM PROLONGED RELEASES OF 2, 4, 8, AND 24-HR FROM A HANFORD 70-M STACK DURING CONDITIONS OF ATMOSPHERIC STABILITY WERE CALCULATED USING WIND DATA FROM THE HANFORD TOWER. RESULTS INDICATED THAT RADIATION EXPOSURE ESTIMATES FOR THE EMISSION PERIODS WERE GENERALLY MUCH LOWER THAN THOSE PREVIOUSLY DERIVED FOR HANFORD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$2.60 CY, \$1.70 MF

*DISPERSION + *HANFORD SITE + *WASTE DISPOSAL, GAS + ATMOSPHERIC DIFFUSION EXPERIMENT + DOSE CALCULATION, EXTERNAL + METEOROLOGY

15-13501 THOMPSON R

BIOLOGY RESEARCH AT HANFORD LABORATORIES
GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-SA-3715 +. 81 PAGES, SEPTEMBER 15, 1964

THE DEVELOPMENT OF THE PROGRAM OF BIOLOGICAL RESEARCH AT HANFORD LABORATORIES IS REVIEWED. SINCE 1950, PERSONNEL HAVE MORE THAN DOUBLED AND LABORATORY FACILITIES HAVE BEEN EXPANDED TO ACCOMMODATE AN ENLARGED PROGRAM. THE EARLY EMPHASIS ON MONITORING HAS BEEN GRADUALLY REPLACED WITH BROADER CONCERN FOR RADIONUCLIDE METABOLISM AND RADIATION EFFECTS, IN GENERAL, AND WITH STUDIES UTILIZING RADIATION AND RADIONUCLIDES IN THE INVESTIGATION OF BIOLOGICAL PROBLEMS UNRELATED TO RADIATION. THE PAST 10 YEARS HAVE SEEN THE DEVELOPMENT OF A NUMBER OF RESEARCH AREAS. MINIATURE SWINE ARE EXTENSIVELY EMPLOYED IN STUDIES OF RADIONUCLIDE METABOLISM AND TOXICOLOGY. THIS ANIMAL IS, IN MANY RESPECTS, AN APPROPRIATE STAND-IN FOR MAN. A PURE-BRED COLONY OF APPROXIMATELY 200 BEAGLES IS EMPLOYED IN A BROAD PROGRAM OF INHALATION STUDIES. A FIELD AND LABORATORY ECOLOGY PROGRAM, MAKING USE OF RADIONUCLIDE TRACER TECHNIQUES, HAS LARGELY SUPPLANTED THE EARLIER PROGRAM OF BIOLOGICAL MONITORING OF THE HANFORD ENVIRONS. THIS PROGRAM HAS NOT ONLY UTILIZED THE EXTENSIVE CONTROLLED ENVIRONS OF THE HANFORD RESERVATION, BUT HAS ALSO BEEN INVOLVED WITH STUDIES OF FALLOUT THROUGHOUT THE NORTHWEST AND IN ALASKA. A LIST IS INCLUDED OF RECENT REPRESENTATIVE PUBLICATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$3.00 CY, \$2.00 MN

BIBLIOGRAPHY + ECOLOGICAL CONSIDERATION + FALLOUT + HANFORD SITE + INGESTION + INHALATION + MONITOR, RADIATION, ENVIRONMENTAL + RADIATION EFFECT

15-13502 PALMER HE

STUDIES OF RADIOACTIVITY IN ALASKAN ESKIMOS BY URINALYSIS AND BY NON-SHIELDED WHOLE-BODY COUNTING METHODS
GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-SA-3688 + CONF-747-1 +. 11 PAGES, SEPTEMBER 18, 1964, FROM 4TH SYMPOSIUM ON RADIOACTIVITY IN SCANDINAVIA, RISO, DENMARK, OCTOBER 1964

THE CONTENT OF CS-137 IN URINE SAMPLES OF ALASKA ESKIMOS WAS CORRELATED WITH RESULTS OF MEASUREMENTS OF CS-137 BODY BURDEN AS DETERMINED BY WHOLE-BODY COUNTING. DATA ON THE CS-137 CONTENT DURING THE FIRST HALF OF 1964 ARE PRESENTED. HIGH CONCENTRATIONS OF NA-22 OBSERVED IN URINE SAMPLES COLLECTED IN MARCH AND APRIL WERE TRACED TO NA-22 IN CARIBOU MEAT CONSUMED BY THE SUBJECTS. THE NA-22 CONTENT WAS SO LARGE THAT THE K-40 CONTENT COULD NOT BE USED TO DETERMINE K, AND THE K HAD TO BE DETERMINED BY FLAME PHOTOMETRY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$1.00 CY, \$1.00 MN

*BIOLOGICAL CONCENTRATION, MAN + *CESIUM + ANALYTICAL TECHNIQUE, URINE + COUNTER, WHOLE BODY + POTASSIUM + SODIUM

15-13503 EMERGENCY OPERATING CENTERS. PROFESSIONAL GUIDE SERIES. INTERIM EDITION
PRAEGER-KAVANAGH-WATERBURY, ENGINEERS-ARCHITECTS, NEW YORK
NP-14108 +. 119 PAGES, JANUARY 1964

EMERGENCY OPERATING CENTERS ARE INTENDED TO SERVE AS PROTECTED FACILITIES TO PROVIDE FOR THE COMMAND AND CONTROL FUNCTION OF POLITICAL JURISDICTIONS FROM WHICH RESPONSIBLE OFFICIALS CAN COMMAND AND CONTROL EMERGENCY OPERATIONS DURING AND AFTER A NUCLEAR ATTACK. DATA ARE PRESENTED TO GUIDE ARCHITECTS ENGAGED IN THE DESIGN OF PROTECTIVE STRUCTURES EITHER AS SEPARATE UNDERGROUND STRUCTURES OR INCORPORATED INTO THE BASEMENT OF PUBLIC OR OFFICE BUILDINGS. TOPICS DISCUSSED INCLUDE SITE SELECTION - STRUCTURAL FACTORS - BLAST CLOSURES AND PROTECTIVE SYSTEMS - HEATING, VENTILATION, AND AIR CONDITIONING - PLUMBING, EMERGENCY POWER SOURCES - COMMUNICATIONS CENTERS - AND METHODS USED FOR GROUND SHOCK TESTING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

*EMERGENCY PROCEDURE + EMERGENCY COOLING CONSIDERATIONS + EMERGENCY POWER, ELECTRIC + EMERGENCY SYSTEM + RECOVERY PROCESS + SHIELDING + SITING, GENERAL + VENTILATION SYSTEM

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13505 REPORT ON THE PROBLEM OF THE POSSIBILITY OF THE UNDERGROUND DISPOSAL OF RADIOACTIVE WASTES
BUNDESANSTALT FUER BODENFORSCHUNG, HANOVER, WEST GERMANY
AEC-TR-6549 +. 77 PAGES, TRANSLATED FROM A REPORT OF THE BUNDESANSTALT FUER BODENFORSCHUNG, HANOVER,
GERMANY, UNDATED.

STUDIES WERE CARRIED OUT ON THE POSSIBLE UNDERGROUND STORAGE OF LARGE AMOUNTS OF WASTES IN
WEST GERMANY. BOTH AQUIFEROUS AND CAVERN DEPOSITS WERE CONSIDERED, AND VARIOUS POSSIBLE PLACES
IN GERMANY ARE DISCUSSED. SALT DEPOSITS, MASSES, AND STRUCTURES ARE DESCRIBED IN SOME DETAIL.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$7.60 CY

*GERMANY + *WASTE DISPOSAL, TERRESTRIAL + GEOLOGICAL CONSIDERATION, GENERAL +
GEOLOGICAL CONSIDERATION, STRATIGRAPHY + HYDROLOGICAL CONSIDERATION, GENERAL + WASTE DISPOSAL, SALT

15-13506 BERGER KC + ERHARDT WH + FRANCIS CW
* POLONIUM-210 ANALYSES OF VEGETABLES, CURED AND UNCURED TOBACCO, AND ASSOCIATED SOILS
UNIVERSITY OF WISCONSIN
2 PAGES, 2 TABLES, 8 REFERENCES, SCIENCE 150(3704), PAGES 1738-1739 (DECEMBER 24, 1965)

ANALYSIS OF THE EDIBLE PORTION OF VEGETABLES AND SAMPLES OF GREEN LEAF TOBACCO FAILED TO SHOW
POLONIUM-210. THE CURED SAMPLES OF LEAF TOBACCO AND THE SOILS THAT WERE ANALYZED ALL
CONTAINED SMALL QUANTITIES OF THE ELEMENT. MUCK SOILS CONTAINED THREE TIMES AS MUCH PO-210
AS DID MINERAL SOILS. SOLUTIONS USED COMMONLY TO EXTRACT AVAILABLE FORMS OF MANY MINERAL
ELEMENTS FAILED TO EXTRACT A DETECTABLE AMOUNT OF PO-210. INDICATIONS ARE THAT PO-210 OR ITS
RADIOACTIVE PRECURSORS ARE NOT TAKEN UP FROM THE SOIL DIRECTLY BY PLANT ROOTS BUT RATHER BY
SORPTION IN DEAD, MOIST PLANT MATERIALS AT THE ATMOSPHERE-PLANT INTERFACE.

*BIOLOGICAL CONCENTRATION, VEGETATION + *POLONIUM + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY

15-13507 FORSMAN AH + GASKILL JR + PHILLIPS WA + TAYLOR RD
RADIATION DOSIMETER
U.S. PAT. 3,243,590 +. 4 PAGES, 1 FIGURE, MARCH 29, 1966

A THERMOLUMINESCENT PERSONNEL RADIATION DOSIMETER COMPRISING GRANULAR, DOSIMETRIC LITHIUM
FLUORIDE BONDED TO A SECTION OF GRAPHITE CLOTH BY MEANS OF A RADIATION AND LIGHT TRANSPARENT
INORGANIC BINDER IS DESCRIBED. THERMOLUMINESCENT EMISSION OF LIGHT FROM THE LITHIUM FLUORIDE
IS INDUCED BY RESISTIVELY HEATING THE GRAPHITE CLOTH. THE DOSIMETER IS RUGGED, DURABLE, AND
REUSABLE, AND IS ESPECIALLY SUITED FOR AUTOMATED READOUT PROCESSING.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D. C. \$0.25 CY

*DOSIMETRY, THERMOLUMINESCENCE + *MONITOR, RADIATION, PERSONNEL

15-13508 KOSTYRKO + OLSZEWSKA I + ZARNOWIECKI K
LABORATORY CONTROL METHODS OF RADIOACTIVE CONTAMINATION IN WATERS
INSTITUTE OF NUCLEAR RESEARCH, WARSAW, POLAND
INR-568/XIX +. 22 PAGES, NOVEMBER 1964

THE THREE MOST TYPICAL METHODS FOR PREPARING THE MEASUREMENT PREPARATIONS FROM AQUEOUS
SOLUTIONS AIMED AT EVALUATION OF RADIOACTIVITY LOSSES CAUSED BY DIFFERENT CHEMICAL OPERATIONS
ARE INVESTIGATED. THESE METHODS CONSIST IN EVAPORATING SOLUTIONS IN BEAKERS OR EVAPORATION
DISHES AND SUBSEQUENT ERASING OF THE PRECIPITATE FROM EVAPORATION DISHES, OR WIPING OUT OF
THE PRECIPITATE FROM EVAPORATION DISHES WITH WET FILTER PAPER AND SUBSEQUENT BAKING AT
ELEVATED TEMPERATURES. THE RESULTS SHOW THAT GENERALLY MOST ADVANTAGEOUS IS THE FIRST
METHOD, PROVIDED THAT ADEQUATE PRECAUTIONARY MEASURES ARE PRESERVED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM,
WISCONSIN 54669

*ANALYTICAL TECHNIQUE, WATER + EVAPORATION + PRECIPITATION

15-13509 ZELLER H
LARGE VOLUME IMPACTOR COLLECTOR. REPORT NO. 2893
LITTON SYSTEMS, INC., ST. PAUL, MINN.
G00-401-139 +. 70 PAGES, 34 FIGURES, DECEMBER 20, 1965

DEVELOPMENT OF THE LARGE VOLUME IMPACTOR COLLECTOR (LVIC) IS REPORTED. THE SYSTEM USES AN
AIR-EJECTOR PUMP AS THE PRIME AIR MOVER. THE EJECTOR IS AN UNCOMPLICATED DEVICE AND USES NO
MOVING PARTS. THUS, THERE IS NOTHING TO WEAR OUT OR BURN. THE LVIC WAS SUCCESSFULLY FLIGHT
TESTED AT TWO ALTITUDES - 33.8 AND 32 KM. THE SAMPLES OBTAINED FROM THE TWO FLIGHTS WERE
SUITABLE FOR BOTH RADIOCHEMICAL AND ELECTRON MICROSCOPE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$3.00 CY, \$0.75 MN

*MONITOR, RADIATION, SAMPLING + *SAMPLING + AIR + PARTICLE SIZE

15-13510 BRUCE RS
RADIOACTIVITY IN MILK, 1965 INTERIM REPORT
AGRICULTURAL RESEARCH COUNCIL RADIOBIOLOGICAL LABORATORY, WANTAGE, ENGLAND

ACCESSION NUMBER 15-13505 TO 15-13510

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13510 *CONTINUED*
ARCRL-15 +. 10 PAGES, FEBRUARY 1966

MEASUREMENTS OF STRONTIUM-90 AND CESIUM-137 IN MILK SHOW THAT THE DOWNWARD TREND IN THE LEVELS OF CONTAMINATION CONTINUED BETWEEN JULY AND DECEMBER 1965. THE AVERAGE RATIO OF STRONTIUM-90 TO CALCIUM IN MILK FROM THROUGHOUT THE UNITED KINGDOM DURING 1965 WAS 19 PCI SR-90/G.CA - THE MEAN CONCENTRATION OF CESIUM-137 WAS 98 PCI/LITRE. BOTH FIGURES ARE ABOUT TWO-THIRDS OF THE VALUES IN 1964.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVENUE, NEW YORK, NEW YORK, 10022, \$0.50 CY

*BIOLOGICAL CONCENTRATION, MILK + *CESIUM + *STRONTIUM + CALCIUM + UNITED KINGDOM

15-13511 SEMIANNUAL PROGRESS REPORT ON AGRICULTURAL RESEARCH, JANUARY 1-JUNE 30, 1965
UT-AGC AGRICULTURAL RESEARCH LABORATORY, OAK RIDGE, TENNESSEE
ORO-635 +. 161 PAGES, 53 TABLES, 15 FIGURES, DECEMBER 30, 1965

PROGRESS IS REPORTED IN STUDIES ON THE EARLY AND LATE EFFECTS OF MIXED GAMMA AND NEUTRON EXPOSURE ON BURROS, CATTLE, SHEEP, AND SWINE - THE PHYSIOLOGY OF REPRODUCTION OF CATTLE, SHEEP, AND RABBITS - THE ANALYSIS OF DEATH PATTERNS OF IRRADIATED BURROS, CATTLE, SHEEP, AND SWINE - PHYSIOLOGICAL EVENTS THAT OCCUR AS A RESULT OF WHOLE-BODY IRRADIATION OF RATS, SHEEP, AND RABBITS - RADIOINDUCED TUMORS IN RATS - THE METABOLISM OF CERTAIN FISSION PRODUCTS AND CHEMICALLY RELATED NUCLIDES IN SHEEP, SWINE, AND CATTLE - THE EFFECT OF A SINGLE LARGE DOSE OF I-131 ON PERFORMANCE AND UREINE METABOLISM IN DAIRY COWS - TRACER STUDIES OF POULTRY NUTRITION, WITH EMPHASIS ON PROTEIN METABOLISM IN CHICKENS - THE FISSION PRODUCT CHEMISTRY OF SOILS WITH EMPHASIS ON STUDIES OF PROPERTIES OF MINERAL CLAY FRACTIONS OF SOILS THAT AFFECT THE AVAILABILITY OF FISSION PRODUCTS TO PLANT ROOTS, IN WHICH CS-134 WAS USED AS A TRACER - AND STUDIES ON RADIATION GENETICS WITH EMPHASIS ON HERITABLE EFFECTS OF GAMMA OR NEUTRON RADIATIONS ON PLANT EMBRYOS, BUDS, AND POLLEN, AND ENVIRONMENTAL FACTORS MODIFYING SUCH EFFECTS. A LIST IS INCLUDED OF PUBLICATIONS DURING THE PERIOD COVERED BY THIS REPORT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 \$5.00 CY, \$1.00 MN

*AGRICULTURAL CONSIDERATION + *RADIATION EFFECT + CESIUM + ECOLOGICAL CONSIDERATION + GAMMA + INGESTION + IODINE + MINERAL EXCHANGE + NEUTRON + SOIL, NUCLIDE OCCURRENCE

15-13512 BLAIR HA
TOXICITY OF RADIO-ELEMENTS
ROCHESTER UNIVERSITY, NEW YORK, ATOMIC ENERGY PROJECT
UR-668 +. 55 PAGES, 9 TABLES, 9 FIGURES, JANUARY 1, 1965, PAGES 55-109 OF UNIVERSITY OF ROCHESTER, ATOMIC ENERGY PROJECT. BRIEF DESCRIPTION OF MOST OF THE RESEARCH PROGRAMS COMPLETED DURING 1964. ANNUAL REPORT

RESULTS OF RESEARCH ARE SUMMARIZED ALONG WITH INVESTIGATIVE PROCEDURES USED IN WORK ON EFFECTS OF INHALED ALPHA EMITTERS - VITAMIN D RELATIONS WITH CA METABOLISM - EFFECTS OF CA - P RATION ON IN VITRO CALCIFICATION - SOFT-TISSUE CA ANALYSIS - EQUILIBRATION BETWEEN RAT TISSUE CA AND INJECTED RADIOCALCIUM - PARATHYROID EXTRACT EFFECTS ON KIDNEY METABOLISM OF RADIOPHOSPHATE - DOG BLOOD AND URINE CA SPECIFIC ACTIVITY - BLOOD-BONE EXCHANGE MECHANISMS - RENAL TISSUE CA ROLE IN URINARY CA ACTIVITY - FLUORIDE, MG, AND PHOSPHATE EFFECTS ON IN VITRO CALCIFICATION - INTERACTIONS OF Y WITH PHYSIOLOGICAL LIGANDS - PARATHYROID HORMONE EFFECTS ON HELA CELLS - STRUCTURES OF OCTACALCIUM PHOSPHATE AND HYDROXYLAPATITE - FLUORIDATED WATER USE IN HEMODIALYSIS - PO-210 INHALATION - PHAGOCYTOSIS MECHANISMS - BODY CONTENT OF TH-232 DAUGHTERS AFTER THOROTRAST INJECTION - RN METABOLISM IN MAN - I-131 UPTAKE BY MAN - ANTIHYPERTENSIVE EFFECTS OF ALPHA - METHYLDOPA AND HYDROCHLOROTHIAZIDE - SKELETAL METABOLISM - EFFECTS OF INHALED RN IN RODENTS - SR-90 RETENTION AND TOXIC EFFECTS IN RATS AND RAT EMBRYOS - TH DETERMINATION IN BONE - REACTIONS OF URANYL IONS WITH NUCLEOTIDES - AND EFFECTS OF INHALED RADIOACTIVE AEROSOLS IN MAN AND ANIMALS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151

*INHALATION + AEROSOL + ALPHA EMITTER + CALCIUM + CHEMICAL TOXICITY + IODINE + POLONIUM + RADON + STRONTIUM + THORIUM

15-13513 BLAIR HA
CHEMICAL TOXICITY
UNIVERSITY OF ROCHESTER, NEW YORK, ATOMIC ENERGY PROJECT
UR-668 +. 22 PAGES, 1 TABLE, 1 FIGURE, JANUARY 1, 1965, PAGES 123-149 OF UNIVERSITY OF ROCHESTER, ATOMIC ENERGY PROJECT. BRIEF DESCRIPTION OF MOST OF THE RESEARCH PROGRAMS COMPLETED DURING 1964. ANNUAL REPORT

INVESTIGATION METHODS AND RESULTS ARE SUMMARIZED FOR WORK ON CELL SURFACE ROLE IN RADIATION DAMAGE - INHALATION AND EXCRETION OF UO-2 AEROSOLS BY RATS, MONKEYS, AND DOGS - BIOCHEMICAL AND GENETIC BEHAVIOR OF CYTOCHROMES AND RELATED PIGMENTS IN YEAST REACTIONS OF NA- AND K-ADENOSINE TRIPHOSPHATE - SENSITIVE SPECTROCHEMICAL MEASUREMENTS - STRUCTURAL-FUNCTIONAL RELATIONS IN ERYTHROCYTE MEMBRANES - METABOLISM AND EXCRETION OF HG BY RATS - DISCRIMINATION BETWEEN ALKALI METAL CATIONS BY YEAST - FACTORS AFFECTING INVERTASE DISTRIBUTION ON YEAST CELLS - ANIMAL METABOLISM OF HG-203-LABELED MFHYDRIN - KINETICS OF FLUORIDE SORPTION BY RATS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151

*CHEMICAL TOXICITY + AEROSOL + INHALATION + RADIATION DAMAGE + URANIUM

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13514 CARTER + OKUBO A
A STUDY OF THE PHYSICAL PROCESSES OF MOVEMENT AND DISPERSION IN THE CAPE KENNEDY AREA. FINAL REPORT
CHESAPEAKE BAY INSTITUTE, JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND
NYO-2973-1 +. 174 PAGES, MARCH 1965

THIS REPORT DESCRIBES WORK CARRIED OUT BY THE CHESAPEAKE BAY INSTITUTE, THE JOHNS HOPKINS UNIVERSITY, TO PREDICT THE FATE OF ANY RADIOACTIVE MATERIAL WHICH MIGHT BE RELEASED INTO THE SEA FROM ABORTED SPACE TEST FLIGHTS LAUNCHED FROM CAPE CANAVERAL. STUDIES INCLUDE PHYSICAL PROCESSES OF WATER MOVEMENT AND DISPERSION AND THEIR EFFECT UPON GEOCHEMICAL PROCESSES OF EXCHANGE AND SEDIMENTATION AND UPON BIOLOGICAL PROCESSES OF UPTAKE. IN ADDITION TO A DESCRIPTION OF THE EXPERIMENTAL TECHNIQUES, A SIMPLE THEORETICAL MODEL IS PRESENTED WHICH IS CONSISTENT WITH EXPERIMENTAL EVIDENCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$5.00 CY, \$1.00 MN

*NUCLEAR ROCKET + *OCEAN AND SEA + *TRACER, FLUORESCENT + DILUTION + DISPERSION + HYDRAULIC EXPERIMENT + SURFACE WATER, GENERAL + SURFACE WATER, TRACER

15-13515 POPENOE P
AERORADIOACTIVITY SURVEY AND AREAL GEOLOGY OF PARTS OF SOUTHEASTERN NEW YORK AND SOUTHERN NEW ENGLAND (ARMS-11)
U.S. GEOLOGICAL SURVEY + DIVISION OF BIOLOGY AND MEDICINE, USAEC
CEX-58.4.6 +. 31 PAGES, 8 FIGURES, 1 TABLE, 31 REFERENCES, SEPTEMBER 1966

AN AIRBORNE GAMMA-RADIATION SURVEY OF CONNECTICUT, RHODE ISLAND, AND PARTS OF NEW YORK, MASSACHUSETTS, NEW HAMPSHIRE, AND VERMONT WAS MADE DURING THE PERIOD FROM 1958 THROUGH 1960 BY THE U.S. GEOLOGICAL SURVEY ON BEHALF OF THE DIVISION OF BIOLOGY AND MEDICINE, USAEC. RESULTS OF THE SURVEY INDICATE THAT A WIDE RANGE OF NATURAL RADIOACTIVITY EXISTS AND THAT THE RADIOACTIVITY IS CLOSELY RELATED TO BOTH THE TYPE OF BEDROCK UNDERLYING GLACIAL DRIFT, AND TO THE GLACIAL DRIFT. THIS REPORT DISCUSSES THE RADIOACTIVITY AND CORRELATES THE DATA WITH AREAL GEOLOGY IN THE SOUTHERN PART OF THE AREA SURVEYED. THE NORTHERN PART OF THE AREA IS DISCUSSED IN CEX-59.4.14-1.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 \$1.00 CY, \$0.50 MN.

*GEOLOGICAL CONSIDERATION, STRATIGRAPHY + *SURVEY, RADIATION, AERIAL + GEOLOGICAL CONSIDERATION, GENERAL + SURVEY, RADIATION, ENVIRONMENTAL

15-13516 SURVEY OF RADIOACTIVE SUBSTANCES FOR MEDICAL DIAGNOSIS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, WASHINGTON, D.C.
PRESS REL. HEW-M88 +. 2 PAGES, AUGUST 28, 1966

A PILOT SURVEY TO DETERMINE THE EXTENT TO WHICH RADIOACTIVE SUBSTANCES ARE BEING USED IN THE UNITED STATES FOR MEDICAL DIAGNOSIS, THERAPY, AND RESEARCH WAS ANNOUNCED BY THE PUBLIC HEALTH SERVICE. THE STUDY WILL BE CONDUCTED BY THE STANFORD RESEARCH INSTITUTE, MENLO PARK, CALIFORNIA, UNDER A CONTRACT WITH THE DIVISION OF RADIOLOGICAL HEALTH, USPHS.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C. 20545

*SURVEY, RADIATION, USPHS + POPULATION EXPOSURE

15-13521 STRUXNESS EG
ICRP PUBLICATION 7 ON THE PRINCIPLES OF ENVIRONMENTAL MONITORING RELATED TO THE HANDLING OF RADIOACTIVE MATERIALS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
3 PAGES, 3 REFERENCES, NUCLEAR SAFETY 8(1) PAGES 50-52 (FALL 1966)

THIS REVIEW IDENTIFIES THREE TYPES OF SURVEYS FOR ENVIRONMENTAL MONITORING AROUND NUCLEAR INSTALLATIONS - PRE-OPERATIONAL, ROUTINE, AND EMERGENCY. THE GENERAL PRINCIPLES BY WHICH SUCH PROGRAMS ARE DESIGNED AND OPERATED ARE INDICATED. A NEW CONCEPT OF RELEVANT MONITORING IS INTRODUCED WHICH IS BASED ON THE SPECIFIC IDENTIFICATION OF CRITICAL RADIONUCLIDES, CRITICAL EXPOSURE PATHWAYS, AND CRITICAL POPULATION GROUPS FOR EACH INSTALLATION AND ITS ENVIRONMENT. THE KEY TO SUCCESS RESTS WITH THE ABILITY TO IDENTIFY THE CRITICAL POPULATION GROUP AND TO PREDICT THE POTENTIAL INTERNAL AND EXTERNAL EXPOSURES REALISTICALLY.

*MONITOR, RADIATION, ENVIRONMENTAL + ECOLOGICAL CONSIDERATION + ICRP (INT. COMM. ON RADIOLOGICAL PROTECTION) + MONITOR, RADIATION, BACKGROUND + MONITOR, RADIATION, EMERGENCY + POPULATION EXPOSURE + RADIATION PROTECTION, ORGANIZATION + RADIATION SAFETY AND CONTROL

15-13522 OLSON JS
PROGRESS IN RADIATION ECOLOGY - RADIONUCLIDE MOVEMENT IN MAJOR ENVIRONMENTS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
6 PAGES, 1 TABLE, 45 REFERENCES, NUCLEAR SAFETY 8(1) PAGES 53-58 (FALL 1966)

SEVERAL RECENT MEETINGS AND PAPERS EXTENDED THE INFORMATION ON CYCLING AND LEVELS OF RADIONUCLIDES IN TERRESTRIAL, FRESHWATER, AND MARINE ENVIRONMENTS. PRIOR INFORMATION IN THIS FIELD WAS BROUGHT TOGETHER CONVENIENTLY IN THE FIRST NATIONAL SYMPOSIUM ON RADIOECOLOGY IN 1961. ONE TREND IN ECOLOGICAL ANALYSIS IS TOWARD FURTHER TESTING OF MATHEMATICAL MODELS FOR TRANSFERS BETWEEN PARTS OF A COMPLEX ECOLOGICAL SYSTEM BY USING EQUATIONS AND (ANALOG OR

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13522 *CONTINUED*

DIGITAL) COMPUTER SIMULATIONS LIKE THOSE WHICH HAVE PROVED USEFUL IN THE HEALTH PHYSICS AND PHYSIOLOGY OF INTERNAL DOSE. DIETARY SOURCES OF CONTAMINATION FOR MAN ARE FREQUENTLY AT LEAST AS IMPORTANT AS SOURCES OF CONTAMINATION FROM DRINKING WATER AND AIR. IN ASSESSING HAZARDS, CONCENTRATION FACTORS BASED ON STABLE ELEMENTS COULD BE USED MORE WIDELY THAN IS DONE AT PRESENT. SUCH FACTORS MAY GIVE RISE TO CONSERVATIVE ESTIMATES OF PERMISSIBLE RELEASE FOR ELEMENTS WHOSE HALF-LIFE IS SHORT OR WHOSE TRANSFER THROUGH ENVIRONMENTAL NETWORKS IS SLOW.

*ECOLOGICAL CONSIDERATION + CARBON + CESIUM + FALLOUT + PHOSPHORUS + WASTE DISPOSAL, GENERAL

15-13523 WITKAMP M

BIOLOGICAL CONCENTRATIONS OF CS-137 AND SR-90 IN ARCTIC FOOD CHAINS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
5 PAGES, 41 REFERENCES, NUCLEAR SAFETY 8(1) PAGES 58-62 (FALL 1966)

EFFICIENT FOLIAR SORPTION OF FALLOUT MINERALS AND THEIR TRANSFER WITHOUT MUCH DISSIPATION ALONG THE ARCTIC FOOD CHAIN FROM LICHEN VIA CARIBOU AND REINDEER TO HUMAN INHABITANTS OF INLAND COMMUNITIES LEAD TO BODY BURDENS OF CS-137 AND PRESUMABLY OF SR-90 THAT ARE SEVERAL TIMES HIGHER THAN THOSE OF THE REST OF THE WORLD POPULATION. REASONS FOR THESE HIGHER THAN AVERAGE BODY BURDENS ARE NOT HIGH FALLOUT LEVELS BUT RATHER THE UNIQUE ECOLOGICAL CONDITIONS OF THE CLOSED AND MARGINAL ECONOMIES OF VEGETATION, FAUNA, AND MAN IN THE ARCTIC ENVIRONMENT.

*BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, VEGETATION + CESIUM + DIETARY HABIT + ECOLOGICAL CONSIDERATION + FALLOUT + STRONTIUM

15-13538 AURAND K + ARNDT J + WOLTER R

BEHAVIOR OF RADIONUCLIDES IN SEWER SYSTEMS AND PURIFICATION PLANTS SUBSEQUENT TO DISCHARGE OF RADIOACTIVE WASTES WITH CONCENTRATIONS INCREASED OVER SHORT PERIODS
BUNDESGESUNDHEITSAMT, BERLIN
BMWF-FBK-66-04 +. 40 PAGES, APRIL 1966

THIS REPORT GIVES AN EVALUATION OF HAZARDS FOR SEWER WORKERS AND POPULATION CAUSED BY RADIOACTIVE SUBSTANCES IN SEWAGE. FOR SEWER WORKERS, THERE IS PRACTICALLY NO DANGER OF INCORPORATION. HAZARDS FOR SEWER WORKERS DUE TO EXTERNAL RADIATION EXPOSURE ARE ONLY POSSIBLE UNDER EXTREMELY HIGH ACTIVITIES, WHICH PRACTICALLY DO NOT OCCUR. THE POPULATION MAY INGEST RADIOACTIVE SUBSTANCES INTRODUCED INTO THE ENVIRONMENT BY WAY OF SEWAGE, EITHER THROUGH DRINKING WATER OR FOODSTUFFS. LIMITING OF CONCENTRATIONS IN SEWAGE ENSURES SAFE PROTECTION AGAINST HAZARDOUS INGESTION THROUGH DRINKING WATER. FOR FOODSTUFFS, LIMITING OF ACTIVITIES TO BE RELEASED MAY BE NECESSARY DUE TO POSSIBLE CONCENTRATIONS, PARTICULARLY OF LONG-LIFE RADIONUCLIDES. THE DILUTION OF RADIONUCLIDES TEMPORARILY ENTERED INTO SEWAGE, WAS STUDIED EXPERIMENTALLY IN LOW-CAPACITY PURIFICATION PLANTS OF DIFFERENT DESIGN ACCORDING TO DIN 4261.

AVAILABILITY - MICROCARD EDITIONS INC., ACCOUNTING AND SHIPPING DEPT., W. SALEM, WISCONSIN 54669

*POPULATION EXPOSURE + PERSONNEL EXPOSURE, RADIATION + WASTE DISPOSAL, LIQUID

15-13551 FALLOUT IN NEW ZEALAND. QUARTERLY REPORT, JULY-SEPTEMBER 1965

NATIONAL RADIATION LAB., CHRISTCHURCH, NEW ZEALAND
NRL-F18 + NP-15044 +. 20 PAGES, SEPTEMBER 1965

RESULTS ARE REPORTED FROM FALLOUT MONITORING STUDIES IN NEW ZEALAND DURING THE THIRD QUARTER OF 1965. DATA ARE INCLUDED ON THE TOTAL GAMMA ACTIVITY ON AIR-FILTER SAMPLES, THE TOTAL BETA ACTIVITY OF RAIN WATER, THE CONTENT OF SR-90 IN RAIN WATER, AND THE CONTENT OF CS-137 AND SR-90 IN MILK SAMPLES COLLECTED DURING THE PERIOD.

AVAILABILITY - MICROCARD EDITIONS, INC. ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC. 54669

*FALLOUT + *NEW ZEALAND + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, MILK + CESIUM + GROSS GAMMA + RAINOUT + STRONTIUM + WATER, GENERAL

15-13552 RADIOACTIVITY SURVEY DATA IN JAPAN

NATIONAL INSTITUTE OF RADIOLOGICAL SCIENCES, CHIBA, JAPAN
NP-15882 +. 26 PAGES, FIGURES, NOVEMBER 1964

RADIOACTIVITY SURVEY DATA AFTER THE NUCLEAR DETONATION TEST CONDUCTED ON THE CHINESE MAINLAND, ASSUMED TO BE AT LAKE LOP NOR, ARE REPORTED. DATA ARE GIVEN FOR TOTAL BETA ACTIVITY IN RAIN WATER AND ATMOSPHERE AND I-131 CONTENT IN MILK, HUMAN URINE, ATMOSPHERE, RAIN WATER, AND THYROID GLANDS IN CATTLE AND MAN FOR 1964. THE CHEMICAL COMPOSITION OF FALLOUT WAS ALSO DETERMINED.

AVAILABILITY - MICROCARD EDITIONS, INC., ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISCONSIN 54669

*JAPAN + *NUCLEAR EXPLOSION DEBRIS + *SURVEY, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + FALLOUT + GROSS BETA + IODINE + RAINOUT

15-13553 OSIERBERG C + CUTSHALL N + JOHNSON V + CRONIN J + JENNINGS D + FREDERICK L
SOME NON-BIOLOGICAL ASPECTS OF COLUMBIA RIVER RADIOACTIVITY
OREGON STATE UNIVERSITY

ACCESSION NUMBER 15-13522 TO 15-13553

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13553 *CONTINUED*

RLO-1750-4 + CONF-660507-3 +. 17 PAGES, MARCH 4, 1966, FOR PRESENTATION AT SYMPOSIUM FOR THE DISPOSAL OF RADIOACTIVE WASTES INTO SEA, OCEANS, AND SURFACE WATERS, VIENNA

THE IMPORTANCE OF THE COLUMBIA RIVER, ITS ESTUARY, AND THE ADJACENT OCEAN AS A RADIOECOLOGY LABORATORY IS EMPHASIZED. RADIOACTIVITY MEASUREMENTS HAVE BEEN MADE IN SEDIMENTS, WATER, AND BIOTA OF THE COLUMBIA RIVER AND PACIFIC OCEAN. STUDIES OF SEDIMENT AND WATER RADIOACTIVITY ARE REVIEWED. METHODS FOR MEASURING ZN-65 AND CR-51 IN SEDIMENTS AND THE NATURE OF THE BINDING MECHANISMS IN SEDIMENTS ARE DESCRIBED. STUDIES OF ION EXCHANGE ON SEDIMENTS SHOWED THAT LESS THAN 5% OF THE ZN-65 ON COLUMBIA RIVER SEDIMENTS WAS EXCHANGEABLE. OF THE THREE PARAMETERS MEASURED, RADIOACTIVITY IN WATER WAS THE MOST DIFFICULT DUE TO THE DILUTION FACTOR. METHODS FOR REMOVING TRACE METALS FROM WATER ARE COMPARED. CHROMIUM-51 IS REGARDED AS A POSITIVE AND SENSITIVE TRACER OF COLUMBIA RIVER WATER AT SEA BECAUSE NO OTHER SOURCE OF CR-51 EXISTS IN THE NORTHEASTERN PACIFIC OCEAN. DEVELOPMENT OF TECHNIQUES FOR MEASURING ZN-65, SB-124, MN-54, AND CR-51 IN THE COLUMBIA RIVER PLUME AT SEA ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*RIVER, COLUMBIA + *WASTE DISPOSAL, RIVER + ANTIMONY + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + CHROMIUM + DISPERSION + MANGANESE + MINERAL EXCHANGE + OCEAN AND SEA + SEDIMENT + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, SEDIMENT + ZINC

15-13554 OREN OH

STUDY OF THE PHYSICO-CHEMICAL-BIOLOGICAL PROCESSES AFFECTING THE DISPERSION OF RADIONUCLIDES. FINAL REPORT
TECHNION-ISRAEL INST. OF TECH., HAIFA
NP-15861 +. 48 PAGES, DECEMBER 1964

RESULTS ARE REPORTED FROM A STUDY OF OCEANOGRAPHIC FEATURES OF THE ISRAEL CONTINENTAL SHELF OF THE MEDITERRANEAN SEA THAT MAY AFFECT THE DISTRIBUTION OF RADIONUCLIDES FROM WASTE SOLUTIONS OR OTHER SOURCES. DATA ARE INCLUDED ON THE CHEMICAL COMPOSITION OF THE SEA WATER (WITH SPECIAL ATTENTION TO SEASONAL CHANGES IN NUTRIENT CONCENTRATIONS), SEDIMENTS OF THE COASTAL SHELF, BIOLOGICAL CYCLES (WITH EMPHASIS ON THE QUANTITY AND COMPOSITION OF PLANKTON), MACROBENTHONIC INVERTEBRATES, FISH (WITH EMPHASIS ON FISH OF COMMERCIAL IMPORTANCE), MEASUREMENTS OF PRIMARY PRODUCTION IN THE AREA AT VARIOUS SEASONS, THE EFFECTS OF NILE RIVER FLOODS ON UPWELLING AND VERTICAL MIXING, AND THE CONSEQUENCES OF THE INTERACTION OF LARGE MASSES OF FRESH WATER CONTAINING SUSPENDED MATERIALS.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*DISPERSION + *WASTE DISPOSAL, OCEAN + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + ECOLOGICAL CONSIDERATION + OCEAN AND SEA + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, SEDIMENT

15-13555 GILBERT WS

NEW RADIATION PROBLEMS ASSOCIATED WITH THE 200-BEV ACCELERATOR
LAWRENCE RADIATION LAB.

UCRL-16464 +. CONF-651109-10 +. 15 PAGES, FROM 1ST SYMPOSIUM ON ACCELERATOR RADIATION DOSIMETRY AND EXPERIENCE, UPTON, NEW YORK

THE 200 BEV PROTON ACCELERATOR STUDIED BY THE LAWRENCE RADIATION LABORATORY IS DESCRIBED, WITH SPECIAL ATTENTION GIVEN TO THOSE ASPECTS OF THE DESIGN RELATING TO RADIATION PROBLEMS. VARIOUS RADIATION PROBLEMS ARE COMPARED WITH THOSE ALREADY ENCOUNTERED AT PRESENTLY OPERATING ACCELERATORS. THE PRIMARY USE OF EXTERNAL BEAMS GREATLY FACILITATES MACHINE MAINTENANCE AND OPERATION. MUON SHIELDING IS DISCUSSED IN SOME DETAIL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*RADIATION SAFETY AND CONTROL + ACCELERATOR + PERSONNEL EXPOSURE, RADIATION + SHIELDING

15-13556 KURSHAKOV NA

THE PATHOGENESIS AND GENERAL CLINICAL CHARACTERISTICS OF ACUTE RADIATION ILLNESS

JPRS-35011 + TT-66-31449 +. 23 PAGES, 1965, PAGES 2-24 FROM OSTRAYA RADIATIONNAYA TRAVMA U CHELOVEKA, MOSCOW, 1965

THE PATHOLOGY OF RADIATION SICKNESS IN MAN IS REVIEWED. SYMPTOMS OBSERVED DURING THE INITIAL PERIOD, LATENT REACTIONS, MANIFEST CLINICAL SIGNS, AND THE PERIOD OF RECOVERY ARE DESCRIBED IN DETAIL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*PERSONNEL EXPOSURE, RADIATION + *RADIATION INJURY, TREATMENT OF + INCIDENT, EXPOSURE + RADIATION DAMAGE + RADIATION EFFECT + RECOVERY PROCESS

15-13557 DRUTMAN RD + MALYSHEVA MS + SHTUKKENBERG YM

DETERMINATION OF ABSORBED DOSES

JPRS-35011 + TT-66-31449 +. 11 PAGES, 1965, PAGES 25-35 FROM OSTRAYA RADIATIONNAYA TRAVMA U CHELOVEKA, MOSCOW, 1965

A WOMAN SCIENTIFIC WORKER ENTERED A ROOM WHERE EXPERIMENTAL SAMPLES WERE BEING EXPOSED TO A CO-60 GAMMA SOURCE. SHE WITHDREW THE SAMPLES FROM A DEWAR FLASK IN THE CENTER OF THE SOURCE,

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15-13557 *CONTINUED*

WHICH CONSISTED OF 48 CO-60 RODS 80 MM IN HEIGHT AND 9 MM IN DIAMETER SITUATED UNIFORMLY ALONG A CYLINDRICAL SURFACE WITHIN A STAINLESS STEEL CASSETTE. THE TOTAL ACTIVITY OF THE CO-60 SOURCE AMOUNTED TO 36 KG EQUIVALENTS OF RA. A PHANTOM WAS USED FOR CALCULATIONS OF THE ABSORBED DOSES TO THE HEAD, BODY, ARMS, HANDS, AND LEGS. PROCEDURES USED FOR CALCULATIONS OF THE ABSORBED DOSE ARE DESCRIBED. THE DOSE TO VITALLY IMPORTANT ORGANS OF THE BODY AND BONE MARROW WAS ESTIMATED TO RANGE FROM 450 TO 600 RADS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*DOSE CALCULATION, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION + COBALT + INCIDENT, EXPOSURE

15-13558 AYRES RU

SPECIAL ASPECTS OF ENVIRONMENT RESULTING FROM VARIOUS KINDS OF NUCLEAR WARS. PART III. OVERVIEW HUDSON INSTITUTE., INC.

HI-388-RR (PT.III) +. 92 PAGES, 6 FIGURES, 5 TABLES, NOVEMBER 30, 1964

THE POSSIBLE EFFECTS OF NUCLEAR WARFARE ON THE ENVIRONMENT ARE CONSIDERED. THE SIGNIFICANCE OF VARIOUS PROBLEMS THAT MAY ARISE POST-ATTACK IS EVALUATED. IT IS POINTED OUT THAT IT WILL TAKE MANY YEARS FOR THE RESPONSE OF THE ECOSYSTEM TO SUCH A DISTURBANCE TO BE AMELIORATED. THE RELATION BETWEEN ECOSYSTEM RECOVERY AND THE ECONOMY IS DISCUSSED. HISTORICAL EXAMPLES OF ECOLOGICAL DISASTERS CITED FOR COMPARATIVE PURPOSES INCLUDE FIRES, FLOODING, EROSION, PEST OUTBREAKS, OUTBREAKS OF EPIDEMIC DISEASE, AND EXTREME CONDITIONS OF WEATHER AND CLIMATE. ESTIMATES ARE INCLUDED OF THE SURVIVING POPULATION, SURVIVING INDUSTRY AND PROPERTY, AND SURVIVING BIOLOGICAL AND AGRICULTURAL RESOURCES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA.

*ECOLOGICAL CONSIDERATION + *NUCLEAR DETONATION + AGRICULTURAL CONSIDERATION + ENVIRONMENTAL CONDITION + POPULATION EXPOSURE + RECOVERY PROCESS

15-13559 HARDIE RW + ENDRES GW

THERMOLUMINESCENT DOSIMETRY SYSTEM. STATUS REPORT HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND

HW-84398 +. 15 PAGES, OCTOBER 2, 1964

THE LITHIUM-FLUORIDE PHOSPHOR SHOWS PROMISING CAPABILITY AS A GAMMA AND X-RAY DOSIMETER. THE SENSITIVITY WAS ADEQUATE TO DETECT A MINIMUM RADIATION DOSE OF 20 MR FOR 50 MG OF PHOSPHOR. LOW-ENERGY X-RAY EXPOSURES (APPROXIMATELY 20 KEV) SHOW THE RESPONSE TO INCREASE ONLY ABOUT 20% ABOVE THE RESPONSE AT HIGH ENERGY (APPROXIMATELY 1 MEV). THE SENSITIVITY OF PHOSPHORS VARIED BY AS MUCH AS A FACTOR OF TWO BETWEEN MANUFACTURERS AND ALSO BETWEEN BATCHES OF PHOSPHOR FROM THE SAME MANUFACTURER. THE DOSIMETRY PROPERTIES ARE SENSITIVE. 50-MG SAMPLES YIELD THE MOST LIGHT OUTPUT PER MG OF PHOSPHOR FOR THE THERMOLUMINESCENT READER AND GEOMETRY USED. DOSIMETERS EXPOSED TO 300 MR WERE READ AT VARIOUS TIMES FROM ONE DAY TO FIFTEEN DAYS AFTER EXPOSURE. AFTER FIFTEEN DAYS, THE LIGHT OUTPUT PER UNIT RADIATION DOSE HAD DECREASED ONLY 5% FROM THE LIGHT OUTPUT AFTER ONE DAY. THE MINIMUM SENSITIVITY OF THE NEUTRON DOSIMETERS TESTED IS ABOUT 1 REM. AT THIS EXPOSURE, THE DETECTION PROBABILITY IS ABOUT 50%. PROPERTIES OF SEVERAL HYDROGENOUS MATERIALS WERE INVESTIGATED IN AN ATTEMPT TO INCREASE THE NEUTRON SENSITIVITY OF THE SYSTEM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY

*DOSIMETRY, THERMOLUMINESCENCE + GAMMA + NEUTRON + X-RAY

15-13560 GENERAL SUMMARY OF PROGRESS ON RADIOACTIVE FALLOUT DISTRIBUTION

NEW YORK OPERATIONS OFFICE

NYO-2174-36 +. 72 PAGES, 1965

PROGRESS IS REPORTED IN STUDIES OF RADIOACTIVE FALLOUT DISTRIBUTION IN SURFACE WATERS AND SHORE SEDIMENTS OF THE ATLANTIC OCEAN FROM 1964 TO 1965. SAMPLES OF SURFACE WATER COLLECTED BY U.S. AND EUROPEAN WEATHER SHIPS WERE ANALYZED FOR TOTAL RADIOACTIVITY AND CS-137 AND SR-90 CONTENT. MEASUREMENTS WERE ALSO MADE OF THE FALLOUT OVER SEA SURFACES. PROCEDURES USED FOR SAMPLE COLLECTION ARE DESCRIBED, AND THE CALIBRATION OF A FLAME PHOTOMETER FOR USE IN THE RADIOCHEMICAL ANALYSIS OF SAMPLES IS DISCUSSED. SEDIMENTS COLLECTED AT VARIOUS LOCATIONS WERE ANALYZED FOR Y-91 AND LA-140, AND PLANKTON SAMPLES FROM THE NORTH ATLANTIC, SARGASSO SEA, AND CARIBBEAN WERE ANALYZED FOR BETA RADIOACTIVITY. A PROCEDURE IS DESCRIBED FOR THE DETERMINATION OF STABLE CA IN SAMPLES AFTER NEUTRON ACTIVATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.75 MN

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + CALCIUM + CESIUM + OCEAN AND SEA + SAMPLING + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, SEDIMENT + YTTRIUM

15-13561 OBERHOFER M

DOSIMETRY OF INDIVIDUALS BY THE FILM BLACKENING METHOD

EUROPEAN ATOMIC ENERGY COMMUNITY

SC-T-66-0708 +. 13 PAGES, FIGURES, 1964, TRANSLATED FROM ARCH. TECH. MESSEN LFG., PAGES 149-52, (1964)

ACCESSION NUMBER 15-13557 TO 15-13561

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13561 *CONTINUED*

A SURVEY IS GIVEN OF THE USE OF PHOTOGRAPHIC EMULSIONS FOR INDIVIDUAL DOSIMETRY. STARTING FROM THE CONCEPT OF BLACKENING AND THE BLACKENING CURVE, THE SENSITIVITY OF PHOTOEMULSIONS TO X AND GAMMA RAYS AND THE ENERGY DEPENDENCE OF THE BLACKENING ARE DISCUSSED. THE ENERGY DEPENDENCE OF THE BLACKENING CAN BE USED FOR ENERGY DETERMINATION. BETA-DOSIMETRY WITH PHOTOEMULSIONS AND BETA-GAMMA-DOSIMETRY IN MIXED RADIATION FIELDS ARE DISCUSSED. AN ACCOUNT IS THEN GIVEN OF THE QUALITATIVE AND QUANTITATIVE MEASUREMENT OF THERMAL AND FAST NEUTRONS WITH PHOTOEMULSIONS. INFORMATION IS ALSO GIVEN CONCERNING FILM BADGE DESIGN, CALIBRATION METHODS, ERROR POSSIBILITIES, AND THE ACCURACY OF DOSIMETRIC TECHNIQUES INVOLVING THE USE OF PHOTOEMULSIONS.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD, ST., CHICAGO, ILL., 60616, \$1.60 COPY, \$0.80 MICROFICHE

*DOSIMETRY, PHOTOGRAPHIC + *MONITOR, RADIATION, PERSONNEL

15-13562 ANDERSEN AJ

UPTAKE BY PLANTS OF RADIOSTRONTIUM FROM CONTAMINATED SOILS

DANISH ATOMIC ESTABLISHMENT, RISO

2 PAGES, 2 TABLES, 7 REFERENCES, NATURE 208(5006), PAGES 195-196, (OCT. 9, 1965)

EXTRACTABILITY OF RADIOSTRONTIUM FROM CONTAMINATED SOIL SAMPLES WAS EFFECTIVELY REDUCED BY HEAT TREATMENT AND BY THE ADDITION OF PHOSPHATE TO THE SOIL. THE INFLUENCE OF HEAT TREATMENT AND SUPERPHOSPHATE APPLICATION ON THE PLANT UPTAKE OF RADIOSTRONTIUM WAS EXAMINED IN POT EXPERIMENTS. THE EFFECT OF APPLYING CALCIUM CARBONATE TO THE CONTAMINATED SOIL SURFACE WAS ALSO DETERMINED. HEATING THE CONTAMINATED SOIL TO 800 DEGREES C REDUCED THE UPTAKE OF RADIOSTRONTIUM BY PLANTS FROM LOAMY SOILS BY A FACTOR OF TWENTY. IN THE SANDY SOILS ONLY A FOUR-FOLD DECREASE IN THE UPTAKE WAS FOUND. ADDITION OF SUPERPHOSPHATE CAUSED A MARKED REDUCTION IN THE PLANT UPTAKE OF RADIOSTRONTIUM. ADDITION OF CALCIUM CARBONATE DID NOT REDUCE THE UPTAKE OF RADIOSTRONTIUM FROM THESE SOILS.

*MINERAL EXCHANGE + *STRONTIUM + AGRICULTURAL CONSIDERATION + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY

15-13564 ZENDLE R + FEINBERG RJ

PORTABLE INSTRUMENTATION FOR DETECTION OF MAXIMUM PERMISSIBLE BURDEN OF INSOLUBLE CO-60 LUNG CONTAMINATION
KNOLLS ATOMIC POWER LAB.

CONF-660621-4 +. 18 PAGES, FROM HEALTH PHYSICS SOCIETY, 11TH ANNUAL MEETING, HOUSTON, TEXAS

A PROCEDURE FOR IN-VIVO DETECTION OF SMALL QUANTITIES OF INSOLUBLE COBALT-60 CONTAMINATION IN HUMAN LUNGS WAS TESTED FOR SENSITIVITY. A MASONITE PHANTOM WAS CONSTRUCTED TO SIMULATE THE SHAPE AND DENSITY OF THE CHEST AND LUNGS. SOURCES OF KNOWN COBALT-60 ACTIVITY WERE PLACED IN THE PHANTOM TO SIMULATE VARIOUS DISTRIBUTIONS AND QUANTITIES OF INSOLUBLE LUNG CONTAMINATION. A PORTABLE SCINTILLATION PROBE SURVEY METER WITH A 2-BY-2-INCH NaI (TI) DETECTOR WAS USED TO MEASURE THE COBALT-60 GAMMA RESPONSE AT THE SURFACE OF THE PHANTOM. IN THE PREVALENT NATURAL BACKGROUND OF .02 MR/HR, THE PROCEDURE AND INSTRUMENT RELIABLY INDICATED THE PRESENCE OF 0.1 MICROCURIE OF COBALT-60 IN THE PHANTOM REGARDLESS OF ITS DISTRIBUTION, WITH THE UNSHIELDED DETECTOR AT THE SURFACE OF THE MASONITE. CALCULATIONS SHOW THAT THE MAXIMUM PERMISSIBLE LUNG BURDEN MAY BE ESTIMATED AS ABOUT 1.2 MICROCURIE OF INSOLUBLE COBALT-60. AT LEAST 10' OF THIS ACTIVITY DEPOSITED ORIGINALLY WOULD PROBABLY REMAIN IN THE LUNGS FOR SIX MONTHS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*COBALT + *MAXIMUM PERMISSIBLE BODY BURDEN + BIOLOGICAL CONCENTRATION, MAN + COUNTER + DEPOSITION

15-13565 PAAKKOLA O

RADIOSTRONTIUM IN MILK, GRASS AND SOME OTHER BIOLOGICAL SAMPLES IN FINLAND

INSTITUTE OF RADIATION PHYSICS, HELSINKI

SFL-A3 +. 34 PAGES, REFERENCES, APRIL 1966

RESULTS FOR ANNUAL MEANS OF STRONTIUM-90 IN DRIED MILK IN FINLAND WEIGHTED FOR TOTAL MILK PRODUCTION, ARE - (1960) 6.7, (1961) 5.8, (1962) 13.3, (1963) 22.4, (1964) 22.8 AND 18.4 PCI SR-90/G CA. THE RISE OF THE SUMMER MAXIMA BEGAN IN 1963 AND 1964 IN THE END OF JUNE AND REACHED ITS HIGHEST VALUE IN JUNE MONTH. THE DAILY AND GEOGRAPHICAL VARIATIONS IN STRONTIUM-90/CALCIUM RATIOS IN FINLAND WERE NOT LARGE. IN AUGUST 1963 SR-89 MEASURED IN MILK FROM NORTH FINLAND REACHED A MAXIMUM OF ABOUT 200 PCI/G CA. THE OBSERVED RATIOS FOUND IN SUMMER 1963 FOR TWO FARMS WERE ON THE AVERAGE 0.05. DURING FEBRUARY 1964, DAILY DIETS IN ONE HOSPITAL IN HELSINKI HAD A MEAN SR-90/CA RATIO OF 30.4 PCI/G, I.E. ABOUT 25% HIGHER THAN SR-90/CA RATIO IN MILK DURING THE SAME PERIOD. DURING THE SPRING OF 1965 THE STRONTIUM-90/CALCIUM RATIO WAS ABOUT 1.0 PCI/G FOR BALTIC HERRING CAUGHT IN THE COASTAL WATERS OF FINLAND.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC. 54669

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, MILK + *FINLAND + *STRONTIUM + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + BIOLOGICAL CONCENTRATION, VEGETATION + CALCIUM + DIETARY HABIT

15-13574 PUBLIC HEALTH ENGINEERING ABSTRACTS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

40 PAGES, PUBLIC HEALTH ENGINEERING ABSTRACTS 46(2-3), PAGES 41-80, (MARCH 1966)

PUBLIC HEALTH SERVICE REPORT, FEB.-MARCH 1966. THIS ONE REPRESENTS A MONTHLY REVIEW OF MORE

ACCESSION NUMBER 15-13561 TO 15-13574

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13574 *CONTINUED*

THAN 800 DOMESTIC AND FOREIGN JOURNALS OF SCIENCE AND ENGINEERING, REPORTS OF STATE AND FEDERAL GOVERNMENTS, AND REPORTS AND PROCEEDINGS OF SCIENTIFIC RESEARCH GROUPS. TOPICS COVERED IN THIS REPORT ARE - (1) ATMOSPHERIC POLLUTION, (2) GARBAGE AND OTHER REFUSE, (3) INSECTS AND INSECT-BORNE DISEASES, (4) MILK AND OTHER FOODS, (5) OCCUPATIONAL HEALTH, (6) PUBLIC-HEALTH PRACTICE, (7) RADIOLOGICAL HEALTH AND SAFETY, (8) SEWERAGE, INDUSTRIAL WASTES, AND WATER POLLUTION, AND (9) WATER SUPPLIES AND PLUMBING.

*BIBLIOGRAPHY + AIR POLLUTION + ATMOSPHERIC POLLUTION + BIOLOGICAL CONCENTRATION, MILK + RADIATION SAFETY AND CONTROL + WASTE DISPOSAL, GENERAL + WATER POLLUTION + WATER, DRINKING

15-13577 RADIOLOGICAL HEALTH DATA AND REPORTS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

48 PAGES, FIGURES, TABLES, REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS 7(4), PAGES 209-256, (APRIL 1966)

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS PUBLISHED BY THE PUBLIC HEALTH SERVICE AND INCLUDES REPORTS PROVIDED TO THE DIVISION OF RADIOLOGICAL HEALTH BY FEDERAL AGENCIES, STATE HEALTH DEPARTMENTS, AND FOREIGN GOVERNMENT AGENCIES. TOPICS COVERED ARE - (1) SYNOPSES OF RADIOLOGICAL HEALTH REPORTS, (2) DATA ON RADIOACTIVE CONTAMINATION OF MILK, FOOD, WATER, AND AIR, AND (3) RESULTS OF ENVIRONMENTAL MONITORING PROGRAMS.

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, MILK + AIR + BIOLOGICAL CONCENTRATION, MAN + CESIUM + DEPOSITION + FALLOUT + IODINE + NUCLEAR DECONTAMINATION + PERSONNEL EXPOSURE, RADIATION + POPULATION EXPOSURE + STRONTIUM + SURVEY, RADIATION, ENVIRONMENTAL + SURVEY, RADIATION, USPHS + WATER, GENERAL

15-13596 PENSKO J

DOSIMETRY OF ENVIRONMENTAL GAMMA-RADIATION IN POLAND BY MEANS OF GAMMA-RAY SPECTRA IN THE FIELD
CENTRAINE LABORATORIUM OCHRONY RADIOLOGICZNEJ, WARSAW, POLAND
CLOR-48/D +. 27 PAGES, 1966

THE DIRECT MEASUREMENTS OF THE GAMMA-RAY BACKGROUND EXPOSURE RATE WAS CARRIED OUT UP TO DATE BY MEANS OF IONIZATION CHAMBERS OR GEIGER-MULLER COUNTERS. THESE METHODS ARE VERY SENSITIVE AND ACCURATE BUT DO NOT ALLOW TO SEPARATE NATURAL GAMMA BACKGROUND FROM THE FALLOUT COMPONENTS. THE EXPOSURE RATE CAUSED BY FALLOUT WAS USUALLY DETERMINED BY THE CONCENTRATION MEASUREMENTS OF THE MORE IMPORTANT FISSION PRODUCTS IN THE SOIL OR PLANTS. IN THIS PAPER, SOME OF OUR EXPERIENCES WITH THE SPECTROMETRIC METHOD ARE PRESENTED WHICH MAKE IT POSSIBLE FOR DIRECT EVALUATION OF DOSE-RATES FROM THE MAIN GAMMA EMITTERS OF BACKGROUND RADIATION IN POLAND. SOME RESULTS OBTAINED WERE COMPARED WITH THE EXPOSURE RATE COMPUTATION AFTER THE ESTIMATION OF POTASSIUM, URANIUM AND THORIUM CONCENTRATION IN THE SOIL SAMPLES. THE 1962-1965 RESULTS OF ENVIRONMENTAL DOSE RATE MEASUREMENTS OF MORE IMPORTANT GAMMA EMITTERS (NATURAL AND FISSION PRODUCTS) FOR 20 PLACES IN POLAND WERE PRESENTED AND DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151

*DOSE MEASUREMENT, EXTERNAL + *DOSIMETRY, GENERAL + *MONITOR, RADIATION, BACKGROUND + *SURVEY, RADIATION, ENVIRONMENTAL + GAMMA + POLAND + POTASSIUM + SOIL, NUCLIDE OCCURRENCE + THORIUM + URANIUM

15-13597 PENSKO J

NATURAL AND ARTIFICIAL (FROM NUCLEAR EXPLOSIONS) GAMMA BACKGROUND RADIATION IN POLAND - DOSES RECEIVED BY THE POPULATION
CENTRAINE LABORATORIUM OCHRONY RADIOLUGICZNEJ, WARSAW, POLAND
CLOR-49/D +. 38 PAGES, 1966

THE RESULTS OF THE ENVIRONMENTAL DOSE RATE MEASUREMENTS OF MORE IMPORTANT GAMMA EMITTERS (NATURAL AND FISSION PRODUCTS) FOR 20 PLACES IN POLAND ARE PRESENTED AND DISCUSSED. MAINLY THE SPECTROMETRIC METHOD WAS USED, AND SOME MEASUREMENTS WERE DONE BY MEANS OF THE HIGH-PRESSURE IONIZATION CHAMBER. THE FISSION PRODUCTS FROM NUCLEAR EXPLOSIONS CONSIDERABLY CHANGED THE NATURAL GAMMA-RAY BACKGROUND IN POLAND ESPECIALLY IN SUMMER 1963. THE PHOTOPEAK OF MN-54 WHICH CORRESPONDS TO THE ENERGY OF 0.840 MEV WAS OBSERVED IN THE SPECTROGRAMS OBTAINED IN 1964.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 COPY

*DOSE MEASUREMENT, EXTERNAL + *SURVEY, RADIATION, ENVIRONMENTAL + ANALYTICAL TECHNIQUE, GENERAL + FALLOUT + GAMMA + MONITOR, RADIATION, BACKGROUND + NUCLEAR EXPLOSION DEBRIS + POLAND

15-13598 DATA FROM RADIATION PROTECTION PROGRAMS. VOL. 2, NO. 6

CANADA. DEPARTMENT OF NATIONAL HEALTH AND WELFARE. RADIATION PROTECTION DIVISION, OTTAWA
NP-14320 +. 49 PAGES, JUNE 1964

DATA ARE PRESENTED ON RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIR, PRECIPITATION, MILK, WHEAT, SOIL, AND HUMAN BONE COLLECTED IN CANADA DURING APRIL AND MAY 1964. DATA ARE INCLUDED FROM REACTOR ENVIRONMENT MONITORING, PERSONNEL DOSIMETRY, ISOTOPE SAFETY ASSESSMENT, AND FIELD INVESTIGATIONS OF RADIATION SAFETY.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

ACCESSION NUMBER 15-13574 TO 15-13598

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13598 *CONTINUED*

*FALLOUT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CANADA + DOSIMETRY, GENERAL + MONITOR, RADIATION, ENVIRONMENTAL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + RAINOUT + SAMPLING + SOIL, NUCLIDE OCCURRENCE

15-13601 LEISTNER L

INVESTIGATION ON RADIOACTIVE CONTAMINATION OF FOODSTUFFS STEMMING FROM ANIMALS
EUROPEAN ATOMIC ENERGY COMMUNITY, COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
EUR-2287.D +. 60 PAGES, JANUARY 4, 1965

DATA RELATING TO THE TRANSFER OF THE MOST IMPORTANT RADIONUCLIDES FROM THE ENVIRONMENT THROUGH ANIMAL PRODUCTS TO MAN ARE PRESENTED. AS THESE ARE NOT DIRECTLY UTILIZED FOR THE COUNTRIES OF THE EUROPEAN COMMUNITY, FURTHER STUDIES ARE PROPOSED ON THE CHANGING ECOLOGICAL CONDITIONS.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, MAN + ECOLOGICAL CONSIDERATION + EURATOM + FALLOUT

15-13602 GARNIER A

EVALUATION AS A FUNCTION OF AGE OF THE EFFECTIVE ENERGY ABSORBED IN ANY GRAM OF ORGANS OTHER THAN THE GASTROINTESTINAL TRACT BY THE PRINCIPAL RADIONUCLIDES WHICH COULD EVENTUALLY CONTAMINATE THE FOOD AND THE ENVIRONMENT

COMMISSARIAT A L'ENERGIE ATOMIQUE, FORTENAY-AUX-ROSES, FRANCE. CENTRE ETUDES NUCLEAIRES
EUR-2425.F + CEA-R-2809 +. 95 PAGES, JUNE 1965, IN FRENCH

TO EVALUATE INTERNAL RADIATION DOSES FROM INGESTED FISSION PRODUCTS, IT IS NECESSARY TO KNOW THE EFFECTIVE ENERGY DISSIPATED IN ANY GRAM OF THE ORGAN OF REFERENCE, WHICH DEPENDS, FOR ANY RADIONUCLIDE, ON THE PHYSICAL ENERGY ABSORBED IN THE BODY ORGAN, ON THE RELATIVE BIOLOGICAL EFFECTIVENESS (RBE), ON THE RELATIVE DAMAGE FACTOR AND ON THE MASS OF THE ORGAN. THIS EFFECTIVE ENERGY MAY BE EVALUATED AS A FUNCTION OF THE SIZE AND OF THE MASS OF THE ORGANS FROM BIRTH TO ADULT AGE. THIS WORK IS DONE FOR THE PRINCIPAL RADIONUCLIDES THAT COULD EVENTUALLY CONTAMINATE THE FOOD AND THE ENVIRONMENT.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, MAN + *BIOMEDICAL + *DOSE MEASUREMENT, INTERNAL + DOSE + EURATOM + INGESTION

15-13603 RADIOACTIVE CONTAMINATION OF FOODSTUFFS IN THE COUNTRIES OF THE COMMUNITY IN 1963

EUROPEAN ATOMIC ENERGY COMMUNITY
EUR-2460.D,F,I,N +. 67 PAGES, 1965, IN GERMAN, FRENCH, ITALIAN, AND DUTCH

FOOD CONTAMINATION WITH SR-89, AND SR-90, AND CS-137 WAS MEASURED IN EURATOM COUNTRIES DURING 1963. RADIATION DOSES TO THE POPULATION RESULTING FROM MILK CONTAMINATED BY SR-89 AND SR-90 AND DIETARY CONTAMINATION BY SR-90 WERE ESTIMATED. THE PATTERN OF CONTAMINATION IS ILLUSTRATED BY TABLES AND GRAPHS. AVERAGE CONTAMINATION WAS CALCULATED AND COMPARED WITH THAT IN THE UNITED STATES, CANADA, AND THE UNITED KINGDOM AND WITH MILK DATA FOR 1962 IN THE EURATOM COUNTRIES.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CESIUM + CONTAMINATION + DOSE + DOSE CALCULATION, INTERNAL + EURATOM + FALLOUT + STRONTIUM

15-13606 BOURDEAU P + CAVALLORO R + MYTTENAERE C + VERFAILLIE G

MOVEMENT OF FALLOUT RADIONUCLIDES IN IRRIGATED ECOSYSTEMS OF THE PO VALLEY, ITALY
EUROPEAN ATOMIC ENERGY COMMISSION, ISPRA

15 PAGES, HEALTH PHYSICS, VOLUME 11, PAGES 1429-1444, (1965), PRESENTED AT SYMPOSIUM ON TERRESTRIAL RADIOECOLOGY, BATTELLE MEMORIAL INSTITUTE, PACIFIC NORTHWEST LABORATORY, RICHLAND, MAY 3-5, 1965

IN 1963 AND 1964 IN THE PO VALLEY, CS-137, SR-90, RU-106, CE-144, AND MN-54 INCREASED IN RICE UNTIL HARVEST. IN GRAINS, MOST OF THE CE-144 AND SR-90 WAS IN THE HULL. CS-137 WAS THE MOST ACTIVE NUCLIDE IN THE ENDOSPERM. ACTIVITIES WERE HIGHER IN PERENNIAL MEADOWS. COVERING FLOODED RICE REDUCED CE-144 IN SHOOTS BY 72 PERCENT, SR-90 AND CS-137 BY 23-26 PERCENT, AND MN-54 BY 4 PERCENT. DRAINING REDUCED CS-137 BY 19 PERCENT, BUT INCREASED MN-54 BY 62 PERCENT. PANICLES WERE SIMILARLY AFFECTED. COVERING REDUCED ALL NUCLIDES TO A GREATER EXTENT IN MEADOW THAN IN RICE. CS-137 APPEARS TO BE QUITE AVAILABLE TO RICE FROM FLOODED SOILS. LEVELS IN ANIMALS SEEMED TO REFLECT HABITAT AND DIET.

*BIOLOGICAL CONCENTRATION, VEGETATION + *ITALY + *WATER, IRRIGATION + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, FOOD + CERIUM + CESIUM + DIETARY HABIT + MANGANESE + RUTHENIUM + STRONTIUM

15-13608 GLASS RL

MORTALITY OF NEW ENGLAND DENTISTS 1921-1960
PUBLIC HEALTH SERVICE, WASHINGTON, D. C.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13608 *CONTINUED*
PHS PUBL. 999-RH-18 +. 70 PAGES, 62 TABLES, 3 FIGURES, 80 REFERENCES, MAY 1966

AN EPIDEMIOLOGICAL STUDY WAS CONDUCTED TO DETERMINE THE MORTALITY OF DENTISTS IN COMPARISON WITH THAT OF THE GENERAL POPULATION AND OF PHYSICIANS. LEUKEMIA MORTALITY HAS APPROXIMATED THAT EXPECTED FROM SEVERAL SETS OF STANDARD RATES. MORTALITY FROM ALL CAUSES HAS BEEN LESS THAN THAT EXPECTED FROM DEATH RATES OF THE NEW-ENGLAND-WHITE-MALE POPULATION AND U.S. PHYSICIAN POPULATION, BUT GREATER THAN THAT OF CERTAIN MEDICAL SPECIALISTS. CANCER MORTALITY HAS BEEN SIGNIFICANTLY LESS THAN, AND MORTALITY FROM CARDIOVASCULAR DISEASES ABOUT EQUAL TO, THAT OF THE GENERAL POPULATION. SUICIDE IS THE ONLY CAUSE OF DEATH WITH GREATER THAN EXPECTED MORTALITY THROUGHOUT THE STUDY PERIOD. NO RELATIONSHIP BETWEEN MORTALITY AND EXPOSURE TO IONIZING RADIATION WAS OBSERVED.

AVAILABILITY - (PUBLIC HEALTH SERVICE) DIVISION OF RADIOLOGICAL HEALTH, WASHINGTON, D. C. 20201 FREE
PERSONNEL EXPOSURE, RADIATION + POPULATION EXPOSURE + RADIATION EFFECT + X-RAY

15-13616 A STUDY OF FISSION PRODUCT LEVELS AND METABOLISM IN FOOD PRODUCING ANIMALS AS DETERMINED BY WHOLE BODY COUNTING. SUMMARY PROGRESS REPORT, DECEMBER 1, 1963 THROUGH AUGUST 15, 1966
ILLINOIS UNIVERSITY, URBANA
COO-1339-4 +. 25 PAGES, 1966

THE ORIGINAL PROPOSAL FOR THIS PROJECT STATED 3 PRIMARY OBJECTIVES - (1) CALIBRATING THE ILLINOIS ANIMAL SCIENCE COUNTER (ILLASCO) FOR K-40 AND CS-137 DETECTION EFFICIENCY IN FOOD-PRODUCING ANIMALS AND HUMAN BEINGS, AND STUDYING THE EFFECTS OF FISSION PRODUCT RADIOCONTAMINANTS ON K-40 MEASUREMENTS AS WELL AS PROCEDURES FOR MINIMIZING SUCH EFFECTS, (2) STUDYING CS-137 METABOLISM IN CATTLE USING THE EXISTING CS-137 CONTENT OF HAY AS THE SOURCE OF INTAKE, AND (3) ESTABLISHING A FISSION-PRODUCT MONITORING PROGRAM. AN INVESTIGATION OF CA-47 KINETICS WAS BEGUN IN DAIRY GOATS, WITH THE OBJECTIVES OF STUDYING CA POOL SIZES AND TURNOVER RATES DURING PREGNANCY AND LACTATION. CALIBRATION WORK WILL CONTINUE IN CONJUNCTION WITH BODY COMPOSITION STUDIES. FUTURE INVESTIGATIONS ARE PROPOSED ON CA AND SR METABOLISM IN A NUMBER OF SPECIES, INCLUDING GOATS, CATTLE, PIGS AND DOGS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 CY, \$0.50 MN

*COUNTER, WHOLE BODY + BIOLOGICAL CONCENTRATION, ANIMAL + CALCIUM + CESIUM + POTASSIUM + STRONTIUM

15-13617 A STUDY OF FISSION PRODUCT LEVELS AND METABOLISM IN FOOD PRODUCING ANIMALS AS DETERMINED BY WHOLE BODY COUNTING. PROGRESS REPORT, AUGUST 15, 1965 THROUGH AUGUST 15, 1966
ILLINOIS UNIVERSITY, URBANA
COO-1339-3 +. 37 PAGES, 1966

THE ILLINOIS ANIMAL SCIENCE COUNTER (ILLASCO) HAS BEEN CALIBRATED FOR K-40 GAMMA DETECTION EFFICIENCY IN HUMAN BEINGS BY MEANS OF INTRAVENOUS K-42 INJECTION OF 25 MALE VOLUNTEERS. POTASSIUM-40 MEASUREMENTS ARE BEING STUDIED IN RELATION TO GROWTH AND AS A MEANS OF SELECTING BREEDING STOCK IN BOTH SHEEP AND SWINE. CESIUM-137 RETENTION HAS BEEN MEASURED IN CATTLE AND SHEEP. RETENTIONS IN BOTH SPECIES CAN BE DESCRIBED AS 3-COMPONENT SUMS OF EXPONENTIALS. CALVES EXCRETED CS-137 MORE RAPIDLY THAN COWS. METHOD FOR STUDYING CA-47 KINETICS IN DAIRY GOATS WERE DEVELOPED. FROM NOVEMBER 15, 1965, TO AUGUST 15, 1966, FIFTEEN INJECTIONS OF CA-47 WERE MADE IN EACH OF 5 ANIMALS. BLOOD SPECIFIC ACTIVITY-TIME CURVES AND WHOLE-BODY RETENTIONS WERE OBTAINED AND EXCHANGEABLE CA POOL SIZES (E) AND POOL HALF-LIVES WERE CALCULATED. BEFORE PREGNANCY AND DURING EARLY PREGNANCY, E REMAINED RATHER CONSTANT IN INDIVIDUAL ANIMALS AND RANGED BETWEEN 3 GM CA AND 14 GM CA IN 5 GOATS. POOL HALF-LIVES VARIED FROM 20 HOURS TO 32 HOURS. DURING LATE PREGNANCY, POOL HALF-LIVES DECREASED AS PARTURITION APPROACHED TO A LOW AT 11 HOURS. AN INVESTIGATION OF SR-85 RETENTION IN PIGS HAS BEEN INITIATED. THE EFFECTS OF AGE AT WHICH SR-85 IS ADMINISTERED AND OF DIETARY CA AND P CONTENT ON RETENTION ARE BEING STUDIED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$2.00 CY, \$0.50 MN

*BIOLOGICAL CONCENTRATION, ANIMAL + CALCIUM + CESIUM + COUNTER, WHOLE BODY + INGESTION + STRONTIUM

15-13618 EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966
E. I. DU PONT DE NEMOURS AND COMPANY, SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
DPST-66-30-2 +. 17 PAGES, AUGUST 1966

THIS REPORT, FOR THE PERIOD JANUARY 1 THROUGH JUNE 30, 1966, PRESENTS THE RESULTS OF THE ENVIRONMENTAL MONITORING PROGRAM FOR THE ATMOSPHERE, VEGETATION AND FOOD, AND WATER. THE QUANTITY OF RADIOACTIVE WASTE RELEASED BY THE SAVANNAH RIVER PLANT TO ITS ENVIRONS WAS, FOR THE MOST PART, TOO SMALL TO BE DISTINGUISHED FROM NATURAL BACKGROUND RADIATION OR WAS OBSCURED BY WORLDWIDE FALLOUT FROM NUCLEAR WEAPONS TESTING. FALLOUT FROM THE CHINESE NUCLEAR TEST ON MAY 9, 1966, WAS DETECTED AT SRP.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 \$1.00 CY \$0.50 MN

*SAVANNAH RIVER PLANT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + CESIUM + FALLOUT + GAMMA + RIVER, SAVANNAH + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + TRITIUM

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13619 MIETTINEN JK
INVESTIGATIONS OF RADIOACTIVITY IN MAN AND HIS ENVIRONMENT IN THE FINNISH LAPLAND
HELSINKI UNIVERSITY, FINLAND
NP-16002, PAPER 1 + CONF-660405 +. 15 PAGES, 1966

RESULTS OF RESEARCH CONCERNING FALLOUT FROM NUCLEAR EXPLOSIONS ARE PRESENTED. MOST EFFORT WAS DEVOTED TO A STUDY OF NORTHERN LAPLAND. TECHNOLOGY WAS DEVELOPED TOWARD CAPACITIES TO MAKE RELIABLE PREDICTIONS IF NEW FALLOUT SITUATIONS ARISE.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*FALLOUT + *FINLAND + ECOLOGICAL CONSIDERATION + NUCLEAR EXPLOSION DEBRIS + POPULATION EXPOSURE

15-13620 JOKELAINEN A
CS-137 IN SOME FINNISH DIETS IN 1962
HELSINKI UNIVERSITY, FINLAND
NP-16002, PAPER 9 + CONF-660405-12 +. 10 PAGES, 1966, PRESENTED TO THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, SEPTEMBER 5-10, 1966

RESULTS OF A DIETARY SURVEY OF FAMILIES IN FINNISH LAPLAND ARE PRESENTED. THESE DATA WERE CORRELATED WITH DATA ON CS-137 CONTENT OF THE DIET FOOD, AND DATA ON CS-137 BODY BURDEN.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, MAN + *CESIUM + *FINLAND + DIETARY HABIT

15-13621 BARTH DS
BIENVIRONMENTAL RADIATION RESEARCH PROJECT
PUBLIC HEALTH SERVICE, LAS VEGAS, NEVADA, SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
CONF-660538-1 +. 20 PAGES, MAY 23, 1966, FROM AMERICAN PUBLIC HEALTH ASSOCIATION MEETING, LAS VEGAS, NEVADA

A DESCRIPTION IS GIVEN OF A RESEARCH PROGRAM CREATED FOR THE GENERAL MISSION OF DEVELOPING HUMAN RADIOIODINE EXPOSURE-DOSE RELATIONSHIPS FOR A VARIETY OF FIELD SOURCES AND A VARIETY OF REALISTIC MODIFYING PARAMETERS. ORGANIZATION, FACILITIES, EQUIPMENT, AND GENERAL APPROACH TO THE MANY PROBLEMS TO BE SOLVED ARE PRESENTED. BRIEF DESCRIPTIONS OF TYPES OF FIELD EXPERIMENTS WHICH HAVE BEEN CONDUCTED ARE GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$1.00 CY, \$0.50 MN

*IODINE + ECOLOGICAL CONSIDERATION + METEOROLOGY + POPULATION EXPOSURE + RADIATION PROTECTION, ORGANIZATION + RADIATION SAFETY AND CONTROL

15-13623 GOHAR HA + HASHISH SE + HASSAN A + MOULOKHIA K
AN EXPERIMENTAL STUDY OF SR-90 CONTAINED IN MARINE ANIMALS FOLLOWING POSSIBLE RELEASE OF RADIOACTIVE WASTE IN SEA WATER. FINAL REPORT 1963-1964
THE INSTITUTE OF OCEANOGRAPHY, U.A.P. + ATOMIC ENERGY ESTABLISHMENT
NP-15156 +. 65 PAGES, 1964

A PROJECT DEALING WITH THE NATURE AND KINETICS OF SR-90 UPTAKE AND RELEASE BY AND FROM AN ABUNDANT GASTROPOD - NERITA FERAKALI RECLUZ IN THE RED SEA AREA WAS CARRIED OUT. THE RESULTS OBTAINED ARE SUMMARIZED AS FOLLOWS - (1) LOWERING THE BATHING FLUID TEMPERATURE IN STEPS FROM 38 C TO 10 C, HAS CAUSED SLOWING OF THE SR-90 UPTAKE BY THE SHELL. FOR THE SOFT TISSUES, LOWERING THE TEMPERATURE HAS SLIGHTLY BUT NOT SIGNIFICANTLY AFFECTED THE RATE OF SR-90 UPTAKE. FOR SR-90 RELEASE PROCESS, LOWERING THE TEMPERATURE, HAS NOT AFFECTED THE RETAIN OF SR-90 BY THE SHELL, NOR IT HAS AFFECTED THE RATE OF SR-90 RELEASE FROM THE SOFT TISSUES. LOWERING THE PH FROM 7.0 TO 6.0 HAS CAUSED GREATER SR-90 UPTAKE BY THE SHELLS, AND THE SOFT TISSUES. RAISING THE PH FROM 7.0 TO 8.0 HAS CAUSED A SLIGHT DECREASE IN SR-90 UPTAKE BY BOTH THE SHELLS AND THE SOFT TISSUES. THE UPTAKE OF SR-90 BY THE SHELLS WAS IN GENERAL DEPRESSED BY THE ADDITION OF INHIBITORS, SUCH AS CYANIDE, AZIDE AND IODOACETATE. THE UPTAKE BY THE SOFT TISSUES WAS NOT AFFECTED BY THE INHIBITOR ADDITION. X-RAY DIFFRACTION STUDIES PERFORMED ON THE INNER, OUTER, AND MIXED LAYERS OF THE SHELL HAVE REVEALED THE PRESENCE OF CALCITE AND ARAGONITE FORMS OF CALCIUM CARBONATE IN THE SHELL.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + *STRONTIUM + CALCIUM + ECOLOGICAL CONSIDERATION + IODINE + ZINC

15-13624 RADIOACTIVE CONTAMINATION LEVELS IN THE ENVIRONMENT AND IN THE FOOD CHAIN. ANNUAL REPORT, 1964
EUROPEAN ATOMIC ENERGY COMMUNITY, BELGIUM
EUR-2520.F +. 1964, 31 PAGES, IN FRENCH

MAIN ITEMS STUDIED UNDER THE EUR-CEA CONTRACT OF ASSOCIATION DURING 1964 ARE DESCRIBED IN THIS REPORT. STUDIES PREVIOUSLY INITIATED IN THE GASTRO-INTESTINAL TRACT AND IODINE METABOLISM IN CHILDREN HAVE BEEN PUSHED AHEAD AND SOME PARTIAL RESULTS OBTAINED. THE GASTRO-INTESTINAL TRACT STUDY HAS BEEN ROUNDED OFF BY THE ELABORATION OF A NEW MATHEMATICAL MODEL. THE FOOD CHAIN STUDIES HAVE BEEN COMPLETED AND WORK HAS STARTED ON THE ANALYSIS OF THIS DATA. PARTIAL

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13624 *CONTINUED*

RESULTS CONCERNING AVERAGE CONSUMPTION HAVE BEEN OBTAINED. THE STUDY ON THE TRANSFER OF RADIOACTIVE CONTAMINATION FROM POLLUTION SOURCES TO FOODSTUFFS HAS BEEN CARRIED OUT BY MEANS OF A PROGRESSIVE METHOD OF APPROACH.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE), ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*ECOLOGICAL CONSIDERATION + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + DIETARY HABIT + IODINE

15-13625 RADIOACTIVITY SURVEY DATA IN JAPAN. NUMBER 6
NATIONAL INSTITUTE OF RADIOLOGICAL SCIENCES, CHIBA, JAPAN
NP-15883 +. 24 PAGES, FEBRUARY 1965

SINCE 1954, RAIN WATER AND FALLOUT DUST HAVE BEEN COLLECTED MONTHLY IN A RECEIVER AT THE METEOROLOGICAL RESEARCH INSTITUTE, TOKYO, AND THE CONTENT OF STRONTIUM-90 AND CESIUM-137 HAVE BEEN DETERMINED. THE SAMPLES, COLLECTED MONTHLY AT SIX STATIONS IN JAPAN, HAVE ALSO BEEN ANALYZED. THE RESULTS OF OBSERVATION DURING THE PERIOD FROM AUGUST 1963 TO DECEMBER 1964 ARE GIVEN.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*JAPAN + *SURVEY, RADIATION, ENVIRONMENTAL + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + CESIUM + FALLOUT + PARTICULATE + RAINOUT + STRONTIUM + WATER, DRINKING + WATER, GENERAL

15-13626 FULLER WH + HARDCASTLE JE + HANNAPEL RJ + BOSMA S
CALCIUM-45 AND STRONTIUM-89 MOVEMENT IN SOILS AND UPTAKE BY BARLEY PLANTS AS AFFECTED BY CA(AC)2 AND SR(AC)2 TREATMENT OF THE SOIL
UNIVERSITY OF ARIZONA
13 PAGES, 3 TABLES, 7 FIGURES, 10 REFERENCES, JANUARY 3, 1966, SOIL SCIENCE 101(6) PAGES 472-484 (JUNE 1966)

CALCIUM AND STRONTIUM ACETATE SUBSTANTIALLY EFFECTED THE MOVEMENT OF CONTAMINATING RADIOSTRONTIUM IN CALCAREOUS, ACID, ORGANIC AND GYPSIFEROUS SOILS. THE EXTENT OF THE MOVEMENT VARIED WITH THE SOIL. THE RATE OF MOVEMENT OF SR-89 AND CA-45 FOR THE SIX SOILS INVOLVED DECREASED. THE CATION-EXCHANGE CAPACITY OF THE SOILS INCREASED. UPTAKE BY BARLEY SEEDLINGS OF THE RADIOSTRONTIUM AND RADIOCALCIUM REMAINING IN THE SOIL COLUMNS WAS FOUND TO CORRELATE DIRECTLY WITH THE NA(AC)-EXTRACTABLE (PRESUMABLY EXCHANGEABLE) RADIOELEMENTS.

*MINERAL EXCHANGE + AGRICULTURAL CONSIDERATION + BIOLOGICAL CONCENTRATION, VEGETATION + CALCIUM + ION EXCHANGE + SOIL, PROPERTY + SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM

15-13627 RADIOACTIVITY IN MILK 1964
AGRICULTURAL RESEARCH COUNCIL, RADIOBIOLOGICAL LABORATORY, WINTAGE, ENGLAND
ARCRL-13 +. 15 PAGES, FEBRUARY 1965

THIS INTERIM REPORT CONTAINS THE RESULTS OF MEASUREMENTS OF RADIOACTIVITY IN MILK IN GREAT BRITAIN BETWEEN JULY AND DECEMBER 1964. NO IODINE-131 WAS DETECTED IN MILK UP TO THE MIDDLE OF OCTOBER. AFTER THE DETONATION OF THE CHINESE NUCLEAR DEVICE AT THAT TIME, LEVELS OF IODINE-131 REMAINED BELOW THE LIMIT OF ACCURATE DETECTION (ABOUT 10 PC/LITRE) ALTHOUGH ITS PRESENCE WAS INDICATED IN ONE OR TWO SAMPLES. IN THE SECOND HALF OF 1964 THERE WAS A GENERAL DECREASE IN THE CONTAMINATION OF MILK WITH STRONTIUM-90 AND CESIUM-137. THIS TREND WAS EVIDENT IN ALL ZONES OF THE COUNTRY-WIDE SURVEY, AND IT ALSO APPLIED TO THE MAJORITY OF SPECIAL SITES. THE COUNTRY-WIDE RATIO OF STRONTIUM-90 TO CALCIUM IN MILK DURING THE LAST SIX MONTHS OF 1964 AVERAGED ABOUT TWO-THIRDS OF THAT IN THE CORRESPONDING PERIOD OF 1963. THE CONCENTRATION OF CESIUM-137 IN MILK FROM THE COUNTRY-WIDE SURVEY CHANGED IN A MANNER SIMILAR TO THAT OF STRONTIUM-90. THE LEVELS OF STRONTIUM-90 AND CESIUM-137 IN MILK DURING THE FIRST PART OF 1964 EXCEEDED THOSE AT THE CORRESPONDING TIME IN 1963.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVENUE, NEW YORK, NEW YORK 10022 \$0.50 CQPY

*BIOLOGICAL CONCENTRATION, MILK + *UNITED KINGDOM + CALCIUM + CESIUM + FALLOUT + IODINE + POPULATION EXPOSURE + STRONTIUM

15-13628 KALMON B + HULETT SH
ENVIRONMENTAL RADIATION LEVELS AND CONCENTRATIONS FIRST HALF 1966
GOODYEAR ATOMIC CORPORATION, PIKETON, OHIO
GAT-528 +. 10 PAGES, SEPTEMBER 1, 1966

THIS REPORT SUMMARIZES SURVEYS OF RADIATION AND CONTAMINATION LEVELS, FOR THE FIRST HALF OF 1966, IN THE VICINITY OF THE PORTSMOUTH AREA GASEOUS DIFFUSION PLANT. ENVIRONMENTAL SAMPLES GENERALLY ARE COLLECTED ON A MONTHLY BASIS, WITHIN FIVE MILES OF THE PLANT, AT LOCATIONS CHOSEN BECAUSE OF ACCESSIBILITY, PREVAILING WIND DIRECTION, OR BECAUSE THE LOCATIONS ARE THE MOST REPRESENTATIVE. SIGNIFICANT REDUCTIONS IN AVERAGE RADIATION AND CONTAMINATION LEVELS WERE NOTED DURING THIS REPORTING PERIOD. THESE REDUCTIONS WERE IN WATER CONCENTRATIONS FOR BOTH ALPHA AND BETA-GAMMA ACTIVITIES, IN BACKGROUND DOSE-RATE LEVELS, AND IN ALPHA AIRBORNE ACTIVITY. THE BETA-GAMMA AIRBORNE ACTIVITY INCREASED OVER THE PREVIOUS SIX-MONTH AVERAGE, BUT THE INCREASE WAS SO SMALL THAT THE STATISTICAL COUNTING ERROR IS SIGNIFICANT. THE AVERAGE CONCENTRATIONS OF ENVIRONMENTAL ACTIVITY, BASED ON THE PERCENTAGE OF THE AEC

ACCESSION NUMBER 15-13624 TO 15-13628

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13628 *CONTINUED*

CONCENTRATION STANDARDS, ARE - AIRBORNE ALPHA ACTIVITY - 7.3 PERCENT, AIRBORNE BETA-GAMMA - 0.03 PERCENT, WATER BETA-GAMMA - 1.19 PERCENT, AND BACKGROUND DOSE RATE EXTRAPOLATED TO 3 FEET ABOVE THE GROUND - 17.7 PERCENT. A COMPARISON OF THESE AND PAST AVERAGES WITH AVERAGES PUBLISHED IN RADIOLOGICAL HEALTH DATA, 6, 9, SEPTEMBER 1965, INDICATES THAT THE PORTSMOUTH AREA AVERAGES ARE VERY SIMILAR TO THOSE IN OTHER PARTS OF THE UNITED STATES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$1.00 COPY, \$0.50 MICROFICHE

*PORTSMOUTH PLANT + *SURVEY, RADIATION, ENVIRONMENTAL + AIR + ALPHA EMITTER + BETA EMITTER + DOSE MEASUREMENT, EXTERNAL + GAMMA EMITTER + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + SAMPLING + WATER, GENERAL

15-13639 BROECKER WS + BONEBAKKER ER + ROCCO GG

THE VERTICAL DISTRIBUTION OF CESIUM 137 AND STRONTIUM 90 IN THE OCEANS, 2 LAMONT GEOLOGICAL OBSERVATORY, COLUMBIA UNIVERSITY + TRACERLAB
5 PAGES, 3 FIGURES, 2 TABLES, 7 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 7(8), PAGES 1999-2003, (APRIL 15, 1966)

FURTHER DATA ARE PRESENTED IN SUPPORT OF OUR PREVIOUS CONCLUSION THAT THE VERTICAL DISTRIBUTIONS OF CS-137 AND SR-90 ARE IN ACCORD WITH THE OCEAN MIXING RATES DEMANDED BY THE DISTRIBUTION OF NATURAL RADIOCARBON IN THE SEA. AS OF EARLY 1963 NO SIGNIFICANT ACTIVITY APPEARS TO HAVE PENETRATED BELOW 500 METERS IN EITHER THE NORTH ATLANTIC OR EQUATORIAL PACIFIC OCEANS. A METHOD FOR SHIPBOARD SEPARATION OF CS AND SR FROM 200-LITER BATCHES OF SEAWATER IS OUTLINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.75 MICROFICHE

*CESIUM + *OCEAN AND SEA + *STRONTIUM + DISPERSION

15-13645 BATTLE J

CALCULATING ERD DURING A PROLONGED EXPOSURE IN A FALLOUT ENVIRONMENT
RESEARCH TRIANGLE INSTITUTE
NP-14774 +. 19 PAGES, REFERENCES, JUNE 8, 1964

THE EQUIVALENT-RESIDUAL-DOSE (ERD) CONCEPT PROPOSED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION PERMITS A MORE RELIABLE PREDICTION OF THE MEDICAL EFFECTS OF NUCLEAR RADIATION EXPOSURE DURING EMERGENCIES. THIS STUDY DESCRIBES A SIMPLE COMPUTER TOOL FOR CALCULATING ERD UNDER A VARIETY OF FALLOUT CONDITIONS, LEVELS OF PROTECTION, AND TIME-VARYING EXPOSURE PATTERNS. SEVERAL APPLICATIONS OF THE TOOL ARE PRESENTED. ONE IS THE DETERMINATION OF TIME SAVED IN THE RECOVERY OF ACTIVITIES AS A FUNCTION OF DECONTAMINATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA.

*CIVIL DEFENSE + *DOSE + *RADIATION EFFECT + BIOMEDICAL + COMPUTER PROGRAM + DECONTAMINATION + DOSE CALCULATION, EXTERNAL + FALLOUT + RADIATION PROTECTION, ORGANIZATION + RADIATION SAFETY AND CONTROL

15-13656 BONNER NA + MISKEL JA

RADIOACTIVITY. DISTRIBUTION FROM CRATERING IN BASALT
LAWRENCE RADIATION LAB., LIVERMORE, CALIFORNIA
4 PAGES, SCIENCE, VOL. 150, PAGES 489-492, (OCTOBER 22, 1965)

SAMPLES OF AIRBORNE AND GROUND-DEPOSITED DEBRIS PRODUCED BY AN EXPERIMENT IN NUCLEAR EXCAVATION WERE ANALYZED TO DETERMINE THE FATE OF VARIOUS RADIOACTIVE NUCLIDES. A FEW TENTHS PERCENT OF THE NONVOLATILE SPECIES AND 10 TO 20 PERCENT OF THE VOLATILE SPECIES ESCAPED BEYOND THE IMMEDIATE VICINITY OF THE CRATER.

*NUCLEAR EXPLOSION DEBRIS + EXCAVATION, NUCLEAR + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + SOIL, NUCLIDE OCCURRENCE

15-13657 HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 13, 1966

OAK RIDGE NATIONAL LABORATORY
ORNL-4007 +. 300 PAGES, FIGURES, TABLES, OCTOBER 1966

RECENT DATA AND FINDINGS ARE SUMMARIZED IN THE AREAS OF (1) WASTE DISPOSAL, (2) RADIATION ECOLOGY, (3) RADIATION PHYSICS, (4) RADIATION DOSIMETRY, (5) INTERNAL DOSIMETRY, AND (6) HEALTH PHYSICS TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$7.00 CY, \$1.50 MN

*WASTE DISPOSAL, TERRESTRIAL + AEROSOL + AMERICIUM + BIOLOGICAL CONCENTRATION, GENERAL + CERIUM + CESIUM + DOSE CALCULATION, INTERNAL + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, GENERAL + ECOLOGICAL CONSIDERATION + HAZARDS ANALYSIS + HEALTH PHYSICS TRAINING + KRYPTON + MINERAL EXCHANGE + PLUTONIUM + POPULATION EXPOSURE + RADIATION EFFECT + RADIATION SAFETY AND CONTROL + RIVER, CLINCH + RUTHENIUM + STRONTIUM + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, SALT

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13658 HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1965
OAK RIDGE NATIONAL LABORATORY
ORNL-3849 +. 225 PAGES, FIGURES, TABLES, OCTOBER 1965

RECENT DATA AND FINDINGS ARE SUMMARIZED IN THE AREAS OF (1) WASTE DISPOSAL, (2) RADIATION ECOLOGY, (3) RADIATION PHYSICS, (4) RADIATION DOSIMETRY (5) INTERNAL DOSIMETRY, AND (6) HEALTH PHYSICS TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U. S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 CY

*WASTE DISPOSAL, TERRESTRIAL + AEROSOL + AMERICIUM + BIOLOGICAL CONCENTRATION, GENERAL + CESIUM + CURIUM + DOSE CALCULATION, INTERNAL + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, GENERAL + ECOLOGICAL CONSIDERATION + HAZARDS ANALYSIS + HEALTH PHYSICS TRAINING + KRYPTON + MINERAL EXCHANGE + PLUTONIUM + POPULATION EXPOSURE + RADIATION EFFECT + RADIATION SAFETY AND CONTROL + RIVER, CLINCH + RUTHENIUM + STRONTIUM + TRITIUM + WASTE DISPOSAL, ECONOMICS + WASTE DISPOSAL, GENERAL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, SALT

15-13662 MALSKAYA RV
ON THE RADIOACTIVITY OF UNDERGROUND WATERS OF THE WESTERN UKRAINIAN REGION
5 PAGES, 5 FIGURES, 3 REFERENCES, GEOKHIMIYA 12, PAGES 1487-1491, (DECEMBER, 1965), ABSTRACT ONLY

THE SUBTERRANEAN WATERS OF THE SOUTHWESTERN REGION OF THE UKRAINE (THE SOUTHWESTERN EDGE OF THE RUSSIAN PLATEAU, THE PRE-CARPATHIAN DEPRESSION, CARPATHIAN SLOPES, AND THE AFTER-CARPATHIAN DEPRESSION) HAVE BEEN STUDIED FOR SEVERAL YEARS WITH REGARD TO THEIR CONTENT OF RADIOACTIVE MATERIALS (URANIUM AND RADIUM). ACCUMULATED MATERIAL ON THE RADIOHYDROGEOLOGICAL SAMPLES OF THESE SUBTERRANEAN WATERS MAKES IT POSSIBLE TO DETERMINE THE NATURAL RADIOHYDROCHEMICAL BACKGROUND AND VALUES OF ANOMALOUS HIGH CONTENTS OF RADIOACTIVE ELEMENTS IN THE SUBTERRANEAN WATERS OF EACH AQUIFER COMPLEX.

*HYDROLOGICAL CONSIDERATION, QUALITY OF WATER + RADIUM + UNION OF SOVIET SOCIALIST REPUBLICS + URANIUM

15-13709 CROSSLEY DA
BIOLOGICAL ELIMINATION OF RADIONUCLIDES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
3 PAGES, 18 REFERENCES, NUCLEAR SAFETY 5(3) PAGES 265-268 (SPRING 1964)

THE ELIMINATION OF ASSIMILATED RADIONUCLIDES BY MEANS OF THE BIOLOGICAL PROCESSES TAKING PLACE IN ORGANISMS HAS SEVERAL IMPLICATIONS FOR NUCLEAR SAFETY. ONE OBVIOUSLY IMPORTANT USAGE OF ELIMINATION RATES IS FOR PREDICTING THE ACCUMULATION OF RADIONUCLIDES BY THE HUMANS WHO MAY BE EXPOSED, OCCASIONALLY OR CHRONICALLY TO RADIOACTIVE CONTAMINANTS IN THEIR FOOD OR WATER SUPPLY. MEASUREMENT OF BIOLOGICAL LOSS RATES ASSISTS IN THE ESTIMATION OF RATES OF MOVEMENT OF RADIONUCLIDES ALONG FOOD CHAINS AND THE CONCENTRATION OF RADIONUCLIDES WHICH MAY BE REACHED BY LINKS OF FOOD CHAINS.

*BIOLOGICAL CONCENTRATION, GENERAL + ECOLOGICAL CONSIDERATION

15-13710 TAMURA T
SELECTIVE SORPTION REACTIONS OF CESIUM WITH SOIL MINERALS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
4 PAGES, 1 FIGURE, NUCLEAR SAFETY 5(3) PAGES 262-265 (SPRING 1964)

SELECTIVE SORPTION REACTIONS OF CESIUM- AND STRONTIUM-BEARING SOLUTIONS ARE OF PARTICULAR INTEREST IN GROUND DISPOSAL OPERATIONS BECAUSE SUCH SOLUTIONS CONTAIN MACROCONCENTRATIONS OF STABLE IONS, WITH ONLY MICROCONCENTRATIONS OF RADIOACTIVE IONS. IT IS ALSO EVIDENT FROM FALLOUT CONTAMINATION STUDIES THAT SELECTIVE SORPTION PLAYS AN IMPORTANT PART IN REDUCING THE MOVEMENT OF RADIONUCLIDES INTO THE DEEPER SOIL LAYERS AND IN REDUCING THE UPTAKE OF RADIONUCLIDES BY PLANTS. THE REACTIONS OF BOTH CESIUM AND STRONTIUM HAVE BEEN INTENSIVELY INVESTIGATED, AND BOTH THESE ELEMENTS HAVE SHOWN SELECTIVE SORPTION REACTIONS.

*CESIUM + *MINERAL EXCHANGE + *STRONTIUM + POTASSIUM + SOIL, PROPERTY

15-13724 WATER RESOURCES BULLETIN
AMERICAN WATER RESOURCES ASSOCIATION
39 PAGES, WATER RESOURCES BULLETIN 2(2) JUNE 1966

AMERICAN WATER RESOURCES ASSOCIATION BULLETIN, APRIL 1966. THIS REPORT IS ONE OF A SERIES OF SUCH BULLETINS DEALING WITH THE LATEST SOURCES OF INFORMATION ON WATER RESOURCES.

*HYDROLOGICAL CONSIDERATION, GENERAL + *WATER, GENERAL + HYDRAULIC ANALYSIS + HYDRAULIC EFFECT

15-13726 MIRONOV OG
CONTAMINATION OF VEGETATION BY RADIOACTIVE FALLOUT
3 PAGES, 2 FIGURES, 1 TABLE, 3 REFERENCES, ATOM. ENERGIYA 18(6), PAGES 659-661 (JUNE, 1965)

A CONTROLLED ENVIRONMENTAL EXPERIMENT IS DESCRIBED WHICH WAS DESIGNED TO DISTINGUISH BETWEEN NATURAL AND FALLOUT RADIOACTIVITY IN NATURAL VEGETATION AND TO FURTHER DISTINGUISH BETWEEN SURFACE CONTAMINATION AND BIOLOGICAL ACCUMULATION FROM THE SOIL. THE RESULTS WERE INCONCLUSIVE.

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13726 *CONTINUED*

*FALLOUT + BIOLOGICAL CONCENTRATION, VEGETATION + CERIUM + CESIUM + GROSS BETA + RADIOCHEMICAL ANALYSIS + RUTHENIUM + SOIL, NUCLIDE OCCURRENCE + SPECTROMETRY, GAMMA + STRONTIUM + UNION OF SOVIET SOCIALIST REPUBLICS + ZIRCONIUM

15-13754 WHICKER FW + FARRIS GC + DAHL AH

WILD DEER AS A SOURCE OF RADIONUCLIDE INTAKE BY HUMANS AND AS INDICATORS OF FALLOUT HAZARDS
COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO

IRPA-146 +. 11 PAGES, 4 TABLES, 22 REFERENCES, PAPER PRESENTED TO FIRST INTERNATIONAL CONGRESS OF IRPA IN ROME, ITALY, SEPTEMBER 5-10, 1966

CONCENTRATIONS OF VARIOUS FALLOUT RADIONUCLIDES WERE MEASURED IN NATIVE FORAGE AND IN TISSUES OF WILD MULE DEER OVER A FIVE YEAR PERIOD IN NORTH-CENTRAL COLORADO. CONCENTRATIONS OF CS-137 IN DEER FLESH WERE 5 TO 13 TIMES HIGHER THAN CONCENTRATIONS REPORTED IN BEEF AND IN PORK. THE DATA INDICATED THAT CONSUMPTION OF DEER FLESH COULD RESULT IN A CS-137 INTAKE WHICH COULD POSSIBLY EXCEED THE INTAKE OF THE NUCLIDE FROM THE TOTAL DIET. CONSUMPTION OF DEER LIVER WOULD RESULT IN THE INGESTION OF CE-144, CS-137, MN-54, AND RU-106. THE DATA INDICATED THAT DEER TISSUES CAN BE USEFUL AND, IN SOME CASES, UNUSUALLY SENSITIVE INDICATORS OF ENVIRONMENTAL CONTAMINATION BY CE-144, CS-137, I-131, MN-54, RU-106, AND SR-90. RELATIONSHIPS BETWEEN FORAGE AND DEER TISSUE FOR CS-137, I-131 AND SR-90 WERE INVESTIGATED. DURING 1963, THE RADIATION DOSE TO THE SKELETON OF YEARLING DEER FROM SR-90 AVERAGED 330 MRADS, WHICH WAS GENERALLY HIGHER THAN THE TOTAL DOSE FROM NATURAL BACKGROUND AND OTHER SOURCES COMBINED. DURING THE SAME PERIOD, THE SR-90 CONCENTRATIONS IN DEER BONE WERE HIGHER BY A FACTOR OF 35 THAN REPORTED BONE LEVELS IN HUMANS. DURING THE STUDY, DOSE RATES TO DEER THYROID, LIVER, AND MUSCLE REACHED 20, 0.014, AND 0.012 RADS/YEAR, RESPECTIVELY.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, VEGETATION + CERIUM + CESIUM + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + INGESTION + MANGANESE + RUTHENIUM + STRONTIUM + SURVEY, RADIATION, ENVIRONMENTAL

15-13755 CLOUTIER RJ + DALTON CP

RADIATION SAFETY PROBLEMS CONNECTED WITH THE MEDICAL USE OF RADIOISOTOPES
OAK RIDGE ASSOCIATED UNIVERSITIES, INC., OAK RIDGE, TENNESSEE

IRPA-207 +. 14 PAGES, 1 TABLE, 9 FIGURES, 34 REFERENCE, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

THIS PAPER DISCUSSES RADIATION SAFETY ASPECTS OF THE USE OF RADIOPHARMACEUTICALS. SEVERAL INGENUOUS DEVICES FOR HANDLING RADIOISOTOPES DURING PREPARATION AND ADMINISTRATION ARE DESCRIBED, AND A NUMBER OF SUGGESTIONS ARE MADE FOR FURTHER IMPROVEMENT. THE EXISTING STANDARDS FOR CONTROL OF PATIENTS AND VISITORS ARE EVALUATED, WITH PARTICULAR ATTENTION TO CRITERIA FOR HOSPITALIZATION OF PATIENTS GIVEN RADIOISOTOPES. EARLY INVESTIGATIONS DURING AUTOPSIES PERFORMED ON RADIOACTIVE BODIES INDICATED THAT THERE WOULD BE NO SIGNIFICANT HAZARDS IF THE ACTIVITY INVOLVED WERE FIVE MILLICURIES OR LESS. THIS TOPIC IS REVIEWED ON THE BASIS OF CONTINUED EXPERIENCE WITH THE PROBLEM. THE NEED FOR TRAINING MEDICAL PERSONNEL IN RADIATION PROTECTION IS APPARENT. GUIDELINES HAVE BEEN SET FOR THE PHYSICIAN, BUT FEW EXIST FOR NURSES AND OTHER HOSPITAL PERSONNEL. PROPOSALS ON WHAT THIS TRAINING SHOULD INCLUDE ARE PRESENTED. CURRENTLY EACH USER OF MEDICAL RADIOISOTOPES HAS DEVELOPED HIS OWN METHODS OF COMPLYING WITH EXISTING REGULATIONS, BUT THERE IS LITTLE INTERCOMMUNICATION TO HELP IMPROVE INDIVIDUAL PROGRAMS. BY OUTLINING THE PRESENT STATUS OF MEDICAL RADIATION SAFETY, THE AUTHORS HOPE TO STIMULATE FURTHER DISCUSSION AND TO ENCOURAGE MORE EXTENSIVE PUBLICATION OF SOLUTIONS TO MEDICAL RADIATION PROTECTION PROBLEMS.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*RADIATION SAFETY AND CONTROL + HAZARD, RELATIVE + HEALTH PHYSICS TRAINING + RADIOISOTOPE + REGULATION, GENERAL

15-13756 JAMMET HP + GUGORA R + LEGO R + HARBLE G + FAES M

CLINICAL OBSERVATION AND TREATMENT OF AN ACCIDENTAL WHOLE BODY EXPOSURE
CENTRE D'ETUDES NUCLEAIRES DE MOL

IRPA-164 +. 57 PAGES, 35 FIGURES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

THE PAPER DEALS WITH A RADIOLOGICAL ACCIDENT WHICH HAPPENED RECENTLY NEAR A NUCLEAR REACTOR. THE GENERAL SYNDROME HAS BEEN AN INITIAL IMPORTANT SHOCK PHASE WITH VOMITING, POLYNUCLEOSIS AND METABOLIC CHANGES - DURING THE 3-WEEK PHASE OF LATENCY THE SEVERITY OF THE INJURY WAS MADE EVIDENT BY THE BREAKING DOWN OF THE HEMATOPOIETIC FUNCTIONS - A PHASE OF 4 WEEKS CHARACTERIZED BY A FEVER STATE, A TOTAL MEDULLAR APLASIA, AND SEVERE TOXEMIC SYMPTOMS WAS FOLLOWED BY A SPECTACULAR PHASE OF RECOVERY OF THE HEMATOPOIETIC FUNCTIONS AND BY A PROLONGED PERIOD OF CONVALESCENCE. THE HEMATOLOGICAL INVESTIGATIONS REGARDING ERYTHROCYTES, RETICULOCYTES, NEUTROCYTES, LYMPHOCYTES, THROMBOCYTES, THROMBO-ELASTOGRAPHY, AND MEDULLOGRAMS AS WELL AS CYTOGENETIC EXAMINATIONS OF CHROMOSOMES PERMITTED A CLINICAL EVALUATION OF THE TOTAL RESULTING DOSE. THE LOCAL SYNDROME OF OVER-EXPOSURE OF AN INFERIOR MEMBER ADVANCED AFTER A 10-DAY PERIOD OF LATENCY IN THE SAME FASHION AS AN EXTREMELY SEVERE RADIOLESION, SHOWING THE SAME CUTANEOUS, CONNECTIVE, VASCULAR, NERVOUS AND BONY MANIFESTATIONS THAT COULD BE EXPECTED. FOR THE GENERAL SYNDROME THE TREATMENT CONSISTED OF TOTAL ISOLATION WITH BACTERIOLOGICAL CONTROL, OF THE ADMINISTRATION OF PREVENTIVE PROCEDURES AGAINST HEMORRHAGE AND OF ADEQUATE ANTIBIOTICS, DIET, ERYTHROCYTIC TRANSFUSIONS. THE

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13756 *CONTINUED*

TREATMENT OF THE LOCAL SYNDROME IS BEING CONTINUED BY BACTERIOLOGICAL ISOLATION AND APPLICATION OF VIVIFYING CREAMS AND PADUTIN.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*INCIDENT, EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + *RADIATION INJURY, TREATMENT OF + RADIATION DAMAGE

15-13757 SNYDER WS

HEALTH PHYSICS ASPECTS OF SUPERSONIC TRANSPORT

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

IRPA-116 +. 10 PAGES, 8 FIGURES, 10 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

PASSENGERS AND CREW OF A SUPERSONIC TRANSPORT (SST) WILL BE EXPOSED TO MORE INTENSE FIELDS OF COSMIC RADIATION THAN ARE USUALLY ENCOUNTERED IN COMMERCIAL FLIGHTS AT THE PRESENT TIME. THE ASSESSMENT OF THE RADIATION HAZARD POSED BY THIS NEW DEVELOPMENT MUST TAKE INTO ACCOUNT THE INTENSITY OF THE RADIATION FIELDS IN THE CRUISING ALTITUDE OF THE SST (60,000-70,000 FT), THE QUALITY FACTORS APPROPRIATE FOR THESE RADIATIONS, AND THE MANY FACTORS WHICH DETERMINE THE FREQUENCY AND DURATION OF EXPOSURE AND THE AGE DISTRIBUTION OF THE EXPOSED AS MEMBERS OF THE POPULATION. USING PRESENTLY AVAILABLE DATA ON THE RELEVANT RADIATION FIELDS, THE DOSE RATE AND DOSE EQUIVALENT RATE TO OCCUPANTS OF THE SST ARE ESTIMATED SEPARATELY FOR SOLAR COSMIC RADIATION AND FOR GALACTIC COSMIC RADIATION. THESE DOSE RATES WOULD BE CONSIDERABLY HIGHER IN THE CASE OF PLANES FLYING A POLAR ROUTE THAN FOR THOSE FOLLOWING A ROUTE AT LOWER LATITUDES. UNUSUALLY HIGH DOSE RATES MAY OCCUR DURING PERIODS OF A MAJOR SOLAR FLARE, AND IT SEEMS POSSIBLE, IN VERY EXCEPTIONAL CASES, SOME CHANGE IN FLIGHT PLANS MIGHT BE DESIRABLE TO REDUCE THE DOSE FROM SOLAR COSMIC RADIATION. THE CUMULATIVE EXPOSURE OF A CREW MEMBER WHO IS CONSTANTLY FLYING ON POLAR ROUTES MIGHT WELL BE IN THE RANGE OF THE PRESENT RECOMMENDED LEVELS FOR OCCUPATIONAL EXPOSURE. THE DOSE FOR THE VAST MAJORITY OF PASSENGERS WOULD BE EXPECTED TO BE WELL WITHIN THE PERMISSIBLE LIMITS ON POPULATION EXPOSURE. EXTRAPOLATING PRESENT DATA ON PASSENGER MILES FLOWN PER YEAR, IT APPEARS THAT THE TOTAL CONTRIBUTION TO THE GENETIC DOSE WOULD BE WELL BELOW 1 PER CENT OF THE RECOMMENDED LIMIT OF 5 REM PER GENERATION.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*DOSE CALCULATION, EXTERNAL + *POPULATION EXPOSURE + PERSONNEL EXPOSURE, RADIATION + STRATOSPHERE

15-13758 RICHMOND CR + FURCHNER JE

ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES CORRELATIONS

LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO

IRPA-183 +. 52 PAGES, 7 TABLES, 12 FIGURES, 28 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

VALUES RECOMMENDED FOR MAXIMUM PERMISSIBLE CONCENTRATIONS (MPC) OF RADIONUCLIDES IN AIR AND WATER AND FOR RETENTION BY THE BODY AND ITS COMPONENT TISSUES ARE COMMONLY BASED ON DATA OBTAINED FROM ACUTE TRACER STUDIES IN RODENTS. CONCEPTUALLY, HOWEVER, CONDITIONS OF CHRONIC EXPOSURE FOR HUMAN SUBJECTS ARE EMBODIED IN MPC CALCULATIONS. ONE APPROACH TO RESOLVING THIS PROBLEM IS TO FIND INTERSPECIES CORRELATIONS IN RADIONUCLIDE METABOLISM AND WAYS OF EXTRAPOLATING TO MPC VALUES FOR MAN. FOLLOWING CONTINUOUS INGESTION OF A CONSTANT AMOUNT OF A MATERIAL, AN EQUILIBRIUM LEVEL WILL BE REACHED WITHIN THE BODY. THIS LEVEL IS PREDICTABLE FROM ACUTE ADMINISTRATION STUDIES. THE INTEGRAL OF THE EFFECTIVE RETENTION FUNCTION (LIMITS OF ZERO TO INFINITY) IS PROPORTIONAL TO EQUILIBRIUM LEVEL AND HAS DIMENSIONS OF MULTIPLES OF THE DAILY INTAKE - EQUILIBRIUM LEVEL IS ALSO PROPORTIONAL TO RADIATION DOSE. WE HAVE DEVELOPED INTERSPECIES CORRELATIONS OF THE FORM $Y = AX^B$, WHICH RELATE EQUILIBRIUM LEVELS (Y) OBTAINED FOR MICE, RATS, DOGS, MONKEYS AND MAN TO G BODY WT. (X) FOR H-3 (TRITIUM WATER), NA-22, K-42, MN-54, ZN-65, RB-86, I-131 AND CS-137. THE PROPORTIONALITY CONSTANT B DIFFERS FOR EACH CORRELATION. IN EACH CASE VALUES OBTAINED DIRECTLY FROM HUMAN STUDIES AGREE WELL WITH VALUES FOR MAN DERIVED FROM THE CORRELATION. WE ALSO CONSIDERED EQUILIBRIUM LEVELS AS A FUNCTION OF BODY SURFACE, METABOLIC WEIGHT AND METABOLIC RATE USING THE POWER FUNCTION (WITH AND WITHOUT THE LOG TRANSFORM) AND A FIRST DEGREE POLYNOMIAL AS MODELS. THE POLYNOMIAL RELATING EQUILIBRIUM LEVEL TO BODY SURFACE BEST DESCRIBES CESIUM METABOLISM AND ACCOUNTS FOR SHORTER TURNOVER TIMES OBSERVED IN CHILDREN.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, MAN + CESIUM + IODINE + MANGANESE + POPULATION EXPOSURE + POTASSIUM + RUBIDIUM + SODIUM + TRITIUM + ZINC

15-13759 ZIEMER PL + GEORGE RE + KESSLER WV

THE UPTAKE, RETENTION AND EXCRETION OF INHALED EUROPIUM OXIDE IN TWO HEALTHY ADULT MALES

PURDUE UNIVERSITY, LAFAYETTE, INDIANA

IRPA-160 +. 6 PAGES, 3 FIGURES, 2 TABLES, 5 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION ROME, ITALY, SEPTEMBER 5-10, 1966

BODY BURDENS AND ACTIVITY EXCRETED WERE REPEATEDLY MEASURED AFTER AN ACCIDENTAL EUROPIUM OXIDE INHALATION BY TWO ADULT MALES AT PURDUE UNIVERSITY. ISOTOPIC COMPOSITION OF THE EUROPIUM INVOLVED WAS DETERMINED TO BE 93.4 PERCENT EU-156, 3.25 PERCENT EU-155, 2.9 PERCENT EU-154, AND 0.35 PERCENT EU-152. INITIAL BODY BURDENS WERE FOUND TO BE 55 AND 38 MICROCURIES OF THE

ACCESSION NUMBER 15-13756 TO 15-13759

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13759 *CONTINUED*

MIXED EUROPIUM ISOTOPES. RETENTION AFTER THE EARLY RAPID ELIMINATION PROCESSES WAS DESCRIBED BY A POWER FUNCTION. ONE SUBJECT CLEARED 80 PERCENT OF HIS INITIAL RESPIRATORY TRACT BURDEN DURING THE FIRST DAY - THE SECOND CLEARED 89 PERCENT. BASED ON THE RECENT LUNG MODEL OF THE ICRP, INTEGRAL LUNG DOSES FOR THE TWO SUBJECTS WERE CALCULATED TO BE 6.8 AND 2.2 RAD - LOWER LARGE INTESTINE DOSES RESULTING FROM EARLY RAPID CLEARANCE WERE 3.1 AND 2.2 RAD.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*BIOLOGICAL CONCENTRATION, MAN + COUNTER, WHOLE BODY + DOSE CALCULATION, INTERNAL + EUROPIUM + INHALATION + PERSONNEL EXPOSURE, RADIATION

15-13760 FUKUDA S + NARITOMI M + IZAWA S + IZUMI Y

AIRBORNE IODINE MONITORING AT THE RADIOISOTOPE PRODUCTION TEST PLANT, JAERI
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE

IRPA-153 +. 18 PAGES, 2 TABLES, 15 FIGURES, 8 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

IN THE ISOTOPE PRODUCTION TEST PLANT, IODINE-131 IS PRODUCED BY DISTILLING IRRADIATED TELLURIC ACID (H₂TEO₄). AIRBORNE RADIOIODINE IS GENERATED IN THE CELL AND IS DISCHARGED TO THE ATMOSPHERE THROUGH A STACK AFTER PASSING THROUGH AN AIR CLEANING SYSTEM, CONSISTING OF CHARCOAL FILTERS AND HIGH EFFICIENCY PARTICULATE FILTERS. SOME MINOR PORTION OF AIRBORNE RADIOIODINE GENERATED IS LEAKED DIRECTLY OUT OF THE CELL TO THE SERVICE AREA AND OPERATION AREA, ALTHOUGH A NEGATIVE PRESSURE IS MAINTAINED IN THE CELL. TO ASSESS THE AIRBORNE RADIOIODINE CONCENTRATION IN AIR, AN EXTENSIVE RADIATION MONITORING PROGRAMME WAS PERFORMED BY USING THE VARIOUS TYPES OF MONITORING DEVICES. AN IODINE SAMPLER WAS DEVELOPED WHICH IS COMPOSED OF THREE SAMPLING COMPONENTS, I.E. HV-70 FILTER PAPER, CHARCOAL IMPREGNATED FILTER PAPER (2MM THICK, CHARCOAL CONTENT 50 WT. PERCENT) AND CHARCOAL CARTRIDGES (18MM THICK, 30-MESH GRANULAR CHARCOAL). THE SAMPLER WAS DESIGNED FOR EASE OF HANDLING, QUICK COUNTING AFTER SAMPLING AND LOW COST, AS WELL AS FOR ENSURING THE REPRODUCIBLE COLLECTION EFFICIENCY. AT SEVERAL DIFFERENT SAMPLING POSITIONS OF THE AIR CLEANING SYSTEM, THE OVERALL COLLECTION EFFICIENCY OF THE SAMPLER WAS EVALUATED BY TAKING INTO ACCOUNT THE ACTIVITY COLLECTED IN A COLD TRAP CONTAINING GRANULAR CHARCOAL WHICH IS CONNECTED IN SERIES TO THE SAMPLER. IT WAS FOUND THAT THE OVERALL COLLECTION EFFICIENCY RANGES FROM 70 PERCENT TO 98 PERCENT, HIGHLY DEPENDENT ON WHETHER THE SAMPLES WERE TAKEN AT UPPER STREAM OR DOWNSTREAM OF THE AIR CLEANING SYSTEM. DATA OBTAINED FROM THE AIRBORNE RADIOIODINE MONITORING CONDUCTED DURING AND AFTER THE PROCESSING WILL BE PRESENTED.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*IODINE + AIR + AIR CLEANING + FISSION GAS RELEASE + JAPAN + MONITOR, RADIATION, AIR + MONITOR, RADIATION, SAMPLING

15-13761 HOLTZMAN RB

RA-226 AND THE NATURAL AIRBORNE NUCLIDES PB-210 AND PO-210 IN ARCTIC BIOTA
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS

IRPA-143 +. 11 PAGES, 6 FIGURES, 3 TABLES, 20 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

TO BETTER DETERMINE THE CHARACTERISTICS AND EFFECTS ON HUMANS OF ARCTIC BIOTA WITH HIGH CONCENTRATIONS OF PB-210 AND PO-210, THESE NUCLIDES, ALONG WITH THEIR LONG-LIVED PREDECESSOR, RA-226, WERE MEASURED IN LICHENS, IN BONE AND MUSCLE OF CARIBOU AND OTHER ARCTIC ANIMALS, AND IN ESKIMO PLACENTA. IN CARIBOU BONE THE PO-210 WAS IN RADIOACTIVE EQUILIBRIUM WITH THE PB-210 AND AVERAGED ABOUT 11.7 PCI/G ASH, TWICE THE PB-210 IN REINDEER BONE. THE PB-210 CONTENT OF MUSCLE OF BOTH SPECIES WAS 10 PCI/KG (WET). BY CONTRAST, THE PO-210 CONTENT WAS MUCH GREATER, ABOUT 200 PCI/KG. A DEFINITE SEASONAL DECREASE WAS NOTED IN THE PB-210 IN MUSCLE DURING THE SECOND HALF OF THE YEAR. SIMILAR VARIATIONS WERE INDICATED FOR PO-210 IN MUSCLE AND FOR PB-210 IN BONE. THE HIGH LEVELS IN CARIBOU ARE ATTRIBUTED TO THE HIGH FALLOUT LEVELS OF THESE NUCLIDES IN LICHENS, THEIR WINTER FORAGE, WHICH CONTAIN (IN DRY WEIGHT) 6 PCI PB-210/G AND 12 PCI PO-210/G. THE OTHER ANIMALS EXHIBITED APPRECIABLY LOWER CONCENTRATIONS IN BONE AND MUSCLE. WOLF, WHICH CONSUMES LARGE QUANTITIES OF CARIBOU, EXHIBITED ACTIVITIES IN BONE OF 1 PCI/G ASH, ABOUT THAT OBSERVED IN SOME ESKIMO BONE BY HILL. THE PO-210 CONTENT OF WOLF MUSCLE WAS ABOUT THE SAME AS THAT OF CARIBOU, 200 PCI/KG, BUT THE PB-210 WAS ONLY ABOUT 1 PCI/KG. SIMILAR, BUT LESS DRAMATIC DIFFERENCES WERE OBSERVED IN ESKIMO PLACENTA. ESTIMATES OF UPTAKE SHOW THAT ESKIMOS COULD ACQUIRE SUFFICIENT OF THE LONG-LIVED PB-210 TO DOUBLE THE TOTAL SKELETAL RADIATION DOSE (RAD) OVER THAT OF MIDWESTERNERS. HOWEVER, DESPITE OF THE HIGH CONCENTRATIONS OF THE PO-210 IN MEAT, DIRECT INTAKE ACCOUNTS FOR ONLY A RELATIVELY SMALL INCREASE IN TOTAL DOSE.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*ECOLOGICAL CONSIDERATION + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, ANIMAL FEED + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, VEGETATION + FALLOUT + LEAD + POLONIUM + RADIUM

15-13762 THOMPSON RC + PALMER RF

EFFECT OF AGE AND DIET ON EXCRETION OF STRONTIUM AND CALCIUM BY RATS
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON

IRPA-105 +. 13 PAGES, 5 FIGURES, 4 TABLES, 17 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13762 *CONTINUED*
5-10, 1966

MATURE (8-MONTH OLD) AND GROWING (26-DAY OLD) RATS, FED ON DIETS VARYING IN CALCIUM CONTENT FROM 0.03-2.0 PERCENT WERE GIVEN A SINGLE INJECTION OF SR-90 AND CA-45. EXCRETION OF THESE RADIONUCLIDES, IN URINE AND FECES, WAS MEASURED OVER A PERIOD OF SIXTY DAYS. SIMILARITIES AND DIFFERENCES IN THEIR PATTERNS OF EXCRETION ARE DISCUSSED IN RELATION TO THE PROBABLE MECHANISMS RESPONSIBLE FOR THE BEHAVIOR NOTED. OF PARTICULAR INTEREST WAS THE DECREASE IN RATIO OF URINARY TO FECAL EXCRETION OF BOTH SR-90 AND CA-45 AS A FUNCTION OF TIME FOLLOWING INJECTION. THIS CHANGE WAS MORE EVIDENT IN THE ADULT THAN IN THE GROWING RAT AND WAS MOST MARKED ON A HIGH CALCIUM DIET. TO EXPLAIN THIS VARIATION IT IS HYPOTHESIZED THAT STRONTIUM AND CALCIUM RELEASED FROM FIRM BINDING SITES IN BONE MAY EXIST IN THE BLOOD IN A DIFFERENT FORM THAN STRONTIUM AND CALCIUM IN EQUILIBRIUM WITH FREELY EXCHANGEABLE SITES ON BONE SURFACES.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*STRONTIUM + BIOLOGICAL CONCENTRATION, ANIMAL + CALCIUM

15-13763 SHORE MI + FRED RK
CALCULATION OF RADIONUCLIDE CONCENTRATION CURVES IN RELATIVELY INACCESSIBLE COMPARTMENTS OF A THREE COMPARTMENT KINETIC MODEL
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, DIVISION OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND
IRPA-103 +. 10 PAGES, 6 FIGURES, 13 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

WHEN A RADIOACTIVE TRACER IS ADMINISTERED INTRAVENOUSLY, ONE CAN FOLLOW WITH RELATIVE EASE THE SPECIFIC ACTIVITY - TIME CURVE OF THE COMPOUND IN THE CIRCULATION. HOWEVER, IT IS DIFFICULT TO ESTABLISH THE SPECIFIC-ACTIVITY--TIME CURVE OF THE COMPOUND IN THE VARIOUS TISSUES OF THE ORGANISM. THE NEAREST APPROACH THAT CAN BE MADE AT THE PRESENT TIME IS THE MEASUREMENT OF ACTIVITY IN THE TOTAL ORGANISM USING WHOLE BODY COUNTING TECHNIQUES, OR EXTERNAL AND POSSIBLE INTERNAL SCANNING PROCEDURES TO OBTAIN INFORMATION ON THE SPECIFIC ACCUMULATION OF THE RADIOACTIVE TRACER IN A GIVEN TISSUE. THE PRESENT STUDY IS DESIGNED TO MAKE USE OF THE INFORMATION AVAILABLE IN THE SPECIFIC ACTIVITY CURVE OBTAINED FROM THE PLASMA IN CONJUNCTION WITH A SINGLE SPECIFIC ACTIVITY VALUE OBTAINED FROM A TISSUE TO PERMIT THE CALCULATION OF THE ACTUAL SPECIFIC-ACTIVITY--TIME CURVE OF THE COMPOUND IN THE TISSUE. THIS APPROACH HAS BEEN TESTED IN A THREE COMPARTMENT MODEL SIMULATED WITH A DIGITAL COMPUTER.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*BIOLOGICAL CONCENTRATION, GENERAL + *MATHEMATICAL STUDY

15-13766 TERESI JD + NEWCOMBE CL
AN EVALUATION OF HAZARDS FROM IMMERSION OF PLUTONIUM IN THE MARINE ENVIRONMENT
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY + SAN FRANCISCO STATE COLLEGE
IRPA-90 +. 20 PAGES, 3 TABLES, 9 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

THE POTENTIAL HAZARD DUE TO A SINGLE IMMERSION AND SUBSEQUENT RELEASE OF PLUTONIUM WAS EVALUATED ON THE BASIS OF ITS POSSIBLE INCORPORATION IN THE MARINE FOOD CHAINS INCLUDING THE ALGA, PORPHYRA, AND THE SEAWEED PRODUCTS AGAR AND ALGINIC ACID. THE HAZARDS WERE ESTIMATED BY COMPARING THE RECOMMENDED PERMISSIBLE BODY BURDENS FOR LARGE POPULATIONS (1/10TH OCCUPATIONAL PERMISSIBLE BODY BURDEN) WITH THE EXPECTED BODY BURDEN CALCULATED ON THE BASIS OF VERY CONSERVATIVE ASSUMPTIONS. THE CONCENTRATION OF PLUTONIUM FROM A SINGLE RELEASE IN THE SEA THAT WOULD LEAD TO THE PERMISSIBLE BODY BURDEN THROUGH THE FISH FOOD CHAIN WAS CALCULATED ON THE BASIS OF PUBLISHED CONCENTRATION FACTORS. THE VALUE OF THE CONCENTRATION OF PLUTONIUM TO GIVE THIS BODY BURDEN WAS FOUND TO BE 0.064 MICROCURIE PER MILLILITER ASSUMING A SINGLE INTAKE OF 200 GMS OF FISH PER INDIVIDUAL. THE EXPECTED BODY BURDENS FROM PORPHYRA, AGAR, AND ALGINIC ACID WERE THEN CALCULATED ON THE BASIS OF THE CALCULATED PLUTONIUM CONCENTRATION AND THE PUBLISHED CONCENTRATION FACTOR FOR SEAWEED. CALCULATIONS WERE ALSO MADE OF VARIOUS DIFFUSION PARAMETERS USING SIX PUBLISHED DIFFUSION MODELS TO OBTAIN AREAS OF CONTAMINATION WITH TIME AND THE DURATION OF A HAZARDOUS CONCENTRATION.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*HAZARDS ANALYSIS + *OCEAN AND SEA + *PLUTONIUM + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + DISPERSION + ECOLOGICAL CONSIDERATION + MAXIMUM PERMISSIBLE BODY BURDEN + MAXIMUM PERMISSIBLE CONCENTRATION (MPC)

15-13767 SHAPIRO J + SEGALL A + WORCESTER J
THE APPLICATION OF A PERSONNEL MONITORING SYSTEM TO POPULATION DOSIMETRY OF BACKGROUND RADIATION
HARVARD SCHOOL OF PUBLIC HEALTH, BOSTON, MASSACHUSETTS
IRPA-84 +. 22 PAGES, 6 TABLES, 1 FIGURE, 10 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

A FIELD STUDY WAS UNDERTAKEN TO EVALUATE THE USE OF POCKET ION-CHAMBER DOSIMETERS FOR MEASURING POPULATION DOSE TO BACKGROUND RADIATION. SPECIAL TESTS WERE DEvised FOR SELECTION OF STABLE AND REPRODUCIBLE ION CHAMBERS. THE DOSIMETERS WERE WORN BY INDIVIDUALS FOR A WEEK AT A TIME OVER A 5-WEEK PERIOD, AND CALIBRATED AND STANDARDIZED AFTER EACH WEEK OF USE.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13767 *CONTINUED*

AFTER FIELD USE, TESTS OF THE SYSTEM SHOWED INCREASED VARIABILITY OVER THE VARIABILITY AT THE BEGINNING OF THE TESTS. THE LEAKAGE OF THE DOSIMETERS WAS ALSO APPARENTLY INCREASED IN FIELD USE OVER THAT FOUND IN LABORATORY EXPERIMENTS. THE STUDY SHOWED THE NEED OF FREQUENT TESTING IN THE FIELD OF ANY SYSTEM USED FOR POPULATION DOSIMETRY AT THE LOW LEVELS CHARACTERISTIC OF BACKGROUND RADIATION. THE DESIGN OF A STUDY OF POPULATION EXPOSURE TO BACKGROUND RADIATION WITH PERSONNEL MONITORING DEVICES IS DISCUSSED. FORMULAS ARE PRESENTED FOR DETERMINING THE TOTAL NUMBER OF DOSIMETERS TO USE AND THE NUMBER OF DOSIMETERS TO ASSIGN PER INDIVIDUAL, BASED ON INITIAL PILOT STUDIES.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*MONITOR, RADIATION, BACKGROUND + DOSIMETRY, GENERAL + POPULATION EXPOSURE

15-13768 BUNCH OF + GAMMILL WP

RADIOLOGICAL ASPECTS OF A REACTOR DESTRUCTIVE TEST

HEALTH AND SAFETY DIVISION, USAEC, IDAHO OPERATIONS OFFICE, IDAHO FALLS, IDAHO

IRPA-82 +. 21 PAGES, 7 FIGURES, 3 TABLES, 10 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

THIS PAPER DESCRIBES THE RADIOLOGICAL CONSIDERATIONS CONNECTED WITH PLANNING AND CONDUCTING REACTOR DESTRUCTIVE TESTS AT THE NATIONAL REACTOR TESTING STATION IN IDAHO. THERE HAVE BEEN, IN RECENT YEARS, FIVE REACTOR DESTRUCTIVE TESTS, INCLUDING ONE ON JANUARY 11, 1966. IN THE LAST TEST A MODIFIED SNAP-10A REACTOR WAS INTENTIONALLY DISASSEMBLED AS A RESULT OF A NUCLEAR EXCURSION DESIGNED TO SIMULATE THE MAXIMUM ACCIDENT FOR THIS SYSTEM. THE PRIMARY RADIOLOGICAL OBJECTIVES OF THESE TESTS WERE TO DETERMINE THE MAGNITUDE OF THE FISSION PRODUCT RELEASE AND TO ASSESS THE RADIATION EXPOSURES RESULTING FROM THE TEST. THIS PAPER PRESENTS INFORMATION ON PLANNING PRIOR TO THE TESTS AND A SUMMARY OF THE RADIATION EXPOSURES RESULTING FROM THE RELEASES, WITH SPECIAL EMPHASIS GIVEN TO THE SNAPTRAN-2 DESTRUCTIVE TEST. IT IS SHOWN THAT, BY USING A PROPERLY DESIGNED ENVIRONMENTAL SAMPLING SYSTEM AND THE STATISTICAL APPROACH OF ATMOSPHERIC DISPERSION, ONE CAN QUICKLY AND ACCURATELY ESTIMATE THE MAGNITUDE OF A RELEASE. AN EQUATION IS SHOWN WHICH IS AMENABLE TO HAND OR COMPUTER SOLUTION AND WILL ALLOW ESTIMATES OF THE FRACTIONATION OF THE FISSION PRODUCTS. MANY OF THE CONSIDERATIONS IN THIS PAPER ARE APPLICABLE TO ANY TEST INVOLVING THE RELEASE TO THE ATMOSPHERE OF SIGNIFICANT QUANTITIES OF FISSION PRODUCTS.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*RADIATION SAFETY AND CONTROL + ACCIDENT, MAXIMUM CREDIBLE (MCA) + FISSION PRODUCT RELEASE, GENERAL + SAMPLING + TEST, DESTRUCTIVE

15-13769 CULLEN TL

DOSIMETRIC MEASUREMENTS IN BRAZILIAN REGIONS OF HIGH NATURAL RADIOACTIVITY LEADING TO CYTOGENETIC STUDIES

INSTITUTO DE FISICA DA PONTIFÍCIA UNIVERSIDADE CATÓLICA, RIO DE JANEIRO, BRAZIL

IRPA-57 + NYO-2577-8 +. 16 PAGES, 3 FIGURES, 4 TABLES, 6 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, SEPTEMBER 1966

SEVERAL BRAZILIAN REGIONS OF HIGH NATURAL RADIOACTIVITY PROVIDE EXCELLENT OPPORTUNITIES TO STUDY EFFECTS OF CHRONIC EXPOSURE TO LOW LEVEL RADIATION. GROUPS FROM CATHOLIC UNIVERSITY, NEW YORK UNIVERSITY, AND UNIVERSITY OF BRAZIL JOINED IN A COOPERATIVE INVESTIGATION. IN THE MONAZITE SAND ZONE PEOPLE LIVE IN INTIMATE CONTACT WITH SURFACE CONTAMINATION. THREE SOURCES OF EXPOSURE ARE CONSIDERED - EXTERNAL GAMMA-RADIATION, INTERNAL CONTAMINATION WITH LONG-LIVED RADIOISOTOPES, INTERNAL CONTAMINATION BY THORON DAUGHTER PRODUCTS. A SURVEY WITH LITHIUM FLUORIDE DOSIMETERS SHOWED AN AVERAGE EXTERNAL EXPOSURE OF 750 MR/YR WITH A RANGE FROM 160 TO 2500 MR/YR. MEASUREMENTS OF THORON EXHALED IN BREATH INDICATE BODY BURDENS OF 0.1 TO 0.6 NCI OF MSTH. A WHOLE BODY COUNTER IS UNDER CONSTRUCTION USING SUGAR AS SHIELDING MATERIAL. THORON CONCENTRATION IN HOMES IS MEASURED BY ELECTROSTATIC CAPTURE ON STEEL CYLINDERS AND MEASUREMENT IN IONIZATION CHAMBER. USING PERIPHERAL BLOOD TECHNIQUES THE CYTOGENETICS GROUP HAS FOUND A MUCH HIGHER FREQUENCY OF CHROMOSOMAL ABERRATIONS IN THE EXPOSED THAN IN THE CONTROL GROUP, ALTHOUGH DATA ARE STILL INSUFFICIENT. TWO SITES HAVE BEEN CHOSEN IN THE REGION OF VOLCANIC INTRUSIVES, MORRO DO FERRO, NEAR POCOS DE CALDAS, AND ARAXA. MORRO DO FERRO WITH LEVELS UP TO 3.2 MR/HR IS A CENTER FOR STUDIES LEADING TO RADIOECOLOGY. SOIL-GRASS AND SOIL-PLANT STUDIES SHOW CONCENTRATIONS OF RA-228 IN GRASS AND PLANTS UP TO 10 TO THE 3RD PCI/G ASH. RATS LIVE IN A THORON ENVIRONMENT OF UP TO 10 MINUS 8 CI/LITER. IN THE ARAXA FARMLAND SOIL-FOOD STUFF RELATIONS ARE STUDIED. THE CYTOGENETIC STUDY WILL CENTER ON THE SMALL NUMBER OF FAMILIES WHO SUBSIST MAINLY ON FOOD FROM THE RADIOACTIVE FARMS.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*BRAZIL + *POPULATION EXPOSURE + *RADIATION EFFECT + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, VEGETATION + COUNTER, WHOLE BODY + DOSE MEASUREMENT, EXTERNAL + ECOLOGICAL CONSIDERATION + RADIUM + SOIL, NUCLIDE OCCURRENCE

15-13770 IZAWA M + WATARI K

PREPARATION OF METAL SALT-ION EXCHANGE RESINS AND THEIR APPLICATION TO RADIOCHEMICAL ANALYSES

NATIONAL INSTITUTE OF RADIOLOGICAL SCIENCES, JAPAN

IRPA-52 +. 8 PAGES, 6 TABLES, 3 FIGURES, 11 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13770 *CONTINUED*

A SERIES OF A NEW TYPE OF ADSORBENTS FOR RADIONUCLIDES IN AQUEOUS SOLUTIONS HAS BEEN SYNTHESIZED CONSISTING OF AN ION EXCHANGE RESIN AND AN INORGANIC SALT, AND THEIR PROPERTIES WERE STUDIED. PREPARATION OF THE RESINS IS SIMPLE AND EASY. FOR EXAMPLE FERRIC HYDROXIDE-CATION EXCHANGE RESIN CAN BE MADE BY PUTTING A FERRIC FORM OF A CATION RESIN INTO A CONCENTRATED HYDROXIDE ION SOLUTION, AND COPPER FERROCYANIDE-ANION EXCHANGE RESIN BY PUTTING A FERROCYANIDE FORM OF AN ANION RESIN INTO A CUPRIC ION SOLUTION. THE PREPARED RESINS HAVE COMBINED ADSORPTION PROPERTIES OF BOTH THE METAL SALT AND THE EXCHANGE RESIN. THEY ARE GENERALLY NON-HYGROSCOPIC AND GRANULAR, SO THAT THEY CAN BE STORED IN DRY STATE. IN PRINCIPLE, THE RESINS CAN BE MADE BY ANY COMBINATION OF INSOLUBLE METAL SALTS AND ION EXCHANGE RESINS. BY CONSIDERING ADSORPTION CAPACITY AND EXCHANGEABILITY OF METAL SALTS AND RESINS, A WIDE VARIETY OF APPLICATIONS OF THE RESINS CAN BE MADE FOR CHEMICAL AND RADIOCHEMICAL ANALYSES E.G., METAL HYDROXIDE-RESINS FOR ADSORPTION OF ZIRCONIUM, RUTHENIUM AND ALKALINE EARTH IONS, METAL FERROCYANIDE-RESINS FOR SPECIFIC ADSORPTION OF CESIUM AND FOR MUTUAL SEPARATION OF ALKALI METALS AND OF FISSION PRODUCTS (SR, ZR, NB, RU, CS, CE). A FEW EXAMPLES OF APPLICATIONS OF FERROCYANIDE-RESINS ARE PRESENTED.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*ION EXCHANGE + CERIUM + CESIUM + DECONTAMINATION + NIOBIUM + RADIOCHEMICAL ANALYSIS + RUTHENIUM + STRONTIUM + WASTE TREATMENT, LIQUID + ZIRCONIUM

15-13771 PORTER CR + CARTER MW + KAHN D + PEPPER EW
RAPID FIELD METHOD FOR THE COLLECTION OF RADIONUCLIDES FROM MILK
U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, DIVISION OF RADIOLOGICAL HEALTH, PUBLIC HEALTH SERVICE
IRPA-51 +. 21 PAGES, 6 TABLES, 3 FIGURES, 23 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

SURVEILLANCE OF THE RADIONUCLIDE CONTENT OF MILK IS SIMPLIFIED BY CONCENTRATING THE RADIONUCLIDES ON ION-EXCHANGE RESINS. IN THE FIELD, EDTA ADDED TO MILK SAMPLES COMPLEXES CALCIUM IONS AND PREVENTS LOADING OF THE CATION-EXCHANGE RESIN BY CALCIUM. ONE-LITER SAMPLES OF MILK ARE THEN PASSED CONSECUTIVELY THROUGH 40 ML OF ANION-EXCHANGE AND 85 ML OF CATION-EXCHANGE RESIN AT A RATE AS GREAT AS 100 ML PER MINUTE. THE RESINS RETAIN THE FISSION PRODUCTS THAT ENTER COW MILK - RADIOIODINE BY ANION-EXCHANGE, AND RADIOSTRONTIUM, RADIOBARIUM, AND RADIOCESIUM BY CATION-EXCHANGE. THE RESIN COLUMNS ARE WASHED WITH WATER, SEALED, AND SHIPPED TO THE LABORATORY FOR ANALYSIS. THE COLUMNS ALLOW COMPLETE ANALYSIS OF THE CITED RADIONUCLIDES IN THAT MORE THAN 95 PERCENT OF EACH IS COLLECTED ON THE RESIN. SAMPLE CONCENTRATION IS RAPID, OCCURRING IN LESS THAN 15 MINUTES. BY COMPARISON WITH LIQUID MILK ANALYSIS ON 3.5-LITER SAMPLES, GAMMA SPECTRAL ANALYSIS IS MORE SENSITIVE THAN OTHER METHODS BECAUSE OF INCREASED COUNTING EFFICIENCIES RESULTING FROM THE SMALL VOLUME OF THE RESIN, AND RADIOCHEMICAL ANALYSIS OF THE RADIOSTRONTIUM IS A RAPID, SIMPLE PROCEDURE.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*ANALYTICAL TECHNIQUE, MILK + *ION EXCHANGE + BARIUM + CESIUM + IODINE + POTASSIUM + RADIOCHEMICAL ANALYSIS + SPECTROMETRY, GAMMA + STRONTIUM

15-13772 COWPER G + OSBORNE RV
MEASUREMENT OF TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, CANADA
IRPA-42 +. 8 FIGURES, 5 REFERENCES, 13 PAGES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

A HIGH FLUX HEAVY WATER REACTOR PRODUCES TRITIUM COPIOUSLY. SINCE LEAKAGE OF HEAVY WATER FROM THE MODERATOR OR THE COOLANT CIRCUIT WILL LEAD TO TRITIATED WATER VAPOUR IN NEARBY AIR IN POSSIBLY HAZARDOUS CONCENTRATIONS, A MEANS FOR MEASURING TRITIUM IN AIR IS NEEDED. OFTEN SUCH MEASUREMENTS HAVE TO BE MADE IN PLACES WHERE THERE ARE ALSO SIGNIFICANT LEVELS OF GAMMA RADIATION SO THE DETECTING DEVICE MUST BE CAPABLE OF DISTINGUISHING BETWEEN THE LOW ENERGY BETAS FROM TRITIUM AND GAMMA RADIATION. THE EXTENT OF THIS PROBLEM IS ILLUSTRATED BY THE FACT THAT 1 (MPC) OF TRITIUM PRODUCES ONLY AS MUCH IONIZATION IN AIR AS A GAMMA RADIATION FIELD OF 50 MICROROENTGENS PER HOUR. ANOTHER IMPORTANT ASPECT OF THE PROBLEM IS THAT THE CONCENTRATION OF TRITIUM IN AIR MAY LIE WITHIN VERY WIDE LIMITS DEPENDING UPON THE PARTICULAR CIRCUMSTANCES OF THE RELEASE. SEVERAL METHODS HAVE BEEN DEVELOPED TO MEET THIS REQUIREMENT USING LARGE GAMMA-COMPENSATED IONIZATION CHAMBERS FOR INSTALLED AREA MONITORS, SMALL VOLUME COMPENSATED CHAMBERS COMPLETE WITH BATTERY OPERATED ELECTROMETERS FOR PORTABLE USE AND SCINTILLATION DETECTORS WHICH ACHIEVE DISCRIMINATION IN FAVOR OF TRITIUM BY SPECIAL CIRCUIT TECHNIQUES. THE DESIGN OF THESE DEVICES AND THEIR APPLICATION IN THE CANADIAN HEAVY WATER PROGRAM WILL BE DISCUSSED.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*REACTOR, HEAVY WATER + *TRITIUM + ANALYTICAL TECHNIQUE, AIR + COUNTER

15-13773 DELLA ROSA RJ + WOLF HG + GOLDMAN M
TRANSLOCATION OF SR-90 FROM MATERNAL SKELETON TO PROGENY DURING GESTATION AND LACTATION
UNIVERSITY OF CALIFORNIA
IRPA-29 +. 7 PAGES, 8 FIGURES, 2 TABLES, 3 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

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15-13773 *CONTINUED*

THE FRACTIONAL TRANSLOCATION OF SR-90 TO PROGENY DURING GESTATION AND LACTATION WAS DETERMINED IN FIVE ADULT BEAGLES. THE BODY BURDENS OF THE DAMS AND/OR THEIR LITTERS WERE DETERMINED IN VIVO BY MONITORING OF THE (SR-90 PLUS Y-90) BREMSSTRAHLUNG AT THE TIME OF BREEDING, WHELPING, DURING NURSING, AND AT WEANING, AT WHICH TIME THE ANIMALS WERE SACRIFICED AND THEIR BODY BURDENS CONFIRMED RADIOCHEMICALLY. FROM 15 TO 30 PER CENT OF THE MATERNAL SKELETAL BURDEN OF SR-90 WAS LOST BY THE COMBINED INFLUENCE OF GESTATION AND LACTATION. THE FRACTIONAL LOSS OF SR-90 WAS DEPENDENT NOT ONLY ON LITTER SIZE, BUT ALSO ON LENGTH OF TIME AFTER ACQUISITION OF THE BODY BURDEN TO BREEDING. LESSER AMOUNTS OF SR-90 WERE MOBILIZED FROM THE MATERNAL SKELETONS WITH INCREASING TIME AFTER ACQUISITION OF THE BODY BURDENS. AT LONGER TIMES, NEARLY ALL OF THE MATERNAL LOSSES WERE ATTRIBUTABLE TO LACTATION. AT BIRTH, THE SR-90 CONTENT OF THE LITTERS REPRESENTED LESS THAN 1 PER CENT OF THE INITIAL MATERNAL BODY BURDENS AND INCREASED TO ABOUT 10 PER CENT AT WEANING. THE BODY BURDENS OF THE LITTERS AT WEANING ACCOUNTED FOR NEARLY 30 PER CENT OF THE MATERNAL LOSS. THESE DATA SUGGEST THAT THE EVALUATION OF POSSIBLE RADIATION HAZARDS TO THE NEWBORN FROM BIOSPHERIC CONTAMINATION REQUIRES KNOWLEDGE OF THE MATERNAL CONTRIBUTION TO THE BODY BURDEN OF THE OFFSPRING AS WELL AS THAT FROM DIETARY SOURCES.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

*BIOLOGICAL CONCENTRATION, ANIMAL + *STRONTIUM + COUNTER, WHOLE BODY

15-13789 HEROLD TR + HOLCOMB HP
A NEUTRON COUNTER FOR ANALYTICAL APPLICATIONS
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
DP-1035 +. 18 PAGES, 10 FIGURES, 6 REFERENCES, AUGUST 1966

A NEUTRON COUNTER WAS DEVELOPED TO ASSAY RAPIDLY AND NONDESTRUCTIVELY SUCH RADIONUCLIDES AS CM-244 AND CF-252 BY COUNTING THE SPONTANEOUS FISSION NEUTRONS THAT THESE ISOTOPES EMIT. NEUTRONS ARE THERMALIZED IN A POLYETHYLENE MODERATOR ASSEMBLY AND COUNTED WITH BF₃ DETECTORS SPACED IN THE MODERATOR. THE COUNTER BACKGROUND IS 4 COUNTS/MINUTE, AND THE COUNTING EFFICIENCY IS 4%. THE RELIABLE DETECTION LIMIT IS 4 X 10 (MINUS 7TH) G FOR CM-244 AND 1.2 X 10 (MINUS 12TH) G FOR CF-252.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY

*COUNTER + *NEUTRON + CALIFORNIUM + CURIUM

15-13790 GUILLOU RB
PARR AREA (ARMS-II)
EDGERTON, GERMESHAUSEN AND GRIER, INC., SANTA BARBARA, CALIF.
CEX-63.6.2 +. 20 PAGES, 6 FIGURES, 1 TABLE, 5 REFERENCES, APRIL 1964

AN AERIAL RADIOLOGICAL MEASURING SURVEY (ARMS) OF THE PARR AREA WAS MADE FOR THE CIVIL EFFECTS TEST OPERATIONS, DIV. OF BIOLOGY AND MEDICINE, USAEC, BY EDGERTON, GERMESHAUSEN AND GRIER, INC. (EG+G), BETWEEN FEB. 28 AND MAR. 15, 1963, AND ON APR. 15, 1963. APPROXIMATELY 7000 TRAVERSE MILES WERE FLOWN, AT AN ALTITUDE OF ABOUT 500 FT, IN THE AREA WHICH CONSISTED OF A 100-MILE SQ CENTERED ON THE CAROLINAS-VIRGINIA NUCLEAR POWER ASSOCIATES FACILITY NEAR PARR, S.C. THE SOUTHWEST PART OF THE AREA, PREVIOUSLY SURVEYED BY THE U.S. GEOLOGICAL SURVEY, WAS NOT RESURVEYED. THE EG+G ARMS-II INSTRUMENTATION WAS USED IN THE SURVEY. THE DATA ARE PRESENTED AS AERORADIOACTIVITY UNITS, OR AREAS WITH SIMILAR GAMMA RADIATION COUNTING RATES AT 500 FT, AT TWO MAP SCALES - (1) GENERALIZED AT ABOUT 1 TO 1,000,000 AND (2) DETAILED AT 1 TO 250,000. MAXIMUM COUNTING RATES WERE LESS THAN 400 COUNTS/SEC IN ABOUT ONE-FOURTH THE AREA, AND LESS THAN 2500 COUNTS/SEC IN ABOUT ONE-TENTH. AERIAL MEASUREMENTS OF GROUND RADIOACTIVITY IN THE ARMS-II PARR AREA WERE CONSISTENT WITH WHAT WAS EXPECTED, CONSIDERING THE GEOLOGY. ROCKS OF THE CAROLINA SLATE BELT PRODUCED LOW COUNTING RATES, AND THE COMPLEX METAMORPHIC AND IGNEOUS GEOLOGY OF THE PIEDMONT PRODUCED COMPLEX AERORADIOACTIVITY UNITS. ARTIFICIAL RADIONUCLIDES WERE PROBABLY PRESENT IN ONLY SMALL QUANTITIES BECAUSE BACKGROUND GAMMA RADIOACTIVITY WAS LESS THAN 200 COUNTS/SEC IN SEVERAL PLACES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*SURVEY, RADIATION, AERIAL + GEOLOGICAL CONSIDERATION, GENERAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + SURVEY, RADIATION, ENVIRONMENTAL

15-13791 GUILLOU RB
ORLANDO AREA (ARMS-II)
EDGERTON, GERMESHAUSEN AND GRIER, INC.
CEX-63.6.1 +. 19 PAGES, 6 FIGURES, 1 TABLE, 4 REFERENCES, APRIL 1964

AN AERIAL RADIOLOGICAL MEASURING SURVEY (ARMS) OF THE ORLANDO AREA WAS MADE FOR THE CIVIL EFFECTS TEST OPERATIONS, DIV. OF BIOLOGY AND MEDICINE, USAEC, BY EDGERTON, GERMESHAUSEN AND GRIER, INC. (EG+G), BETWEEN FEB. 11 AND FEB. 21, 1963. THE SURVEY WAS PART OF A NATIONWIDE PROGRAM TO MEASURE PRESENT ENVIRONMENTAL LEVELS OF GAMMA RADIATION. APPROXIMATELY 4500 TRAVERSE MILES WERE FLOWN, AT AN ALTITUDE OF ABOUT 500 FT, IN THE AREA WHICH CONSISTED OF THE LAND PORTION OF A 100-MILE SQ CENTERED ON THE KENNEDY SPACE CENTER. THE EG+G ARMS-II INSTRUMENTATION WAS USED IN THE SURVEY. THE DATA ARE PRESENTED AS AERORADIOACTIVITY UNITS, OR AREAS WITH SIMILAR GAMMA RADIATION COUNTING RATES AT 500 FT, AT TWO MAP SCALES - (1) GENERALIZED AT ABOUT 1 TO 1,000,000 AND (2) DETAILED AT 1 TO 250,000. THE MAXIMUM AERORADIOACTIVITY IN ALMOST ALL THE AREA WAS LESS THAN 400 COUNTS/SEC. IN A FEW SMALL AREAS ALONG THE EAST COAST, THE MAXIMUM COUNTING RATE WAS 500 COUNTS/SEC. AERIAL MEASUREMENTS OF

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15-13791 *CONTINUED*

GROUND RADIOACTIVITY IN THE ARMS-II ORLANDO AREA WERE CONSISTENT WITH WHAT WAS EXPECTED, CONSIDERING THE GEOLOGY. ARTIFICIAL RADIONUCLIDES WERE PROBABLY PRESENT IN ONLY SMALL QUANTITIES BECAUSE BACKGROUND GAMMA RADIOACTIVITY WAS LESS THAN 200 COUNTS/SEC IN MANY PLACES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*GEOLOGICAL CONSIDERATION, STRATIGRAPHY + *SURVEY, RADIATION, ENVIRONMENTAL + GEOLOGICAL CONSIDERATION, GENERAL + SURVEY, RADIATION, AERIAL

15-13792 BATES, RG

AERORADIOACTIVITY SURVEY AND AERIAL GEOLOGY OF THE PITTSBURGH AREA, PENNSYLVANIA, OHIO, WEST VIRGINIA, AND MARYLAND (ARMS-I)
GEOLOGICAL SURVEY, DENVER, COLO.

CEX-59.4.12 +. 19 PAGES, 5 FIGURES, 16 REFERENCES, SEPTEMBER 1966

DURING THE SUMMER OF 1960 THE U.S. GEOLOGICAL SURVEY MADE AN AIRBORNE RADIOACTIVITY SURVEY OF A LARGE AREA IN WESTERN PA., EASTERN OHIO, NORTHERN W. VA., AND WESTERN MARYLAND. THE SURVEY AREA, TOTALING 14,400 SQ MILES, IS CENTERED ON THE GREATER PITTSBURGH METROPOLITAN AREA. THE SURVEY WAS MADE ON BEHALF OF THE USAEC AS A PART OF ITS AERIAL RADIOLOGICAL MEASUREMENT SURVEYS (ARMS-I) PROGRAM, A PROGRAM OF AIRBORNE RADIOACTIVITY SURVEYS OF NUCLEAR INSTALLATIONS WITHIN THE U.S. WITHIN THE SURVEY AREA ARE THE SHIPPINGPORT, BETTIS, APOLLO, CHESWICK, AND WALTZ MILL NUCLEAR FACILITIES. RADIOACTIVITY LEVELS RANGE FROM 150 TO 900 CPS (COUNTS PER SECOND) AND AVERAGE BETWEEN 500 AND 600 CPS. STRATA OF PERMIAN AGE HAVE THE HIGHEST RADIOACTIVITY LEVEL AND THOSE OF MISSISSIPPIAN AGE THE LOWEST. APPALACHIAN STRUCTURAL TRENDS ARE REFLECTED BY LINEAR RADIOACTIVITY UNITS IN THE SOUTHEASTERN CORNER OF THE SURVEY AREA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*GEOLOGICAL CONSIDERATION, STRATIGRAPHY + *SURVEY, RADIATION, AERIAL + GEOLOGICAL CONSIDERATION, GENERAL + SURVEY, RADIATION, ENVIRONMENTAL

15-13793 ENVIRONMENTAL MONITORING ASSOCIATED WITH DISCHARGES OF RADIOACTIVE WASTE DURING 1965 FROM U.K.A.E.A ESTABLISHMENTS.

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL

AHSB(RP)-R-72 +. 29 PAGES, 26 TABLES, 6 REFERENCES, AUGUST 1966

THIS REPORT DESCRIBES THE RESULTS OF THE ENVIRONMENTAL MONITORING UNDERTAKEN TO CONFIRM THAT THE DISCHARGES OF RADIOACTIVE WASTE DURING 1965 FROM EACH OF THE PRINCIPAL UKAEA ESTABLISHMENTS PRODUCED NO HAZARD IN THE ENVIRONMENT. THE RESULTS ARE SUMMARISED AND COMPARED WITH DERIVED WORKING LIMITS TO FACILITATE AN APPRECIATION OF THE STANDARDS OF SAFETY ACHIEVED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC., 54669

*MONITOR, RADIATION, ENVIRONMENTAL + *UNITED KINGDOM + *WASTE DISPOSAL, GENERAL + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + BIOLOGICAL CONCENTRATION, GENERAL + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + SOIL, NUCLIDE OCCURRENCE + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, OCEAN + WASTE DISPOSAL, RIVER + WASTE DISPOSAL, SOLID

15-13794 CAMERON JF + PAYNE BR

APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM ACTIVITIES

CONF-650652 + GMELIN-AED-CONF-65-158 +. 17 PAGES, 6 FIGURES, 3 TABLES, 25 REFERENCES, PAGES 454-470,

PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

USEFUL HYDROLOGICAL AND METEOROLOGICAL INFORMATION CAN BE OBTAINED FROM MEASUREMENTS OF THE NATURAL TRITIUM CONTENT OF PRECIPITATION, SURFACE WATER AND GROUND WATER. PROJECTS IN WHICH NATURAL TRITIUM IS USED GENERALLY ENTAIL THE MEASUREMENT OF LARGE NUMBERS OF SAMPLES AND CONSEQUENTLY THE ASSAY SYSTEM SHOULD BE DESIGNED TO MEASURE A MAXIMUM NUMBER OF SAMPLES. THE SYSTEM DESCRIBED IS DESIGNED FOR ROUTINE CONCENTRATION AND MEASUREMENT OF A MAXIMUM NUMBER OF SAMPLES WITH ACTIVITIES GREATER THAN 0.5 T.U. WITH AN ACCURACY OF ABOUT PLUS OR MINUS 5% OR PLUS OR MINUS 0.5 T.U.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*COUNTER + *TRITIUM + ANALYTICAL TECHNIQUE, WATER

15-13795 BUTTLAR HV + FARZINE K + WOHLFAHRT D

TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
INSTITUT FUR TECHNISCHE KERNPHYSIK DER TECHNISCHEN HOCHSCHULE DARMSTADT

CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 7 FIGURES, 12 REFERENCES, PAGES 471-486, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN REACTED WITH ETHYLEN TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN OESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICINCIDENCE BACKGROUND IS 2.74

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15-13795 *CONTINUED*

PLUS OR MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLING COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND, TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY, AND LONG-TIME STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*TRITIUM + ANALYTICAL TECHNIQUE, WATER + COUNTER + GERMANY + SURFACE WATER, NUCLIDE OCCURRENCE

15-13796 AKHTAR S + SMITH HA

CONCENTRATION, STORAGE, AND DETERMINATION OF TRITIUM AT ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE PERCENT
UNIVERSITY OF TENNESSEE

CONF-650652 + GMELIN-AED-CONF-65-158 +. 14 PAGES, 2 FIGURES, 11 REFERENCES, PAGES 491-504, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

NATURALLY OCCURRING OR EXTERNALLY ADDED TRITIUM IS A VALUABLE TRACER IN MANY GEOPHYSICAL AND HYDROLOGICAL INVESTIGATIONS. FROM THE POINT OF VIEW OF ANALYTICAL INTEREST, WHICH IS THE SUBJECT MATTER OF THIS PAPER, THESE STUDIES INVOLVE DETERMINATION OF TRITIUM, USUALLY IN WATER, AT TWO DIFFERENT LEVELS OF ACTIVITY, NAMELY THE ACTIVITY LEVEL OF THE ORDER OF A MILLIMICROCURIE PER MILLILITER OF THE SAMPLE AND THE FAR LOWER LEVEL OF A FEW TRITIUM UNITS (T.U.).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*ANALYTICAL TECHNIQUE, WATER + *TRITIUM + TRACER, RADIOACTIVE

15-13797 FERGUSSON GJ

RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE

WM. H. JOHNSTON LAB., INC., BALTIMORE

CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 4 FIGURES, 2 TABLES, 7 REFERENCES, PAGES 525-540, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

A NUMBER OF MEASUREMENTS HAVE BEEN MADE OF C-14 CONCENTRATION IN THE UPPER TROPOSPHERE BY COLLECTION OF CARBON DIOXIDE WITH MOLECULAR SIEVE SAMPLERS. SAMPLES HAVE BEEN COLLECTED FROM 15 DEGREES N TO 48 N AND FROM 30,000 TO 43,000 FEET ALTITUDE. THESE MEASUREMENTS HAVE SHOWN C-14 ACTIVITIES UP TO TEN TIMES THE PRE-BOMB GROUND LEVEL ACTIVITY. THE OBSERVED ACTIVITY DECREASES RAPIDLY WITH DECREASING LATITUDE AND ALTITUDE. STRONG STRATIFICATION HAS BEEN EVIDENT IN SOME SETS OF MEASUREMENTS. A SERIES OF MEASUREMENTS DURING SPRING 1963, WHEN C-14 LEVELS IN THE UPPER TROPOSPHERE WERE HIGH, YIELDED A T/C-14 RATIO OF 0.48 PLUS OR MINUS 0.12. THIS RESULT IS IN CLOSE AGREEMENT WITH THE STRATOSPHERIC DATA OF HAGEMANN FOR THE 1957-58 PERIOD, AND IMPLIES THAT THE CHANGING RATIO OF FUSION TO FISSION DEVICES HAS NOT BEEN ACCOMPANIED BY A SIGNIFICANT CHANGE IN THE RATIO OF T TO C-14 PRODUCTION. THE ANNUAL ADDITION OF C-14 TO THE TROPOSPHERE IS EASILY COMPUTED FROM GROUND LEVEL C-14 MEASUREMENTS. THUS FROM THE T/C-14 RATIO OF MATERIAL ENTERING THE TROPOSPHERE THE ANNUAL INPUT OF TRITIUM CAN BE COMPUTED MORE PRECISELY THAN FROM SURFACE TRITIUM MEASUREMENTS, AND SO CAN AID UNDERSTANDING OF THE TRITIUM CYCLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*TRITIUM + *TROPOSPHERE + CARBON + SAMPLING

15-13798 LAL D + RAMA

ATMOSPHERIC PATHWAYS OF MAN-MADE C-14, H-3, AND SR-90

CONF-650652 + GMELIN-AED-CONF-65-158 +. 8 PAGES, 5 FIGURES, 10 REFERENCES, PAGES 541-548, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, JUNE 7-11, 1965, PULLMAN, WASHINGTON

THE SALIENT FEATURES OF H-3 AND SR-90 DEPOSITION AND THE C-14 ACTIVITIES IN THE TROPOSPHERE ARE SUMMARIZED BELOW. (1) THE TRITIUM FALLOUT IN THE YEAR 1963 REVEALS A SHARP DISCONTINUITY AT ABOUT 30 DEGREES LATITUDE IN THE NORTHERN HEMISPHERE. A SIMILAR DISCONTINUITY IS SEEN IN THE CASE OF SR-90. (2) THE TROPOSPHERE EXCESS C-14 CONCENTRATIONS ROSE TO VALUES OF UP TO 105% DURING AUGUST 1963 FROM INITIAL VALUES OF ABOUT 40% DURING JANUARY 1963. (3) NORTH OF 42 DEGREES N, THE INCREASES OF C-14 CONCENTRATIONS IN THE TROPOSPHERE, REACHING PEAK VALUES AROUND JULY IN 1963 AND 1964, WERE THE SAME UP TO 78 DEGREES LATITUDE (WITHIN 1-2%). THIS COULD BE EXPLAINED ONLY IF THERE IS A RAPID MIXING OF C-14. THESE OBSERVATIONS ON H-3 AND C-14 CLEARLY SHOW THAT THE REGIONS NORTH OR SOUTH OF 30 DEGREES IN THE NORTHERN HEMISPHERE CAN BE INDIVIDUALLY CONSIDERED SUFFICIENTLY WELL MIXED ON TIME SCALES OF ONE MONTH OR LESS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*ATMOSPHERIC CIRCULATION, GLOBAL + *TRITIUM + CARBON + FALLOUT + STRONTIUM

15-13799 GONSIOR B + FRIEDMAN I + LINDENMAYR G

NEW TRITIUM AND DEUTERIUM MEASUREMENTS IN ATMOSPHERIC HYDROGEN

CONF-650652 + GMELIN-AED-CONF-65-158 +. 10 PAGES, 5 FIGURES, PAGES 549-559, PRESENTED AT INTERNATIONAL

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13799 *CONTINUED*

CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASH., JUNE 7-11, 1965

RESULTS ARE PRESENTED FOR TRITIUM CONCENTRATIONS IN ATMOSPHERIC HYDROGEN SAMPLES DATING BACK TO 1961.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*TRITIUM + ANALYTICAL TECHNIQUE, GAS + DEUTERIUM + HYDROGEN

15-13800 OSTLUND HG

1964 HURRICANE TRITIUM

UNIVERSITY OF MIAMI

CONF-650652 + GMELIN-AED-CONF-65-158 +. 5 PAGES, 1 FIGURES, 1 TABLE, PAGES 560-564, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DURING THE 1964 HURRICANE SEASON VERY PRELIMINARY ATTEMPTS WERE MADE TO COLLECT WATER FROM A FEW STORMS FOR TRITIUM ANALYSIS. THE RESULTS ARE DESCRIBED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY.

*TRITIUM + METEOROLOGY + PRECIPITATION

15-13801 HOUTERMANS J

TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN

UNIVERSITY OF CALIFORNIA

CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 11 FIGURES, 9 REFERENCES, PAGES 565-576, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

THE SPECIFIC ACTIVITY OF TRITIUM IN SURFACE WATER SAMPLES FROM THE NORTH PACIFIC OCEAN HAS BEEN MEASURED SINCE 1959 IN THE LA JOLLA TRITIUM LABORATORY. ONE OF THE PURPOSES HAS BEEN THE TRACING OF OCEAN WATER MOVEMENTS, PARTICULARLY THE DOWNWARD MIXING OF SURFACE WATER. THIS PAPER DESCRIBES THE PRESENT STATUS OF THE WORK AS REGARDS THIS PARTICULAR EFFORT. HYDROGEN BOMB TESTING HAS RAISED THE ACTIVITY OF THE SURFACE OCEAN WATER FROM PRE-BOMB VALUES ON THE ORDER OF ONE TRITIUM UNIT (T.U.) TO VALUES ON THE ORDER OF TEN TO TWENTY TRITIUM UNITS (1 T.U. EQUAL 1 T ATOM PER 10(18TH) H ATOMS). THESE HIGHER LEVELS OF ACTIVITY AND THE PULSE NATURE OF THE INPUT PROVIDE A GOOD OPPORTUNITY FOR SUCH TRACING OF OCEAN WATER MOVEMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*OCEAN AND SEA + *TRITIUM + DILUTION + DISPERSION + SURFACE WATER, NUCLIDE OCCURRENCE

15-13802 ZIMMERMANN U + MUNNICH KO + ROETHER W + KREUTZ W + SCHUBACH K + SIEGEL O

DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN ISOTOPES

CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 6 FIGURES, 7 REFERENCES, PAGES 577-588, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

AN INVESTIGATION OF NATURAL DEUTERIUM AND BOMB-TRITIUM IN GROUNDWATER, IN LYSIMETER SEEPAGE WATER AND IN SOIL MOISTURE (1-7) HAS SUGGESTED THAT IN SUBSTANCE THE WATER TRANSPORT IN THE SOIL IS A VERY SLOW PROCESS, AND THAT IT MAY TAKE YEARS UNTIL THE WATER TABLE IS REACHED. THE SEEPAGE WATER, WHICH EVENTUALLY SHOWS UP AT A DEPTH OF 2 OR 3 METERS AFTER A PERIOD OF HOURS OR DAYS AFTER A HEAVY RAINFALL IS ACTUALLY OLD CAPILLARY WATER FROM THE IMMEDIATE SOIL LAYER ABOVE. IN SUBSTANCE THE DOWNWARD MOVEMENT OF THE SOIL WATER DEPENDS MERELY ON THE FIELD CAPACITY OF THE SOIL. IN REALITY, OF COURSE, THE BOUNDARY DOES NOT REMAIN EXACT, RATHER IT IS BLURRED BY SEVERAL DIFFUSION-LIKE PROCESSES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*DISPERSION + *HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *TRITIUM + DILUTION + HYDROLOGICAL CONSIDERATION, GENERAL

15-13803 THATCHER LL + PAYNE BR

THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING

CONF-650652 + GMELIN-AED-CONF-65-158 +. 26 PAGES, 9 FIGURES, 2 TABLES, PAGES 604-629, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

GROUND WATER MAY BE DATED BY DETERMINING THE DECAY OF TRITIUM THAT HAS OCCURRED IN A SAMPLE OF GROUND WATER (NATURAL TRITIUM) OR BY FOLLOWING THE PROGRESS DOWN GRADIENT OF TRITIUM PULSES INJECTED INTO THE GROUND WATER SYSTEM BY FALLOUT IN RECHARGE WATER. IN EITHER TECHNIQUE THE FUNDAMENTAL COMPONENT OF INFORMATION REQUIRED IS THE RECORD OF TRITIUM RECHARGE INTO THE GROUND WATER SYSTEM. PROGRAMS TO SPECIFICALLY MONITOR THE TRITIUM INPUT INTO THE RECHARGE AREAS OF MAJOR GROUND WATER AQUIFERS ARE ESSENTIALLY NON-EXISTENT. THEREFORE, THE HYDROLOGIST UNDERTAKING SUCH INVESTIGATIONS MUST USUALLY OBTAIN THE TRITIUM FALLOUT INFORMATION BY INTERPOLATION FROM THE TRITIUM FALLOUT OBSERVATIONS OF THE IAEA-WMO WORLD NETWORK. THE NETWORK CONSISTS OF 109 STATIONS AND THE RECORD GOES BACK TO 1961 FOR THE KEY STATIONS. TRITIUM FALLOUT DATA FOR THE PERIOD 1954-1961 FOR A PARTICULAR STATION IN THE NETWORK MAY BE RECONSTRUCTED BY COMPARISON OF THE TRITIUM RESPONSE FOR THE KNOWN PERIOD AT THE STATION AGAINST THE CONTINUOUS RECORDS FOR OTTAWA (1) AND CHICAGO (2), (3). A MORE LIMITED

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13803 *CONTINUED*
RECORD IS ALSO AVAILABLE FOR PALISADES, NEW YORK.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*TRITIUM + FALLOUT + HYDROLOGICAL CONSIDERATION, GENERAL + PRECIPITATION + RAINOUT

15-13804 GAT JR
THE DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES
UNIVERSITY OF CALIFORNIA
CONF-650652 + GMELIN-AED-CONF-65-158 +. 13 PAGES, 3 FIGURES, 20 REFERENCES, PAGES 630-642, PRESENTED AT
INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DURING THE PRE-BOMB COSMIC RAY ERA, TRITIUM COULD HAVE BEEN USED IN HYDROLOGY IN A STRAIGHTFORWARD THOUGH LIMITED FASHION. ONE WOULD HAVE RELATED THE TRITIUM CONCENTRATION IN ANY WATER BODY TO THE CONSTANT ATMOSPHERIC TRITIUM CONCENTRATIONS BY MEANS OF ITS RADIOACTIVE DECAY RATE. FOR A CLOSED TRAPPED WATER SYSTEM OR WHEN WATERS MOVE IN A PISTON-LIKE FASHION, WITHOUT ANY MIXING WITH ADJACENT WATER BODIES, THE RESULTANT AGE CAN BE SIMPLY INTERPRETED AS THE TIME WHICH HAS PASSED SINCE THE LAST EXPOSURE OF THESE WATERS TO THE ATMOSPHERE. IN ALL OTHER CASES A MEAN AGE IS OBTAINED, WHICH ASSUMES PHYSICAL SIGNIFICANCE ONLY INsofar AS THE MIXING PATTERN IN THE RESERVOIR IS EITHER KNOWN OR ESTIMATED. THIS PROBLEM HAS RECENTLY BEEN DISCUSSED BY NIR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*DISPERSION + *HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT + *TRITIUM

15-13805 STEWART GL
EXPERIENCES USING TRITIUM IN SCIENTIFIC HYDROLOGY
U.S. GEOLOGICAL SURVEY
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 5 FIGURES, 1 TABLE, 8 REFERENCES, PAGES 643-658,
PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

NATURAL AND BOMB PRODUCED TRITIUM PROVIDES THE HYDROLOGIST WITH A VALUABLE TOOL FOR TRACING WATER THROUGH THE HYDROLOGIC CYCLE. THE U.S. GEOLOGICAL SURVEY MONITORS TRITIUM IN PRECIPITATION AND IN SURFACE WATERS AT SEVERAL LOCATIONS WITHIN THE UNITED STATES AND PUERTO RICO. GEOGRAPHICAL AND SEASONAL VARIATIONS OF TRITIUM CONCENTRATIONS FOR THESE WATERS DURING 1963 AND 1964 ARE PRESENTED. TRITIUM CONCENTRATIONS IN PRECIPITATION AND SURFACE WATERS DURING 1963 WERE, IN MOST CASES, 3 OR MORE TIMES GREATER THAN IN 1962. CONCENTRATIONS FOR 1964 WERE IN GENERAL, SLIGHTLY LOWER THAN IN 1963. THESE DATA ARE USED TO CORRELATE TRITIUM ACTIVITY WITH HYDROLOGIC CHARACTERISTICS USED IN HYDROLOGIC RESEARCH. INVESTIGATIONS ARE BEING CONDUCTED TO DETERMINE THE POTENTIAL CAPABILITIES OF TRITIUM TRACER AND AGE DATING TECHNIQUES. TRITIUM FRACTIONATION OCCURS DURING THE DIFFUSION OF WATER THROUGH CLAYS. LABORATORY RESULTS INDICATE THAT TRITIUM IS EXCHANGED WITH HYDROGEN IN THE CLAY MINERAL STRUCTURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*HYDROLOGICAL CONSIDERATION, GENERAL + *TRITIUM + MINERAL EXCHANGE + SURFACE WATER, NUCLIDE OCCURRENCE + TRACER, RADIOACTIVE + UNITED STATES

15-13806 VERHAGEN BT + SELLSCHOP JP
TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES
UNIVERSITY OF THE WITWATERSRAND, SOUTH AFRICA
CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 9 FIGURES, PAGES 659-670, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DATA ARE PRESENTED ON THE TRITIUM CONTENT OF SOME SUBTERRANEAN WATERS OF SOUTH AFRICA. A THERMAL DIFFUSION SYSTEM WAS USED FOR ENRICHMENT OF TRITIUM. COUNTING IS DONE WITH A GAS PROPORTIONAL COUNTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$8.00 CY

*GROUND WATER, NUCLIDE OCCURRENCE + *TRITIUM + ANALYTICAL TECHNIQUE, WATER + COUNTER + SOUTH AFRICA

15-13807 PERKINS EJ + WILLIAMS BR
THE BIOLOGY OF THE SOLWAY FIRTH IN RELATION TO THE MOVEMENT AND ACCUMULATION OF RADIOACTIVE MATERIALS, II.
THE DISTRIBUTION OF SEDIMENTS AND BENTHOS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, CHAPELCROSS
PG REPORT-587(ICC) +. 37 PAGES, 25 FIGURES, 4 TABLES, 115 REFERENCES, 1966

THIS PAPER GIVES DATA FOR THE DISTRIBUTION OF SEDIMENTS AND BENTHOS IN RELATION TO INSOLUBLE OR PARTICULATE RADIOACTIVE NUCLIDES. THE MECHANISMS OF TRANSPORT OF SILT AND ASSOCIATED RADIOACTIVITY IN THE N.E. IRISH SEA AND SOLWAY FIRTH ARE SHOWN TO BE PRIMARILY DUE TO THE DIFFERENCE BETWEEN FLOOD AND EBB TIDE VELOCITIES CONSEQUENT UPON DISTORTION OF THE TIDAL WAVE. A POSSIBLE REASON FOR THE FUNDAMENTAL DIFFERENCE BETWEEN MARSHES BORDERING UPON THE IRISH SEA AND THOSE OF THE EAST COAST OF ENGLAND IS DISCUSSED.

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ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13807 *CONTINUED*

AVAILABILITY - UNITED KINGDOM ATOMIC ENERGY AUTHORITY, 11 CHARLES II STREET, LONDON, S W. 1

*ENVIRONMENTAL CONDITION + *OCEAN AND SEA + *UNITED KINGDOM + ANALYTICAL TECHNIQUE, SOLID + MINERAL EXCHANGE + RUTHENIUM + SEDIMENT + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, SEDIMENT

15-13808 FREESWICK DC

AUTOMATIC SAMPLER FOR COLLECTING RADIOACTIVE PARTICULATES IN GROUND LEVEL AIR
NEW YORK OPERATIONS OFFICE, HEALTH AND SAFETY LAB

HASL-178 +. 35 PAGES, 15 FIGURES, 5 REFERENCES, AUGUST 1966

AN AIR SAMPLING SYSTEM DESIGNED AT THE HEALTH AND SAFETY LABORATORY WILL AUTOMATICALLY COLLECT SEVEN 24 HOUR SAMPLES. IT ONLY REQUIRES CHANGING FILTERS TWICE A WEEK, TO OBTAIN CONTINUOUS DAILY SAMPLES. PARTICULATE LOADING EFFECTS ON THE MICROSORBAN FILTERS USED IN THE SYSTEM ARE MINIMIZED BY DESIGNATING AN EXPERIMENTAL VALUE OF 6 LITERS/MIN/SQ.CM AS PART OF THE DESIGN CRITERIA. THIS FLOW RATE PER UNIT AREA RESULTS IN AIR VOLUMES OF APPROXIMATELY 100 CUBIC METERS PER SAMPLE WHEN CORRECTED FOR PRESSURE AND TEMPERATURE. THE TOTAL VOLUME OF AIR PER SAMPLE IS CALCULATED FROM DATA OBTAINED BY TWO FLOW RATE METERING DEVICES. ONE OF THE TWO DEVICES PROVIDES A PERMANENT RECORD OF THE FLOW RATES FOR EACH SAMPLE. THE BULK OF THE SYSTEM IS LOCATED INDOORS SO THAT A MINIMUM NUMBER OF COMPONENTS REQUIRE SPECIAL CONSIDERATION FOR ENVIRONMENTAL CONDITIONS. THE LEVEL OF RADIOACTIVE DETECTION WHEN USING A HASL DESIGNED BETA SCINTILLATION COUNTER IS 0.013 PCI/CU, METER. IN THE MORE THAN 16,000 HOURS THE SYSTEM HAS BEEN IN OPERATION, THERE WERE ONLY FOUR MALFUNCTIONS. ONE OF THE MALFUNCTIONS, THE NORTHEAST POWER FAILURE OF NOVEMBER 9, 1965, RESULTED IN THE TOTAL LOSS OF ONE SAMPLE. THE SAMPLES OF TWO OTHER MALFUNCTIONS WERE SALVAGED BY USING THE DATA OBTAINED FROM THE RECORDING FLOWMETER. THE FOURTH SAMPLE WAS LOST DUE TO A COMPONENT FAILURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*MONITOR, RADIATION, AIR + *MONITOR, RADIATION, SAMPLING + AIR + SAMPLING

15-13809 SHAMBON, A

SPECTRAL ENERGY DISTRIBUTION OF UNFILTERED X-RAYS FROM A 250 KV CONSTANT POTENTIAL MACHINE
NEW YORK OPERATIONS OFFICE, HEALTH AND SAFETY LAB

HASL-179 +. 22 PAGES, 4 FIGURES, 7 TABLES, 4 REFERENCES, AUGUST 1966

A REPRESENTATION OF THE ENERGY DISTRIBUTION OF FOUR UNFILTERED BEAMS FROM A 250 KV CONSTANT POTENTIAL X-RAY MACHINE IS PRESENTED. THIS REPRESENTATION IS CONSISTENT WITH THE INVERSE SQUARE LAW FOR ATTENUATION OF RADIATION WITH DISTANCE AND WITH THE DOSE RATES OBTAINED WITH A FREE AIR IONIZATION CHAMBER. BY USING A FILTERED BEAM AND AIR CHAMBER MEASUREMENTS AT TWO POSITIONS IN THE BEAM, THE LOCATION OF THE X-RAY SOURCE WAS ACCURATELY ESTABLISHED. IT WAS THEN POSSIBLE TO APPLY THE INVERSE SQUARE LAW TO PARTIAL DOSE RATES IN 10 KV INTERVALS FOUND ANALYTICALLY AT ONE POSITION AND DETERMINE ATTENUATED PARTIAL DOSE RATES AT TWO OTHER POSITIONS OF THE UNFILTERED BEAM. THE SUM OF THESE PARTIAL DOSE RATES WAS COMPARED WITH FREE AIR CHAMBER MEASUREMENTS OF THE TOTAL DOSE RATE. THE TOTAL DOSE RATE OF THE FILTERED BEAM WAS USED TO CALIBRATE A VICTOREEN STRAY RADIATION CHAMBER. THIS CALIBRATION WAS COMPARED WITH ONE OBTAINED WITH NBS CALIBRATED SOURCES. ALL COMPARISONS SHOWED GOOD AGREEMENT. A MONITORING SYSTEM WAS SET UP TO PROVIDE A MEANS TO CORRECT FOR SMALL VARIATIONS IN THE OUTPUT OF THE MACHINE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50

*DOSE MEASUREMENT, EXTERNAL + *X-RAY + DOSE CALCULATION, EXTERNAL + INSTRUMENTATION CALIBRATION

15-13812 GRAVESON RT

POINT SOURCE DETECTION BY SCINTILLATION SURVEY METER
NEW YORK OPERATIONS OFFICE, HEALTH AND SAFETY LAB

HASL-177 +. 38 PAGES, 11 FIGURES, 2 TABLES, 7 REFERENCES, JULY 1966

WHILE THE SCINTILLATION SURVEY METER DISPLAYS HIGH SENSITIVITY TO GAMMA RADIATION, ITS ABILITY TO LOCATE SMALL RADIOACTIVE SOURCES IS LIMITED. THE PARAMETERS CONTROLLING DETECTED COUNT RATE SUCH AS DETECTOR SIZE, QUANTUM EFFICIENCY, AND THE EFFECT OF PULSE HEIGHT DISCRIMINATION HAVE BEEN EXPLORED WITH RESPECT TO SODIUM IODIDE PHOSPHORS. THE ANALYSIS OF THE STATISTICAL VARIABILITY OF RATEMETER READINGS IS RELATED TO THE MINIMUM INCREASE IN COUNT RATE NECESSARY FOR RELIABLE DETECTION. ALSO, THE EFFECT OF RELATIVE MOTION BETWEEN THE SOURCE AND THE SURVEY METER AS IT AFFECTS DETECTION SENSITIVITY HAS BEEN RELATED TO RATEMETER RESPONSE TIME. EMPIRICAL AS WELL AS RIGOROUS RELATIONSHIPS HAVE BEEN DERIVED AND USED TO ACCURATELY PREDICT THE PERFORMANCE OF SEVERAL SIZES OF SCINTILLATION DETECTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*MONITOR, RADIATION, GENERAL + GAMMA + INSTRUMENTATION CALIBRATION

15-13818 BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965

ARGONNIE NATIONAL LABORATORY

ANL-7136 +. 342 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1965

PROGRESS IS REPORTED FOR THE YEAR 1965 FOR RESEARCH IN THE AREA OF RADIATION BIOLOGY. A LIST OF PUBLICATIONS BY MEMBERS OF THE RESEARCH STAFF OF THE BIOLOGICAL AND MEDICAL RESEARCH

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13818 *CONTINUED*
DIVISION IS GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$7.00 CY, \$1.75 MN

*RADIATION EFFECT + BIOLOGICAL CONCENTRATION, GENERAL + CESIUM + DOSIMETRY, GENERAL + ECOLOGICAL CONSIDERATION + GAMMA + NEUTRON + RADIATION DAMAGE + RADIATION PROTECTION, CHEMICAL + RADIATION SAFETY AND CONTROL + SPECTROMETRY, GAMMA + TRITIUM + X-RAY

15-13819 SR-90 LEVELS IN THE DIETS AND BONES OF CHILDREN
COMISION NACIONAL DE ENERGIA ATOMICA, BUENOS AIRES
NYO-2753-4 +. 30 PAGES, 1966

MEASUREMENTS OF NATURAL SR AND SR-90 CONTENT IN FOODS, TOGETHER WITH DIETARY INFORMATION, WERE USED TO ESTIMATE THE UPTAKE OF SR-90 IN CHILDREN OF DIFFERENT AGE GROUPS RESIDING IN THE VICINITY OF BUENOS AIRES, ARGENTINA. THE CONTENT OF SR-90 WAS ALSO MEASURED IN BONE SAMPLES FROM CHILDREN OF DIFFERENT AGE GROUP COLLECTED IN 1965. DIETARY LEVELS OF SR-90 IN 1965 WERE LOWER THAN THOSE OF 1964 FOR ALL AGE GROUPS. ANALYSIS OF THE DATA INDICATES THAT THE TURNOVER RATE OF SR-90 CHANGES WITH AGE. VERY YOUNG INFANTS HAVE A FAST TURNOVER RATE OF ABOUT 7%/MO BUT ONLY 1.5%/MO IN THE SECOND YEAR OF LIFE, AND THE ADULT RATE OF 3.5%/YR IS REACHED DURING THE THIRD YEAR OF LIFE. STRONTIUM TO CA DISCRIMINATION FACTORS FOR THE DIFFERENT AGE GROUPS WERE ALSO CALCULATED FROM THE DATA. THE RESULTS INDICATE THAT SR IS DISCRIMINATED AGAINST LESS IN VERY YOUNG INFANTS THAN IN OLDER CHILDREN WITH A DISCRIMINATION FACTOR OF ABOUT 0.7 IN THE FIRST MONTH AFTER BIRTH AND 0.3 FOR THE SECOND YEAR OF LIFE. SKELETAL TURNOVER RATES AND SR AND CA DISCRIMINATION FACTORS APPEARED TO BE INTERRELATED AND BOTH REACHED ADULT VALUES DURING THE THIRD YEAR OF LIFE WITH A FASTER TURNOVER RATE AND CORRESPONDINGLY LESS DISCRIMINATION OCCURRING DURING ADOLESCENCE.

INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*ARGENTINA + *BIOLOGICAL CONCENTRATION, FOOD + *DIETARY HABIT + *STRONTIUM + BIOLOGICAL CONCENTRATION, MAN + CALCIUM + INGESTION

15-13820 FILIN A + ALEKSEEV Z + IONESKII E
METHODS FOR DETECTING RADIOISOTOPES IN THE COOLING CIRCUIT OF WATER-COOLED HETEROGENEOUS REACTORS
INSTITUTUL DE FIZICA ATOMICA
NP-16006 +. 13 PAGES, 1964

IN DISTINGUISHING BETWEEN VARIOUS ACTIVITIES IT IS DESIRABLE TO KNOW THE ENERGY SPECTRUM AND HALF-LIFE OF A RADIOISOTOPE. THE MAXIMUM BETA ENERGY CAN BE DETERMINED BY ABSORPTION IN ALUMINUM, AND THE GAMMA ENERGY CAN BE DETERMINED ON A GAMMA SCINTILLATION COUNTER. WITH A MIXTURE OF ACTIVITIES THE HARDER COMPONENT OF THE BETA ACTIVITIES CAN BE FOUND MORE READILY AND ACCURATELY. THE ABSORPTION IN ALUMINUM IS NOT ALWAYS STRICTLY EXPONENTIAL AND MUST BE CORRECTED WITH THE USE OF THE PROPER NORMALIZING FACTOR. THE BETA ENERGY, HALF-LIFE, AND GAMMA SPECTRUM GIVE SUFFICIENT INFORMATION TO IDENTIFY A RADIOISOTOPE. FURTHER CONFIRMATION CAN BE OBTAINED BY RADIOCHEMICAL ANALYSIS. SODIUM, IRON, AND COBALT ACTIVITIES WERE SEPARATED AND IDENTIFIED IN THIS WAY. MAGNESIUM, MANGANESE, AND CHROMIUM ACTIVITIES WERE ALSO FOUND.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC. 54669

*ANALYTICAL TECHNIQUE, WATER + CHROMIUM + COBALT + IRON + MAGNESIUM + MANGANESE + RADIOCHEMICAL ANALYSIS + SODIUM + SPECTROMETRY, GAMMA

15-13821 LUKS H
AN ANALYSIS OF LOCATION CONDITIONS FOR REACTORS
KERNFORSCHUNGSANLAGE, JULICH, GERMANY
JUL-189-VW + ORNL-TR-508 +. 132 PAGES, FIGURES, TABLES, REFERENCES, JULY 1964

GENERAL AND SPECIAL PROBLEMS IN SITE SELECTION FOR REACTORS ARE DISCUSSED. PHYSICAL CHARACTERISTICS OF A REACTOR, OPERATING CONDITIONS, AND ENVIRONMENTAL DANGERS ARE CONSIDERED. THE LOCATION AS A FUNCTION OF REACTOR TYPE, HYDROLOGICAL VIEWPOINTS, GEOLOGICAL RELATIONS, TOPOGRAPHICAL CIRCUMSTANCES, METEOROLOGICAL CONDITIONS, POPULATION DENSITY, ADJACENT INDUSTRIES AND OTHER INSTALLATIONS, SOIL USES IN THE ENVIRONS, AND TRAFFIC SITUATIONS ARE DISCUSSED AND EVALUATED. ACCIDENTS AT REACTORS ARE REVIEWED. GERMAN AND FOREIGN REACTOR LOCATIONS ARE DESCRIBED.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISCONSIN 54669

*GERMANY + *SITING, REACTOR + ACCIDENT, HYPOTHETICAL + AGRICULTURAL CONSIDERATION + ECOLOGICAL CONSIDERATION + ENVIRONMENTAL CONDITION + GEOLOGICAL CONSIDERATION, GENERAL + HAZARD, RELATIVE + HAZARDS ANALYSIS + HYDROLOGICAL CONSIDERATION, GENERAL + METEOROLOGY + POPULATION DISTRIBUTION + WASTE DISPOSAL, GENERAL

15-13822 MORRIS DA + BARRACLOUGH JT + CHASE GH + TEASDALE WE + JENSEN RG
HYDROLOGY OF SUB-SURFACE WASTE DISPOSAL--NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT 1964
GEOLOGICAL SURVEY, IDAHO FALLS
ID0-22047-USGS +. 304 PAGES, REFERENCES, MAY 1965

RESEARCH WAS CONDUCTED ON THE HYDROLOGIC ASPECTS OF THE DISPOSAL OF LOW-LEVEL AQUEOUS WASTE TO

ACCESSION NUMBER 15-13818 TO 15-13822

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13822 *CONTINUED*

THE NRTS ENVIRONMENT. GEOLOGIC AND GEOHYDROLOGIC DATA WERE ANALYZED, AND SOME NEW DATA ARE REPORTED. STUDIES WERE MADE OF THE TRA WASTE-DISPOSAL POND AREA. THE EFFECTS OF THE ALASKAN EARTHQUAKE ON THE WATER LEVELS ARE DESCRIBED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$7.00 CY, \$1.50 MN

*HYDROLOGICAL CONSIDERATION, GENERAL + *NRTS (NATIONAL REACTOR TEST STATION) +
*WASTE DISPOSAL, TERRESTRIAL + GEOLOGICAL CONSIDERATION, GENERAL + GEOLOGICAL CONSIDERATION, GEOCHEMICAL +
GEOLOGICAL CONSIDERATION, GEOPHYSICAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + GROUND WATER, GENERAL

15-13823 BOWIE DR
SAMPLING PROGRAM FOR AIRBORNE RADIOACTIVITY
ARMY MEDICAL RESEARCH LAB., ST. LOUIS, MO.
AD-624516 +. 30 PAGES, 8 FIGURES, JANUARY 31, 1965

THE AIR SAMPLING PROGRAM BEING CONDUCTED BY THE FIFTH US ARMY MEDICAL LABORATORY IS PATTERNED AFTER THAT DEVELOPED BY THE US PUBLIC HEALTH SERVICE FOR THE NATIONAL AIR SAMPLING NETWORK. CERTAIN OF THE TECHNIQUES HAVE BEEN MODIFIED OR CHANGED IN ORDER TO SIMPLIFY THE PROCEDURES AND ADAPT THEM TO LOCAL FACILITIES AND INSTRUMENTATION. THE BASIC PROGRAM INVOLVES THE COLLECTION OF PARTICULATE MATTER FROM A KNOWN VOLUME OF AIR. THE COLLECTOR IS A HIGH VOLUME SAMPLER EQUIPPED WITH A GLASS FIBER FILTER. THE GROSS BETA RADIATION EMITTED BY A KNOWN FRACTION OF THE SAMPLE IS MEASURED IN AN APPROPRIATE INSTRUMENT, AND THE CONCENTRATION IS CALCULATED FOR THE SAMPLING PERIOD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 CY, \$0.50 MN

*PARTICULATE + AIR + FILTER, GLASS + GROSS BETA + MONITOR, RADIATION, AIR + MONITOR, RADIATION, SAMPLING +
SAMPLING + SPECTROMETRY, GAMMA

15-13824 ZOLIN LS
THE APPLICATION OF A BORON COUNTER WITH CH₂ MODERATOR IN NEUTRON DOSIMETRY
JOINT INSTITUTE FOR NUCLEAR RESEARCH, DUBNA, USSR
NP-TR-1394 + JINR-P-2252 +. 15 PAGES, 13 REFERENCES, 1965

A DESCRIPTION OF THE CONSTRUCTION AND CHARACTERISTICS OF A BORON COUNTER WITH CH₂ MODERATOR FOR NEUTRON DOSIMETRY ARE PRESENTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*COUNTER + *NEUTRON + DOSIMETRY, GENERAL

15-13825 RADIOLOGICAL PHYSICS
COLUMBIA UNIVERSITY
NYO-2740-3 +. 161 PAGES, FIGURES, TABLES, REFERENCES, PAGES 5-165 FROM ANNUAL REPORT ON RESEARCH PROJECT,
JANUARY 1, 1966

THE DESIGN OF A CAPACITOR TYPE IONIZATION CHAMBER FOR THE DOSIMETRY OF MONOENERGETIC NEUTRONS IN HYDROGENOUS MATERIALS IS DESCRIBED. THE CHAMBER WALL AND COLLECTOR ARE A THERMOSETTING EPOXY PLASTIC MIXTURE THAT GIVES AN EXACT DUPLICATE OF THE HYDROGEN NITROGEN COMPOSITION OF THE TISSUE AND A MIXTURE OF METHANE, NITROGEN, AND CO₂ IS USED AS THE FILLING GAS FOR THE SENSITIVE CHAMBER VOLUME. A SMALL CAPACITOR TYPE IONIZATION CHAMBER THAT EMPLOYS TISSUE EQUIVALENT (MUSCLE) PLASTIC WALLS AND ATMOSPHERIC AIR IN THE SENSITIVE VOLUME WAS FABRICATED FOR USE IN NEUTRON DOSIMETRY. EQUIPMENT DESIGNED FOR THE DOSIMETRY OF A 2.2 BEV PROTON BEAM, WAS TESTED USING ONE BEAM SHAPE AND TWO DIFFERENT PHANTOM CONFIGURATIONS. COMPUTER PROGRAMS WERE WRITTEN TO OBTAIN SUMS OF ALL THE CHAMBER READINGS DURING A GIVEN RUN, RATIOS OF MONITOR CHAMBER TO FLUX READINGS, AND OF DEPTH-DOSE TO MONITOR READINGS AS WELL AS MEAN VALUES AND DEVIATIONS AS REQUIRED. DEPTH DOSE STUDIES IN MOUSE PHANTOMS EXPOSED TO FISSION NEUTRONS AND GAMMA RADIATION FROM THE ORNL HEALTH PHYSICS RESEARCH REACTOR ARE DESCRIBED IN DETAIL. EMPHASIS WAS PLACED ON THE SHIELDING AND SCATTERING EFFECTS PRODUCED WHEN SEVERAL UNRESTRAINED MICE SHARE THE SAME CAGE DURING IRRADIATION. MEASUREMENTS OF THE MICROSCOPIC DISTRIBUTION OF RADIATION ENERGY ARE REPORTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$6.00 COPY, \$1.25 MICROFICHE

*DOSIMETRY, GENERAL + ALPHA EMITTER + ANL (ARGONNE NATIONAL LABORATORY) + BETA EMITTER +
DOSE MEASUREMENT, EXTERNAL + DOSE MEASUREMENT, INTERNAL + GAMMA

15-13827 ICHIKAWA R
REPORT ON NATURALLY OCCURRING RADIONUCLIDES IN HUMAN TISSUES
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
A/AC.82/G/L-1045 (REV.1) +. 24 PAGES, MARCH 1966

RESULTS ARE SUMMARIZED FROM MEASUREMENTS OF NATURALLY OCCURRING RADIONUCLIDES IN HUMAN TISSUES SAMPLED THROUGHOUT THE WORLD. DATA ARE PRESENTED ON THE CONTENT OF RA-226 IN BONES AND TEETH, THE CONTENT OF RA-228 OR TH-228 IN BONE, THE CONTENT OF PB-210 OR PO-210 IN BONE AND TEETH, THE CONTENT OF RA-226 IN SOFT TISSUES, AND THE CONTENT OF PO-210 IN SOFT TISSUES AND PLACENTA. EMPHASIS WAS PLACED ON DATA FROM AREAS OF HIGH NATURAL RADIOACTIVITY SUCH AS

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13827 *CONTINUED*

KERALA, INDIA, THE ARAXA AND TAPIRA REGIONS OF BRAZIL, AND THE ARCTIC REGION OF CANADA. LUNG TISSUES OF CIGARETTE SMOKERS WERE ALSO EXAMINED AND WERE FOUND TO HAVE A HIGHER PO-210 CONTENT THAN THAT OF NONSMOKERS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA.

*BIOLOGICAL CONCENTRATION, MAN + LEAD + POLONIUM + RADIUM + THORIUM

15-13863 RAJEWSKY B + STAHLHOFEN W

POLONIUM-210 ACTIVITY IN THE LUNGS OF CIGARETTE SMOKERS

MAX PLANCK-INSTITUT FUR BIOPHYSIK, FRANKFURT AM MAIN

2 PAGES, 3 TABLES, 9 REFERENCES, NATURE 209, PAGES 1312-1313 (MARCH 26, 1966), PAPER PRESENTED AT THE ELEVENTH INTERNATIONAL CONGRESS OF RADIOLOGY, ROME, SEPTEMBER 1965.

TO CONTRIBUTE FURTHER INFORMATION ON THE NATURAL RADIATION BURDEN APPLIED TO THE HUMAN BODY, WE MEASURED THE PO-210 CONTENT IN DIFFERENT PARTS OF THE LUNGS OF HUMAN CIGARETTE SMOKERS AND NON-SMOKERS. THESE INVESTIGATIONS BECAME NECESSARY, SINCE IN 1964 RADFORD AND HUNT WERE ABLE TO DEMONSTRATE THAT A CONSIDERABLE PORTION OF PO-210, NATURALLY OCCURRING IN TOBACCO, IS INHALED WITH CIGARETTE SMOKE. THE AVERAGE ACTIVITY OF PO-210 ASSESSED IN SOME BRANDS OF CIGARETTES IN OUR LABORATORY IS SUMMARIZED. FOR AN INDIVIDUAL SMOKING 20 CIGARETTES A DAY, THE DAILY PO-210 INHALATION RATE IS 2 PERCENT. CARCINOGENESIS CAUSED BY INHALATION OF PO-210 WITH THE TOBACCO SMOKE IS RATHER UNLIKELY.

*INHALATION + *POLONIUM + BIOLOGICAL CONCENTRATION, VEGETATION + POPULATION EXPOSURE

15-13864 OLSON J

ADVANCES IN RADIATION ECOLOGY

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

4 PAGES, 1 TABLE, 11 REFERENCES, NUCLEAR SAFETY 6(1) PAGES 78-81 (FALL 1964)

SAFETY PROCEDURES ARE COMING TO DEPEND INCREASINGLY ON SCIENTIFIC KNOWLEDGE OF HOW RADIONUCLIDES MOVE AND HOW IONIZING RADIATION COULD AFFECT THE ENVIRONMENT. RADIATION ECOLOGY AIMS TO HELP FURNISH SOME OF THIS NEEDED KNOWLEDGE AND TO USE IT FOR GAINING BETTER PERSPECTIVE ON BASIC AND PRACTICAL ENVIRONMENTAL PROBLEMS. THIS FIRST REVIEW IN A SERIES ON RADIATION ECOLOGY WILL NOTE THE AIMS AND SCOPE OF THE FIELD. THE PROCEEDINGS OF THE FIRST NATIONAL SYMPOSIUM ON RADIOECOLOGY ILLUSTRATE THE SCOPE AND RAISE MANY QUESTIONS.

*ECOLOGICAL CONSIDERATION + AGRICULTURAL CONSIDERATION + BIOLOGICAL CONCENTRATION, GENERAL + FISSION PRODUCT RELEASE, GENERAL + RADIATION EFFECT

15-13866 ABEE HH

ENVIRONMENTAL SURVEYS FOLLOWING ACCIDENTAL RELEASES

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

3 PAGES, 1 TABLE, 17 REFERENCES, NUCLEAR SAFETY 6(1) PAGES 87-89 (FALL 1964)

ENVIRONMENTAL CONTAMINATION RESULTING FROM THE OPERATION OF NUCLEAR FACILITIES HAS BEEN RECOGNIZED AS A POTENTIAL PROBLEM IN THE GROWTH OF THE NUCLEAR INDUSTRY SINCE THE BEGINNING OF THE ATOMIC AGE. MOST LARGE NUCLEAR FACILITIES HAVE DEVELOPED ENVIRONMENTAL SURVEY PROGRAMS TO COMBAT THE PROBLEM AND ASSURE THE PLANT OPERATORS, VARIOUS REGULATORY BODIES, AND THE GENERAL PUBLIC THAT ADEQUATE CONTROL MEASURES ARE BEING TAKEN. THIS REVIEW DEALS WITH THE PROBLEM OF ENVIRONMENTAL SURVEYS FOLLOWING AN ACCIDENTAL RELEASE OF RADIOACTIVE MATERIAL FROM NUCLEAR FACILITIES. IN GENERAL, A MAJOR RADIATION ACCIDENT MAY RELEASE A SUBSTANTIAL QUANTITY OF RADIOACTIVE MATERIALS IN THE FORM OF RADIOACTIVE PARTICULATES AND GASES THAT WOULD ENTER THE ATMOSPHERE, AND RADIOACTIVE LIQUIDS THAT WOULD FLOW TO THE LOCAL SURFACE WATER. AN EXTENSIVE ENVIRONMENTAL SURVEY WOULD BE NEEDED TO FIX CONTAMINATION BOUNDARIES AND TO ESTABLISH NECESSARY CONTROL MEASURES.

*SURVEY, RADIATION, EMERGENCY + *SURVEY, RADIATION, ENVIRONMENTAL + ACCIDENT, HYPOTHETICAL + FISSION PRODUCT RELEASE, GENERAL + INCIDENT, EXPOSURE + INCIDENT, FATALITY + IODINE + REACTOR, BOILING WATER + SAMPLING + SL 1 (STATIONARY LOW POWER PLANT) + SURVEY, RADIATION, AERIAL

15-13872 SEHMEI GA

SUBISOKINETIC SAMPLING OF PARTICLES IN AN AIR STREAM

BATTELLE-NORTHWEST, RICHLAND, WASHINGTON

BNWL-217 +. 66 PAGES, 28 FIGURES, 2 TABLES, 40 REFERENCES, MARCH 1, 1966

THE ERRORS ASSOCIATED WITH SUBISOKINETICALLY SAMPLING AEROSOLS FROM AN AIR STREAM WERE DETERMINED FOR ONE FILTER HOLDER GEOMETRY WITH A 41-MM DIAMETER FILTER AREA EXPOSED. SAMPLING VELOCITIES RANGED FROM 0.008 OF ISOKINETIC TO ISOKINETIC FOR AIRSPEEDS FROM 2.7 TO 30 MPH. ZINC SULFIDE AEROSOL PARTICLES WITH DIAMETERS 3 TO 25 MICRONS WERE STUDIED. MICROSCOPY WAS USED TO EVALUATE THE NUMBER OF PARTICLES ON THE FILTERS. TO DETERMINE SAMPLING ERRORS AS A FUNCTION OF PARTICLE SIZE, LEAST-SQUARES TECHNIQUES WERE USED TO DETERMINE TRUNCATED-PARTICLE-SIZE DISTRIBUTIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.75 MN

*SAMPLING + AEROSOL + AIR + FILTER EFFICIENCY + PARTICLE SIZE

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13873 LEE E + MACK RJ + SEDGLEY DB
GADOSE AND DOSET. PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE
GENERAL ATOMIC DIVISION, GENERAL DYNAMICS CORP.
GA-6511 +. 62 PAGES, 9 FIGURES, 3 TABLES, 7 REFERENCES, APRIL 25, 1966

THIS REPORT DESCRIBES THE DIGITAL COMPUTER PROGRAM GADOSE, THE CALCULATIONAL TECHNIQUES USED, AND A SAMPLE CALCULATION. THE PROGRAM WAS WRITTEN SPECIFICALLY FOR THE HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGR) TYPE OF PLANT, BUT NO SPECIFIC ACCIDENT RESULTS ARE GIVEN. GADOSE IS A FORTRAN PROGRAM WHICH CALCULATES THE RADIOACTIVITY IN VARIOUS REACTOR PLANT LOCATIONS AND THE DOSES TO THE PUBLIC RESULTING FROM INSTANTANEOUS ACCIDENTAL RELEASE OF ACTIVITY INTO ANY OF THE PLANT SPACES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY, \$0.75 MN

*ACCIDENT, HYPOTHETICAL + *COMPUTER PROGRAM + ACCIDENT ANALYSIS + ACCIDENT, CONSEQUENCES + DOSE + DOSE CALCULATION, EXTERNAL + DOSE CALCULATION, INTERNAL + REACTOR, GAS COOLED

15-13874 MAYBERRY BD
DIFFERENTIAL ABSORPTION OF STRONTIUM BY PLANTS. FINAL REPORT
TUSKEGEE INSTITUTE, ALA.
TID-23052 +. 19 PAGES, REFERENCES, MARCH 23, 1966

THE FACTORS WHICH INFLUENCE THE ACCUMULATION OF STRONTIUM IN EDIBLE PLANT PARTS WERE STUDIED. LIMA BEANS, SQUASH, POTATOES, AND TOMATOES WERE GROWN IN THE GREENHOUSE AND IN THE GROWTH CHAMBER. THE GROWING MEDIUM WAS NORFOLK LOAMY SAND OF LOW (5.7) INITIAL PH. PLANT NUTRIENTS, OTHER THAN CALCIUM, WERE ADDED IN CALCULATED OPTIMUM AMOUNTS. THE PLANTS WERE GROWN UNDER THESE CONDITIONS TO THE STAGE OF HARVEST FOR COMMERCIAL PURPOSES. THE PRACTICE OF SUCCESSION CROPPING DID NOT SIGNIFICANTLY DECREASE STRONTIUM ABSORPTION. THE UPTAKE OF STRONTIUM BY PLANTS, IRRESPECTIVE OF SPECIES, WAS DECREASED WITH INCREASE IN CALCIUM CONTENT OF THE ACID SOIL UP TO THE POINT OF 100% OF BASE SATURATION. THE TOTAL UPTAKE OF STRONTIUM BY PLANTS DIFFERED WITH THE SPECIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50, MN.

*BIOLOGICAL CONCENTRATION, VEGETATION + *SORPTION + *STRONTIUM + BIOLOGICAL CONCENTRATION, FOOD + ECOLOGICAL CONSIDERATION + SOIL, PROPERTY

15-13875 OREN OH
STUDY OF THE PHYSICO-CHEMICAL-BIOLOGICAL PROCESSES AFFECTING THE DISPERSION OF RADIONUCLIDES. PART I AND II. REPORT NO. 4 (FINAL)
MINISTRY OF AGRICULTURE, HAIFA
NP-16179 +. 158 PAGES, JANUARY 1964

RESULTS ARE SUMMARIZED FROM STUDIES ON BIOLOGICAL, CHEMICAL, AND PHYSICAL PROCESSES THAT MAY AFFECT THE DISTRIBUTION OF RADIONUCLIDES IN THE EASTERN MEDITERRANEAN SEA, WITH EMPHASIS ON THE LEVANTIN BASIN AND THE COASTAL AREA OF ISRAEL. THE NILE RIVER IS THE ONLY SOURCE OF FRESH WATER AND NUTRIENTS IN THE AREA, AND THE INFLUENCE OF SEASONAL FLOODING OF THE NILE RIVER WAS STUDIED. DATA ARE PRESENTED ON THE TEMPERATURE, SALINITY, AND SILICATE, CALCIUM, AND MAGNESIUM CONTENTS OF THE WATER IN VARIOUS SEASONS OF THE YEAR. DATA ARE ALSO INCLUDED ON NUTRIENT CONTENT, FOOD CHAINS OF PHYTOPLANKTON, ZOOPLANKTON, BENTHIC MICRO- AND MACRO-COMMUNITIES, FISH OF ECONOMIC IMPORTANCE, AND ON PRIMARY PRODUCTION AS MEASURED BY THE C-14 METHOD, AND ON METEOROLOGICAL AND SOLAR FACTORS AFFECTING PRIMARY PRODUCTION IN THE EASTERN MEDITERRANEAN SEA.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*ECOLOGICAL CONSIDERATION + *OCEAN AND SEA + *SURFACE WATER, NUCLIDE OCCURRENCE + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + FALLOUT + ISRAEL + METEOROLOGY + RIVER, GENERAL + SURFACE WATER, PROPERTY + SURFACE WATER, SEDIMENT

15-13876 MARTIN JH
HEALTH AND SAFETY RESEARCH AT CHAPELCROSS. ANNUAL REPORT, 1965
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, ANNON
PG-REPORT-705 +. 6 PAGES, 1966

A CORRELATION BETWEEN RADIATION EXPOSURE AND THYMINE METABOLISM IN MAN WAS FOUND. POSSIBLE USE OF THIS SYSTEM AS AN INDEX OF RADIATION EXPOSURE IS DISCUSSED. THERMAL NEUTRON FLUXES AT DEPTH IN TISSUES WERE MEASURED IN TISSUE-EQUIVALENT PHANTOMS USING A PLASTIC PHOSPHOR DETECTOR, AN IONIZATION COUNTER, AND A LI-6 SCINTILLATION COUNTER AND APPROPRIATE CALCULATIONS. THE DEVELOPMENT OF A NEUTRON DOSIMETER IS DISCUSSED. THE DEVELOPMENT OF A PROPORTIONAL COUNTER FOR USE IN C-14 DATING STUDIES AND THE DEVELOPMENT OF A 5-1 PROPORTIONAL COUNTER FOR THE IDENTIFICATION OF ALPHA EMITTERS IN MARINE SAMPLES BY ALPHA SPECTROMETRY ARE REPORTED. DATA ARE INCLUDED ON THE RADIOACTIVITY IN POND WATER AND THE PARTICLE SIZE AND ISOTOPES PRESENT IN THE GAS CIRCUITS OF CHAPELCROSS REACTORS.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVENUE, NEW YORK, N.Y. 10022, \$0.30 CY

*RADIATION PROTECTION, CHEMICAL + *STRONTIUM + *UNITED KINGDOM + BIOLOGICAL CONCENTRATION, MAN + BIOMEDICAL + CARBON + COUNTER + DOSE + DOSIMETRY, GENERAL + MERCURY + PARTICLE SIZE + PLUTONIUM + RADIATION DAMAGE + RADIATION SAFETY AND CONTROL + REACTOR, GAS COOLED + SPECTROMETRY, ALPHA + SURFACE WATER, NUCLIDE OCCURRENCE + THERMAL NEUTRON

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-13878 BHAT IS + KHAN AA + KAMATH PR
PREOPERATIONAL ENVIRONMENTAL SURVEY FOR TARAPUR ATOMIC POWER PROJECT. PROGRESS REPORT, 1964-65.
ATOMIC ENERGY ESTABLISHMENT, TROMBAY
AEET-242 +. 71 PAGES, FIGURES, TABLES, 1965

ROUTINE MONITORING SITES WERE CHOSEN AND A STUDY OF RADIOACTIVITY CONTENT IN ENVIRONMENTAL SAMPLES WAS INITIATED. FORTY-FIVE SAMPLING STATIONS WERE LOCATED IN THE 32 KM REGION ROUND THE SITE AND 558 ENVIRONMENTAL SAMPLES WERE COLLECTED. FALLOUT LEVELS, TRACE ELEMENTS, AND NATURAL RADIOACTIVITY CONTENT ARE DETERMINED IN THESE SAMPLES. A DESCRIPTION OF THIS WORK IS PRESENTED.

AVAILABILITY - MICROCARD EDITIONS (FOR SALE) ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISC.

*MONITOR, RADIATION, ENVIRONMENTAL + *SURVEY, RADIATION, ENVIRONMENTAL + FALLOUT + INDIA + METEOROLOGY + RADIATION SAFETY AND CONTROL + SAMPLING

15-13879 JACKSON WA + CRAIG DL
ANNUAL PROGRESS REPORT (ON CESIUM AND STRONTIUM UPTAKE AND ASSIMILATION BY HIGHER PLANTS) MAY 1, 1965 - FEBRUARY 1, 1966
NORTH CAROLINA STATE UNIVERSITY
ORO-2410-1 +. 46 PAGES, JANUARY 1966

PROGRESS IS REPORTED IN TRACER STUDIES OF FACTORS INFLUENCING THE UPTAKE OF CS AND SR BY PLANTS. DATA ARE INCLUDED FROM STUDIES IN WHEAT SEEDLINGS. EMPHASIS WAS PLACED ON THE EFFECTS OF NITROGEN ON THE UPTAKE AND TRANSPORT OF CS AND SR. DATA ARE INCLUDED FROM A COMPARATIVE STUDY OF THE EFFECTS OF CA AND K ON NITRATE UPTAKE AND REDUCTION IN SEEDLINGS AND THE EFFECTS OF PHOSPHATES, CARBOHYDRATE LEVEL, NH₄, AND SELECTED CATIONS ON THE UPTAKE OF NITRATE NITROGEN AND CS AND SR. THE CHANGES IN METABOLIC PATTERNS WITHIN SHORT TIME PERIODS INDICATE A LARGE NUMBER OF WAYS IN WHICH PLANT METABOLISM IS ALTERED WHEN EXPOSED TO AMMONIUM OR NITRATE NITRO NITROGEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD VA., \$2.00 CY, \$0.50 MN

*BIOLOGICAL CONCENTRATION, FOOD + *ECOLOGICAL CONSIDERATION + CESIUM + SOIL, PROPERTY + STRONTIUM

15-13880 BENDER MA + GOOCH PC
CYTOGENETIC METHODS. SOMATIC CHROMOSOME ABERRATIONS IN OCCUPATIONALLY IRRADIATED HUMANS
OAK RIDGE NATIONAL LABORATORY
ORNL-P-2175 + CONF-660412-2 +. 14 PAGES, FROM SYMPOSIUM ON ACCIDENTAL IRRADIATION AT PLACE OF WORK, NICE, 1965

RESULTS ARE REVIEWED FROM STUDIES OF RADIOINDUCED CHROMOSOME ABERRATIONS IN OCCUPATIONALLY EXPOSED HUMANS. CHROMOSOME BREAKS INCREASE AS A LINEAR FUNCTION OF RADIATION DOSE AND MAY BE INDUCED IN EITHER SOMATIC OR GERMINAL CELLS. THE PERIPHERAL LEUKOCYTES AND THEIR PRECURSORS HAVE BEEN STUDIED EXTENSIVELY IN CULTURES AND DATA FROM CYTOGENETIC STUDIES ARE SUMMARIZED. IT IS CONCLUDED THAT ABERRATION ANALYSIS OF PERIPHERAL LEUKOCYTES IS A USEFUL TOOL FOR THE DIAGNOSIS OF RADIATION EXPOSURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*BIOMEDICAL + *RADIATION EFFECT + DOSE + ECOLOGICAL CONSIDERATION + PERSONNEL EXPOSURE, RADIATION + RADIATION DAMAGE + RADIATION SAFETY AND CONTROL

15-14423 HILL EL + JOHNSON T + LYDAY RO
COMPUTER PROGRAM FOR ANALYSIS OF BUILDING PROTECTION FACTORS
RESEARCH TRIANGLE INSTITUTE
RM-205-1. PT. II +. 60 PAGES, JULY 6, 1965

THIS IS PART II OF A TWO-PART REPORT ON A COMPUTER PROGRAM FOR ANALYZING BUILDING PROTECTION FACTORS. IT IS INTENDED FOR USE, PRIMARILY, IN PROGRAMS OF THE TECHNICAL SERVICES DIRECTORATE, OCD. SUCH PROGRAMS INCLUDE THE MILITARY OVERSEAS SHELTER SURVEY (MOSS), EVALUATION OF FALLOUT PROTECTION IN HOMES (EPFH), AND CONTINUING NATIONAL FALLOUT SHELTER SURVEYS. PART II OF THIS REPORT CONTAINS A LISTING OF THE COMPUTER PROGRAM STEPS (IN FORTRAN 64) FOR BOTH THE ERROR AND EDIT CHECKS AND THE PF COMPUTATION. IT ALSO CONTAINS INSTRUCTIONS FOR OPERATING THE PROGRAM ON THE CDC 3600 COMPUTER.

*COMPUTER PROGRAM + *SHIELDING + BUILDING

15-14424 HILL EL + JOHNSON T + LYDAY RO
COMPUTER PROGRAM FOR ANALYSIS OF BUILDING PROTECTION FACTORS
RESEARCH TRIANGLE INSTITUTE
RM-205-1. PT. I +. 27 PAGES, 7 FIGURES, 5 REFERENCES, JULY 6, 1965

THIS REPORT DESCRIBES A COMPUTATIONAL PROCEDURE WRITTEN IN FORTRAN 64 FOR ANALYZING THE PROTECTION AGAINST RADIATION AFFORDED BY DIFFERENT TYPES OF BUILDINGS. THE PROCEDURE CONSIDERS CONTRIBUTIONS FROM THE ROOF, SETBACKS, AND LIMITED PLANES OF CONTAMINATION. THE EFFECTS OF APERTURES, INTERIOR PARTITIONS, FLOORS, HEIGHT, MUTUAL SHIELDING AND BUILDING GEOMETRY ARE INCLUDED. THE PRESENT PROGRAM DOES NOT INCLUDE PARTIAL BASEMENTS, AND VERY CONSERVATIVE CALCULATIONS ARE MADE FOR EXPOSED BASEMENTS. THESE PROBLEMS ARE REMEDIED IN THIS PROGRAM BY PERFORMING CALCULATIONS IN ACCORDANCE WITH THE ENGINEERING MANUAL.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14424 *CONTINUED*
*COMPUTER PROGRAM + *SHIELDING + BUILDING + POPULATION EXPOSURE + RADIATION SAFETY AND CONTROL

15-14428 CHASSANY J + GUILLERMIN P + MALLET P
THE HEALTH PHYSICS OF INSTALLATIONS FOR UNCANNING IRRADIATED FUELS OR FOR HANDLING RADIO-ELEMENTS AT MARCOULE
COMMISSARIAT A L'ENERGIE ATOMIQUE, CHUSCLAN
CEA-R-3019 +. 78 PAGES, AUGUST 1966

ELEMENTS OF CONSIDERABLE SPECIFIC RADIOACTIVITY ARE HANDLED UNDER WATER IN THESE INSTALLATIONS. A STUDY IS MADE OF WATERFILTRATION AND OF THE VENTILATION IN PARTICULAR. THE INSTALLATIONS HAVE BEEN DIVIDED INTO ZONES DEPENDING ON THE RADIO-ACTIVE RISKS, AND THE IRRADIATION AND ATMOSPHERIC CONTAMINATION IS THE OBJECT OF A SYSTEMATIC CONTROL AT VARIOUS POINTS. A DESCRIPTION IS GIVEN OF ALL ASPECTS OF HEALTH PHYSICS WHICH HAVE BEEN ENCOUNTERED DURING SIX YEARS - STORAGE, TRANSFER OF RADIOACTIVE MATERIAL, UNCANNING, ROLLING, WASTE EVACUATION, SPECIALIZED OPERATIONS, INSTALLATIONS IN OPERATION AND AT REST, AND TRANSPORT.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*RADIATION SAFETY AND CONTROL + CONTAINMENT, FUEL REPROCESSING + FRANCE + PERSONNEL EXPOSURE, RADIATION + WASTE HANDLING

15-14429 HENDERSON RW
ANALYSIS OF UNDERGROUND WEAPON TEST EFFLUENT SAMPLES
LOS ALAMOS SCIENTIFIC LABORATORY
LA-3420 +. 17 PAGES, SEPTEMBER 1966

DURING UNDERGROUND WEAPONS TESTING, ACCIDENTAL RELEASES OF MATERIAL TO THE ATMOSPHERE MAY OCCUR. THE COMPOSITION OF THIS MATERIAL VARIES DEPENDING ON THE AGE OF THE FISSION PRODUCTS AT THE TIME OF THE RELEASE AND THE STATUS OF THE OPERATION. THIS REPORT GIVES THE METHODS AND PROCEDURES USED BY GROUP H-8 TO DERIVE THE ISOTOPIC COMPOSITION OF THE RELEASED MATERIAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*NUCLEAR EXPLOSION DEBRIS + *TEST, WEAPONS (HP ASPECTS) + FISSION PRODUCT RELEASE, GENERAL + IODINE + KRYPTON + RADIOCHEMICAL ANALYSIS + XENON

15-14430 WATT DE + CLARE DM + GORDON AR
TISSUE DOSE-EQUIVALENT RATES. I. FROM COSMIC RAY NEUTRONS. II. IN THE LOW LEVEL ENVIRONMENT OF CHAPELCROSS NUCLEAR POWER STATION
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, ANNON, SCOTLAND
PG-REPORT-734 +. 12 PAGES, 3 TABLES, 3 FIGURES, 26 REFERENCES, 1966

THE DOSE-EQUIVALENT RATE DUE TO NATURALLY OCCURRING NEUTRON RADIATION IS CALCULATED TO BE 11×8 PLUS OR MINUS 1×0 MREM/Y FOR A SMALL PIECE OF TISSUE IN AIR AT SEA LEVEL AND AT A LOCATION WITH GEOGRAPHICAL COORDINATES. THE NEUTRON DOSE EQUIVALENT EXPERIENCED BY THE POPULATION AT SEA LEVEL FOR ISOTROPIC IRRADIATION VARIES FROM 6×2 PLUS OR MINUS 0×5 MREM/Y AT THE SURFACE OF THE BODY TO 56 PERCENT OF THIS VALUE AT 10 CM DEEP ASSUMING THE BODY IS REPRESENTED BY A SEMI-INFINITE SLAB OF TISSUE 20 CM THICK. THE D.E. RATE AT THE SURFACE OF THE BODY FOR PERSONS FLYING AT SUPERSONIC TRANSPORT ALTITUDES (APPROX. 65,000 FT) IS 0.20 PLUS OR MINUS 0.02 MREM/HR. EXPERIMENTAL MEASUREMENTS, USING THE SPHERICAL MODERATOR TECHNIQUE, CONFIRM THE CALCULATED VALUE FOR THE NATURAL DOSE-EQUIVALENT RATE. THESE MEASUREMENTS WERE EXTENDED TO DETERMINE CONTOURS OF DOSE-EQUIVALENT IN THE LOW LEVEL ENVIRONMENT OF THE REACTOR INSTALLATION. THE NATURAL LEVEL IS NOT EXCEEDED OUTSIDE THE PERIMETER FENCE, AND THE NORMAL WORKING LOCATIONS OF ALL EMPLOYEES WITHIN THE ESTABLISHMENT ARE SUBJECTED TO NEUTRON DOSE-EQUIVALENT RATES WELL BELOW THE MAXIMUM PERMISSIBLE RECOMMENDED BY I.C.R.P.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVENUE, NEW YORK, NEW YORK 10022, \$0.50 COPY

*COSMIC RADIATION + *DOSE CALCULATION, EXTERNAL + NEUTRON + PERSONNEL EXPOSURE, RADIATION + UNITED KINGDOM

15-14431 STEVENS DC + RITCHIE JB
EVALUATION OF AIRHOODS AND AIRBLOUSES USED AT A.E.R.E.
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, ENGLAND
AERE-R-5184 +. 17 PAGES, 2 TABLES, 4 FIGURES, 4 REFERENCES, SEPTEMBER 1966

THE PENETRATION OF A SODIUM CHLORIDE AEROSOL INTO AIRHOODS AND AIRBLOUSES HAS BEEN MEASURED AT VARIOUS FLOW RATES OF COMPRESSED AIR. A FLOW OF 5 CFM IS REQUIRED TO ENSURE A PROTECTION FACTOR OF 1000. A DIRECT READING PROTOTYPE FLOW METER HAS BEEN MADE WHICH CAN BE PERMANENTLY INSERTED INTO THE AIRLINE NEAR THE HOOD OR BLOUSE SO THAT A WEARER CAN ADJUST HIS AIR FLOW AS REQUIRED, ABOVE A RECOMMENDED MINIMUM VALUE. MEASUREMENTS ARE ALSO REPORTED OF THE NOISE LEVELS IN AIRHOODS AND BLOUSES AND SIMPLE MEANS OF REDUCING THESE HAVE BEEN INVESTIGATED. AT A FLOW RATE OF 5 CUBIC FEET PER MINUTE, THE NOISE LEVEL IN THE HOODS AND BLOUSES AT PRESENT IN USE AT A.E.R.E. IS ABOUT 90 DB, AND USERS COULD EXPERIENCE DISCOMFORT AND POSSIBLE TEMPORARY (HEARING) THRESHOLD SHIFT. THESE NOISE LEVELS CAN BE REDUCED BY AS MUCH AS 15 DB BY THE INSERTION OF SIMPLE FILTER PADS AT THE AIR INLET. NEW DESIGNS OF HOODS AND BLOUSES BASED ON THE DRAFT PROVISIONAL SPECIFICATIONS OF THE WORKING PARTY ON STANDARDISATION OF PRESSURIZED SUITS ARE PROVIDED WITH SOUND Baffle FILTERS. IN THESE, THE NOISE LEVELS ARE SATISFACTORY.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14431 *CONTINUED*

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVENUE, NEW YORK, NEW YORK 10022, \$0.70 COPY

*PERSONNEL PROTECTIVE DEVICE + AEROSOL + UNITED KINGDOM

15-14432 JAWOROWSKI Z

CONTENT OF RADIUM-D IN HUMAN BONES AND HAIR

INSTITUTE OF NUCLEAR RESEARCH, POLISH ACADEMY OF SCIENCES

AEC-TR-6491 +. 6 PAGES, 7 FIGURES, 1 TABLES, 14 REFERENCES, NUKLEONIKA 10(5) PAGES 367-373 (1965)

RADIUM-D WAS DETERMINED IN HUMAN BONE AND HAIR SAMPLES COLLECTED IN 1963 IN WARSAW. THE AVERAGE CONCENTRATION OF RA-D IN BONES WAS 0.041 PC/G WET BONE AND IN HAIR 0.198 PC/G HAIR. THESE CONCENTRATIONS ARE 1.6 AND 7 TIMES AS HIGH AS THOSE IN THE SAMPLES COLLECTED IN 1960 IN THE LONDON AREA AND ANALYZED BY THE SAME METHOD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*BIOLOGICAL CONCENTRATION, MAN + *RADIUM + POLAND

15-14434 JAMES RA + FLEMING EH

RELATIVE SIGNIFICANCE INDEX OF RADIONUCLIDES FOR CANAL STUDIES

LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA

UCRL-50,050-1 +. 11 PAGES, SEPTEMBER 13, 1966

A MEANS OF ARRANGING THE RADIONUCLIDES IN THE ORDER OF DECREASING RELATIVE SIGNIFICANCE IS PRESENTED. IN THE CURRENT ABSENCE OF SUFFICIENT DATA TO DO OTHERWISE, IT IS ASSUMED TEMPORARILY THAT THE FRACTION K OF EACH NUCLIDE EXISTING IN THE ENVIRONMENT WHICH IS INGESTED PER DAY IS CONSTANT. THE VALUE OF K FOR EACH NUCLIDE WHICH GIVES THE MAXIMUM ALLOWABLE DOSE SUGGESTED FOR THE GENERAL PUBLIC BY THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION THUS ALLOWS ARRANGING THE NUCLIDES IN THE ORDER OF THEIR SIGNIFICANCE. IN THIS PAPER, THE TIME PERIOD FROM TWO MONTHS AFTER THE LAST DETONATION TO 50 YEARS IS CONSIDERED. FUTURE PAPERS WILL CONSIDER OTHER TIME PERIODS.

AVAILABILITY -- CLEARINGHOUSE FOR FEDERAL AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CRITICAL NUCLIDE + EXCAVATION, NUCLEAR + HAZARD, RELATIVE + NUCLEAR DETONATION

15-14435 MUMME IA + DUGGLEBY JC + FINN RJ + PARSONS DE

PRELIMINARY REGIONAL STUDY OF SURFACE RADIOACTIVITY IN THE BROKEN BAY-ILLAWARRA-KATOOMBA AREA

AUSTRALIAN ATOMIC ENERGY COMMISSION RESEARCH ESTABLISHMENT, LUCAS HEIGHTS

AAEC-TM-317 +. 22 PAGES, APRIL 1966

NATURAL BACKGROUND RADIATION WAS MEASURED ALONG TYPICAL ROAD TRAVERSES IN THE ENVIRONS OF SYDNEY AND LUCAS HEIGHTS. SOIL SAMPLES WERE TAKEN AND RADIOACTIVE ELEMENTS IDENTIFIED BY GAMMA SPECTROMETRY. THE GAMMA-RAY DOSE RATES WERE IN THE RANGE 20-40 MRAD/YEAR, THOUGH HIGHER AND LOWER VALUES WERE RECORDED. THE NORMAL GAMMA-RAY INTENSITIES AT THE SURFACE WERE GENERALLY RELATED TO THE NATURE OF THE UNDERLYING WEATHERED ROCK FORMATIONS. THE CHARACTERISTIC DOSE RATES ARE LISTED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*AUSTRALIA + *SURVEY, RADIATION, ENVIRONMENTAL + DOSE MEASUREMENT, EXTERNAL + GEOLOGICAL CONSIDERATION, STRATIGRAPHY + SOIL, NUCLIDE OCCURRENCE + SPECTROMETRY, GAMMA

15-14436 TERESI JD + NEWCOMBE CL

AN ESTIMATE OF THE EFFECTS OF FALLOUT BETA RADIATION ON INSECTS AND ASSOCIATED INVERTEBRATES

NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA

AD-633024 + USNRDL-TR-982 +. 68 PAGES, FEBRUARY 28, 1966

THREE PRACTICAL CONSIDERATIONS WERE FOUND TO MERIT ATTENTION IN THE EVALUATION OF THE IMPACT OF FALLOUT RADIATION ON THE TERRESTRIAL INSECTS AND ASSOCIATED INVERTEBRATES. FIRST, RELATIVELY LOW DOSE LEVELS WILL AFFECT DEVELOPMENTAL STAGES AS COMPARED TO ADULT STAGES - SECOND, LOWER DOSES ARE REQUIRED TO PRODUCE LATE MORTALITY COMPARED TO THOSE REQUIRED FOR EARLY DEATHS - AND THIRD, RELATIVELY LOW DOSES WILL CAUSE STERILITY. THE CALCULATED POTENTIAL BETA DOSES INDICATED THAT THE DOSE LEVEL EXPECTED TO STERILIZE A LARGE MAJORITY OF THE ORGANISMS CONSIDERED IN THIS STUDY WOULD BE FOUND IN AREAS BOUNDED APPROXIMATELY BY THE 50 R/HR AT 1 HR GAMMA CONTOUR (4,600 BETA RADS ACCUMULATED IN ABOUT 5 DAYS) FOR A 1 MT BURST, BY THE 100 R/HR AT 1 HR GAMMA CONTOUR (5200 BETA RADS IN ABOUT 5 DAYS) FOR A 10 MT BURST, AND BY THE 100 R/HR AT 1 HR CONTOUR (5200 BETA RADS IN ABOUT 14 DAYS) FOR A 100 MT BURST.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*ECOLOGICAL CONSIDERATION + *RADIATION EFFECT + DOSE + FALLOUT

15-14439 MADSHUS K + STROMME A + KOREN K.

CS-137 IN MILK IN NORWAY 1962-1966

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14439 *CONTINUED*
NORSK HYDROS INSTITUTE FOR CANCER RESEARCH + THE NORWEGIAN RADIUM HOSPITAL + STATE INSTITUTE OF RADIATION
HYGIENE
NYO-3364-20 +. 42 PAGES, 1966

THE PRESENT REPORT CONTAINS A SURVEY OF CS-137 CONTAMINATION IN COWS MILK IN NORWAY DURING THE PERIOD MARCH 1962-MAY 1966. THE REPORT IS DIVIDED INTO TWO SECTIONS, THE FIRST ONE BEING A GENERAL SURVEY WITH SUMMARIES AND CONCLUSIONS. THIS PART ALSO INCLUDES CURVES SHOWING THE SEASONAL VARIATIONS OF CS-137 IN MILK BASED UPON MONTHLY OBSERVATIONS, WHILE THE SECOND PART DEALS ONLY WITH SINGLE OBSERVATIONS IN MILK SAMPLES FROM LATE WINTER AND SPRING. THE MILK SURVEY HAS BEEN CONDUCTED IN COOPERATION WITH THE NORWEGIAN MILK PRODUCERS ASSOCIATION. EACH SAMPLE CONSISTS OF 2 LITRES EXTRACTED FROM THE TOTAL AMOUNT OF ONE DAYS DISTRIBUTION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*BIOLOGICAL CONCENTRATION, MILK + *CESIUM + *NORWAY + RADIOCHEMICAL ANALYSIS

15-14472 LINTZ DO
ENVIRONMENTAL RADIOACTIVE BACKGROUND SURVEY FOR THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY. FINAL REPORT, JUNE 1, 1957-JUNE 30, 1959
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
AD-630605 + AFFDL-TR-65-185 +. 62 PAGES, DECEMBER 1965

THIS ENVIRONMENTAL RADIOACTIVE BACKGROUND SURVEY WAS AN ATTEMPT TO ESTABLISH A BASE LINE OF THE NORMALLY OCCURRING RADIOACTIVITY IN THE FAUNA AND FLORA OF A PARTICULAR AREA SUBSEQUENT TO THE OPERATION OF A REACTOR WHICH WILL RELEASE ADDITIONAL RADIOACTIVITY TO THE ENVIRONMENT. THE HEALTH PHYSICS OFFICE OF THE AF NETF HAS COLLECTED SAMPLES OF WATER, SOIL, AIR, SEWAGE, MILK, BIOLOGICAL LIFE, AND VEGETATION IN A 20-MILE RADIUS OF THE AF NETF SITE AND ANALYZED THE SAMPLES FOR ALPHA, BETA, AND GAMMA ACTIVITY. THE RESULTS OF THE ANALYSES OVER THE PERIOD OF THE REPORT ARE GIVEN IN GRAPHIC FORM TO FACILITATE COMPARISON OF THE FLUCTUATIONS IN THE NORMAL BACKGROUND.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, ANIMAL + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + FALLOUT + MONITOR, RADIATION, AIR + RADIATION SAFETY AND CONTROL + RAINOUT + SAMPLING + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, NUCLIDE OCCURRENCE

15-14473 PARKER WJ
THERMAL HARDENING CONSIDERATIONS PERTAINING TO RESIDENTIAL AREAS
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
AD-635250 + USNRDL-TR-984 +. 56 PAGES, JULY 6, 1966

THE INCENDIARY EFFECTS OF THERMAL RADIATION FROM NUCLEAR WEAPONS ON RESIDENTIAL AREAS IS CONSIDERED. IT IS CONCLUDED THAT A HAZARD DOES EXIST AND THAT THE MOST DESIRABLE MEANS OF PROTECTION IS TO MAKE THE EXPOSED MATERIALS IGNITION RESISTANT. A DISCUSSION OF SOME OF THE FEATURES OF THE PYROLYSIS, AND IGNITION OF CELLULOSE AND THE ACTION OF FLAME RETARDANTS THAT ARE OF IMPORTANCE IN THE THERMAL HARDENING PROBLEM IS PRESENTED. SOME EXPERIMENTS WHICH MAY HELP TO ELUCIDATE THESE PROCESSES ARE SUGGESTED. IT IS RECOMMENDED THAT VARIOUS FIRE-RETARDANT TREATMENTS, INCLUDING PRESENTLY USED CHEMICAL FLAME RETARDANTS, HALOGEN FLAME INHIBITORS, PREHEATING TREATMENTS, AND EXPOSURE TO IONIZING RADIATION, BE EVALUATED IN TERMS OF THE PROTECTION THAT THEY MIGHT PROVIDE AGAINST THE THERMAL RADIATION FROM NUCLEAR WEAPONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*CIVIL DEFENSE + *THERMAL CONSIDERATION + NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL

15-14474 MISKE JA
RELEASE OF RADIOACTIVITY FROM NUCLEAR CRATERING EXPERIMENTS
LAWRENCE RADIATION LABORATORY
UCRL-14778 + CONF-660920-6 +. 12 PAGES, AUGUST 26, 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME ITALY, SEPTEMBER 5-10, 1966

DATA FROM THE EXCAVATION EXPERIMENTS TO DATE INDICATE THAT THE CLOSE-IN FALLOUT DEPENDS PRIMARILY ON THE CHEMICAL SPECIES INVOLVED. THE LONG-RANGE CONCENTRATIONS APPEAR TO BE INDEPENDENT OF THE DETAILED NATURE OF THE SOURCE BUT DEPEND PRIMARILY ON THE ATMOSPHERIC DISSIPATIVE PROCESSES ONCE THE EARLY FALLOUT HAS OCCURRED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*FALLOUT + *PLOWSHARE PROGRAM + DEPOSITION + NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL

15-14475 RODEAN HC
EFFECTS OF UNDERGROUND NUCLEAR EXPLOSIONS ON NATURAL GAS WELL PERFORMANCE
LAWRENCE RADIATION LABORATORY
UCRL-12229 +. 17 PAGES, JUNE 23, 1965

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14475 *CONTINUED*

IT IS SHOWN THAT A CHIMNEY AND FRACTURED ZONE (WITH THE DIMENSIONS AND PROPERTIES MEASURED IN AND NEAR THE HARDHAT CHIMNEY) INCREASE THE EFFECTIVE WELL RADIUS TO SUCH AN EXTENT THAT THE GAS FLOW RATE AT EARLY TIMES MAY BE INCREASED APPROXIMATELY TEN TIMES. THE RUBBLE-FILLED CHIMNEY AND ADJACENT FRACTURED ZONE ALSO ADD SIGNIFICANT CAPABILITY TO A WELL IN MEETING INTERMITTENT PEAK-LOAD DEMANDS, AND MAY BE USED AS A GAS-STORAGE RESERVOIR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*NUCLEAR DETONATION + *RADIATION SAFETY AND CONTROL + GEOLOGICAL CONSIDERATION, GENERAL + PLOWSHARE PROGRAM

15-14476 KRAUS W + HERRMANN D + KIESEWETTER W
MODERN METHODS OF PERSONNEL DOSIMETRY
STAATLICHE ZENTRALE FUER STRAHLENSCHUTZ, BERLIN, EAST GERMANY
SZS-6/66 +. 48 PAGES, JULY 1966

THE PHYSICAL PROPERTIES OF RADIATION DETECTORS USED IN PERSONNEL DOSIMETRY ARE DESCRIBED AND COMPARED. THE APPLICABILITY OF THE VARIOUS DOSIMETERS IS DISCUSSED FOR THE PURPOSES OF PERSONNEL MONITORING IN SINGLE INSTITUTES AND IN CONTROL CENTERS, FOR ACCIDENTAL AND OTHER HIGH LEVEL DOSIMETRY, AND FOR THE DOSIMETRY IN NATURAL RADIATION FIELDS AND IN SPACE. THE DIFFICULTIES IN THE INTERPRETATION OF DOSIMETER RESPONSE WITH REGARD TO THE ORGAN DOSE ARE BRIEFLY REVIEWED. 430 REFERENCES (UNTIL SPRING 1966) ARE GIVEN.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*DOSIMETRY, GENERAL + BIBLIOGRAPHY + DOSE + INSTRUMENTATION, RADIATION MONITORING + RADIATION SAFETY AND CONTROL

15-14477 SCHEEL H + KUNERT J
THE SR-90 CONTENT OF SOIL AND PLANTS IN THE TERRITORY OF THE GDR (GERMAN DEMOCRATIC REPUBLIC) 1964
STAATLICHE ZENTRALE FUER STRAHLENSCHUTZ, BERLIN, EAST GERMANY
SZS-7/66 +. 20 PAGES, AUGUST 1966

THE SR-90 CONTAMINATION OF SOIL WAS DETERMINED TO BE ABOUT 30 NCI/SQ. METER. THUS, IN COMPARISON WITH 1963, THE INCREASE WAS ABOUT 7.5 NCI/SQ. METER. WITH THE EXCEPTION OF RYE GRAIN AND CABBAGE NO APPRECIABLE DECREASE OF THE SR-90 CONTENT COULD BE OBSERVED IN DRIED PLANT MATERIALS. AS TO BE EXPECTED, NO CHANGE OF THE SR-90 CONTENT COULD BE DETECTED IN POTATOES, WHEREAS IN BEETS EVEN AN INCREASE OF THE SR-90 CONCENTRATION WAS OBSERVED. FOR GRASS, GREEN MAIZE, AND BEET TOPS, THE RATIO OF SR-90 SURFACE CONTAMINATION TO SR-90 TOTAL CONTAMINATION WAS ESTIMATED TO BE 69, 33, AND 51 PERCENT, RESPECTIVELY. THE RATIOS CORRESPOND TO A FALLOUT RETENTION OF 17, 8, AND 6 PERCENT. THE UPTAKE OF SR-90 FROM SOIL BY GRASS AND GREEN MAIZE WAS 0.6 AND 1.1 PERCENT.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, VEGETATION + *SOIL, NUCLIDE OCCURRENCE + *STRONTIUM + FALLOUT + GERMANY

15-14478 LAKIN R
A PERSONNEL RADIATION DOSIMETER WITH STORAGE FOR PRESENT ALARM AND CONTINUOUS READOUT
LAWRENCE RADIATION LABORATORY
UCRL-14925-T + CONF-661020-5 +. 12 PAGES, OCTOBER 17, 1966, PRESENTED AT THE 13TH ANNUAL NUCLEAR SCIENCE SYMPOSIUM, BOSTON, MASSACHUSETTS

THE CIRCUIT DESIGN OF A GAMMA-RADIATION DOSIMETER IS DESCRIBED WHICH PERMITS CONTINUOUS READOUT IN ROENTGENS FOLLOWED BY A PRESET AUDIBLE ALARM WITH AN EXPONENTIAL HORN TUNED FOR MAXIMUM AUDIO OUTPUT WITH MINIMUM POWER INPUT. ANY RADIATION DOSE RATE CAN BE MONITORED BY SELECTING A G-M DETECTOR THAT GIVES THE DESIRED RANGE. THE UNIT DESCRIBED HAS A READOUT RANGE TO 200 R AND WILL OPERATE IN A RADIATION FIELD UP TO 1000 R/HR WITH AN ACCURACY TO WITHIN PLUS OR MINUS 5 PERCENT IN AN OPERATING TEMPERATURE RANGE FROM 0 TO 60 C. THE UNIT WEIGHS LESS THAN ONE POUND AND HAS THE CAPABILITY TO BE CLIPPED TO THE USERS BELT, ALLOWING FREEDOM OF ACTIVITY DURING EMERGENCY RESCUE OPERATIONS OR OTHER HAZARDOUS ASSIGNMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*INSTRUMENTATION, RADIATION MONITORING + DOSIMETRY, GENERAL + GROSS GAMMA + RADIATION SAFETY AND CONTROL

15-14480 BRASACK G
THE PROFESSIONAL RADIATION BURDEN IN 1965 IN THE GERMAN DEMOCRATIC REPUBLIC
STAATLICHE ZENTRALE FUER STRAHLENSCHUTZ, BERLIN, EAST GERMANY
SZS-9/66 +. 18 PAGES, AUGUST 1966

THE RESULTS OF THE PERSONNEL DOSIMETRY OF 20,133 PERSONS, CONTROLLED BY THE RADIATION PROTECTION CENTER OF THE G.D.R. IN 1965, ARE PRESENTED. A SURVEY ON MONTHLY OVER-EXPOSURES (MORE THAN 0.4 RAD) AS WELL AS ON THE DISTRIBUTION OF ANNUAL EXPOSURES IS GIVEN. THE STATISTICAL TREATMENT OF THE ANNUAL EXPOSURES IS PERFORMED UNDER THE SAME ASPECTS AS IN 1963 AND 1964. IN THE MAIN, THE STATEMENTS OF THE FORMER YEARS HAVE BEEN APPROVED.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14480 *CONTINUED*
AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM,
WISCONSIN 54669

*PERSONNEL EXPOSURE, RADIATION + GERMANY + RADIATION SAFETY AND CONTROL

15-14481 WHITFIELD WJ + MASHBURN JC
DEVELOPMENT OF AN INCREASED SAMPLING RATE MONITORING SYSTEM
SANDIA CORPORATION
SC-RR-66-585 +. 8 PAGES, OCTOBER 1966

THIS REPORT BRIEFLY DESCRIBES A DEVELOPMENTAL DEVICE THAT SAMPLES AIR FOR SMALL PARTICLES IN CLEAN ROOMS. IT DIFFERS FROM STANDARD MONITORS IN THAT IT SAMPLES AT AN INCREASED RATE AND IS DESIGNED FOR VERY LOW CONCENTRATIONS OF AIRBORNE PARTICLES. TEST RESULTS, ALSO INCLUDED IN THIS REPORT, INDICATE THAT THIS DEVICE IS SUPERIOR TO PRESENT PARTICLE COUNTERS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*INSTRUMENTATION, AIR SAMPLING + INSTRUMENTATION, RADIATION MONITORING + PARTICULATE + SAMPLING

15-14482 KHITROV LM + KOTLYAROV KA
THE USE OF A DEEP-WATER GAMMA RADIOMETER FOR THE MEASUREMENT OF RADIOACTIVITY IN THE OCEAN
ACADEMY OF SCIENCES, USSR
AD-629672 + TT-66-60744 +. 11 PAGES, TRANSLATED FROM RADIOACTIVE CONTAMINATION OF OCEANS AND SEAS, PAGES 170-182 (1964)

AN ORIGINAL, AUTOMATIC, DEEP-WATER GAMMA-RADIOMETER WITH A SENSITIVITY THRESHOLD OF 2 X 10 CURIES, INTENDED FOR THE MEASUREMENT OF R/A AT THE MAXIMUM DEPTHS OF THE OCEANS OF THE WORLD, WAS CREATED. DURING MEASUREMENTS OF THE GAMMA BACKGROUND OF THE DEPTHS OF THE CENTRAL AND NORTHERN PARTS OF THE INDIAN OCEAN IN 1960, THERE WAS NOT FOUND ANY INCREASE IN THE R/A LEVEL EXCEEDING THE NATURAL LEVEL BY MORE THAN 2-3 TIMES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*INSTRUMENTATION, RADIATION MONITORING + *OCEAN AND SEA + *SURFACE WATER, NUCLIDE OCCURRENCE + GROSS GAMMA

15-14483 MARTIN TG
CALCULATED INTERNAL RADIATION DOSE FROM INGESTION OF MEAT STERILIZED BY ELECTRON IRRADIATION
U.S. ARMY NATICK LABORATORIES
AD-632360 +. 28 PAGES, APRIL 1966

THE PRODUCTION OF RADIONUCLIDES IN FOOD IRRADIATED WITH HIGH-ENERGY ELECTRONS CAN BE PREDICTED REASONABLY WELL WITH THE EQUATION PRESENTED BY R.A. MEYER. WITH THIS EQUATION AND OTHERS DERIVED FROM THE REPORTS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION, IT IS POSSIBLE TO ESTIMATE THE AMOUNT OF RADIATION RECEIVED BY HUMANS CONSUMING MEAT IRRADIATED BY HIGH-ENERGY ELECTRONS. THE ESTIMATED ANNUAL INTERNAL DOSES DECREASE WITH STORAGE TIME. AT THE MAXIMUM ENERGY TREATED, THE DOSE WOULD DECREASE FROM A MAXIMUM OF 2.36 MREM/YEAR TO A MINIMUM OF 0.113 MREM/YEAR WITH A STORAGE TIME OF 7 DAYS AND TWO YEARS, RESPECTIVELY. THE CALCULATED VALUES REPRESENTED ABOUT 0.1 TO 2 PERCENT OF THE AVERAGE MEAN RADIATION EXPOSURE OF HUMANS (130 MREM/YEAR DUE TO NATURAL ENVIRONMENTAL RADIATION).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*BIOLOGICAL CONCENTRATION, FOOD + *DOSE CALCULATION, INTERNAL + ACCELERATOR + ACTIVATION PRODUCT + RADIATION SAFETY AND CONTROL

15-14484 HONG L
RADIOLOGICAL TARGET ANALYSIS PROCEDURES
STANFORD RESEARCH INSTITUTE
AD-629784 + USNRDL-TRC-6 +. 94 PAGES, 9 FIGURES, MARCH 1966

THE RADIOLOGICAL-TARGET ANALYSES IN THIS REPORT CONSIST OF A SERIES OF ANALYTICAL PROCEDURES FOR EVALUATING THE RESIDUAL NUMBERS FOR SHELTERS AND OTHER LOCATIONS BEFORE, DURING, AND AFTER DECONTAMINATION SO THAT EXPOSURE DOSES MAY BE CALCULATED. THESE RESIDUAL NUMBERS ARE USED TO PROVIDE ESTIMATES OF (1) SHELTER STAY TIMES, (2) MANPOWER REQUIREMENTS FOR PROPOSED DECONTAMINATION, (3) EXPOSURE TO RECOVERY PERSONNEL, (4) DECONTAMINATION EFFECTIVENESS REQUIREMENTS, (5) EQUIPMENT AND SUPPLIES REQUIREMENTS, AND (6) FEASIBILITY OF PLANS AND SCHEDULES FOR THE RECOVERY OF VITAL FACILITIES AND LIVING AREAS. TABLES, CHARTS, FIGURES, AND SAMPLE CALCULATIONS PROVIDE WORKING TOOLS WHICH MAY BE USED FOR CIVIL-DEFENSE PLANNING AND TRAINING, AND SIMILAR PRACTICAL LEVELS OF RADIOLOGICAL DEFENSE PREPARATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*CIVIL DEFENSE + *DECONTAMINATION + FALLOUT + NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL

15-14486 RIGHEY EO

ACCESSION NUMBER 15-14480 TO 15-14486

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14486 *CONTINUED*
PREDICTION OF EYE SAFE SEPARATION DISTANCES. REPORT FOR JANUARY-FEBRUARY 1966
USAF SCHOOL OF AEROSPACE MEDICINE
AD-634723 +. 28 PAGES, JUNE 1966

A METHOD IS GIVEN FOR PREDICTING THE DISTANCES AT WHICH THE THERMAL RADIATION FROM NUCLEAR DETONATIONS WILL BE HAZARDOUS TO THE UNPROTECTED HUMAN EYE. THIS METHOD RELATES CALCULATED RETINAL EXPOSURE TO EXPERIMENTALLY DETERMINED EYE-EFFECTS DATA. THE RESULTS INDICATE THAT THE EYE HAZARD IS THE LIMITING FACTOR IN DETERMINING THE DISTANCE OF NEAREST APPROACH TO A NUCLEAR DETONATION UNLESS EYE PROTECTION IS PROVIDED. HAZARDS AS A FUNCTION OF DISTANCE ARE ALSO DETERMINED FOR THE HUMAN EYE PROTECTED FROM DAYTIME DETONATIONS BY A 2-PERCENT-TRANSMISSION FIXED FILTER. THE RESULTS INDICATE THAT USE OF SUCH A FILTER WILL PROVIDE EYE PROTECTION AT DISTANCES WHERE OTHER HAZARDS BECOME LIMITING FACTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*NUCLEAR DETONATION + *THERMAL CONSIDERATION + BIOMEDICAL + RADIATION DAMAGE + RADIATION SAFETY AND CONTROL

15-14488 WILKIE WH + FISH BR
SCINTILLATION EXTRAPOLATION DOSIMETRY OF SMALL BETA-EMITTING SOURCES
OAK RIDGE NATIONAL LABORATORY
ORNL-P-2516 + CONF-661005-23 +. 24 PAGES, 1965, FROM SYMPOSIUM ON SOLID-STATE AND CHEMICAL RADIATION DOSIMETRY, VIENNA, AUSTRIA

A TECHNIQUE IS DESCRIBED WHICH MAY BE UTILIZED FOR OBTAINING VALUES OF ABSORBED DOSE TO TISSUE-EQUIVALENT VOLUMES APPROACHING THE VOLUME OF INDIVIDUAL TISSUE CELLS. THE METHOD INCORPORATES A SERIES OF SCINTILLATORS (ANTHRACENE OR NE-102-A PLASTIC) WITH DIMENSIONS RANGING FROM 11-MM DIAMETER X 0.5-MM THICK TO 1-MM DIAMETER X .032-MM THICK MOUNTED ON LUCITE LIGHT-PIPES. PULSE-HEIGHT SPECTRA ARE OBTAINED USING EACH SCINTILLATION ASSEMBLY WITH ABSORBER THICKNESSES FROM ZERO TO SEVERAL HUNDRED MG/SQ CM. THESE ARE CONVERTED TO ENERGY SPECTRA BY A COMPUTER PROGRAM TO APPLY APPROPRIATE CORRECTIONS, AND THE ABSORBED DOSE IS CALCULATED. INDIVIDUAL DOSE MEASUREMENTS ARE THEN ASSEMBLED INTO EXTRAPOLATION CURVES WHICH RELATE DOSE TO TISSUE VOLUMES AT SPECIFIED ABSORBER THICKNESSES. THIS TECHNIQUE IS USEFUL FOR MEASUREMENTS WITH SOURCES OF ACTIVITY IN THE RANGE OF 0.05 TO 500 MICROCURIES, WHICH IS BELOW THE RANGE FOR WHICH AN IONIZATION EXTRAPOLATION CHAMBER CAN BE USED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*DOSE MEASUREMENT, EXTERNAL + *DOSIMETRY, GENERAL + DOSE + GROSS BETA + RADIATION SAFETY AND CONTROL

15-14489 ROTHE W + HERRMANN D
DETERMINATION OF MINIMUM FILTER SIZE FOR THE FILTER ANALYSIS PROCESS OF FILM DOSIMETRY
STAATLICHE ZENTRALE FUER STRAHLENSCHUTZ, BERLIN, EAST GERMANY
SZS-6(1965) +. 18 PAGES, JULY 1965, ENGLISH ABSTRACT

IN THE PRESENT PAPER, INVESTIGATIONS ARE DESCRIBED AND RESULTS ARE GIVEN FOR THE MOST FAVORABLE NUMBER OF FILTERS IN FILM BADGES. MINIMUM FILTER SIZES WERE INVESTIGATED FOR GAMMA RADIATION WITH QUANTUM ENERGIES FROM 84 KEV TO 1.25 MEV AND FOR BETA RADIATION WITH AVERAGE ENERGIES FROM 252 TO 940 KEV. THE MATERIAL OF THE FILTERS, THE FILTER THICKNESS, AND THE ANGLE OF INCIDENCE OF THE RADIATION WERE VARIED. DIFFERENT TYPES OF ORWO DOSIMETER FILMS WERE USED.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNT AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*DOSIMETRY, PHOTOGRAPHIC + FILTER + FILTER CHARACTERISTICS + GROSS BETA + GROSS GAMMA + RADIATION SAFETY AND CONTROL

15-14490 MUSTALOWICZ T + WYSOPOLSKI J + JASINSKA T + MICHALSKI Z
IONIZING RADIATION MEASUREMENTS BY USING WIDE-RANGE POLISH MONITORING FILMS
CENTRALNE LABORATORIUM OCHRONY RADIOLOGICZNEJ, WARSAW, POLAND
CLOR-FONTON-53 +. 23 PAGES, 1966, IN POLISH

THE PAPER DESCRIBES THE RESULTS OF INVESTIGATIONS OF NEW WIDE-RANGE DOSIMETRIC FILMS PRODUCED BY POLISH PHOTOCHEMICAL FACTORY FOTON. THE FILMS HAVE BEEN PREPARED ACCORDING TO CLORS ASSUMPTIONS. THEY ARE DOUBLE-EMULSION FILMS HAVING TWO DIFFERENT-SENSITIVITY EMULSIONS ON THE SAME BASE. THE MOST SUITABLE FILM BATCH WAS NO. 50123. THE MEASUREMENT RANGE OF THE FILMS FOR GAMMA RAYS OF CO-60 IS BETWEEN 60 MR AND 1300 R. THE FOG DENSITIES RANGED 0.18 PLUS OR MINUS 0.04. ALL THE TESTED FILM BATCHES HAD THE LOWER CONTRAST, COMPARED TO FOTON 64 CUK FILM IN CURRENT USE.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*DOSIMETRY, PHOTOGRAPHIC + COBALT + POLAND + RADIATION SAFETY AND CONTROL

15-14491 LESSLER RM + GUY FW
GAMMA DOSE CURVES FROM NEUTRON-ACTIVATED SOIL AND SEAWATER COMPARED WITH FISSION-PRODUCT DECAY
LAWRENCE RADIATION LABORATORY
UCRL-14332 +. 5 PAGES, AUGUST 1965

ACCESSION NUMBER 15-14486 TO 15-14491

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14491 *CONTINUED*

CURVES ARE PRESENTED SHOWING TOTAL GAMMA-MEV (TO 50 YEARS) AND GAMMA-MEV/HOUR RESULTING FROM DECAY OF GRANITE, NTS SOIL, AND SEAWATER WHICH HAVE BEEN ACTIVATED BY ONE MOLE OF 14-MEV OR 0.5-MEV NEUTRONS. CURVES ARE GRAPHED AS A FUNCTION OF TIME FROM 1 HOUR TO 10 YEARS. FISSION-PRODUCT DECAY CURVES ARE SHOWN FOR PURPOSES OF COMPARISON.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ACTIVATION PRODUCT + DOSE + GAMMA + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY + SURFACE WATER, NUCLIDE OCCURRENCE + SURFACE WATER, PROPERTY

15-14494 NORMENT HG + SCHWENKE TW + KOHLBERG I
DEVELOPMENT OF AN IMPROVED LAND-SURFACE FALLOUT MODEL. INTERIM REPORT
TECHNICAL OPERATIONS RESEARCH
AD-629002 + TO-B-65-99 + ECOM-TR-01309-1 +. 177 PAGES, JANUARY 1966

A NEW CONCEPT IN FALLOUT MODELS, THE DOD FALLOUT-PREDICTION SYSTEM, IS BEING DESIGNED AND CONSTRUCTED TO SERVE AS A BASIS FOR THE NEXT GENERATION OF FALLOUT-PREDICTION MODELS. THE MODEL CONSIDERS IN DETAIL THE DYNAMICS OF CLOUD RISE AND GROWTH AND PROVIDES FOR FALLOUT-PARTICLE TRANSPORT THROUGH A THREE-DIMENSIONAL TIME VARIANT ATMOSPHERE THAT INCLUDES ANALYTICAL WIND MODELS OF LOCAL CIRCULATION SYSTEMS SUCH AS MOUNTAIN WINDS AND SEA BREEZES. THE MODEL IS BEING PROGRAMMED FOR MACHINE COMPUTATION IN A HIGHLY MODULAR AND FLEXIBLE FASHION TO FACILITATE RESEARCH USAGE OF THE PROGRAM. CODING IS BEING DONE EXCLUSIVELY IN FORTRAN LANGUAGE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ANALYTICAL MODEL + *FALLOUT + COMPUTER PROGRAM + METEOROLOGY + PARTICULATE

15-14495 HAND JE + LAMONDS HA
DEVELOPMENT OF AIRBORNE SURVEILLANCE INSTRUMENTATION. TECHNICAL REPORT NO. S-283-R
EDGERTON, GERMESHAUSEN AND GRIER, INC., SANTA BARBARA, CALIFORNIA
DASA-1704 + AD-630866 +. 174 PAGES, FEBRUARY 1966

A GAMMA-RAY DETECTOR WAS CONSTRUCTED FOR THE DEFENSE ATOMIC SUPPORT AGENCY (DASA) OF THE DEPARTMENT OF DEFENSE, USING AN INORGANIC SCINTILLATOR. THE UNIT IS A CSI(T1) CRYSTAL, 4 INCHES THICK AND 5 INCHES IN DIAM. IT IS VIEWED BY THREE 2-INCH-DIAM PHOTOMULTIPLIER (PM) TUBES. THE CSI(T1) PHOSPHOR IS ENCASED IN A 3/16-INCH-THICK NE-102 PLASTIC FLUOR IN SUCH A MANNER THAT THE PM-TUBE ARRAY ALSO DETECTS SCINTILLATIONS IN THE FLUOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*DOSIMETRY, GENERAL + *INSTRUMENTATION, RADIATION MONITORING + FALLOUT + INSTRUMENTATION, AIR SAMPLING + RADIATION SAFETY AND CONTROL

15-14595 QUESTION G-1D. REANALYSE STEAM LINE RUPTURE FOR GROUND LEVEL RELEASES
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.1.9 TO G.1.10 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

OUR WORK IS BASED ON THE 1964 SINGER, FRIZZOLA, AND SMITH PAPER (PREDICTION OF HOT CLOUD RISE) AS THEIR APRIL 1966 MEASUREMENTS WERE NOT AVAILABLE. EVEN THOUGH HOT-STEAM CLOUDS ARE KNOWN TO RISE, A GROUND-LEVEL RELEASE WITHOUT CLOUD EXPANSION, WITH A 1 METER/SEC WIND SPEED, GIVES A MAXIMUM OFF-SITE DOSE AT 3/4 MILE OF 7.6×10 TO THE MINUS 5TH REMS WHOLE BODY AND 0.21 REM THYROID DOSE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + DOSE CALCULATION, INTERNAL + HEIGHT OF RISE + MICROMETEOROLOGY + REACTOR, BOILING WATER

15-14748 PATHFINDER - COOLANT CHEMISTRY AND RADIATION BACKGROUND
NORTHERN STATES POWER COMPANY
NSP-6603 +. 5 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 57-61, JANUARY 9, 1967, DOCKET NO. 50-130

AFTER A DISCUSSION WITH THE AEC, COOLANT-CHEMISTRY MONITORING NOW DEPENDS ON IN-LINE INSTRUMENTS, WITH LAB ANALYSES TO MONITOR THE SYSTEMS PERIODICALLY. ON TWO OCCASIONS AFTER A STARTUP, CHLORIDE ION PEAKED AT 90 PPB AND THEN AVERAGED NEAR THE DETECTABLE LIMIT (12). GROSS BETA (ACTIVATED CORROSION PRODUCTS) IS INCREASING. THE PURIFICATION FLOW DOES NOT REMOVE THE ACTIVITY WHEN THERE IS NO OTHER PRIMARY SYSTEM FLOW. ****MEASUREMENTS AT 76 MWTH INDICATED 1.4 K/HR NEUTRONS IN PRIMARY PUMP VAULTS. AT 115 MWTH, THE AIR EJECTOR READ 1.5 P/HR. GENERAL BACKGROUND IS UP, AND ADDITIONAL SHIELDING MAY BE NEEDED. PURIFICATION FLOW LINE NEEDED SHIELDING, AND THE HAND/FOOT BACKGROUND COUNTER WAS RELOCATED. ****TURBINE BUILDING AND EXHAUST BUILDING EXHAUST DUCT MONITORS READ 1.5 DECADES ABOVE SAMPLED ACTIVITY DUE TO STEAM-CHASE SHINE. COUNTING-ROOM BACKGROUND HAS INCREASED 50 PERCENT. ****HOLDERS WERE MODIFIED TO BETTER SHADE AND VENTILATE OFF-SITE-MONITORING FILM BADGE, DUE TO A

ACCESSION NUMBER 15-14491 TO 15-14748

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14748 *CONTINUED*
FILM-DARKENING PROBLEM.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*COOLANT CHEMISTRY + *CRUD + MONITOR, RADIATION, AIR + OPERATIONS SUMMARY FOR AEC + PATHFINDER +
RADIATION SAFETY AND CONTROL + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

15-14920 SELECTED STUDIES
LAWRENCE RADIATION LABORATORY
UCRL-50007-66-1 +. 22 PAGES, 19 FIGURES, 3 TABLES, 13 REFERENCES, FROM HAZARDS CONTROL PROGRESS REPORT
NO. 25 (APRIL-AUGUST 1966), PAGES 11-14, 28-43, 55-56, 1966

A THERMISTOR-INSTRUMENTED TOWER INDICATES ATMOSPHERE STABILITY FOR LOCAL-DISASTER REACTIONS.
THERMOLUMINESCENT MATERIAL WAS TESTED AS A DOSIMETER FOR HANDS IN A GLOVE BOX. BEO DESERVES
MORE WORK. CYCLOTRON WORKERS BECOMING CONTAMINATED WITH ZN65, AS SHOWN BY THE WHOLE-BODY
COUNTER. SEASONAL VARIATION IN THORON AND RADON CONTENT WAS STUDIED. A LIGHT
STEAM-DETERGENT DECONTAMINATION GUN WAS DEVELOPED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*OPERATIONS REPORT, GENERAL + *RADIATION SAFETY AND CONTROL + ACCELERATOR + DECONTAMINATION +
DOSIMETRY, THERMOLUMINESCENCE + GLOVE BOX + LAPSE RATE, STABLE + LRL (LAWRENCE RADIATION LABORATORY) +
RADON + THORON

15-14979 FOOTE RS
MEASUREMENT OF RADIOACTIVE FALLOUT BY FIELD TOTAL ABSORPTION GAMMA RAY SPECTROSCOPY. REPORTS. DATA
ANALYSIS FOR PERIOD, JANUARY 1 - SEPTEMBER 1, 1966
TEXAS INSTRUMENTS INC., DALLAS
TID-23369 +. 94 PAGES, NOVEMBER 26, 1965

NEARLY CONTINUOUS MEASUREMENT OF GAMMA EMISSION FROM THE GROUND DEMONSTRATED THE PRACTICALITY
OF AN AUTOMATED, REMOTE, GAMMA-SPECTRAL MONITORING SYSTEM FOR NATURAL AND ARTIFICIAL
RADIOACTIVITY. THE EQUIPMENT IS PORTABLE AND OFFERS THE CAPABILITY OF TAKING SEVERAL-MINUTE
PHOTOGRAPHS OF GAMMA RADIATION ASSOCIATED WITH ANY SECTION OF TERRAIN, AND SUPPLYING DATA
THAT PERMITS IMMEDIATE ASSESSMENT OF RADIONUCLIDE CONCENTRATION. SEVEN MAJOR FISSION-CREATED
RADIONUCLIDE SERIES HAVE BEEN MONITORED IN THE FIELD SPECTRUM FOR THEIR FALLOUT AND DECAY.
THESE INCLUDE CE-144, PR-144, BA-140, LA-140, MN-54, ZR-95, NB-95, CS-137, SB-125, AND I-131.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*FALLOUT + *INSTRUMENTATION, RADIATION MONITORING + ANTIMONY + BARIUM + CERIUM + CESIUM +
COMPUTER PROGRAM + GAMMA + IODINE + LANTHANUM + MANGANESE + NIOBIUM + PROMETHIUM + ZINC

15-14980 VOGT KJ + JACOBS H + POLSTER G
ENVIRONMENTAL RADIOACTIVITY OF THE JUELICH NUCLEAR RESEARCH CENTER
KERNFORSCHUNGSANLAGE, JUELICH, WEST GERMANY
JUL-379-ST +. 88 PAGES, APRIL 1966

RESULTS FROM RADIOACTIVITY MONITORING OF ATMOSPHERE, WATER, SOIL, AND MILK AT JUELICH IN 1965
ARE PRESENTED IN TABULAR AND GRAPHIC FORM.

AVAILABILITY - MICROCARD EDITIONS, INC. ACCOUNTING AND SHIPPING DEPT., WEST SALEM, WISCONSIN 54669

*SURVEY, RADIATION, ENVIRONMENTAL + AIR + BIOLOGICAL CONCENTRATION, MILK + GERMANY +
SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, NUCLIDE OCCURRENCE

15-14981 KING PV
RADIOLOGICAL SAFETY HANDBOOK
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, COCOA BEACH, FLA.
N-65-12416 + NASA-TM-X-54859 +. 117 PAGES, NOVEMBER 1, 1964

THIS HANDBOOK DESCRIBES THE ORGANIZATION, POLICY, PROCEDURES, AND SAFETY REQUIREMENTS FOR A
RADIOLOGICAL SAFETY PROGRAM. IT IS WRITTEN AS A TECHNICAL SUPPLEMENT TO SAFETY REGULATIONS
AND SAFETY PLANS FOR USERS OF X RAYS AND RADIOACTIVE MATERIALS. THE HANDBOOK SPECIFICALLY
DEFINES KSC PROCEDURES AND REQUIREMENTS FOR THE PROCUREMENT, TRANSFER, AND SHIPMENT OF
RADIOACTIVE MATERIALS, FOR THE HANDLING AND DISPOSAL OF RADIOACTIVE MATERIALS, FOR PERSONNEL
MONITORING, AND EMERGENCY PROCEDURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*RADIATION SAFETY AND CONTROL + *TRANSPORTATION AND HANDLING + AIR + CONCENTRATION, MAXIMUM + DOSE +
EMERGENCY PROCEDURE + PERSONNEL EXPOSURE, RADIATION + POPULATION EXPOSURE + TRACER, RADIOACTIVE +
WASTE DISPOSAL, GENERAL + X-RAY

15-14984 BLUMENFELD SN
NUCLEAR WAR AND SOIL MICROFLORA

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14984 *CONTINUED*
RAND CORP.
RM-4827-TAB +. 44 PAGES, REFERENCES, AUGUST 1966

THE POSSIBILITY OF A PRONOUNCED, LONG-TERM REDUCTION OR MODIFICATION OF MICROBIAL FLORA AS A RESULT OF NUCLEAR BOMBARDMENT, CAUSING A DERANGEMENT THAT WOULD AFFECT THE ABILITY OF THE SOIL TO SUPPORT THE GROWTH OF CROPS, COULD HAVE SERIOUS IMPLICATIONS FOR AGRICULTURE. THERE ARE TWO NUCLEAR-BOMBARDMENT PHENOMENA THAT COULD CONCEIVABLY AFFECT THE SOIL MICROFLORA - IGNITION OF EXTENSIVE FIRES IN FORESTS AND CROPS, AND ACUTE AND CHRONIC IRRADIATION BY FALLOUT. IT IS VERY UNLIKELY THAT EVEN A MAJOR NUCLEAR WAR COULD SUFFICIENTLY DISRUPT THE SOIL ECOLOGY TO AN EXTENT THAT WOULD CURTAIL THE SOILS PRODUCTIVITY OR ENDANGER THE POPULATION DEPENDENT ON IT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*CIVIL DEFENSE + *ECOLOGICAL CONSIDERATION + *FALLOUT + *NUCLEAR DETONATION + *THERMAL CONSIDERATION + DOSE + FIRE + RADIATION DAMAGE + RADIATION EFFECT + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY

15-14986 WALLIS LR + CORBIT CD
RADIOLOGICAL ASPECTS OF THE DEACTIVATION OF HANFORD PRODUCTION REACTORS
DOUGLAS UNITED NUCLEAR, INC., RICHLAND
DUN-SA-14 + CONF-660920-8 +. 40 PAGES FROM 1ST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY

THE DEACTIVATION PROCEDURES AND MONITORING AND CONTROL PROGRAMS ARE REVIEWED FOR THE DEACTIVATION OF THREE HANFORD REACTORS. EXPERIENCE GAINED OVER A ONE-YEAR PERIOD INDICATES THAT THE RADIOLOGICAL CRITERIA ADHERED TO DURING THE DEACTIVATION WERE SUFFICIENTLY RESTRICTIVE AND THAT THE PERIODIC RADIATION AND CONTAMINATION SURVEILLANCE PROGRAM FOR THE REACTORS IS ADEQUATE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*RADIATION SAFETY AND CONTROL + *REACTOR DECOMMISSIONING EXPERIENCE + BATTELLE NORTHWEST + MONITOR, RADIATION, GENERAL

15-14987 OVERSTREET R
DECONTAMINATION OF SOILS CONTAINING SALT AND RADIOACTIVE ELEMENTS
UNIVERSITY OF CALIFORNIA, BERKELEY
UCB-34P23-1 +. 71 PAGES, SEPTEMBER 1966

STUDIES OF TWO ORGANIC SOILS SHOWED THAT THE EXCHANGE COMPLEX IS EASILY SATURATED WITH DIVALENT CATIONS SUCH AS CA AND SR. A STUDY OF THE VARIATION OF THE CA EXCHANGE CAPACITY OF PEAT SOIL WITH PH INDICATES THAT SITES READILY AVAILABLE TO CA AND SR BUT NOT TO NA ARE ALSO READILY AVAILABLE TO H. IN A GREENHOUSE EXPERIMENT, SR-85 WAS PAINTED ON THE LEAVES OF CHAMISE, BUCKBRUSH, AND OAK PLANTS. THE AMOUNTS OF THE ISOTOPE APPEARING IN THE SUBSEQUENT NEW GROWTH (6 WEEKS) WERE MEASURED. SIGNIFICANT TRANSLOCATION OF SR-85 OCCURRED IN BUCKBRUSH, WHERE THE FINAL CONCENTRATION IN THE NEW GROWTH WAS APPROXIMATELY 10% OF THAT IN THE TREATED OLD GROWTH. THE COMPARABLE TRANSLOCATION IN CHAMISE WAS ABOUT ONE TENTH OF THAT FOUND IN BUCKBRUSH. THE SMALLEST TRANSLOCATION OF SR-85 OCCURRED IN OAK, WHERE THE CONCENTRATION IN THE NEW GROWTH WAS QUITE LOW.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ECOLOGICAL CONSIDERATION + *ION EXCHANGE + CALCIUM + CESIUM + DECONTAMINATION + SOIL, NUCLIDE OCCURRENCE + SOIL, PROPERTY + STRONTIUM

15-14989 PRESTON RG
FREE-FIELD PEAK PARTICLE MOTIONS FROM UNDERGROUND NUCLEAR EXPLOSIONS IN ALLUVIUM
LAWRENCE RADIATION LABORATORY
UCID-15008 +. 6 PAGES, JULY 27, 1966

SCALED FREE-FIELD RADIAL PEAK PARTICLE ACCELERATIONS, VELOCITIES, AND DISPLACEMENTS ASSOCIATED WITH SUBSURFACE MOTIONS FROM UNDERGROUND NUCLEAR EXPLOSIONS IN UNSATURATED ALLUVIUM ARE GIVEN. CURVES WERE PLOTTED FROM DATA DERIVED FROM FISHER, RINGTAIL, HOGNOSE, AND HAYMAKER SHOTS. THESE CURVES ARE NOT VALID FOR SHOTS IN ALLUVIUM IN WEST YUCCA FAULT, WHERE THE ALLUVIUM IS CHARACTERIZED BY HIGHER DENSITIES AND COMPRESSIONAL VELOCITIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*NUCLEAR DETONATION + GEOLOGICAL CONSIDERATION, GEOPHYSICAL + PLOWSHARE PROGRAM

15-14990 MORRISON GE
AN INVESTIGATION OF THE DISTRIBUTION OF NEPHTYS CAECOIDES IN YAQUINA BAY
OREGON STATE UNIVERSITY, CORVALLIS
RLD-1750-8(VOL.3), (PAPER 1) +. 33 PAGES, 5 FIGURES, 7 TABLES, FROM ECOLOGICAL STUDIES OF RADIOACTIVITY IN THE COLUMBIA RIVER ESTUARY AND ADJACENT PACIFIC OCEAN. PROGRESS REPORT, JULY 1, 1965 - JUNE 30, 1966, J.E. MCCAULEY-EDITOR, 1965

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-14990 *CONTINUED*

A STUDY WAS UNDERTAKEN IN YAQUINA BAY, OREGON, DURING THE SUMMER OF 1964 TO DETERMINE THE DISTRIBUTION AND THE FACTORS AFFECTING THE DISTRIBUTION OF THE POLYCHAETE WORM, NEPHTYS CAECOIDES, HARTMAN, 1938, IN THE ESTUARY. THIS ORGANISM HAS A CONTINUOUS DISTRIBUTION FROM OFFSHORE TO A POINT ABOUT EIGHT KILOMETERS INTO THE BAY. ENVIRONMENTAL FACTORS CONSIDERED WERE SALINITY, TEMPERATURE, AND SEDIMENT COMPOSITION. THE RESULTS OF THIS STUDY DO NOT SINGLE OUT A FACTOR AS THE ONE LIMITING THE DISTRIBUTION OF N. CAECOIDES IN YAQUINA BAY. DURING SUMMER MONTHS, IT IS POSSIBLE THAT SEDIMENT POROSITY, ORGANIC CONTENT, AND TEMPERATURE OPERATE TOGETHER TO FORM AN UNFAVORABLE ENVIRONMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ECOLOGICAL CONSIDERATION + OCEAN AND SEA + SURFACE WATER, PROPERTY

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-08815 BRYANT PM
METHODS OF ESTIMATION OF THE DISPERSION OF WINDBORNE MATERIAL AND DATA TO ASSIST IN THEIR APPLICATION
(ADDENDUM TO PART I SECTION 6 EFFECTIVE STACK HEIGHT)
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AHSB(RP)R42 (ADD.) +. 3 PAGES, 1 TABLE, 3 REFERENCES, NOVEMBER 1964, UKAEA

A METHOD OF ESTIMATING THE DIFFERENCE BETWEEN THE EFFECTIVE AND ACTUAL STACK HEIGHTS DUE TO EFFLUX VELOCITY AND BUOYANCY IS GIVEN IN SECTION 6.2 OF THE REPORT. THIS METHOD IS NO LONGER CONSIDERED TO BE APPROPRIATE IN RESPECT OF ESTIMATION OF THE LIFT DUE TO BUOYANCY, AND THE PURPOSE OF THIS ADDENDUM IS TO DRAW ATTENTION TO A PREFERABLE METHOD. THE MAXIMUM PLUME-RISE FORMULA BY LUCAS IS COMPARED WITH THE OAK RIDGE FORMULA, WHICH CONTAINS AN EFFLUX-VELOCITY TERM. CONCLUSIONS ARE THAT PLUME RISE DUE TO THE EFFLUX VELOCITY CAN BE NEGLECTED, IN COMPARISON WITH RISE ESTIMATED BY THE EXPRESSION OF LUCAS ET AL., UNLESS THE EFFLUX VELOCITY IS AT LEAST AN ORDER OF MAGNITUDE GREATER THAN THE VALUE OF 13.5 M/SEC.

ATMOSPHERIC STABILITY + HEIGHT OF RISE + SOURCE, ELEVATED + SOURCE, POINT + STACK

16-10778 CSANADY GT
THE BUOYANT MOTION WITHIN A HOT GAS PLUME IN A HORIZONTAL WIND
UNIVERSITY OF WATERLOO, ONTARIO
15 PAGES, 4 FIGURES, 20 REFERENCES, JOURNAL OF FLUID MECHANICS 22(2)- 225-239 (1965)

A SMOKE PLUME THAT HAS BECOME NEARLY HORIZONTAL AT SOME DISTANCE FROM THE SOURCE BEHAVES MUCH LIKE A LINE-THERMAL, FOR WHICH, USING A PERTURBATION METHOD, A SOLUTION IN LAMINAR FLOW MAY BE OBTAINED. BY ANALOGY WITH SOME OTHER PROBLEMS IN TURBULENT FLOW AND TURBULENT DIFFUSION, THE LAMINAR SOLUTION IS ASSUMED TO APPROXIMATE WHAT IS OBSERVED IN THE TURBULENT CASE, PROVIDED THAT THE RATE OF GROWTH OF THE DIFFUSING CLOUD IS ASSESSED REALISTICALLY. THE SO-CALCULATED PATTERN OF STREAMLINES IN A CROSS-SECTION OF THE PLUME AGREES QUALITATIVELY WITH THE OBSERVED BEHAVIOUR OF HOT PLUMES AND PUFFS, CONSISTING OF TWO VORTEX-LIKE STRUCTURES OF OPPOSITE SENSE OF ROTATION, LYING ON EITHER SIDE OF THE PLUME CENTRE. THE BODILY UPWARD MOVEMENT OF THE PLUME IS FOUND TO DEPEND CRITICALLY ON THE RATE OF GROWTH OF THE PLUME. THUS WHEN THE PLUME DIAMETER GROWS FASTER THAN LINEARLY WITH DISTANCE (SUCH BEHAVIOUR CHARACTERIZES THE QUASI-ASYMPTOTIC STAGE OF RELATIVE DIFFUSION PREDICTED BY BATCHELOR, 1952, FOR WHICH RICHARDSON'S (4/3)-POWER LAW OF EDDY DIFFUSIVITY HOLDS) THE PLUME TENDS TO REACH AN ASYMPTOTIC HEIGHT.

*BUOYANT RISE + ATMOSPHERIC DIFFUSION + HEIGHT OF RISE + PLUME BEHAVIOR, GENERAL + SOURCE, ELEVATED + STACK + TURBULENCE, CONVECTIVE

16-11075 ALLEN RG + COURTNEY FE
THE METEOROLOGICAL PROGRAM AT PARR, SOUTH CAROLINA
CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC. + LOCKHEED NUCLEAR PRODUCTS, LOCKHEED-GEORGIA COMPANY, MARIETTA, GEORGIA
CVNA-172 + ER-6168 +. 109 PAGES, 30 FIGURES, APRIL 1, 1963, CFSTI

THIS PHASE OF WORK WAS TO SERVE SEVERAL PURPOSES. THESE WERE - (1) TO ACTUALLY RECORD, ON-SITE, THE FREQUENCY OF OCCURRENCE OF LIGHT WINDS, TEMPERATURE INVERSIONS, PRECIPITATION, ETC., (2) TO ANALYZE THESE DATA IN LIGHT OF POTENTIAL ROUTINE OPERATION OF A MAJOR NUCLEAR REACTOR, (3) TO MEASURE IN THE FIELD OR CALCULATE FROM FIELD DATA ACTUAL ON-SITE DIFFUSION PARAMETERS SUCH AS DEVIATION OF WIND DIRECTIONS WITH TIME AND THE STRENGTH OF WINDS AT VARYING HEIGHTS ABOVE GROUND AS A FUNCTION OF TEMPERATURE LAPSE RATES, (4) TO ASSESS THOSE DIFFUSION PARAMETERS WHICH ARE IMPORTANT IN THE EVENT OF POSTULATED ACCIDENTAL RELEASES OF RADIOACTIVE MATERIAL INTO THE ATMOSPHERE.

*SAFETY ANALYSIS REPORT, METEOROLOGY + *SITE CLIMATOLOGY + ATMOSPHERIC DIFFUSION, CLIMATOLOGY + CVTR (CAROLINAS VIRGINIA TUBE REACTOR) + INSTRUMENTATION, METEOROLOGICAL + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE

16-12168 BODURTHA FT
CONTROL OF POWER PLANT STACK EMISSIONS FOR CLEAN AIR
E. I. DU PONT DE NEMOURS AND COMPANY, WILMINGTON, DELAWARE
13 PAGES, 1 TABLE, 4 FIGURES, 28 REFERENCES, PAGES 399-411 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS,

CONSIDERS THE SO₂ EMITTED FROM A COAL BURNING PLANTS STACK IN NORMAL CONDITIONS. (OUT OF THE PLETHORA OF PLUME-RISE EQUATIONS, AUTHOR BELIEVES THAT THE BOSANQUET-PEARSON DISPERSION EQUATIONS WITH THE LUCAS PLUME-RISE EQUATION GIVE THE OPTIMUM ANSWER. THE B-P EQUATION IS A BASIS FOR NEW JERSEY LEGISLATION). PLUME RISE IS A MORE IMPORTANT FACTOR THAN DISPERSION, INVERSION (DESPITE LOWER WIND SPEEDS, HOT PLUMES WILL STAY ALOFT, YIELDING LOWER GROUND-LEVEL CONCENTRATIONS THAN IN NORMAL CONDITIONS, ALSO FUMIGATION RESULTS IN LESSER CONCENTRATIONS THAN NEUTRAL STABILITY, EXCEPT FOR LOW-LEVEL EMISSIONS), OR FOG (SUGGESTS THAT IN THE THREE FAMOUS AIR-POLLUTION INCIDENTS, SO₂ WAS CONVERTED TO SO₃ AND CONCENTRATED IN THE FOG AS H₂SO₄ - THIS EFFECT IS SUGGESTED AS MORE IMPORTANT THAN THE ORDINARILY INERT PARTICLES GENERALLY HYPOTHESIZED AS THE CAUSE). TOPOGRAPHY IS DISCUSSED (AN INVERSION-TRAPPED PLUME HAS BEEN SEEN TO BE DEFLECTED DOWNWARD BY A HILL AND THEN RETURN TO THE STACK BASE - VALLEY LOCATIONS ARE POOR). APPENDICES PRESENT THE PERTINENT EQUATIONS, WITH MODIFICATIONS FOR BUOYANT AND NONBUOYANT PLUMES. THE B-P EQUATIONS GIVE 30-MINUTE CONCENTRATIONS, WHILE PEAK ONE-MINUTE CONCENTRATIONS MAY BE 5-10 TIMES THESE.

*AIR POLLUTION + *SOURCE, CONTINUOUS + ANALYTICAL MODEL + BREEZE, VALLEY + DISPERSION + LAPSE RATE, STABLE

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-13330 RABINOVICH YS
THE DIFFUSION OF A HEAVY CONTAMINANT FROM A POINT SOURCE IN THE ATMOSPHERE
LENINGRAD HYDROMETEOROLOGICAL INSTITUTE
5 PAGES, 4 FIGURES, 7 REFERENCES, FEBRUARY 12, 1965 FIZ ATMOSFERY OKEANA 1(9) PAGES 920-928, (1965)

AN ANALYTICAL SOLUTION TO THE PROBLEM OF THE DIFFUSION OF A HEAVY CONTAMINANT IN A TURBULENT ATMOSPHERE IS PROPOSED. THE VERTICAL WIND PROFILE AND THE VERTICAL-DIFFUSION COEFFICIENT ARE APPROXIMATED BY POWER FUNCTIONS OF HEIGHT.

ATMOSPHERIC DIFFUSION COEFFICIENT + DIFFUSION + EQUATION, GENERAL + SOURCE, POINT

16-13332 GROMOVA NV + FEIGELSON EM
OUTGOING RADIATION IN THE CLOUDY ATMOSPHERE
INSTITUTE OF PHYSICS OF THE ATMOSPHERE, ACADEMY SCIENCE USSR
8 PAGES, 11 FIGURES, 9 TABLES, 12 REFERENCES, FEBRUARY 21, 1965, FIZ ATMOSFERY OKEANA 1(9), PAGES 952-963 (1965)

THE ANGULAR AND SPECTRAL DISTRIBUTIONS OF RADIATION LEAVING THE ATMOSPHERE ARE DETERMINED IN THE 0.4-0.95 MICRO-METER SPECTRAL RANGE OUTSIDE THE ABSORPTION BANDS. THE CONDITIONS OF CONTINUOUS CLOUDINESS ARE CONSIDERED FOR VARIOUS ALTITUDES AND THICKNESSES OF THE CLOUDY LAYER.

ATMOSPHERIC DIFFUSION + EQUATION, GENERAL + RADIOACTIVITY, RELEASE

16-13498 FUQUAY JJ + SIMPSON CL + HINDS WT
ESTIMATES OF GROUND-LEVEL AIR EXPOSURES RESULTING FROM PROTRACTED EMISSIONS FROM 70-METER STACKS AT HANFORD GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-80204 +. 29 PAGES, JANUARY 2, 1964

DATA FROM THEORETICAL AND EXPERIMENTAL STUDIES OF ATMOSPHERIC DIFFUSION WERE USED FOR ESTIMATING THE CONSEQUENCES OF DISCHARGING RADIOACTIVE AND CHEMICALLY TOXIC MATERIALS FROM 70-M STACKS AT HANFORD ON ENVIRONMENTAL EXPOSURE AT GROUND LEVEL. HANFORD DIFFUSION DATA OBTAINED IN FIELD EXPERIMENTS WERE USED TO DETERMINE THE PARAMETERS OF THE TAYLOR EQUATION FOR LATERAL GROWTH. IT WAS FOUND THAT THE LATERAL GROWTH OF A PLUME COULD BE EXPRESSED SOLELY IN TERMS OF WIND OBSERVATIONS TAKEN NEAR THE SOURCE. THIS RESULT LED TO THE DERIVATION OF AIR EXPOSURE VALUES FROM THE BIVARIATE NORMAL MODEL ACCOUNTING FOR THE WIND VARIABILITY CHARACTERISTIC TO THE HANFORD SITE. THE AIR EXPOSURES EXPECTED FROM PROLONGED RELEASES OF 2, 4, 8, AND 24-HR FROM A HANFORD 70-M STACK DURING CONDITIONS OF ATMOSPHERIC STABILITY WERE CALCULATED USING WIND DATA FROM THE HANFORD TOWER. RESULTS INDICATED THAT RADIATION EXPOSURE ESTIMATES FOR THE EMISSION PERIODS WERE GENERALLY MUCH LOWER THAN THOSE PREVIOUSLY DERIVED FOR HANFORD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$2.60 CY, \$1.70 MF

*DISPERSION + *HANFORD SITE + *WASTE DISPOSAL, GAS + ATMOSPHERIC DIFFUSION EXPERIMENT + DOSE CALCULATION, EXTERNAL + METEOROLOGY

16-14353 STUMKE H
CONSIDERATION OF SIMPLIFIED TERRAIN TYPES IN THE CALCULATION OF THE TURBULENT PROPAGATION OF CHIMNEY GASES
INSTITUTE FOR AERODYNAMICS AND GAS DYNAMICS OF THE INSTITUTE OF TECHNOLOGY, STUTTGART, GERMANY
ORNL-TR-981 +. 22 PAGES, STAUB 24(5) PAGES 175-182 (1964)

IT IS NOW THE AIM OF THE PRESENT INVESTIGATION TO INCLUDE IRREGULARITIES OF THE TERRAIN IN THE FLOW DIRECTION IN THE PROPAGATION CALCULATION. WE WILL ASSUME THE FLOW FIELD TO BE TWO-DIMENSIONAL AND LIMIT OURSELVES TO SUCH ELEVATIONS WHICH ARE FOUND PERPENDICULAR TO THE DIRECTION OF FLOW. IN PARTICULAR, WE WILL CONSIDER TERRAIN STEPS WHICH ASCEND OR DESCEND FROM ONE FIXED LEVEL TO THE OTHER FIXED LEVEL ALONG AN INCLINED PLANE. THE MEAN FLOW AGAIN IS ASSUMED TO BE A POTENTIAL FLOW. IT IS CLEAR THAT THIS ASSUMPTION IS NOT VERY WELL SATISFIED AT GROUND LEVEL ON ACCOUNT OF THE FRICTION WHICH IS PARTICULARLY HIGH THERE. THE FLOW AT A DESCENDING TERRAIN STEP IS OBTAINED FROM THE FLOW AT AN ASCENDING TERRAIN STEP BY REVERSING THE FLOW DIRECTION BUT LEAVING EVERYTHING ELSE UNCHANGED. IT IS SATISFACTORY CONSEQUENTLY TO CONSIDER THE POTENTIAL FLOW AT AN ASCENDING TERRAIN STEP.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$2.60 COPY, \$0.89 MICRONEGATIVE

*ATMOSPHERIC DIFFUSION + *STACK + CONCENTRATION, MAXIMUM + DIFFUSION COEFFICIENT + MATHEMATICAL STUDY + PLUME BEHAVIOR, GENERAL + SOURCE, LINE

16-14354 KLUG W
METEOROLOGICAL FACTORS IN THE PROPAGATION CALCULATION
METEOROLOGICAL INSTITUTE OF THE INSTITUTE OF TECHNOLOGY, DARMSTADT, GERMANY
ORNL-TR-982 +. 16 PAGES, STAUB 24(1) PAGES 396-400 (1964)

THE THEORY OF TURBULENT DIFFUSION IN THE ATMOSPHERE IN RECENT YEARS HAS FOUND INCREASING APPLICATION TO PROBLEMS CONCERNING THE PREVENTION OF ATMOSPHERIC CONTAMINATION AS THEY OCCUR IN PRACTICE. HOWEVER, SUCH AN APPLICATION REQUIRED INFORMATION ON THE OCCURRING METEOROLOGICAL PARAMETERS IN ADDITION TO INFORMATION ON THE SO-CALLED TECHNOLOGICAL VALUES CONTAINED IN THE EQUATION (SOURCE STRENGTH OF THE HARMFUL GAS, HEIGHT OF THE CHIMNEY MOUTH, DISCHARGE TEMPERATURE AND VELOCITY AT THE CHIMNEY MOUTH, ETC.). INFORMATION ON THESE VALUES ARE RELATIVELY SCARCE TODAY. IT IS THE AIM OF THIS INVESTIGATION TO SUMMARIZE AND COMPARE

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-14354 *CONTINUED*

DATA ON DIFFUSION PARAMETERS OBTAINED FROM VARIOUS SOURCES AND BY VARIOUS METHODS. THIS WAS TO PERMIT AN IMPROVED AND FACILITATED APPLICATION OF THE PROPAGATION CALCULATION.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616, \$1.60 COPY, \$.80 MICRONEGATIVE

*ATMOSPHERIC DIFFUSION + ATMOSPHERIC DIFFUSION STUDY, PRAIRIE GRASS + ATMOSPHERIC POLLUTION + STACK + TRACER, FLUORESCENT + TURBULENCE, STATISTICS

16-14355 CHARASH E

THE ESTIMATION OF EFFLUENT CONCENTRATIONS FROM AN ELEVATED CONTINUOUS SOURCE
AUSTRALIAN ATOMIC ENERGY COMMISSION RESEARCH ESTABLISHMENT, LUCAS HEIGHTS
AAEC-TM-307 +. 26 PAGES, DECEMBER 1965

FROM FUNDAMENTAL THEORY AND EMPIRICAL KNOWLEDGE OF THE STRUCTURE OF ATMOSPHERIC TURBULENCE SPECTRA, DIFFUSION EQUATIONS ARE DEVELOPED WITH PARAMETERS WHICH ARE ADJUSTABLE TO REFLECT THE INFLUENCE OF VARYING SURFACE ROUGHNESS AS WELL AS A WIDE RANGE OF STABILITY CONDITIONS. INSTRUCTIONS ARE GIVEN FOR PRACTICAL APPLICATIONS OF THE DIFFUSION EQUATIONS WHICH SHOULD BE VALID FOR TRAVEL DISTANCES OF ABOUT A MILE AT HEIGHTS GREATER THAN FIFTY FEET ABOVE GROUND.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

*SOURCE, CONTINUOUS + ATMOSPHERIC DIFFUSION + SUTTON DIFFUSION FORMULA + TURBULENCE, STATISTICS

16-14356 HAGE KD + ARNASON G + BOWNE NE + BROWN PS + ENTREKIN HD + LEVITZ M + SEKORSKI JA
PARTICLE FALLOUT AND DISPERSION IN THE ATMOSPHERE. FINAL REPORT
THE TRAVELERS RESEARCH CENTER, INC.
SC-CR-66-2031 +. 102 PAGES, JULY 1966

THIS REPORT DESCRIBES THE DEVELOPMENT OF A THEORETICAL MODEL FOR CALCULATING AIR AND GROUND CONCENTRATIONS OF MASSIVE PARTICLES (DENSITY 1 TO 10) OF INTERMEDIATE SIZES (1 TO 100 MICRONS DIAMETER) RELEASED FROM AN INSTANTANEOUS POINT OR LINE SOURCE AT ALTITUDES UP TO 90 KM. THE MODEL IS FORMULATED AND PROGRAMMED FOR USE ON A DIGITAL COMPUTER AND WAS DEVELOPED TO INVESTIGATE POSSIBLE HAZARDS ASSOCIATED WITH ABORTED MISSIONS OR ORBITAL-DECAY REENTRIES OF SPACE VEHICLES POSSESSING NUCLEAR FUELS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$4.00 COPY, \$0.75 MICRONEGATIVE

*COMPUTER PROGRAM, METEOROLOGICAL + *DISPERSION + AEROSPACE SAFETY + FALLOUT + PARTICLE, RADIOACTIVE

16-14361 KANGOS JD

THE INFLUENCE OF LOCAL WINDS ON FALLOUT. FINAL REPORT NO. 2, MAY-DECEMBER 1965
TRAVELERS RESEARCH CENTER, INC., HARTFORD, CONNECTICUT
FCOM-00392-F +. 54 PAGES, MARCH 1966

INFORMATION ON THE STRUCTURE OF THE SEA BREEZE OBTAINED BY PREVIOUS OBSERVATIONAL AND THEORETICAL STUDIES HAS BEEN EMPLOYED TO DEVELOP A KINEMATIC MODEL OF THE THREE-DIMENSIONAL WIND FIELD ASSOCIATED WITH THE SEA BREEZE. EXISTING INFORMATION ON THE STRUCTURE OF THE STABILIZED FALLOUT CLOUD HAS BEEN USED IN THE NUMERICAL COMPUTATION OF THE DEPOSITION OF RADIOACTIVE PARTICLES THROUGH A SPECIFIED SEA-BREEZE CIRCULATION. A PROGRAM WAS DEVELOPED FOR THE NUMERICAL COMPUTATION OF FALLOUT TRANSPORT THROUGH AN ANALYTICALLY PRESCRIBED THREE-DIMENSIONAL SEA-BREEZE CIRCULATION AND FOR THE COMPUTATION OF ITS GROUND DEPOSITION PATTERN. THE COMPUTER PROGRAM WAS UTILIZED TO ILLUSTRATE THE FALLOUT DEPOSITION PATTERNS OBTAINABLE FROM SIMPLE MODELS OF THE STABILIZED CLOUD THROUGH ALTERNATIVE MODELS OF THREE-DIMENSIONAL SEA-BREEZE WIND FIELDS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY

*BREEZE, SEA + *FALLOUT + COMPUTER PROGRAM, METEOROLOGICAL + WIND STATISTICS

16-14362 KRUGER P

METEOROLOGICAL EVALUATION OF RADIOACTIVE FALLOUT. FINAL REPORT
HAZLETON-NUCLEAR SCIENCE CORPORATION
HNS-457-73F + 69 PAGES, JUNE 30, 1966

THIS REPORT SUMMARIZES THE DATA OBTAINED DURING THE PERIOD 1960 THROUGH 1964 UNDER CONTRACT AT(04-3)-457 AND EVALUATED IN SOME 20 TOPICAL PROGRESS REPORTS AND JOURNAL PUBLICATIONS. FISSION PRODUCT DEBRIS, NOTABLY SR-90, DEPOSITED BY PRECIPITATION IS EXAMINED UNDER VARIOUS STORM CONDITIONS, AND THE EFFECTS OF SEVERAL METEOROLOGICAL PARAMETERS ARE NOTED. THESE INCLUDE THE TRANSPORT PROCESSES OF THE DEBRIS FROM STRATOSPHERE TO TROPOSPHERE, THE EFFECTS OF CHANGES IN AIR MASSES INVOLVED IN A STORM, THE EFFECTS OF CHANGES IN PRECIPITATION GENERATION AND GROWTH MECHANISMS, STRATIFICATION ACROSS INVERSIONS, AND THE EVAPORATION OF RAINDROPS BELOW CLOUD BASES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*METEOROLOGY + *PRECIPITATION + BIBLIOGRAPHY + STRATOSPHERE + STRONTIUM + TROPOSPHERE

ACCESSION NUMBER 16-14354 TO 16-14362

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-14595 QUESTION G-1D. REANALYSE STEAM LINE RUPTURE FOR GROUND LEVEL RELEASES
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.1.9 TO G.1.10 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS,
NOVEMBER 10, 1966, DOCKET NO. 50-259/260

OUR WORK IS BASED ON THE 1964 SINGER, FRIZZOLA, AND SMITH PAPER (PREDICTION OF HOT CLOUD RISE)
AS THEIR APRIL 1966 MEASUREMENTS WERE NOT AVAILABLE. EVEN THOUGH HOT STEAM CLOUDS ARE KNOWN
TO RISE, A GROUND-LEVEL RELEASE WITHOUT CLOUD EXPANSION, WITH A 1 METER/SEC WIND SPEED, GIVES
A MAXIMUM OFF-SITE DOSE AT 3/4 MILE OF 7.6×10 TO THE MINUS 5TH REMS WHOLE BODY AND 0.21 REM
THYROID DOSE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS +
ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + DOSE CALCULATION, INTERNAL + HEIGHT OF RISE +
MICROMETEOROLOGY + REACTOR, BOILING WATER

16-14836 EFFECTIVENESS OF CONTAINMENT AIR FILTRATION IN REDUCING OFFSITE DOSE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
12 PAGES, 9 FIGURES, PAGES A-1 TO A-12 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE
APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

THYROID DOSE COMPUTATION (AT SITE BOUNDARY AND LOW POPULATION RADIUS) ARE GIVEN FOR VARIOUS
COMBINATIONS OF CONTAINMENT AIR-RECIRCULATION RATES AND FILTER EFFECTIVENESS. WITH A LEAK
RATE (0.3'/DAY) THREE TIMES THE DESIGN LEAK RATE AND NO FILTRATION AT ALL, THE SITE BOUNDARY
DOSE IS 450 REMS. WITH ONE FAN/FILTER COMBINATION, THE DOSE IS APPROXIMATELY 170 REMS. IN
ADDITION, TRACER TESTS ON-SITE SHOW CONCENTRATIONS LESS THAN 1/10TH THOSE USED IN TID 14844,
WHILE THE MODELS USED IN SAFETY ANALYSES USED OVER 4 TIMES THE CONCENTRATION SHOWN BY TRACER
TESTS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + AIRBORNE RELEASE +
CONTAINMENT FILTERING SYSTEM + DOSE + FISSION PRODUCT, IODINE + REACTOR, PRESSURIZED WATER +
TRACER, GENERAL + WIND STATISTICS

16-14901 REIMER A
THE MICROMETEOROLOGY OF THE WHITESHELL NUCLEAR RESEARCH ESTABLISHMENT AT PINAWA MANITOBA PRE-OPERATIONAL
SURVEY REPORT
ATOMIC ENERGY OF CANADA LIMITED
AECL-2620 +. 37 PAGES, 60 FIGURES, 4 TABLES, 7 REFERENCES, NOVEMBER 1966

DATA OBTAINED AT WHITESHELL NUCLEAR RESEARCH ESTABLISHMENT, PINAWA, MANITOBA, FROM THE
MICROMETEOROLOGICAL TOWER AND THE CLIMATOLOGICAL SITE, OVER A 23-MONTH PERIOD ENDING IN 1965,
IS ANALYZED. THE 200-FOOT MEAN WIND SPEED WAS FOUND TO BE RELATIVELY STRONG (14.3 MPH), AND
SINCE THE 20-FOOT WIND WAS REDUCED BY THE FRICTIONAL EFFECT OF TREE COVER IN THE SURROUNDING
AREA, WIND SHEAR WAS LARGE. A MODERATE CHANNELING EFFECT DUE TO TERRAIN FEATURES WAS FOUND,
AND DURING STABLE CONDITIONS WINDS WERE PREDOMINANTLY FROM THE SOUTH HALF OF THE DIRECTION
CIRCLE. INVERSIONS USUALLY EXIST AT NIGHT AT WYRE, AND STRONG INVERSIONS ARE COMMON.
LAPSE-RATE PROBABILITY AND INVERSION-DURATION DIAGRAMS AND TABLES ARE INCLUDED.

AVAILABILITY - ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO, CANADA, \$1.00 COPY

*MICROMETEOROLOGY + *SITE CLIMATOLOGY + ATMOSPHERIC DIFFUSION + CANADA + WIND PROFILE

16-14902 HULL AP + SMITH ME
ENVIRONMENTAL MONITORING OF I-131 AS A VERIFICATION OF METEOROLOGICAL CALCULATIONS OF DISPERSION FROM A
100 METER STACK
BROOKHAVEN NATIONAL LABORATORY
IRPA-88 +. 25 PAGES, 6 FIGURES, 6 TABLES, 9 REFERENCES, FROM THE FIRST INTERNATIONAL CONGRESS OF THE
INTERNAL RADIATION PROTECTION ASSOCIATION HELD SEPTEMBER 5-10, 1966, ROME

A NUMBER OF SIMILAR METHODS FOR ESTIMATING LONG-TERM GROUND-LEVEL CONCENTRATIONS OF THE
EFFLUENT FROM A CONTINUOUS ELEVATED POINT SOURCE HAVE BEEN DEVELOPED BY METEOROLOGISTS.
ALTHOUGH THESE ARE GENERALLY ACCEPTED AND APPLIED, RELATIVELY FEW VERIFICATIONS OF THEM HAVE
BEEN CONDUCTED. THIS CAN BE ATTRIBUTED TO THE DIFFICULTIES OF SECURING SUFFICIENTLY ACCURATE
CONTINUOUS MEASUREMENTS OF THE SOURCE, AND OF MEAN GROUND-LEVEL CONCENTRATIONS TO PRODUCE
SIGNIFICANT DATA. IN 1964 A PROJECT WAS ESTABLISHED AT BROOKHAVEN NATIONAL LABORATORY TO
UTILIZE I-131 EMITTED FROM A 100-M STACK AS AN ATMOSPHERIC TRACER. STACK-EFFLUENT SAMPLES
INDICATE THAT DURING 1965 THE ROUTINE EMISSION BY THE BROOKHAVEN GRAPHITE RESEARCH REACTOR
(BGRR)-HOT LABORATORY COMPLEX FROM THIS STACK WAS ABOUT 10 MILLICURIES/DAY.

AVAILABILITY -- PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION,
PERGAMON PRESS, OXFORD, 1967

*MONITOR, RADIATION, ENVIRONMENTAL + *STACK + BNL (BROOKHAVEN NATIONAL LABORATORY) + IODINE +
TRACER, GENERAL

16-14903 CRAWFORD TV
PREDICTING AND SAMPLING NUCLEAR CLOUDS FROM THE VIEWPOINT OF DIFFUSION THEORY
LAWRENCE RADIATION LABORATORY
UCRL-14983 +. 42 PAGES, 31 FIGURES, 2 TABLES, 7 REFERENCES, APRIL 29, 1966

ACCESSION NUMBER 16-14595 TO 16-14903

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-14903 *CONTINUED*

ASSUMING AN IDEALIZED GAUSSIAN CLOUD, A NUMBER OF NUMERICAL CALCULATIONS ARE MADE TO ILLUSTRATE THE CONSEQUENCES OF DIFFERENT METHODS OF SAMPLING. IT IS SHOWN THAT ALONG FLIGHT PATH, CONCENTRATION DATA MUST BE OBTAINED WITH A SPATIAL RESOLUTION EQUIVALENT TO THE STANDARD DEVIATION OF THE CLOUD (IN DISTANCE) AT THE TIME OF SAMPLING. IF ONE IS GOING TO INVESTIGATE DIFFUSION BY LOOKING AT CLOUD GROWTH, THEN THE ISOPLETH OF CONCENTRATION USED TO DEFINE THE CLOUD BOUNDARY MUST BE FOUR TO FIVE ORDERS OF MAGNITUDE BELOW THE INITIAL PEAK CONCENTRATION, OR THE ISOPLETH OF RADIOACTIVITY (WITH A DECAY PROPORTIONAL TO t TO THE MINUS 1) MUST BE EIGHT TO NINE ORDERS OF MAGNITUDE BELOW INITIAL PEAK CONCENTRATION. IF CAREFUL CONTROL OF AIRCRAFT SAMPLING TECHNIQUE IS NOT MAINTAINED, IT IS UNLIKELY THAT ONE WILL BE ABLE TO USE DATA TO DISTINGUISH BETWEEN THE PREDICTIONS OF DIFFERENT DIFFUSION THEORIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*ATMOSPHERIC DIFFUSION + *SAMPLING, HIGH ALTITUDE + CONCENTRATION, ISOPLETH + MATHEMATICAL STUDY + NUCLEAR EXPLOSION DEBRIS

16-14904 GIBBONS MG

TRANSMISSIVITY OF THE ATMOSPHERE FOR THERMAL RADIATION FROM NUCLEAR WEAPONS
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY

AD-641401 : USNRDL-TR-1060 +. 39 PAGES, 5 TABLES, 3 FIGURES, 27 REFERENCES, AUGUST 12, 1966

THE TRANSMISSIVITY OF THE ATMOSPHERE IS ESTIMATED FOR THERMAL RADIATION FROM A NUCLEAR WEAPON OF ANY GIVEN YIELD AND HEIGHT OF BURST UNDER VARIOUS ATMOSPHERIC CONDITIONS. SITUATIONS IN WHICH THE EFFECTIVE SOURCE HEIGHT (FOR THERMAL RADIATION) IS LESS THAN ONE-QUARTER MILE, THE ATMOSPHERE IS UNCLOUDED, AND THE SURFACE OF THE EARTH (OR ITS COVERING) IS OF LOW ALBEDO, ARE CONSIDERED FIRST. THE TRANSMISSIVITY FOR THESE SITUATIONS IS GIVEN IN TERMS OF A FORMULA DERIVED FROM EARLIER EXPERIMENTS. FACTORS ARE GIVEN FOR MODIFYING THE BASIC TRANSMISSIVITY VALUES TO APPLY TO OTHER SITUATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

MATHEMATICAL STUDY + NUCLEAR EXPLOSION DEBRIS + TEST, WEAPONS (HP ASPECTS)

16-14905 BLEEKER W

TECHNICAL NOTE NO. 68. METEOROLOGICAL ASPECTS OF ATMOSPHERIC RADIOACTIVITY
WORLD METEOROLOGICAL ORGANIZATION, GENEVA, SWITZERLAND

WMO-TN-68 + GMELIN-AED-CONF-64-026-3 +. 194 PAGES, 54 FIGURES, 21 TABLES, 219 REFERENCES, 1965, PRESENTED AT THE 13TH SESSION OF THE UNITED NATIONS SCIENTIFIC COMMITTEE ON THE EFFECTS OF ATOMIC RADIATION, GENEVA, 1964.

THE FOLLOWING PAPERS WERE PRESENTED BY WMO EXPERTS DURING THE 13TH SESSION OF THE UNITED NATIONS SCIENTIFIC COMMITTEE ON THE EFFECTS OF ATOMIC RADIATION - ON PARTICLE FORMATION IN NUCLEAR BOMB DEBRIS. THE GENERAL CIRCULATION OF THE ATMOSPHERE AS DEDUCED WITH THE AID OF TRACERS, SOME COMMENTS ON METEOROLOGICAL PROBLEMS OF THE GLOBAL DISTRIBUTION OF STRATOSPHERIC RADIOACTIVE FALLOUT, OZONE AND WATER VAPOUR IN THE UPPER TROPOSPHERE AND LOWER STRATOSPHERE, SOME REMARKS ABOUT THE SCAVENGING OF RADIOACTIVE MATERIAL FROM THE ATMOSPHERE BY PRECIPITATION, VERTICAL TRANSPORT AND DEPOSITION OF ATMOSPHERIC CONSTITUENTS, RADIOACTIVE CONTAMINATION OF THE OCEANS, FALLOUT FORECASTING, SOME ASPECTS OF THE U.S.A. FALLOUT PROGRAM, AND SOME REMARKS WITH RESPECT TO THE HIGH RADIOACTIVITY IN WESTERN EUROPE DURING NOVEMBER 1962.

AVAILABILITY - SECRETARIAT OF THE WORLD METEOROLOGICAL ORGANIZATION, GENEVA, SWITZERLAND

*FALLOUT + *METEOROLOGY + *NUCLEAR EXPLOSION DEBRIS + *TRACER, RADIOACTIVE +
ATMOSPHERIC CIRCULATION, GLOBAL + OCEAN AND SEA + PRECIPITATION

16-14906 ELDERKIN CE

EXPERIMENTAL INVESTIGATION OF THE TURBULENCE STRUCTURE IN THE LOWER ATMOSPHERE
PACIFIC NORTHWEST LABORATORY

BNWL-329 +. 299 PAGES, 6 TABLES, 70 FIGURES, 45 REFERENCES, DECEMBER 1966

MEASUREMENTS OF TURBULENCE IN ALL THREE COMPONENTS OF THE WIND WERE MADE AT SEVERAL HEIGHTS, IN NEUTRAL, UNSTABLE, AND STABLE CONDITIONS, AND IN A VARIETY OF WIND SPEEDS. THE DATA WERE ANALYZED ON AN ANALOG COMPUTER FOR POWER SPECTRAL-DENSITY DISTRIBUTIONS, COSPECTRAL DENSITY DISTRIBUTIONS, AND REYNOLDS STRESSES. A SHIFT TO HIGHER WAVE NUMBERS WAS DETECTED FOR STABLE CASES IN THE SPECTRA FOR ALL THREE COMPONENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY \$0.65 MICRONEGATIVE

*TURBULENCE, SHEAR (WIND) + *TURBULENCE, STATISTICS + MEASUREMENT, GENERAL

16-14907 HARDY EP + RIVERA J

FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, SEPTEMBER 1 - DECEMBER 1, 1966
NEW YORK OPERATIONS OFFICE, HEALTH AND SAFETY LAB

HASL-174 +. 206 PAGES, FIGURES, TABLES, JANUARY 1, 1967

THIS REPORT IS ONE OF A SERIES OF REPORTS ON THE FOLLOWING SUBJECTS--AIR SAMPLING, PRECIPITATION OF RADIONUCLIDES, NEW ZEALAND RADIOACTIVITY REPORT, ARGONNE, AND ISPRA, SR-90

ACCESSION NUMBER 16-14903 TO 16-14907

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-14907 *CONTINUED*
CONCENTRATION, BALLON SAMPLING PROGRAM, AND LISTING OF RECENT PUBLICATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ATMOSPHERIC CIRCULATION, GLOBAL + *ATMOSPHERIC DIFFUSION + *BIBLIOGRAPHY + *FALLOUT + *FILTER + *SAMPLING, HIGH ALTITUDE + *STRONTIUM + ANL (ARGONNE NATIONAL LABORATORY) + NEW ZEALAND + PRECIPITATION + STRATOSPHERE

16-14908 FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, SEPTEMBER 1-DECEMBER 1, 1966. APPENDIX USAEC HEALTH AND SAFETY LABORATORY, NEW YORK HASL-174(APP.) +. 206 PAGES, JANUARY 1, 1967

THIS REPORT CONTAINS INFORMATION ON SR-90 AND SR-89 IN MONTHLY DEPOSITION AT WORLD LAND SITES, FISSION-PRODUCT AND ACTIVATION-PRODUCT RADIONUCLIDES DEPOSITION AT SELECTED SITES, RADIOSTRONTIUM DEPOSITION AT ATLANTIC OCEAN WEATHER STATIONS, RADIOSTRONTIUM IN MILK AND TAP WATER, TABLE OF CONVERSION FACTORS, TABLE OF RADIONUCLIDES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*DEPOSITION + *FALLOUT + *STRONTIUM + OCEAN AND SEA

16-14910 MURPHY CH + BULL GV
REVIEW OF THE HIGH ALTITUDE RESEARCH PROGRAM (HARP)
U. S. ARMY BALLISTIC RESEARCH LABORATORIES, ABERDEEN PROVING GROUND, MARYLAND
BRL-R-1327 +. 49 PAGES, JULY 1966

PROJECT HIGH ALTITUDE RESEARCH PROGRAM (HARP) IS DIRECTED TOWARD THE USE OF GUNS FOR SCIENTIFIC PROBING OF THE UPPER ATMOSPHERE. THE ATTRACTIVE FEATURES OF GUNS ARE THE BASIC ECONOMY OF SUCH A SYSTEM AND THE HIGH ACCURACY OF GUNS FOR PLACEMENT AT ALTITUDE AS WELL AS ACCURACY IN GROUND IMPACT. RESULTS TO DATE ARE PRIMARILY WIND PROFILES MEASURED BY RADAR CHAFF, ALUMINIZED BALLOONS AND PARACHUTES, AND TRIMETHYLALUMINUM TRAILS, ALTHOUGH A NUMBER OF SUCCESSFUL 250 MHZ AND 1750 MHZ TELEMETRY FLIGHTS HAVE BEEN MADE. SUN SENSORS, MAGNETOMETERS, AND TEMPERATURE SENSORS HAVE BEEN FLOWN, AND AN ELECTRON DENSITY SENSOR WAS FIRED IN EARLY JUNE. DEVELOPMENT OF OTHER ACTIVE SENSORS IS CONTINUING.

AVAILABILITY - DEFENSE DOCUMENTATION CENTER, CAMERON STATION, ALEXANDRIA, VIRGINIA

*INSTRUMENTATION, METEOROLOGICAL + *WIND PROFILE

16-14914 PALMER CE + WISE CW + STEMPSON LJ + DUNCAN GH
SPECIAL REPORT NO. 2. THE PRACTICAL ASPECT OF TROPICAL METEOROLOGY
UNIVERSITY OF CALIFORNIA, LOS ANGELES
AD-61,568 + AFCRC-TM-55-460 +. 195 PAGES, MARCH, 1955

THE REPORT IS IN SEVEN PARTS. AFTER A SHORT INTRODUCTION, THE MANNER IN WHICH THE TROPICAL FORECASTER MAY UTILIZE CLIMATOLOGICAL INFORMATION IS DISCUSSED. THE NEXT SECTION EMPHASIZES THE APPROACH TO THE EVALUATION OF TROPICAL DATA IS DIFFERENT FROM THAT WHICH IS STANDARD IN HIGH-LATITUDE METEOROLOGY. THEN FOLLOWS A LONG DISCUSSION OF WIND ANALYSIS, USING STREAM-LINE ISOTACHS. THE FIFTH SECTION COVERS METHODS OF ANALYZING CLOUD AND WEATHER DISTRIBUTION (THE METHODS OUTLINED HERE ARE DESIGNED SPECIFICALLY FOR USE IN TROPICAL REGIONS). THE SIXTH SECTION DEALS WITH PROBLEMS OF CORRELATING WIND AND WEATHER PATTERNS, OF CONTINUITY AND WITH RELATED TOPICS (THE MATERIAL IS PRESENTED CHIEFLY IN THE FORM OF PRACTICAL EXAMPLES). FINALLY, THE STRUCTURE, GENESIS, AND MOVEMENT OF TROPICAL CYCLONES ARE BRIEFLY DISCUSSED.

AVAILABILITY - DEFENSE DOCUMENTATION CENTER, CAMERON STATION, ALEXANDRIA, VIRGINIA

*METEOROLOGY + MEASUREMENT, GENERAL + METEOROLOGICAL SUPPORT + PRECIPITATION + SITE CLIMATOLOGY + WIND PROFILE + WIND STATISTICS

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-07725 SCHMITT RC + TOOLE CR
EXPERIMENTAL INVESTIGATION OF DEPARTURE FROM NUCLEATE BOILING
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
5 PAGES, 4 FIGURES, AMERICAN NUCLEAR SOCIETY CONFERENCE ON REACTOR OPERATING EXPERIENCE, JACKSON LAKE LODGE, WYOMING, JULY 28-29, 1965, ANS TRANSACTIONS, SUPPLEMENT TO VOLUME 8, PAGE 24

SPERT II WAS OPERATED TO ACHIEVE DNB (FOLLOWING A POWER BURST IN QUASI EQUILIBRIUM OPERATION. PARTIAL MELTING OCCURRED AT THE PERIPHERY OF THE CORE. SEVERAL WELL-KNOWN CORRELATIONS PREDICTED DNB HEAT FLUXES 2 OR 3 TIMES THE OBSERVED HEAT FLUX. EVIDENCE EXISTS THAT (A) DNB HEAT FLUXES MAY BE EXCEEDED IN POWER BURSTS WITHOUT MELTING, (B) DNB HEAT FLUXES USING AVERAGE CORE HYDRODYNAMICS HAVE BEEN INADEQUATE BECAUSE MODELS DO NOT ACCOUNT FOR INDIVIDUAL CHANNEL FLOW INSTABILITIES IN LOCAL BOILING.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + *FUEL MELTDOWN + *HEAT TRANSFER, BOILING + *OPERATING EXPERIENCE + IN PILE EXPERIMENT + REACTOR, TEST + SPERT 2 (SPECIAL POWER EXCURSION REACTOR TEST)

17-09287 AMENDMENT NO. 11 TO LICENSE APPLICATION FOR NUCLEAR TEST REACTOR
GENERAL ELECTRIC COMPANY, SAN JOSE
17 PAGES, 1 TABLE, OCTOBER 4, 1965, DOCKET NO. 50-73, PDR

OBJECTIVE OF THIS AMENDMENT - TO SUBMIT TECHNICAL SPECIFICATIONS PROPOSED FOR OPERATION OF NTR AS ESSENTIALLY FINALIZED THROUGH DISCUSSIONS WITH THE AEC STAFF.

CONTROL ROD + CONTROL SYSTEM + FUEL HANDLING + FUEL STORAGE + INSTRUMENTATION, NUCLEAR + LICENSING STATUS OF NUCLEAR PROJECTS + OPERATING LIMITS/TECHNICAL SPECIFICATIONS + REACTOR SAFETY SYSTEM + REACTOR, RESEARCH + SITING, REACTOR + VENTILATION SYSTEM

17-10242 GOLDMANN K + MINUSHKIN B
SODIUM TECHNOLOGY
UNITED NUCLEAR CORPORATION
TID-8541 +. 105 PAGES, 230 REFERENCES, 37 FIGURES, 14 TABLES, PP. 321-425 OF REACTOR TECHNOLOGY, SELECTED REVIEWS--1965, L. E. LINK, EDITOR, ARGONNE NATIONAL LABORATORY, JANUARY 1966, CFSTI, \$4.50 CY, \$2.00 MN

THIS REVIEW COVERS SODIUM TECHNOLOGY THAT HAS BEEN DEVELOPED IN CONJUNCTION WITH THE DESIGN, CONSTRUCTION, AND OPERATION OF LIQUID-METAL-COOLED REACTOR PLANTS. ALSO REVIEWED IS THE STATE OF THE ART OF SODIUM TECHNOLOGY AS RELATED TO NEXT-GENERATION POWER PLANTS, WHICH ARE PROJECTED TO HAVE A CAPABILITY OF PRODUCING STEAM AT 1050 F, WITH MAXIMUM LIQUID-METAL TEMPERATURES OF 1200 TO 1300 F. WITHIN THIS FRAMEWORK THE LIQUID METALS OF INTEREST ARE SODIUM AND SODIUM-POTASSIUM (NAK). REVIEWED HERE ARE MATERIALS TECHNOLOGY, SUCH AS MATERIALS SELECTION, CORROSION, CONTROL OF SODIUM PURITY, AND THE EXPERIENCE GAINED IN THESE AREAS WITH OPERATING PLANTS.

*NAK (SODIUM POTASSIUM ALLOY) + *SODIUM + CONTAINMENT DESIGN + CORROSION + METAL, LIQUID + OPERATION + REACTOR, LIQUID METAL COOLED

17-10482 LEWIS L
THE ADMINISTRATION OF RADIATION SAFETY AT THE CVTR
CAROLINAS-VIRGINIA NUCLEAR POWER ASSOCIATES, INC.
12 PAGES, 2 FIGURES, REFERENCES, NUCLEAR SAFETY, 7(2), PP. 137-148 (WINTER 1965-1966)

ARTICLE DESCRIBES THE BROAD ASPECTS OF THE RADIATION-SAFETY PROGRAM AT THE CVTR, A PRIVATELY OWNED AND OPERATED, HEAVY-WATER-MODERATED AND -COOLED POWER DEMONSTRATION REACTOR, LOCATED IN PARR, S.C. THE OPERATING POLICY, THE ORGANIZATION FOR SAFETY, AND SOME IMPORTANT CONSIDERATIONS OF THE RADIOLOGICAL PROTECTION PROGRAM ARE OUTLINED. NOTE IS ALSO MADE OF THE USE OF AEC LICENSING AND REGULATORY REQUIREMENTS AS A BASIS FOR THE SAFETY PROGRAM AND EFFORTS. THE ARTICLE ALSO DESCRIBES HOW SAFETY COGNIZANCE IS INCORPORATED IN OPERATING AND TEST PROCEDURES AND DOCUMENTS. PLANT OPERATING EXPERIENCE, EMERGENCY PROCEDURES, AND ECONOMICS OF THE HEALTH AND SAFETY PROGRAM ARE ALSO DESCRIBED.

*ADMINISTRATIVE CONTROLS AND PRACTICES + *CVTR (CAROLINAS VIRGINIA TUBE REACTOR) + *SAFETY REVIEW (OPERATIONS, EXPERIMENTS) + REACTOR SAFETY SYSTEM + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, WATER + REGULATION, AEC + SAFETY PRINCIPLES AND PHILOSOPHY

17-10483 CRAMER EN
REPORT ON THE 1965 CONFERENCE ON REACTOR OPERATING EXPERIENCE
OAK RIDGE NATIONAL LABORATORY
11 PAGES, 1 TABLE, REFERENCES, NUCLEAR SAFETY, 7(2), PP. 148-159 (WINTER 1965-1966)

SIXTY-FIVE PAPERS WERE PRESENTED, AND ONE PANEL DISCUSSION WAS HELD DURING THE CONFERENCE ON REACTOR OPERATING EXPERIENCE HELD JULY 28-29, 1965. ABSTRACTS OF THE PAPERS WERE PUBLISHED IN A SUPPLEMENT TO VOLUME 8 OF THE ANS TRANSACTIONS. THE SUBJECTS OF THE EIGHT SESSIONS WERE - I. REACTOR AND SYSTEMS COMPONENTS. II. ADMINISTRATIVE AND OPERATIONAL PHILOSOPHY. III. PANEL DISCUSSION ON REACTOR OPERATING PROCEDURES. IV. OPERATING PARAMETER MEASUREMENTS AND TECHNIQUES. V. REACTOR OPERATING EXPERIENCE. VI. FISSION-PRODUCT CONTROL. VII. SPECIAL TESTS AND OPERATIONS. VIII. CONTROL AND SAFETY SYSTEMS. THIS REVIEW REPORTS PERTINENT THOUGHTS AND TRENDS NOTED, WITH DETAILED REVIEW OF ONLY A FEW SIGNIFICANT PAPERS.

*OPERATING EXPERIENCE + *REACTOR, GENERAL + ADMINISTRATIVE CONTROLS AND PRACTICES + CONTROL, GENERAL + FISSION PRODUCT RELEASE, GENERAL + SAFETY PRINCIPLES AND PHILOSOPHY

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-10622 POWER REACTOR DEVELOPMENT COMPANY, ENRICO FERMI ATOMIC POWER PLANT REPORT FOR DECEMBER 1965
POWER REACTOR DEVELOPMENT COMPANY
EF-28 +. 14 PAGES, 2 FIGURES, DECEMBER 1965, DOCKET NO. 50-16

THIS ISSUE IN THE SERIES SEEMS ADEQUATE IN DEPTH AND COVERS OPERATIONS, HEALTH PHYSICS, MAINTENANCE AND MODIFICATION, NONNUCLEAR TEST PROGRAMS, AND FACILITY CHANGES.

USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATIONS SUMMARY FOR AEC + FERMI + MAINTENANCE AND REPAIR + MODIFICATION, SYSTEM OR EQUIPMENT + OPERATING EXPERIENCE + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, LIQUID METAL COOLED

17-10624 ENRICO FERMI ATOMIC POWER PLANT REPORT FOR FEBRUARY 1966
POWER REACTOR DEVELOPMENT COMPANY
EF-30 +. 11 PAGES, FEBRUARY 1966, DOCKET NO. 50-16

THIS REPORT IS ONE OF A SERIES. IT SEEMS ADEQUATE IN DEPTH, AND COVERS OPERATIONS, HEALTH PHYSICS, MAINTENANCE, AND MODIFICATION, NONNUCLEAR TEST PROGRAMS, AND FACILITY CHANGES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATIONS SUMMARY FOR AEC + FERMI + MAINTENANCE AND REPAIR + MODIFICATION, SYSTEM OR EQUIPMENT + OPERATING EXPERIENCE + REACTOR, FAST + REACTOR, LIQUID METAL COOLED

17-11331 COMPENDIUM OF UNUSUAL REACTOR AND CRITICALITY INCIDENTS AND EXPERIMENTS
DIVISION OF OPERATIONAL SAFETY, USAEC
60 PAGES, 66 REFERENCES, 1965, SOURCE

VERY BRIEF SUMMARIES OF 90 INCIDENTS AT VARIOUS REACTORS AND PROCESS PLANTS, BEGINNING IN 1945. NO FIXED REPORTING CRITERIA.

*INCIDENT COMPILATION + FAILURE, GENERAL + REACTOR, AEC OWNED

17-11626 O BOYLE MJ
YANKEE CORE EVALUATION PROGRAM
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, ATOMIC POWER DIV.
WCAP-6080 +. 108 PAGES, 27 FIGURES, 25 TABLES, JUNE 1966, DOCKET NO. 50-29, CFSTI \$4.00 CY, \$0.75 MN

(SECT. 320) - LOOSE CRUD DEPOSITS PREVENTED APAC FROM DEFILMING THE OXIDE ON FUEL CLAD.
(SECT. 340) - TWO-INCH-LONG WIRE-LIKE METAL FOUND JAMMED IN A FUEL-ROD SPACER APPARENTLY DID NO HARM. PHASE-III-FUEL-ROD (46,000 MWD/MTU) GAS WAS ANALYZED, CLAD-HARDNESS BURST-STRENGTH SHOWN TO INCREASE, UO₂ MICROSTRUCTURE UNALTERED, BUT CLAD INNER SURFACE SHOWED TWO PHASE-REACTION LAYER. (SECT. 350) - CS-137 IS 8 PERCENT HIGHER THAN MASS SPECTROGRAPHIC ANALYSIS FOR PHASE-III RODS. LESS PU PRODUCTION LED TO DISCOVERY OF A SOFTENING NEUTRON SPECTRUM.

*FUEL ELEMENT + CLAD + CRUD + FLOW BLOCKAGE + PLUTONIUM + REACTOR, PRESSURIZED WATER + YANKEE

17-11664 ROBERTSON RF
FUEL, MATERIALS, AND COOLANTS FOR WR-1
ATOMIC ENERGY OF CANADA LTD., WHITESHELL
AECL-2553 + 66-CNA-311 + CONF-660516-9 +. 14 PAGES, 4 TABLES, 2 FIGURES, 13 REFERENCES, AUGUST 1966, FROM ANNUAL CONFERENCE ON ORGANIC AND HEAVY WATER REACTORS, WINNIPEG, CANADA, DEP. MN

HB40 IS USED INSTEAD OF SANTOWAX OM BECAUSE IT IS LIQUID AT ROOM TEMPERATURE. HB40 DECOMPOSITION IS NO WORSE THAN SANTOWAX ESTIMATES. ZIRCALOY-4 AND ZIRCALOY-2.5 PERCENT NIOBIUM CLAD AND PRESSURE TUBES ARE ADEQUATE. LOW CHLORINE CONTENT AND 100 PPM OF WATER ARE NECESSARY IN COOLANT. FUEL SEEMS TO BE ADEQUATE, ALTHOUGH ONE FUEL STRING HAS BEEN REMOVED BECAUSE OF A SUSPECTED DEFECT IN THE CLADDING.

*OPERATING EXPERIENCE + CANADA + COOLANT CHEMISTRY + FAILURE, FUEL ELEMENT + FUEL BURNUP + REACTOR, HEAVY WATER + REACTOR, ORGANIC COOLED + WR 1 (WHITESHELL REACTOR NO. 1, CANADA) + ZIRCALOY

17-11846 VAUGHN RD
EXPERIENCE WITH INTEGRAL GAS COOLED REACTORS
NUCLEAR POWER GROUP, ENGLAND
23 PAGES, 13 FIGURES, PRESENTED AT SYMPOSIUM ON THE EVOLUTION OF PROVED NUCLEAR POWER REACTOR CONCEPTS AND POTENTIALITIES OF CONCEPTS STILL IN THE PROTOTYPE STAGE, ROME, JUNE 24-25, 1965, PP 333-43 OF POSSIBILITA E PREVEDIBILE EVOLUZIONE DEI TIPI DI REATTORI SPERIMENTATI O IN CORSODI SPERIMENTAZIONE. ROME, COMITATO NAZIONALE ENERGIA NUCLEARE, 1966

BRIEFLY DESCRIBES KNOWLEDGE GAINED DURING CONSTRUCTION OF THE OLOBURY TWO-REACTOR STATION. CONSTRUCTION OF THE PRESTRESSED CONCRETE VESSEL, WHICH HOUSES BOTH THE CORE AND BOILERS, IS REVIEWED. THE INSULATION USED (0.1 MM STAINLESS STEEL SHEETS SEPARATED BY STAINLESS WIRE MESH HELD IN PLACE BY 6 MM COVER PLATES) RESULT IN A CONSIDERABLE SAVING IN REACTOR VESSEL VOLUME COMPARED WITH ALTERNATE FORMS. DISCUSSES THE DESIGN FEATURES OF THE BOILERS FOR MINIMIZING EXPECTED TUBE VIBRATION. ROBUST DESIGN OF THE GAS BLOWERS IS JUSTIFIED AS A RESULT OF REQUIRED OPERATION IN THE STALLED REGIME WHEN BRINGING ON LINE WITH OTHER BLOWERS OPERATING.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-11846 *CONTINUED*

*DESIGN STUDY + *REACTOR DESCRIPTION + CONCRETE, PRESTRESSED + CONTAINMENT CONSTRUCTION + CONTAINMENT STRUCTURE + CONTAINMENT, PRESSURE VESSEL + OLDUBURY (UK) + REACTOR, GAS COOLED + THERMAL INSULATION + VIBRATION

17-11854 SAFETY EVALUATION BY DRL OF GETR
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
1 PAGES, DOCKET NO. 50-70, PAGES 2, AUGUST 30, 1966, PDR

PAGE 2-. A POISON ROD WAS FOUND UNLATCHED FROM ITS FUEL-FOLLOWER SECTION AFTER THE REACTOR HAD OPERATED 14 DAYS IN THIS CONDITION. THIS WAS DUE TO TWO OPERATOR ERRORS - (1) THE POISON SECTION HAD BEEN INSTALLED UPSIDE DOWN, AND (2) THE WRONG TOOL HAD BEEN USED IN THE PRESTARTUP PULL-TEST, GIVING AN ERRONEOUS INDICATION OF A SUCCESSFUL TEST. PROCEDURES WERE CHANGED TO DEFINE THE PROPER LIFTING TOOL AND TO REQUIRE THAT THE ROD-SEAT LIGHT IS OBSERVED TO GO OUT WHEN THE LIFT IS MADE.

*FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + CONTROL ROD +
GETR (GENERAL ELECTRIC TEST REACTOR) + REACTOR, TEST + REVIEW + SAFETY ANALYSIS REPORT, GENERAL

17-11856 DENISE RP
FLOW-TRANSMITTER - PIPING FAILURE AT NS SAVANNAH
FIRST ATOMIC SHIP TRANSPORT, INC., NEW YORK, NEW YORK
2 PAGES, AUGUST, 1966, ATOMIC ENERGY CLEARING HOUSE 12(37), PAGES 15-16, (SEPTEMBER 12, 1966)

ON AUGUST 11-12, 1966, THE PRIMARY-COOLANT MAKEUP RATE INCREASED, AND LATER A CONTAINMENT WATER-LEVEL INDICATION OCCURRED. LEAKAGE AT 72 GAL/HR WAS TOLERATED UNTIL ARRIVAL IN PORT EARLY ON AUGUST 12. INSPECTION SHOWED A BROKEN FLOW-TRANSMITTER FITTING, WHERE THE 316SS THREADED-NIPPLE ENTERS THE TRANSMITTER. REPAIR WAS MADE WITH A MAXIMUM WHOLE-BODY EXPOSURE OF 70 MILLIREMS. THE DISCHARGES WERE BELOW THE MAXIMUM PERMISSIBLE CONCENTRATION.

*FAILURE, PIPE + *INSTRUMENTATION, FLOW + MAINTENANCE AND REPAIR + N S SAVANNAH + REACTOR, MARITIME + REACTOR, PRESSURIZED WATER

17-11857 DENISE RP
FAILURE OF A SEAL WELD IN NS SAVANNAH PRIMARY SYSTEM CHECK VALVE
FIRST ATOMIC SHIP TRANSPORT, INC., NEW YORK, NEW YORK
1 PAGE, AUGUST 1966, ATOMIC ENERGY CLEARING HOUSE 12(37), PAGE 14, (SEPTEMBER 12, 1966) DOCKET NO. 50-238

AFTER THE REPAIR OF A BROKEN FITTING ON AUGUST 12, 1966, A SLIGHT LEAK WAS OBSERVED (2-3 DROPS/MIN) AT FULL PRESSURE FROM MAIN COOLANT CHECK VALVE PS-8V, AT THE HINGE-PIN CANOPY-SEAL WELD. THE VALVE WAS REPAIRED AT THE NEXT PORT. THE CANOPY RING HAS BEEN COCKED DURING THE INITIAL INSTALLATION, AND A HALF-INCH PIECE OF SLAG WAS FOUND BEHIND THE RING. ALSO, A WELD HAD PENETRATED UNDER THE RING, AND THE SILVER PRESSURE-SEAL GASKET HAS ALSO BEEN IMPROPERLY SEATED.

FAILURE, INSTALLATION ERROR + N S SAVANNAH + REACTOR, MARITIME + REACTOR, PRESSURIZED WATER + VALVE

17-11858 COE RJ
ADDITIONAL INFORMATION ON A302B REACTOR VESSEL HYDROGEN EMBRITTLEMENT
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(36), PAGE 31, (SEPTEMBER 5, 1966) DOCKET NO. 50-29

AN EXPERIMENTAL PROGRAM WAS BEGUN TO ESTABLISH A PLANT STARTUP PROCEDURE TO GUARANTEE LOW HYDROGEN CONCENTRATIONS IN THE VESSEL STACK WHENEVER IT IS SUBJECT TO PRESSURE STRESS. THE PROGRAM IS SAID TO ALSO PROVE THAT THE WESTINGHOUSE NDTT-VS-INTEGRATED-EXPOSURE CURVE IS ADEQUATE TO TAKE THIS INTO ACCOUNT.

*CONTAINMENT, PRESSURE VESSEL + *EMBRITTLEMENT + *HYDROGEN + OPERATING EXPERIENCE +
REACTOR, PRESSURIZED WATER + YANKEE

17-11860 NUCLEAR TECHNOLOGY BRANCHES QUARTERLY REPORT. JANUARY 1-MARCH 31, 1966
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
100-17192 +. 53 PAGES, 37 FIGURES, 13 TABLES, AUGUST 1966, CFSTI \$3.00 CY, \$0.50 MN

ATR.- A DETAILED POWER MAP IN THE ATRC SHOWED THE SW LOBE POWER 7 PERCENT HIGHER THAN IN THE NE LOBE. NO EXPLANATION HAS YET BEEN FOUND. THIS ALSO AFFECTS THE ROD WORTHS. ETR.- HIGH-TEMPERATURE BERYLLIUM SPECIMENS WERE EXAMINED FOR STRENGTH AND GAS RELEASE. EXPECTED INCREASE IN COMPRESSION YIELD-STRENGTH HAS BEEN REDUCED BY GAS BUBBLES IN GRAIN BOUNDARIES, GIVING CLEAVAGE ALONG EXTRUSION PLANES. ATR.- ELECTROLESS-NICKEL-COATED ALUMINUM FUEL PLATES HAVE BEEN TESTED OUT OF PILE, AND SOME INPILE RESULTS SHOULD BE READY SOON.

*BERYLLIUM + *RADIATION DAMAGE + *REACTIVITY EFFECT, ANOMALOUS + ATR (ADVANCED TEST REACTOR - NRTS) + COATING, SURFACE + CORROSION + ETR (ENGINEERING TEST REACTOR) + FLUX DISTRIBUTION + FUEL ELEMENT + REACTOR, TEST

17-11906 RUBIN B + DANIEL RC + LYNAM L + MCCAULEY JE + MEIERAN HB
IRRADIATION PERFORMANCE CAPABILITIES OF OXIDE FUEL RODS - X-1-U TEST OF TWO 100-INCH LONG HIGHLY RATED ANNULAR ZRO2 + UO2 FUEL RODS

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-11906 *CONTINUED*

WESTINGHOUSE ELECTRIC CORPORATION, BETTIS ATOMIC POWER LABORATORY, PITTSBURGH
WAPD-TM-574 +. 196 PAGES, 32 TABLES, 100 FIGURES, 18 REFERENCES, SEPTEMBER 1966, CFSTI \$6.00 CY

A 100-INCH-LONG FUEL ROD, CONTAINING ANNULAR PELLETS OF ZRO2 PLUS 55.6 WT PERCENT UO2 SHEATHED IN FREESTANDING ZIRCALOY 4, FAILED AFTER 10(21ST) FISSIONS 1CC AT 685,000 BTU PER HR-FT SQ IN AN NRX TEST LOOP AT ONE-THIRD DESIGN BURNUP. FAILURE WAS DUE TO LOCALIZED OXIDATION AND SPALLING OF THE ZIRCALOY-4 DUE TO FLOW STARVATION AND SUBSEQUENT STEAM BLANKETING. CLADDING DIMENSIONAL INSTABILITY AND HIGH-TEMPERATURE FUEL PLASTICITY ARE BELIEVED TO HAVE CAUSED FLOW STARVATION. SEVERE INTERNAL SHEATH HYDRIDING OCCURRED AFTER THE FAILURE.

*FAILURE, CLADDING + *FAILURE, FUEL ELEMENT + *FUEL BURNUP + REACTOR, PRESSURIZED WATER + ZIRCALOY

17-11907 BUNCH WL + PHILIPP LD + WOOD MR
TIME-TO-POWER AS A REACTOR STARTUP PARAMETER
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
6 PAGES, 7 FIGURES, NUCLEAR APPLICATIONS 2(5), PAGES 357-362, (OCTOBER 1966)

THE TIME-TO-POWER (TTP) APPROACH USES INSTANTANEOUS FLUX AND PERIOD SIGNALS TO PROVIDE ONE CONTROL SIGNAL TO CONTINUOUSLY INCREASE REACTOR POWER TO THE DESIRED LEVEL (ABOUT 96 PERCENT OF FULL POWER), WITH A DECREASING RATE-OF-RISE AS FULL POWER IS APPROACHED. CHOICE OF THE ACTUAL TIME INTERVAL DEPENDS ON ANY LIMITING RATE-OF-RISE CONSIDERATION (MW/MIN), USUALLY AT INTERMEDIATE POWERS. (AN INSTRUMENT WAS BUILT AND TESTED AT HANFORD.) THE ARTICLE DISCUSSES CONCEPTS, MATHEMATICS, AND TRIAL USAGE. BASIC ADVANTAGE IS TO EXTEND RATE-OF-RISE CONTROL CIRCUITS INTO THE POWER RANGE, WHERE TRADITIONALLY SUCH CIRCUITS ARE USELESS BECAUSE SUCH A SLOW RATE OF RISE IS NEEDED.

*INSTRUMENTATION, RATE OF CHANGE + HANFORD SITE + INSTRUMENTATION, NUCLEAR + REACTOR, POWER

17-11908 GREENFIELD MA + KOONTZ RL
THE DESIGN BASIS FOR PINHOLE GAMMA-RAY CAMERAS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA + ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA
8 PAGES, 8 FIGURES, 7 REFERENCES, NUCLEAR APPLICATIONS 2(5), PAGES 415-422 (OCTOBER 1966)

CAMERAS WERE USED AFTER VARIOUS INCIDENTS TO LOCATE INTENSELY RADIOACTIVE SOURCES AND TO LOCATE (NONDESTRUCTIVELY) CRACKS, BOWING, AND FUEL SHIFTS WITHIN A CLAD, IRRADIATED, FUEL ROD. PREVIOUS REPORTS HAVE REPORTED THE CONCEPTS AND USAGE, THIS REPORTS THE PROPER DESIGN OF THE PINHOLE, EXPOSURE TIME, ETC., AND SHOWS TYPICAL RESULTS.

*TEST, NONDESTRUCTIVE + FUEL ELEMENT + INCIDENT, ACTUAL, RECOVERY FROM

17-11909 HERBST DA + TALBOY JH
DIFFERENTIAL CALORIMETER FOR IN-PILE GAMMA-RAY HEATING MEASUREMENTS
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
6 PAGES, 6 FIGURES, 4 REFERENCES, NUCLEAR APPLICATIONS 2(5), PAGES 423-428 (OCTOBER 1966)

TWO CALORIMETERS WERE BUILT WHICH AGREE WITHIN PLUS-OR-MINUS 10 PERCENT OVER 0.003 TO 0.5 WATTS/GRAM OF SAMPLE. SIGNIFICANT IMPROVEMENTS WERE MADE BY CONTROLLING THE INSTRUMENT ENVIRONMENT (AIR), THE TEMPERATURE, AND BY PREVENTING IT FROM TOUCHING THE ENCLOSING THIMBLE. MEASUREMENTS MADE IN JUGGERNAUT AND CP-5 REPORTED.

*HEAT GENERATION, INTERNAL + *IN CORE MEASUREMENT + *INSTRUMENTATION, IN CORE

17-11910 GREENBORG J
NEUTRON-FLUX AND GAMMA-RAY DOSE DISTRIBUTIONS IN THE NPR SHIELD
PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
9 PAGES, 7 FIGURES, 1 TABLES, 12 REFERENCES, NUCLEAR APPLICATIONS 2(5), PAGES 430-439 (OCTOBER 1966)

EXTENSIVE NEUTRON AND GAMMA-RAY MEASUREMENTS IN THE REFLECTOR AND PRIMARY SHIELD OF THE NPR, YIELDED FAST, EPITHERMAL, AND THERMAL-NEUTRON FLUX AND GAMMA-RAY DOSE DISTRIBUTIONS THROUGH APPROXIMATELY 9 FT OF REFLECTOR AND SHIELD ASSEMBLY. EMPHASIS WAS PLACED ON OBTAINING ABSOLUTE FLUX AND DOSE MEASUREMENTS WITH RESPECT TO REACTOR POWER. THE MEASURED FLUX AND DOSE RATES WERE COMPARED TO THOSE CALCULATED BY THE REMOVAL DIFFUSION THEORY COMPUTER PROGRAM MAC (A CALCULATION IN 18 REMOVAL GROUPS AND 31 DIFFUSION GROUPS). AGREEMENT IS EXCELLENT FOR FAST-NEUTRON FLUX AND GAMMA-RAY DOSE RATE IN THE CONCRETE SHIELD AND FOR THERMAL AND EPITHERMAL FLUX IN THE GRAPHITE REFLECTOR. CALCULATIONS OF THERMAL AND EPITHERMAL FLUXES IN THE CONCRETE SHIELD ARE IN LESSER AGREEMENT WITH MEASURED VALUES, GENERALLY WITHIN A FACTOR OF 2.

*DOSE MEASUREMENT, EXTERNAL + *SHIELDING + COMPARISON, THEORY AND EXPERIENCE +
NPR (HANFORD NEW PRODUCTION REACTOR) + REACTOR, GRAPHITE MODERATED

17-11911 RADIUM CAPSULE RUPTURE AT CHARLOTTE, NORTH CAROLINA MEDICAL CENTER, OCTOBER 12, 1966
PROVIDENCE MEDICAL CENTER
1 PAGE, NUCLEONICS WEEK 7(42), PAGE 3, OCTOBER 20, 1966

DECONTAMINATION OPERATIONS ARE BEING CONCLUDED AT THE PROVIDENCE MEDICAL CENTER IN CHARLOTTE, N. C., CLOSED DOWN OCTOBER 12, 1966, AFTER DISCOVERY OF A RUPTURED MONEL NASOPHARYNGEAL APPLICATOR CONTAINING 50 MG OF RADIUM SULFATE. THE CLOSING WAS ORDERED BY THE STATE BOARD OF HEALTH WHEN 0.002 OUNCE OF THE SULFATE HAS BEEN TRACKED OUT OF AN OFFICE WHERE THE APPLICATOR

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-11911 *CONTINUED*

WAS USED FOR EAR, NOSE AND THROAT THERAPY. SIX-HUNDRED PERSONS WERE CHECKED BY A MOBILE LAB SET UP BY THE STATE RADIATION UNIT, SEVEN WERE SLATED FOR FURTHER EXAMINATION. HOMES OF AN ADDITIONAL 60 WERE TO BE CHECKED.

*INCIDENT, ACTUAL, NONREACTOR + *RADIUM + CONTAMINATION

17-11916 ENGLISH JL + GRIESS JC

DYNAMIC CORROSION STUDIES FOR THE HIGH FLUX ISOTOPE REACTOR

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-TM-1030 +. 43 PAGES, 2 TABLES, 16 FIGURES, 10 REFERENCES, SEPTEMBER 1966 CFSTI \$2.00 CY, \$0.50 MN

PRESENTS RESULTS OBTAINED FROM STUDIES OF LONG-TERM CORROSION BEHAVIOR OF ALUMINUM ALLOYS, BERYLLIUM, STAINLESS STEEL, AND MISCELLANEOUS MATERIALS CONSIDERED FOR USE IN THE HFIR. THE TEST ENVIRONMENT WAS WATER, ADJUSTED TO A PH OF 5.0 WITH NITRIC ACID, AT 100 C AND AT FLOW RATES RANGING FROM 0.5 FPM TO 81 FPS. THE ALUMINUM ALLOYS CORRODED AT LOW RATES, 0.2 MPY AT THE HIGHER VELOCITIES. BERYLLIUM WAS SUBJECT TO LIGHT PITTING. ELECTROLYZED COATINGS ON STAINLESS STEEL SHOWED EXCELLENT CORROSION RESISTANCE. DELRIN, A FORMALDEHYDE PLASTIC, CONSIDERED FOR GASKET MATERIAL, SUFFERED CONSIDERABLE DAMAGE.

*CORROSION + ALUMINUM + BERYLLIUM + HFIR (HIGH FLUX ISOTOPE REACTOR) + REACTOR, FAST BURST + REACTOR, RESEARCH + REACTOR, TEST + REACTOR, WATER + STEEL, STAINLESS

17-11923 EDVARDSSON KA + WAHLBERG T

PLANNED PROCEDURES FOR FAST DETERMINATION OF RADIATION LEVELS AND PERSONNEL DOSIMETRY IN CONNECTION WITH RADIOLOGICAL ACCIDENTS

AB ATOMENERGI, SWEDEN

STI/PUB/99 +. 8 PAGES, 4 FIGURES, 1 REFERENCES, PAGES 665-672 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12-1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IAEA \$7.00

AB ATOMENERGI, SWEDEN, HAS AN EMERGENCY ORGANIZATION WHICH STARTS TO FUNCTION AS SOON AS AN ALARM INDICATES THAT AN EXTRAORDINARY SITUATION WITH CONSIDERABLE RADIATION HAZARDS HAS OCCURRED. THIS ORGANIZATION IS OPERATING FROM A HEADQUARTERS WHERE EQUIPMENT IS STORED AND DIFFERENT TYPES OF INTERNAL AND EXTERNAL COMMUNICATIONS ARE AVAILABLE. AS TO DETERMINATION OF EXPOSURES, IT IS DESIRABLE BOTH TO OBTAIN ROUGH PRELIMINARY VALUES FOR EXTERNAL AND INTERNAL EXPOSURE RATES AS SOON AS POSSIBLE AND TO GET FAIRLY ACCURATE VALUES FOR THE EXPOSURE OF EACH INDIVIDUAL INVOLVED IN THE ACCIDENT WITHIN REASONABLE TIME.

*EMERGENCY PROCEDURE + *RADIATION PROTECTION, ORGANIZATION + ACCIDENT, RADIOISOTOPE + DOSE MEASUREMENT, EXTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SURVEY, RADIATION, EMERGENCY + SWEDEN

17-11927 PUTZIER EA + LAGERQUIST CR + HAMMOND SE + MANN JR + PILTINGSRUD CW

EVALUATION AND TREATMENT OF AN ACUTE INTERNAL EXPOSURE TO PLUTONIUM

THE DOW CHEMICAL COMPANY, ROCKY FLATS DIVISION, GOLDEN, COLORADO

STI/PUB/99 +. 18 PAGES, 4 TABLES, 12 FIGURES, 2 REFERENCES, PAGES 549-566 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, JUNE 1965, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12, 1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IAEA \$7.00

AFTER DROPPING BURNING PLUTONIUM INTO CARBON TETRACHLORIDE, AN INDIVIDUAL WAS CONTAMINATED, WOUNDED, AND ALSO HAD INHALED PLUTONIUM. AFTER DECONTAMINATION, DTPA TREATMENT BEGAN, AND RAPID URINE RADIOANALYSIS VERIFIED ITS EFFECTIVENESS. A WHOLE-BODY COUNTER CHECKED THE DISTRIBUTION OF THE PU. DATA SUGGEST THAT THE DOSE FREQUENCY OF DTPA MAY AFFECT ITS EFFECTIVENESS.

*PLUTONIUM + *RADIATION INJURY, TREATMENT OF + ANALYTICAL TECHNIQUE, URINE + DOSE MEASUREMENT, INTERNAL + EXPLOSION + GLOVE BOX + INCIDENT, ACTUAL, GENERAL

17-11928 PARKER HM + NEWTON CE

THE HANFORD CRITICALITY ACCIDENT - DOSIMETRY TECHNIQUES INTERPRETATIONS AND PROBLEMS

GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS, RICHLAND, WASHINGTON

STI/PUB/99 +. 16 PAGES, 7 TABLES, 17 REFERENCES, PAGES 567-582 PERSONNEL DOSIMETRY FOR RADIATION ACCIDENTS, JUNE 1965, PROCEEDINGS OF A SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION HELD JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE WORLD HEALTH ORGANIZATION, IN VIENNA, MARCH 8-12, 1965, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, IAEA \$7.00 CY

TECHNIQUES USED FOR 22 PERSONS WERE UNUSUALLY COMPLETE - QUICK-SORT PROCEDURES (NA-24 IN VIVO) SEGREGATED EXCESSIVELY EXPOSED PERSONS, WITH CLOSE CORRELATION TO LATER LABORATORY TECHNIQUES. PRIMARY RELIANCE WAS PLACED ON FILM BADGES. THE SIMPLE GM COUNTER IN CONTACT WITH THE STOMACH SHOWED ABOUT 65 CPM PER RAD OF NEUTRON DOSE, AS VERIFIED BY WHOLE-BODY COUNTER. (IRONICALLY, NEW FILM BADGES WITH BETTER DOSIMETERS HAD BEEN ORDERED EARLIER BUT WERE DELIVERED THREE MONTHS AFTER THE ACCIDENT.) PROBLEMS IN THE VARIOUS TECHNIQUES FOR DOSE DETERMINATION ARE DISCUSSED. RELIANCE ON FIXED DETECTORS IS DISCOUNTED.

*DOSE MEASUREMENT, EXTERNAL + ACCIDENT, CRITICALITY + EMERGENCY PROCEDURE + HANFORD SITE + INCIDENT, ACTUAL, GENERAL + PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-11934 GILLEY LW + HOLLAND LB + POSTON JW + WARD DR
OPERATIONAL PROBLEMS WITH THE HEALTH PHYSICS RESEARCH REACTOR
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3973 (VOL.1) +. 2 PAGES, SEPTEMBER 1966, PAGES 11-12 OF NEUTRON PHYSICS DIVISION ANNUAL PROGRESS
REPORT FOR PERIOD ENDING MAY 31, 1966, CFSTI \$3.00 CY, \$0.75 MN

THE BURST SIZE VARIED BY 40 PERCENT FROM THE AVERAGE, WHICH WAS TRACED TO POOR DAMPING OF THE
SHOCK ABSORBER OF THE BURST ROD, WHICH IN TURN CAUSED OSCILLATION OF THE SAFETY BLOCKS AND
ASSOCIATED PARTS. THE BOLTS HOLDING THE CORE TOGETHER ALSO MIGHT NOT HAVE BEEN TIGHT ENOUGH
AND THE PARAMETERS INFLUENCING BURST SIZE CAN BE MEASURED ONLY WITH LIMITED ACCURACY.
REMEDIAL ACTION FOR THE ABOVE.

HPRR (HEALTH PHYSICS RESEARCH REACTOR) + OPERATING EXPERIENCE + REACTOR, FAST BURST

17-11989 CERAMICS RESEARCH AND DEVELOPMENT QUARTERLY REPORT. OCTOBER-DECEMBER 1965
BATTELLE-NORTHWEST, PACIFIC NORTHWEST LABORATORY
BNWL-269 +. 114 PAGES, 13 TABLES, 85 FIGURES, AUGUST 12, 1966

EXAMINATION OF RUPTURED ROD FROM PRTR INCIDENT OF SEPTEMBER 1965 BEGUN. BETA-PHASE ZIRCALOY
INDICATES THAT CLADDING TEMPERATURE WAS NEAR BREAK AND WAS ABOVE 850 C. MOLTEN FUEL IN THE
CENTERLINE HAD PENETRATED FROM THE 4 PERCENT PLUTONIUM OXIDE REGION THROUGH THE CENTERLINE OF
THE 1 PERCENT REGION, THROUGH THE DEPLETED URANIUM DIOXIDE PELLETS, THEN INTO THE GAS SPACE AT
THE TOP OF THE ROD WHERE IT ATTACKED THE INCONEL SPRING. IN ANOTHER ROD, THE 1-PERCENT AND
4-PERCENT REGIONS HAD MIXED BEFORE IRRADIATION, AND LOCAL OVERHEATING HAD ALLOWED PARTIAL
CLAD COLLAPSE. FLUX MONITORS INDICATE THAT POWER PEAKING DOES NOT ACCOUNT FOR EXCESSIVE
TEMPERATURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA

*FUEL MELTDOWN + *INCIDENT, ACTUAL, GENERAL + IN PILE LOOP + PRTR (PLUTONIUM RECYCLE TEST REACTOR) +
REACTOR, AEC OWNED + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, TEST

17-11994 ALEXANDERSON EL + BRANNAN CE + OLSON WR
OPERATING EXPERIENCE AT THE ENRICO FERMI ATOMIC POWER PLANT
POWER REACTOR DEVELOPMENT CO., DETROIT + ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT + THE DETROIT
EDISON CO., DETROIT
ANS-100 +. 16 PAGES, 7 FIGURES, 3 TABLES, 7 REFERENCES, MARCH 1, 1965, DOCKET NO. 50-16, PAGES 41-56 OF
FAST REACTOR TECHNOLOGY, AMERICAN NUCLEAR SOCIETY NATIONAL TOPICAL MEETING, DETROIT, MICHIGAN, APRIL
26-28, 1965

GENERAL DISCUSSION OF PLANT COMPONENTS, AS AFFECTED BY TEST-PROGRAM OPERATION. SHORT REPORT
OF NUCLEAR TESTING BELOW 1 MW(TH). ONE SAFETY SYSTEM CIRCUIT WAS FOUND IN WHICH FAILURE OF
ONE PAIR OF DIODES (OUT OF 117 PAIRS) RESULTED IN A CANNOT-SCRAM SITUATION. IN-CORE BF3
DETECTORS DISCARDED AS INITIAL LOADING SHOWED THEM SUBJECT TO GAMMA INTERFERENCE. ONE SAFETY
ROD FAILED TO SCRAM AS SODIUM LEAKED THROUGH A BELLOWS AND FROZE THE RELEASE MECHANISM.
CONTAINMENT LEAKS FOUND IN FOUR NEOPRENE WASHER SEALS, (A FLEXIBLE-GASKET-TYPE SEAL IS NOW
USED - WEATHERBANI). SLIGHT GAINS IN REACTIVITY SEEM TO FOLLOW PERIODS OF HIGH SODIUM
TEMPERATURE, AS PERHAPS THE ZIRCONIUM CLADDING TAKES UP HYDROGEN. GAS-ENTRAINMENT REACTIVITY
EFFECT NOT SEEN.

*REACTOR STARTUP EXPERIENCE, INITIAL + CONTAINMENT LEAKAGE CONTROL + FAILURE, SCRAM MECHANISM +
INSTRUMENTATION, STARTUP + REACTIVITY EFFECT, ANOMALOUS + REACTOR, FAST + REACTOR, LIQUID METAL COOLED +
SAFE FAILURE CRITERION

17-12029 KEDZIERSKI
FAILURE IN N S SAVANNAH EMERGENCY COOLING VALVE, SEPTEMBER 30, 1966
FIRST ATOMIC SHIP TRANSPORT, INC., NEW YORK, NEW YORK
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(43), PAGES 17-18 (OCTOBER 24, 1966) DOCKET NO. 50-238

WEEKLY TEST OF DK (HEAT REMOVAL) SYSTEM PERFORMED SATISFACTORILY ON SEPTEMBER 26. AN
INTERMITTENT GROUND WAS INDICATED ON SEPTEMBER 30 (440-VOLT BUS). ON OCTOBER 2, AFTER
BERTHING AT BREMERHAVEN, THE GROUND WAS LOCATED IN THE CIRCUIT FOR DK-21V
(EMERGENCY-COOLING-SYSTEM CIRCULATION-PUMP SUCTION VALVE) WHEN BOTH OPEN/CLOSED LIGHTS LIT
DURING TEST. MEGGERING THE MOTOR LEADS SHOWED THAT THEY WERE GROUNDED. MOTOR AND JUNCTION
BOX WERE FOUND SATURATED WITH WATER, WITH LEADS BURNED OUT. SOURCE OF WATER MAY HAVE BEEN
PAST SPILLS OR CONDENSATION (CONDENSATION IN JUNCTION BOX OR DRIPPING) ENTERING THROUGH THE
STUFFING BOX OF THE CABLE.

*EMERGENCY COOLING CONSIDERATIONS + *FAILURE, EQUIPMENT + *INCIDENT, ACTUAL, EQUIPMENT + N S SAVANNAH +
PUMP + REACTOR, MARITIME + REACTOR, PRESSURIZED WATER + VALVE

17-12060 WIKNER NF
REACTOR FUEL ELEMENT CONTAINING ABSORBER
U.S. PAT. 3,137,636 +. 10 PAGES, 5 FIGURES, 6 REFERENCES, JUNE 16, 1964, PATENT (US)

IT IS THE OBJECT OF THE PRESENT INVENTION TO PROVIDE IMPROVED FUEL ELEMENTS FOR A
HIGH-TEMPERATURE NUCLEAR REACTOR IN WHICH FUEL ELEMENTS INCORPORATE MEANS FOR IMPARTING TO
THE REACTOR A LARGE PROMPT NEGATIVE TEMPERATURE COEFFICIENT OF REACTIVITY AT TEMPERATURES
ABOVE THE NORMAL OPERATING TEMPERATURE OF THE REACTOR. THIS NEGATIVE TEMPERATURE COEFFICIENT
WOULD BE PROVIDED ONLY AT ELEVATED TEMPERATURES.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12060 *CONTINUED*

*FUEL ELEMENT + *HIGH TEMPERATURE + *TEMPERATURE COEFFICIENT + POISON, BURNABLE

17-12098 AIKIN AM + HOWIESON J + PAWLIN J
EVALUATION OF FUELS

ATOMIC ENERGY OF CANADA LIMITED + CANADIAN GENERAL ELECTRIC COMPANY LIMITED + CANADIAN WESTINGHOUSE COMPANY LIMITED

66-CNA-312 + CONF-660516-8 +. 7 PAGES, 1966, PAPER PRESENTED AT THE CNA CONFERENCE WINNIPEG, CANADA, MAY 30, 31 AND JUNE 1, 1966, DEP/MN

REVIEWS THE HISTORY, STATUS, AND FUTURE OF CANADIAN, NATURAL-URANIUM, PRESSURIZED-HEAVY-WATER REACTOR FUELS. IN ATTEMPTING HIGHER BURNUP OF METAL FUEL, SWELLING AND DIMENSIONAL CHANGES OCCURRED, SO THE EFFORT WAS DEVOTED TO UO₂ CLAD WITH ZIRCALOY-2. STATUS OF THE NPD - TWO FUEL BUNDLES, WITH DEFECTS FOUND, BUT BOTH ATTRIBUTED TO ABNORMAL HANDLING. NEW BUNDLES WILL BE OF BRAZED, SPLIT-SPACER DESIGN. STATUS AT DOUGLAS POINT - FUTURE FUEL WILL USE ZIRCALOY-4 RATHER THAN -2 FOR SHEATHING BECAUSE ZR-4 HYDRIDING IS HALF THAT OF ZR-2. PRODUCTION COSTS OF 50 DOLLARS/KG U, AND FUELLING COSTS OF 0.7 MILL/KWHR, ARE EXPECTED. FUTURE TRENDS INDICATE HIGHER POWER OUTPUTS, RECONSIDERATION OF U-METAL FUEL, AND THE POSSIBLE USE OF PU ENRICHMENT.

*CANDU (CANADIAN NATURAL URANIUM REACTOR) + *FUEL ELEMENT + *OPERATING EXPERIENCE + CANADA + CLAD + ECONOMICS + HYDRIDE + PLUTONIUM + REACTOR, HEAVY WATER + REACTOR, PRESSURIZED WATER + REVIEW + URANIUM + URANIUM DIOXIDE + ZIRCALOY

17-12100 ANDERSSON TL + BRUNFELTER B + CECCHI PF + HELLSTRAND E + KOCKUM J + LONDEN SD + TIREN LI
A SUMMARY REPORT ON ASSEMBLY 3 OF FRO
AKTIEBOLAGET ATOMENERGI, STOCKHOLM, SWEDEN
AE-233 +. 35 PAGES, JUNE 1966, DEP.MN

THE THIRD CORE OF THE ZERO-ENERGY FAST REACTOR FRO CONSISTED OF 20 PERCENT ENRICHED URANIUM DILUTED TO 29 VOL. PERCENT WITH GRAPHITE AND HAD A VOLUME OF 50 LITERS. LIKE PREVIOUS CORES, IT WAS SURROUNDED BY A THICK COPPER REFLECTOR. THE REPORT SUMMARIZES MEASUREMENTS OF CRITICAL MASS, CONTROL-ROD REACTIVITIES, FINE-STRUCTURE FLUX VARIATIONS, AND CONVERSION RATIO. IN PARTICULAR, EFFECTS ASSOCIATED WITH THE HETEROGENEOUS ARRANGEMENT OF THE URANIUM AND GRAPHITE PLATES ARE EXAMINED.

*CRITICALITY EXPERIMENT + CONTROL ROD WORTH + FLUX DISTRIBUTION + MEASUREMENT, REACTIVITY + REACTOR, GRAPHITE MODERATED + SWEDEN

17-12101 SUMMACH AJ

THE COMMISSIONING OF WR-1

ATOMIC ENERGY OF CANADA LIMITED, WHITESHELL

66-CNA-310 + CONF-660516-10 + AECL-2552 +. 12 PAGES, 1 TABLE, 1966, FROM ANNUAL CONFERENCE ON ORGANIC AND HEAVY WATER REACTORS, WINNIPEG, CANADA, MAY 30-JUNE 1, 1966, DEP.MN

ASPECTS OF THE WHITESHELL REACTOR NO. 1 COMMISSIONING PROGRAM, MAJOR MODIFICATIONS, SIGNIFICANT TEST RESULTS, AND INITIAL OPERATING EXPERIENCE ARE DISCUSSED. MODIFICATIONS AS A RESULT OF PRECRITICAL TESTING WERE - (1) REPLACEMENT OF COMPRESSED-ASBESTOS FLANGE GASKETS, WHICH WOULD NOT HOLD HELIUM, WITH BUNA N GASKETS. THESE WERE LATER REPLACED WITH NEOPRENE, (2) THE MODERATOR DUMP TANK WAS MODIFIED TO PREVENT GAS-LOCKING OF THE PUMPS DURING A DUMP. DURING CONSTRUCTION, ALL PIPING WAS CLEANED BEFORE INSTALLATION, WHICH PROVED TO BE WORTHWHILE. CABLES FOR THE CRANE CONTROL AND ION CHAMBERS WERE INSTALLED IN THE SAME CABLE TRAY, WHICH RESULTED IN CROSS-TALK. THE REACTIVITY POWER COEFFICIENT MEASURED HALF THE CALCULATED VALUE, ATTRIBUTED TO DISPLACEMENT OF THE COOLANT, BY FUEL-SHEATHING GROWTH, OVERLOOKED IN THE CALCULATIONS. THE PERFORMANCE OF GRAYLOC SEALS WAS HIGHLY SATISFACTORY.

*OPERATING EXPERIENCE + *REACTOR STARTUP EXPERIENCE, INITIAL + CANADA + FAILURE, EQUIPMENT + INSTRUMENTATION, ABNORMAL INDICATION + REACTIVITY EFFECT, ANOMALOUS + REACTOR, HEAVY WATER + REACTOR, ORGANIC COOLED + SEAL + WR 1 (WHITESHELL REACTOR NO. 1, CANADA)

17-12102 STRAUSS SD

HALLAM - DEATH OF A CONCEPT

4 PAGES, 6 FIGURES, 2 TABLES, 14 REFERENCES, NUCLEONICS 24(10) PAGES 63-66 (OCTOBER 1966) DOCKET NO. 115-3

PRESENTS THE REASONS FOR TERMINATING THE PROGRAM. A STRONG ARGUMENT FOR TERMINATION WAS THE UPDATED SODIUM REACTOR EXPERIMENT, WHICH REQUIRES A 200 F HIGHER SODIUM TEMPERATURE, MORE APPLICABLE TO THE REFERENCE 1000-MW(E) SODIUM-COOLED FAST BREEDER. THE CONTAINERS FOR THE GRAPHITE MODERATOR BLOCKS WERE THE MAJOR FACTOR RESPONSIBLE FOR TERMINATION. LOCALIZED REACTIVITY LOSSES AND POWER DEPRESSIONS INDICATED THAT THE MODERATOR CANS WERE BEING PENETRATED BY THE SODIUM. VENTING SNORKELS TO EQUALIZE PRESSURE IN AND OUTSIDE THE CANS HAD BEEN ELIMINATED, AND SCALLOPED VERTICAL EDGES WERE INTRODUCED. THESE CHANGES RESULTED IN EXCESSIVE STRESSES. THE OVERALL PLANT AVAILABILITY HAD BEEN ONLY 61 PERCENT. STATUS OF DISPOSITION OF PLANT IS GIVEN. OTHER PROBLEMS (AND SOLUTIONS) ARE DISCUSSED, SUCH AS INSTRUMENTATION NOISE, HEAT-EXCHANGER-TUBE FAILURE, MOISTURE CARRYOVER FROM EVAPORATOR TO SEPARATOR (HAMPFRIE STAM-GENERATOR OPERATION), OXIDE CONTAMINATION OF THE SODIUM, AND JAMMING OF THE FUEL-CHANNEL-ORIFICE PLUGS.

*OPERATING EXPERIENCE + CRUD + FAILURE, COMPONENT + FAILURE, EQUIPMENT + HALLAM + INSTRUMENTATION, ABNORMAL INDICATION + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12124 YEE S
SNAP CRITICAL ASSEMBLY-4B PHASE III WATER IMMERSION EXPERIMENTS
ATOMICS INTERNATIONAL, CANOGA PARK
NAA-SR-9871 +. 113 PAGES, 58 FIGURES, 14 TABLES, DECEMBER 1, 1964, CFSTI \$2.25 CY

THE PHASE III SNAP CRITICAL ASSEMBLY--4B (SCA-4B) EXPERIMENTS WHICH WERE CONDUCTED AS ONE OF THE PROJECTS IN THE SNAP AEROSPACE SAFETY PROGRAM ARE DESCRIBED. THESE EXPERIMENTS DEMONSTRATE CONCLUSIVELY THE EFFECTIVENESS OF (1) A VOID-POISON SLEEVE (SHIPPING SLEEVE) IN MAINTAINING A BARE CORE SUBCRITICAL WHEN IT IS INTERNALLY FLOODED AND FULLY REFLECTED WITH WATER AND (2) VOID-POISON FILLER BLOCKS IN MAINTAINING A BERYLLIUM-REFLECTED CORE SUBCRITICAL WHEN IT IS SUBMERGED IN BUT NOT INTERNALLY FLOODED WITH WATER. EXPERIMENTAL DATA WERE ALSO PROVIDED IN SUPPORT OF THE SUBSEQUENT SNAPTRAN 10A/2-3 DESTRUCTION EXPERIMENT.

*CRITICAL ASSEMBLY FACILITY + *HYDRAULIC EFFECT + *HYDRAULIC EXPERIMENT +
*SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + *SNAP 8 (SYSTEMS FOR NUCLEAR AUXILIARY POWER) +
POISON, BURNABLE + REACTOR, SPACE + WATER, GENERAL

17-12139 INDIAN POINT STATION STARTUP PHYSICS TEST PROGRAM RESULTS CORE B
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
89 PAGES, 38 FIGURES, 8 TABLES, SEPTEMBER 30, 1966, PDR

ONE-HUNDRED AND TWENTY ELEMENTS WERE LOADED IN 2 WEEKS BEGINNING FEB. 25, AND CRITICALITY ACHIEVED ON MARCH 27. ALL RODS BUT GROUP D WERE RUN FULL OUT, AND SOLUBLE POISON DILUTED TO 10,850 PPM. REACTOR THEN MADE CRITICAL ON GROUP D. 1/M PLOTS SHOWN. AN ANALOG COMPUTER WAS USED TO OBTAIN REACTIVITY DIRECTLY FOR VARIOUS TESTS (HOT AND COLD) OF ROD, BORON, AND MODERATOR EFFECTS. OVER THE RANGE OF ROD POSITIONS, NO SIGNIFICANT DIFFERENCES NOTED IN ROD WORTH BETWEEN HOT ZERO-POWER AND PARTIAL-POWER CONDITIONS. AUTOMATIC PLANT CONTROLLER TESTED WITH 25-MW(E)/MIN AND 50-MW(E) STEPS BY CHANGING TURBINE CONTROL-VALVE POSITION. INVESTIGATION OF SEVERAL DISCREPANCIES IN COLD DIRECTLY-MEASURED DIFFERENTIAL ROD WORTHS LED TO THE CONCLUSION THAT THEY WERE IN ERROR BECAUSE OF DIFFERENT CORE-ROD-DETECTOR GEOMETRIES USED IN HOT AND COLD MEASUREMENTS. A AND C GROUP WITHDRAWAL RATES WERE DECREASED TO MAINTAIN SPECIFIED LIMITS.

*OPERATIONS SUMMARY FOR AEC + *REACTOR STARTUP EXPERIENCE, INITIAL + CONTROL ROD WORTH + INDIAN POINT 1 +
REACTOR, PRESSURIZED WATER + REFUELING + TEST, PHYSICS + TEST, PLANT RESPONSE

17-12148 HAUETER RL
BIG ROCK POINT REQUESTS AUTHORITY TO USE VIBRATORY COMPACTED UO2 POWDER FUEL
CONSUMERS POWER COMPANY, JACKSON
19 PAGES, 3 FIGURES, 3 TABLES, JULY 29, 1966, DOCKET NO. 50-255, PDR

IN A REQUEST TO CHANGE FROM PELLET FUEL TO VIBRATORY-COMPACTED FUEL, BIG ROCK POINT PEOPLE STATED THAT THE PROMISE THAT FUEL-CLADDING MECHANICAL INTERACTIONS CAN BE ELIMINATED COMPLETELY BY THE USE OF FREESTANDING CLADDING WITH A NOMINAL CLEARANCE BETWEEN THE PELLETS AND THE CLADDING IS NOT VALID. A SIGNIFICANT ASPECT OF RECENT MEASUREMENTS IS THAT CIRCUMFERENTIAL RIDGING OCCURS IN ALL PELLET FUEL RODS OF CURRENT DESIGNS, EVEN THOUGH THE CLADDING IS FREESTANDING WITH DIAMETRAL GAPS OF UP TO 0.013 IN. BETWEEN THE PELLETS AND THE CLADDING. MEASUREMENTS MADE ON VARIOUS TYPES OF FREESTANDING CLADDING, INCLUDING ZIRCALOY-2, STAINLESS STEEL, INCOLOY, AND INCONEL, SHOW RIDGING AT THE PELLET INTERFACES WHEN OPERATED AT NOMINAL POWER LEVELS. RIDGING OF FREESTANDING, ZIRCALOY-2-CLAD FUEL RODS OPERATED FOR A SHORT TIME IN THE BIG ROCK POINT REACTOR HAS BEEN MEASURED. THE RIDGES ARE VISUALLY ACCENTUATED BY SELECTIVE CRUD DEPOSITION ON THE CLADDING SURFACE. THE MAGNITUDE OF THE RIDGING APPEARS TO BE A FUNCTION OF INITIAL COLD GAP AND FUEL ROD SPECIFIC POWER. RIDGES OF UP TO 0.001 IN. IN HEIGHT HAVE BEEN MEASURED IN 0.425 IN. OD, ZIRCALOY-2-CLAD FUEL RODS HAVING A WALL THICKNESS OF 0.030 IN., AN AS-FABRICATED PELLET-CLADDING GAP OF 0.007 IN., AND OPERATED AT A PEAK SURFACE HEAT FLUX OF UP TO 350,000 BTU/HR-SQ.FT.

*CLAD + *DAMAGE + *FUEL ELEMENT + *STRESS + BIG ROCK POINT + OPERATING EXPERIENCE +
REACTOR, BOILING WATER + SURFACE FILM DEPOSIT

17-12151 OKRENT D
ACRS REPORT ON PEACH BOTTOM STATION
U.S. ATOMIC ENERGY COMMISSION
PRESS REL. J-243 +. 3 PAGES, 12 REFERENCES, OCTOBER 21, 1966, DOCKET NO. 50-171, DPI

ACRS APPROVED FULL-POWER OPERATION FOR PEACH BOTTOM. THE REVIEW INCLUDED MENTION OF SOME FAILURES. (1) STRESS-CORROSION-CRACKED STEEL SUPERHEATER TUBES WERE REPLACED WITH INCONEL. (2) FUEL-TRANSFER MACHINE HAD BINDING PROBLEMS IN HOT HELIUM. (3) FOUR CONTROL-ROD DRIVES HAD ERRATIC STICKING BECAUSE OF FRACTURED BALLS IN THE BALL-NUT ASSEMBLIES, ALTHOUGH THIS DID NOT IMPAIR THE ABILITY TO SCRAM.

*ACRS (ADVISORY COMMITTEE ON REACTOR SAFEGUARDS) + *OPERATING EXPERIENCE + FAILURE, PIPE +
FAILURE, SCRAM MECHANISM + FUEL HANDLING MACHINE + PEACH BOTTOM 1 + REACTOR, GAS COOLED +
REACTOR, GRAPHITE MODERATED

17-12159 GOSLIN WO
SAFETY CONTROL PROGRAM
GENERAL ELECTRIC COMPANY, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-SA-3631 + CONF-670-1 +. 6 PAGES, JULY 23, 1964, FROM ANNUAL AEC MEETING ON INDUSTRIAL SAFETY AND FIRE PROTECTION, IDAHO FALLS, IDAHO, JULY 1964

SAFETY CONTROL PROGRAM IS A SYSTEM FOR MEASURING EMPLOYEE ATTITUDE AND ACCIDENT POTENTIAL

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12159 *CONTINUED*

THROUGH THE MEDIUM OF LOOKING FOR UNSAFE ACTS AND UNSAFE CONDITIONS THAT OCCUR IN THE PLANT. INSPECTIONS ARE MADE OF SAMPLE PARTS OF THE PLANT, AND THE INFORMATION GAINED IS PROJECTED FOR THE ENTIRE PLANT. A CONTROL CHART OF THE NUMBER OF DEFECTS FOUND IN ANY INSPECTION WILL SHOW SIGNIFICANT TRENDS AND OUT-OF-CONTROL PERIODS, WHICH CAN BE USED AS WARNING SIGNALS THAT THE PROBABILITY OF SERIOUS ACCIDENT HAS INCREASED AND THAT REMEDIAL ACTION MUST BE TAKEN. THIS REMEDIAL ACTION MUST BE APPLIED ACROSS THE WHOLE PLANT, NOT IN JUST THE SAMPLE SEGMENTS INDICATING LOSS OF CONTROL.

*PLANT PROTECTIVE SYSTEM + *SAFETY REVIEW (OPERATIONS, EXPERIMENTS) + *SAFETY STUDY + HANFORD SITE

17-12168 BODURTHA FT

CONTROL OF POWER PLANT STACK EMISSIONS FOR CLEAN AIR
E. I. DU PONT DE NEMOURS AND COMPANY, WILMINGTON, DELAWARE

13 PAGES, 1 TABLE, 4 FIGURES, 28 REFERENCES, PAGES 399-411 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS,

CONSIDERS THE SO₂ EMITTED FROM A COAL BURNING PLANTS STACK IN NORMAL CONDITIONS. (OUT OF THE PLETHORA OF PLUME-RISE EQUATIONS, AUTHOR BELIEVES THAT THE BOSANQUET-PEARSON DISPERSION EQUATIONS WITH THE LUCAS PLUME-RISE EQUATION GIVE THE OPTIMUM ANSWER. THE B-P EQUATION IS A BASIS FOR NEW JERSEY LEGISLATION). PLUME RISE IS A MORE IMPORTANT FACTOR THAN DISPERSION, INVERSION (DESPITE LOWER WIND SPEEDS, HOT PLUMES WILL STAY ALOFT, YIELDING LOWER GROUND-LEVEL CONCENTRATIONS THAN IN NORMAL CONDITIONS, ALSO FUMIGATION RESULTS IN LESSER CONCENTRATIONS THAN NEUTRAL STABILITY, EXCEPT FOR LOW-LEVEL EMISSIONS), OR FOG (SUGGESTS THAT IN THE THREE FAMOUS AIR-POLLUTION INCIDENTS, SO₂ WAS CONVERTED TO SO₃ AND CONCENTRATED IN THE FOG AS H₂SO₄ - THIS EFFECT IS SUGGESTED AS MORE IMPORTANT THAN THE ORDINARILY INERT PARTICLES GENERALLY HYPOTHESIZED AS THE CAUSE). TOPOGRAPHY IS DISCUSSED (AN INVERSION-TRAPPED PLUME HAS BEEN SEEN TO BE DEFLECTED DOWNWARD BY A HILL AND THEN RETURN TO THE STACK BASE - VALLEY LOCATIONS ARE POOR). APPENDIXES PRESENT THE PERTINENT EQUATIONS, WITH MODIFICATIONS FOR BUOYANT AND NONBUOYANT PLUMES. THE B-P EQUATIONS GIVE 30-MINUTE CONCENTRATIONS, WHILE PEAK ONE-MINUTE CONCENTRATIONS MAY BE 5-10 TIMES THESE.

*AIR POLLUTION + *SOURCE, CONTINUOUS + ANALYTICAL MODEL + BREEZE, VALLEY + DISPERSION + LAPSE RATE, STABLE

17-12169 SIKES PG + BENSON WE

FORTY PLUS YEARS OF REINFORCED CONCRETE CHIMNEY EXPERIENCE
WISCONSIN ELECTRIC POWER COMPANY, MILWAUKEE, WISCONSIN

14 PAGES, 1 TABLE, 8 FIGURES, 5 REFERENCES, PAGES 423-436 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE, ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

REVIEWS WISCONSIN ELECTRIC POWER COMPANY EXPERIENCE SINCE 1920 WITH 18 CHIMNEYS FOR COAL-FIRED BOILERS. DESCRIBES DESIGN EVOLUTION FROM 210-FT UNLINED TO 550-FT LINED (CONCENTRIC) CHIMNEYS. WHILE MANY PROBLEMS ARE RELATED TO UNIQUE CHEMICAL EFFECTS, SOME ARE UNIVERSAL. PROTECTIVE OUTER COATINGS, WIND AND OTHER STRESS SITUATIONS, INTERMITTENT OPERATION, CONCRETE ADMIXTURES, EXTERIOR VERTICAL CRACKINGS, CAREFUL CLEANING OF TOP OF THE CONCRETE BEFORE POURING OF THE NEXT SECTION, ETC. THE OPERATING EXPERIENCE IS WELL DESCRIBED.

*CONCRETE + *OPERATING EXPERIENCE + *STACK + DAMAGE + REACTOR, POWER

17-12170 ACKERMAN AJ

ATOMIC POWER PLANTS-WHATS WRONG WITH THEM

19 PAGES, 3 FIGURES, 2 TABLES, 3 REFERENCES, PAGES 737-755 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

REVIEWS DRESDEN 1, YANKEE-ROWE, INDIAN POINT 1, HALLAM, ELK RIVER, AND FERMI PLANT RECORDS ON RELIABILITY, ECONOMICS, PUBLIC SAFETY, AND UNRESOLVED PROBLEMS FROM A CONSULTING ENGINEERS VIEWPOINT TO ALERT CIVIL ENGINEERS. INCLUDED IN COMMENTS ON MANAGEMENT RESPONSIBILITY IS THE IMPLICATION THAT REACTOR TECHNOLOGY IS RUN BY SCIENTISTS (WHOSE CHIEF ACTIVITY IS TO MAKE MISTAKES AND THEN CORRECT THEM), WHILE STIFLING THE NORMAL DEVELOPMENT OF STANDARDS BY ENGINEERS (WHO ARE TRAINED NOT TO MAKE MISTAKES). OTHER REMARKS POINT OUT OVER-PROMOTION, GOVERNMENT SUBSIDIES, UNFAIR COMPETITION, ETC.

*FAILURE, GENERAL + *OPERATING EXPERIENCE + *RELIABILITY, SYSTEM + REACTOR, POWER

17-12171 HIGH-PRESSURE RELEASE IN AN EIGHT-INCH TUBE OF THE PUERTO RICO RESEARCH REACTOR

DIVISION OF OPERATIONAL SAFETY, USAEC

3 PAGES, REACTOR SAFETY OPERATING EXPERIENCES, 66-3 (OCTOBER 25, 1966), DPI

A BEAM-TUBE SHIELD-PLUG NEAR THE REACTOR CORE RUPTURED AS A RESULT OF INTERNAL PRESSURE AND BLEW OFF THE END OF THE BEAM TUBE. THE PLUG WAS SOLID BARYTES CONCRETE ENCASED IN QUARTER-INCH-THICK ALUMINUM. THE WELDED END-DISK OF THE BEAM TUBE WAS FORCED AGAINST THE FUEL ELEMENTS. NO DAMAGE TO THE ELEMENTS OCCURRED. AN IDENTICAL PLUG LOCATED IN A SECOND BEAM TUBE WAS REMOVED. NO SWELLING OR EVIDENCE OF INTERNAL PRESSURE WAS FOUND. THE CAUSE OF THE PRESSURE BUILDUP IS NOT KNOWN, BUT POSSIBILITIES ARE (1) HYDROGEN AND OXYGEN GAS FORMATION DUE TO RADIOLYSIS OF WATER FROM HYDRATION OF THE CONCRETE OR LEAKAGE FROM A PIN HOLE, (2) GAS FORMATION BY CORROSION AT THE ALUMINUM-CONCRETE INTERFACE. PLUGS ARE NOW LOCATED AT THE OUTER END OF THE BEAM TUBES AND WILL BE SECURED.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12171 *CONTINUED*

*BEAM HOLE + *EXPLOSION + *INCIDENT, ACTUAL, EQUIPMENT + PUERTO RICO + RADIOLYTIC GAS + REACTOR, AEC OWNED + REACTOR, POOL TYPE + REACTOR, RESEARCH + SHIELDING

17-12173 PERRIGO LD + DEMNITT TF + HAYDEN KD + WEED RD + AYRES JA
PLUTONIUM RECYCLE TEST REACTOR DECONTAMINATION FOLLOWING A MGO-PUO2 FUEL ELEMENT FAILURE
BATTELLE NORTHWEST, RICHLAND
BNWL-SA-636 + CONF-660520-3 +. 10 PAGES, 1 FIGURE, 1 TABLE, MARCH 31, 1966, FROM INTERNATIONAL SYMPOSIUM
ON THE DECONTAMINATION OF NUCLEAR INSTALLATIONS, HARWELL, ENGLAND, CFSTI \$1.00 CY, \$0.50 MN

THE DECONTAMINATION WAS ACCOMPLISHED BY FIRST REDUCING THE TEMPERATURE TO A MINIMUM TO REDUCE LEACHING OF FISSION PRODUCTS FROM THE FUEL. 3500 GALLONS OF HEAVY WATER WAS REMOVED AND CLEANED BY ION EXCHANGE. LIGHT-WATER FLUSHING AND RINSING WAS PERFORMED. CHEMICAL CLEANING WAS THEN STARTED USING A BUFFERED OXALIC PEROXIDE, ALKALINE PERMANGANATE, OXALIC ACID SOLUTION. INSPECTION SHOULD REDEPOSITION OF RADIOACTIVITY FROM THE OXALIC ACID SOLUTION AFTER THE OXIDE FILMS WERE REMOVED. AN 8 PERCENT DIBASIC AMMONIUM CITRATE SOLUTION WAS SUBSTITUTED FOR THE OXALIC ACID AND GAVE GOOD RESULTS. DECONTAMINATION FACTORS FROM 2.2 TO 15 WERE ACHIEVED. LIGHT-WATER RINSING WAS PERFORMED. ALL GASKETS WERE REPLACED BECAUSE OF CHEMICAL DAMAGE. THE RADIATION LEVELS AFTER DECONTAMINATION ARE LOWER THAN THOSE BEFORE THE PUPTURE. NO CORROSION EFFECTS HAVE BEEN NOTICED AFTER 34 MONTHS OF OPERATION.

*DECONTAMINATION + *MAIN COOLING SYSTEM + CORROSION + FAILURE, FUEL ELEMENT + PRTR (PLUTONIUM RECYCLE TEST REACTOR) + REACTOR, AEC OWNED + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, RESEARCH

17-12174 INTERPRETATION - CODE FOR PRESSURE PIPING ASA B31.1 1955 BRAZED VS SOLDERED JOINTS
DIVISION OF OPERATIONAL SAFETY, USAEC
2 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 245, (NOVEMBER 7, 1966), DPI

SECTION 6 - FABRICATION, INDICATES THAT BRAZED OR SOLDERED JOINTS MAY BE USED UNLESS OTHERWISE SPECIFIED. SECTION 2 - INDUSTRIAL GAS AND AIR PIPING (APPARENTLY) SPECIFIES BRAZED JOINTS IN THESE SYSTEMS (APPARENTLY BECAUSE OF ITS SUPERIOR HOLDING STRENGTH AT HIGH TEMPERATURE). AS AN ILLUSTRATION, THE CAMBRIDGE ELECTRON ACCELERATOR FIRE OF JULY 1965 (TID 22594) WAS SUBSTANTIALLY INCREASED BECAUSE A MINOR FIRE UNSOLDERED THE PIPE JOINTS ON THE LIQUIFIED-PETROLEUM-GAS SYSTEM, AND THIS ADDITIONAL FUEL CAUSED MOST OF THE FIRE DAMAGE.

*ACCELERATOR + *FAILURE, INSTALLATION ERROR + *FIRE + FAILURE, PIPE + HYDROGEN + INCIDENT, ACTUAL, GENERAL + OPERATING EXPERIENCE

17-12175 FIRE DAMAGES HOT CELL WINDOW
DIVISION OF OPERATIONAL SAFETY, USAEC
2 PAGES, AEC SERIOUS ACCIDENTS BULLETIN NO. 275, (NOVEMBER 4, 1966), DPI

DURING CLEANING OF A FISSION-GAS APPARATUS WITH BUTYL ALCOHOL, A SMALL BIT OF NAK DROPPED OUT AND REACTED IN AIR. THE SPARK IGNITED THE ALCOHOL VAPOR. MANUAL ACTUATION OF A 600-LB TOTAL-FLOODING CO2 SYSTEM PUT OUT THE FIRE, BUT NOT BEFORE THE INNER WINDOW CRACKED. THE MINERAL OIL WAS DRAINED, SO ADDITIONAL FUEL WAS NOT AVAILABLE. CELL NEGATIVE PRESSURE WAS MAINTAINED, AND EXHAUST FILTERS DID NOT CLOG.

*FIRE + *HOT CELL + *NAK (SODIUM POTASSIUM ALLOY)

17-12178 ELK RIVER REACTOR FORTY-SEVENTH MONTHLY OPERATING REPORT SEPTEMBER 1966
RURAL COOPERATIVE POWER ASSOCIATION
COO-654-36 +. 26 PAGES, 4 FIGURES, DOCKET 115-1, SEPTEMBER 1966, PDR

OF INTEREST ARE - 43 TUBES WERE PLUGGED IN NO. 1 EVAPORATOR FOLLOWING A SERIES OF TESTS. TEN WERE FOUND USING RUBBER PLUGS AND FINDING WATER ON THE PLUGS. SEVEN MORE WERE FOUND ON A HYDRO TEST. SIX MORE WERE FOUND ON A HELIUM TEST, ANOTHER SIX ON A SECOND HELIUM TEST, AND SIX MORE ON A THIRD HELIUM TEST. FOLLOWING THE SEPTEMBER 14 STARTUP, THE TURBINE AIR EJECTOR ACTIVITY WAS ONLY 50,000 CPM (VS 125,000), AND PRIMARY MAKEUP WAS 70 GAL/DAY (VS 500 GAL/DAY). LEAKS WERE REPAIRED IN THE REACTOR OFF-GAS SYSTEM, BUT CONTAINMENT AIR ACTIVITY STILL INCREASES WHEN THE SYSTEM IS PUT IN SERVICE. RADIOIODINE WAS DETECTED IN THE STACK DISCHARGE, AND A CHARCOAL ADSORBER CARTRIDGE WAS INSTALLED FOR WEEKLY MONITORING. IODINE IN PRIMARY COOLANT INCREASES FOLLOWING A STARTUP OR SHUTDOWN AS IODINE, HIDDEN-OUT IN THE PRIMARY SYSTEM, IS RELEASED DURING A PRESSURE-TEMPERATURE CYCLE. FUEL BURNUP, CORRECTED FOR PA-233 AND SAMARIUM TRANSIENTS, APPEARS TO BE ABOUT 0.00071 DOLLAR/MWD.

*OPERATING EXPERIENCE + *OPERATIONS SUMMARY FOR AEC + ELK RIVER + FISSION PRODUCT, IODINE + HEAT EXCHANGER + MAIN COOLING SYSTEM + REACTOR OFFGAS + REACTOR, BOILING WATER + SOURCE, CONTINUOUS + TEST, LEAK RATE

17-12180 EBWR PLUTONIUM CORE OPERATION
ARGONNE NATIONAL LABORATORY, ARGONNE
ANL-7255 +. 4 PAGES, 3 FIGURES, SEPTEMBER 1966, PAGES 1-4 OF REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, CFSTI \$4.00 CY

REACTIVITY NECESSARY FOR 40-MW(TH) OPERATION WAS OBTAINED BY EXCHANGING 6-PERCENT-ENRICHED URANIUM ELEMENTS FOR HIGHLY ENRICHED ONES. BORIC ACID REACTIVITY WORTH OF MINUS 1.25 PERCENT DELTA-K/G/GAL IS MORE THAN PREDICTED. NINE-ROD-BANK REACTIVITY/INCH INCREASES (TO 1.5 PERCENT DELTA-K/INCH AT 10.5 INCHES) BECAUSE ACTIVE PORTION OF THE CORE BECOMES PROGRESSIVELY

ACCESSION NUMBER 17-12171 TO 17-12180

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12180 *CONTINUED*

FLATTER. PRESENT REACTOR VESSEL NDTT IS 80 F AND EXPECTED TO BE 230 F AT END OF PLUTONIUM-CORE IRRADIATION. HELIUM-SURROUNDED VESSEL SPECIMENS WILL MONITOR RADIATION DAMAGE DURING THE PROGRAM.

*FUEL ELEMENT + *PLUTONIUM + EBWR (EXPERIMENTAL BOILING WATER REACTOR) +
NDT DATA (NIL DUCTILITY TRANSITION) + OPERATING EXPERIENCE + REACTOR, AEC OWNED + REACTOR, BOILING WATER

17-12182 KOENIG LA + ZEHME S

THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. PART II
SC-T-66-0712 +. 10 PAGES, TABLES, 1965, TRANSLATED FROM ATOMPRAXIS 11, PAGES 268-70 (1965), JCL \$1.10 FS,
\$0.80 MF

THE MAXIMALLY ADMISSABLE ACTIVITY CONCENTRATIONS OF SEVERAL RADIONUCLIDES IN AIR ARE GIVEN IN A SUMMARIZING TABLE AS AN ANNUAL MEAN DURING CONTINUAL EXPOSURE AND AS A FUNCTION OF AGE. PARENTHETIC VALUES ARE GIVEN THAT APPLY WHEN THERE IS A POSSIBILITY OF INCORPORATING NUCLIDES AS CONTAMINATION THROUGH FOOD INTAKE. THE METHOD OF CALCULATION OF THESE NUMBERS IS EXPLAINED. THE LOWEST VALUES FOR VARIOUS AGE GROUPS ARE GIVEN. THE INFLUENCE OF AGE IS NOT GREAT UNDER THE ASSUMPTIONS IMPOSED.

*AIR + *AIR + *MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *MAXIMUM PERMISSIBLE CONCENTRATION (MPC) +
*RADIOACTIVITY, RELEASE + *RADIOACTIVITY, RELEASE + *SOURCE, CONTINUOUS + *SOURCE, CONTINUOUS + *STACK +
*STACK

KOENIG LA + ZEHME S

THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. PART II
SC-T-66-0712 +. 10 PAGES, TABLES, 1965, TRANSLATED FROM ATOMPRAXIS 11, PAGES 268-70 (1965), JCL \$1.10 FS,
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17-12197 SMITH ER

CONTAINMENT AIR PARTICULATE ACTIVITY IN ELK RIVER REACTOR
RURAL COOPERATIVE POWER ASSOCIATION
3 PAGES, AUGUST 6, 1966, DOCKET NO. 115-1, PDR

THE PLANT PARTICULATE AIR MONITOR USES A MOVING FILTER PAPER, WITH DETECTORS PLACED FOR INSTANTANEOUS AND FOR 6-HOUR-DECAY ALARMS. THE INSTANTANEOUS DETECTOR IS NEARLY ALWAYS ALARMING BECAUSE ITS SETTING IS 3 TIMES 10 (MINUS 10TH) MICRO C/CC, THE MPC FOR UNIDENTIFIED BETA-GAMMA EMITTERS. SINCE THE OBSERVED FILTER PAPER HALF-LIFE FOR THE FIRST FOUR HOURS IS 22 MIN, AND SPECTRUM ANALYSIS SHOWS PREDOMINANTLY KR-88 AND CS-138 IN THE AIR, THE ALARM SETTING SHOULD BE CHANGED TO 6 TIMES 10 (MINUS 8TH) MICRO C/CC (1/10TH THE MPC FOR KR-88 AND CS-138) SO THE ALARM WILL MEAN SOMETHING.

*MONITOR, RADIATION, AIR + *OPERATING EXPERIENCE + AIRBORNE RELEASE + CONTAINMENT, GENERAL + ELK RIVER +
NOBLE GAS + REACTOR, BOILING WATER

17-12198 ELK RIVER JANUARY SHUTDOWN PLANS

RURAL COOPERATIVE POWER ASSOCIATION
2 PAGES, OCTOBER 10, 1966, DOCKET NO. 115-1, PDR

IN A LETTER TO AEC-DRL, THE RURAL COOPERATIVE POWER ASSOCIATION (THE ELK RIVER OPERATING AGENCY) INDICATES PLANS FOR AN EARLY 1967 SHUTDOWN TO (A) INSPECT BORON-STAINLESS-STEEL CONTROL RODS, WHEN THE NEW B4C RODS ARE DELIVERED, AND (B) TO INSTALL A CALIBRATED-ORIFICE LEAK-RATE SOURCE AND TO REDESIGN THE REFERENCE CHAMBER SYSTEM, SO A MORE MEANINGFUL CONTAINMENT TEST MAY BE MADE.

*CONTAINMENT, HIGH PRESSURE + *CONTROL ROD + *TEST, LEAK RATE + CONTAINMENT REFERENCE MEASURING SYSTEM +
ELK RIVER + MATERIAL + REACTOR, BOILING WATER

17-12204 APPENDIX IV - PRINCIPAL CHANGES MADE IN FACILITY

PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 1-2 OF APPENDIX IV FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966, PDR

SPENT-FUEL POOL-WATER ACTIVITY HAS INCREASED (BECAUSE OF ZN-65) SO THAT THE COOLERS AND DEMINERALIZE PIPES WERE SHIELDED. THE STAINLESS-STEEL POOL LINER (WHICH REPLACED THE LEAKY CARBOLINE-PAINTED CONCRETE) DRAINS TO A SUMP TO TAKE LINER LEAKAGE. IN MARCH, THE LEAKAGE INCREASED TO 80 GAL/DAY, TOO MUCH FOR THE LIQUID WASTE SYSTEM. THEREFORE, THE SPACE BETWEEN LINER AND CONCRETE WALL WAS FILLED WITH DEMINERALIZED WATER AND MAINTAINED 1/4 INCH HIGHER THAN POOL-WATER LEVEL. THREE TEST WELLS WERE DUG OUTSIDE. SAMPLES FROM SUMPS, ETC., INDICATE NO SIGNIFICANT RADIOACTIVITY IS ESCAPING.

*CLAD + *FUEL STORAGE + *OPERATIONS SUMMARY FOR AEC + *TEST, LEAK LOCATION + HUMBOLDT BAY +
REACTOR, BOILING WATER

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12205 APPENDIX V. 1 - DISCUSSION OF SIGNIFICANT TESTS
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
1 PAGE, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGE 1 OF APPENDIX V FROM REPORT ON THE OPERATION OF
HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966, THROUGH AUGUST 15, 1966, PDR

REACTOR IS BACK TO FULL POWER FOLLOWING EVALUATION OF THE FLOW REDUCTION (DUE TO SPALLED SCALE TRAPPED ON FUEL ROD SPACERS) WHICH REDUCED THE MINIMUM BURNOUT RATIO AT 125 PERCENT POWER IN THE PEAK CHANNEL FROM 3.1 TO 2.9. AFTER AN APRIL SCRAM AND 3.5-DAY OUTAGE, A CHANGE IN CRITICAL CONTROL ROD POSITION (HALF THE ADDITIONAL ROD MOVEMENT NEEDED TO OVERCOME THE FLOW REDUCTION WAS NO LONGER NEEDED) INDICATED THAT SOME OF THE SPALLED SCALE HAD BEEN WASHED OUT. FLOW MEASUREMENTS OF 10.6 TIMES 10(6TH) POUNDS PER HOUR WERE BETWEEN NORMAL (11.3) AND LOWEST FLOW WITH SPALLED SCALE (9.6). IN JUNE, FLOW BEGAN A DOWNWARD TREND, REACHING 9.9 IN AUGUST.

*FLOW BLOCKAGE + *INCIDENT, ACTUAL, GENERAL + *SURFACE FILM DEPOSIT + HUMBOLDT BAY +
REACTIVITY EFFECT, ANOMALOUS + REACTOR, BOILING WATER

17-12208 SAXTON NUCLEAR EXPERIMENTAL CORPORATION - OPERATIONS REPORT FOR AUGUST 1966
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
44 PAGES, FIGURES, TABLES, OCTOBER 21, 1966, DOCKET NO. 50-146, PDR

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. SEMIANNUAL REPORT IS A COMPILATION ON MONTHLY REPORTS. MONTHLY REPORT HAS SECTIONS (1) SHORT DESCRIPTION OF REACTOR OPERATION, (2) EXPERIMENTAL PROGRAM - FUEL CHANGES, REACTIVITY TESTS, (3) OPERATIONAL TESTS ON SYSTEMS AND COMPONENTS, (4) MAINTENANCE PERFORMED, MECHANICAL, ELECTRICAL AND INSTRUMENT, (5) COOLANT CHEMISTRY DATA, (6) RADIATION AND CONTAMINATION READINGS AT VARIOUS EQUIPMENT, WASTE DISCHARGES, AND PERSONNEL DOSIMETER READINGS.

*OPERATIONS SUMMARY FOR AEC + COOLANT CHEMISTRY + IRRADIATION TESTING + MAINTENANCE AND REPAIR +
RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + SAXTON + TEST, SYSTEM OPERABILITY +
WASTE DISPOSAL, GENERAL

17-12209 SAXTON NUCLEAR EXPERIMENTAL CORPORATION - OPERATIONS REPORT FOR MARCH 1 THROUGH AUGUST 31, 1966
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
44 PAGES, FIGURES, TABLES, OCTOBER 21, 1966, DOCKET NO. 50-146, PDR

(APRIL) - TEST FUEL ELEMENTS REPLACED. NUCLEAR HEATUP BEGAN APRIL 14 AFTER A COLD COOLANT-LOOP LEAK TEST. THREE DAYS AND THREE SYSTEM HEATUPS WERE REQUIRED BECAUSE OF SIMMERING PRESSURIZER SAFETY VALVES. (MAY) - THE PH-VS-REACTIVITY TESTS (HOT PH REDUCED FROM 7.07 TO 5.38) DECREASED MAIN COOLANT TEMPERATURE 9.8 F. (JUNE) - REACTOR SHUTDOWN FOR IBEW STRIKE. A PH REDUCTION FROM 7.12 TO 5.38 GAVE A COEFFICIENT OF 0.118 PERCENT REACTIVITY PER PH UNIT. (AUGUST) - SEVERAL TEST ELEMENTS WERE SHUFFLED, AND FUEL RODS WERE SENT OUT FOR EXAMINATION. FULL CORE-FLUX MAP AND FULL SET OF THERMAL AND HYDRAULIC MEASUREMENTS MADE. CONTAINMENT-INTEGRAL-LEAK-RATE TEST (80 HOURS AT AN AVERAGE OF 10.19 PSIG) GAVE 0.076 PERCENT OF NET FREE VOLUME PER DAY, ALMOST HALF THE SPECIFIED LIMIT.

*OPERATIONS SUMMARY FOR AEC + AFL-CIO + CONTAINMENT, HIGH PRESSURE + REACTIVITY EFFECT, ANOMALOUS +
REACTOR, PRESSURIZED WATER + SAXTON + TEST, LEAK RATE + VALVE

17-12216 ELK RIVER REACTOR 45TH MONTHLY OPERATING REPORT JULY 1966
RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINNESOTA
COO-651-34 +. 21 PAGES, 3 FIGURES, JULY 1966, DOCKET NO. 115-1, PDR

REACTOR WAS STARTED UP JULY 8 FOLLOWING REFUELING. III-E - DURING HEATUP, TEMPERATURE COEFFICIENT WAS MEASURED BETWEEN 100 F (MINUS 0.49 CENT/DEG F) AND 450 F (MINUS 2.02 CENTS/DEG F). DURING POWER ESCALATION, CHECKS OF 12 ROD BANK POSITION CHANGE FOR KNOWN CHANGES BETWEEN XENON EQUILIBRIA STATES WERE COMPARED WITH PREVIOUS CORE 1, SHOWING NO ANOMALOUS REACTIVITY EFFECTS. POWER ESCALATION WAS HALTED AT 30 AND 50 MW(TH) TO ALLOW XENON GROWTH--THIS ENSURED THAT HEAT-FLUX LIMITS WERE NOT EXCEEDED BECAUSE OF THE SMALLER EFFECTIVE CORE (CENTER ROD MAINTAINED AT 12 INCHES INSTEAD OF 0 INCHES AS IN CORE 1 STARTUP). PHOTONEUTRONS WERE OBSERVED FOR 16-50 MINUTES AFTER THE 55-MW SCRAM, BUT STARTUP CHANNELS RESPONDED PROPERLY TO MULTIPLICATION.

*OPERATIONS REPORT, GENERAL + ELK RIVER + INSTRUMENTATION, STARTUP + POWER DISTRIBUTION +
REACTIVITY EFFECT, ANOMALOUS + REACTOR, AEC OWNED + REACTOR, BOILING WATER + REFUELING

17-12217 ELK RIVER REACTOR 45TH MONTHLY OPERATING REPORT JULY 1966
RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINNESOTA
COO-651-34 +. 21 PAGES, 3 FIGURES, JULY 1966, DOCKET NO. 115-1, PDR

(III G) - THE PRIMARY-COOLANT OFF-GAS SYSTEM WAS PUT IN SERVICE AFTER A SCRAM, AND SHUT DOWN WHEN CONDUCTIVITY AND CONTAINMENT AIRBORNE RADIOACTIVITY INCREASED. FLOW OSCILLATIONS AT LOW POWER AND WATER HOLDUP IN EVAPORATION TUBES SHOWED THE WATER HOLD UP IN NUMBER 1 EVAPORATOR WAS 5 TIMES THAT IN NUMBER 2 EVAPORATOR, ALTHOUGH 1 HAD JUST BEEN RE-LEVELLED. (IV) - IMMEDIATELY AFTER THE REFUELING STARTUP, ABOVE-NORMAL CESIUM WAS FOUND IN THE PRIMARY COOLANT. ALTHOUGH MANY EVAPORATOR TUBES WERE PLUGGED, THERE IS STILL A PRIMARY-TJ-SECONDARY LEAK.

*OPERATIONS REPORT, GENERAL + COOLANT CHEMISTRY + ELK RIVER + FAILURE, PIPE + FLOW STABILITY +
HEAT EXCHANGER + REACTOR, BOILING WATER

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12218 LAPAZ AD
ON SITE REVIEW OF REACTOR CONTROL ROD OPERATION
SAFETY OFFICE, OFFICE OF CHIEF OF ENGINEERS, DEPT. OF THE ARMY
ARCS-67-4 +. 35 PAGES, 7 FIGURES, 2 TABLES, 6 REFERENCES, OCTOBER 1966, OCE

A STUCK-ROD INCIDENT REQUIRED A THOROUGH REVIEW OF THE DRIVE MECHANISMS. THE INCIDENT WAS DUE TO THE PRESENCE OF BURRS AT THE INSIDE EDGE OF THE MAGNET-ASSEMBLY-HOUSING ACCESS HOLE AND TO THE LACK OF CHAMFERS ON THE RETAINER ASSEMBLY WHICH HAD NOT BEEN INCORPORATED AS CALLED FOR BY A FIELD MODIFICATION. REVIEWS THE HISTORY OF MALFUNCTIONS IN WHICH THE PRIMARY CAUSE IS BENDING OF PUSH RODS AND THE PUSH-ROD BEARINGS. INTERIM CORRECTIVE ACTION WAS TAKEN AND OPERATION PERMITTED UNTIL NOVEMBER, AT WHICH TIME A COMPLETE INSPECTION OF THE BEARING GUIDES AND PUSH RODS WILL BE MADE.

*FAILURE, SCRAM MECHANISM + AF-NETR (AIR FORCE NUC. ENGINEERING TEST RCTR.) + CONTROL ROD SCRAM MECHANISM + FAILURE, DESIGN ERROR + FAILURE, INSTALLATION ERROR + REACTOR, ARMY + REACTOR, RESEARCH

17-12226 YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 67 FOR THE MONTH OF JULY 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
9 PAGES, 2 TABLES, 2 FIGURES, AUGUST 19, 1966, DOCKET NO. 50-29, PDR

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. AFTER A SHORT SUMMARY OF PLANT OPERATIONS, VARIOUS SUBHEADINGS INCLUDE - PLANT AND REACTOR MAINTENANCE, PLANT AND REACTOR PERFORMANCE, WATER CHEMISTRY, HEALTH AND SAFETY, AND DESIGN CHANGES.

*OPERATIONS REPORT, GENERAL + COOLANT CHEMISTRY + MAINTENANCE AND REPAIR + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + TEST, SYSTEM OPERABILITY + WASTE DISPOSAL, GENERAL + YANKEE

17-12227 SELECTED OPERATING EXPERIENCES
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
1 PAGE YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 67 FOR THE MONTH OF JULY 1966 PAGE 1, AUGUST 19, 1966, DOCKET NO. 50-29, PDR

OF INTEREST ARE THE FOLLOWING - LIGHTNING STORMS ON THE SYSTEM MADE IT ADVISABLE TO REDUCE POWER 10 PERCENT SO A BREAKER TRIP ON ONE POWER LINE WILL NOT CAUSE A SCRAM (DUE TO ONE PUMP LOSING POWER). COOLANT WAS AMMONIATED ON THE 14TH, AND THE REACTIVITY GAIN WAS 0.5 PERCENT. SINCE HEAT-EXCHANGER-TUBING LEAKAGE IS CALCULATED USING TRITIUM VALUES, THE SEVERAL LOAD REDUCTIONS CAUSED PRIMARY-LOOP TRITIUM CONCENTRATIONS TO VARY AND MIGHT HAVE CAUSED A HIGH INDICATED LEAK RATE (7.8 GAL/DAY FROM THE NO. 3 STEAM GENERATOR).

*OPERATIONS REPORT, GENERAL + COOLANT CHEMISTRY + HEAT EXCHANGER + REACTIVITY EFFECT, ANOMALOUS + REACTOR, PRESSURIZED WATER + TEST, LEAK RATE + YANKEE

17-12228 YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 68 FOR THE MONTH OF AUGUST 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON
11 PAGES, 2 FIGURES, TABLES, SEPTEMBER 20, 1966, DOCKET NO. 50-29, PDR

CORE STRETCHOUT HAS BEGUN. CLEANING CONDENSER TUBES GAVE 5.5 MW(E) MORE. SODIUM INJECTION INTO PRIMARY COOLANT INDICATES NO. 1 STEAM GENERATOR NOW HAS A LEAK, PROBABLY GREATER THAN NO. 3. ON THE 25TH, WHEN A BOILER FEED PUMP WAS TAKEN OUT OF SERVICE, ITS CHECK VALVE STAYED OPEN. RECIRCULATION OF FEEDWATER FROM THE OTHER PUMPS CAUSED A LOW-STEAM-GENERATOR-WATER-LEVEL TURBINE TRIP AND SCRAM. ON STARTUP, NO. 3 LOOP WAS INSPECTED (GENERAL AREA, 150-600 MR/HR) AT 10 PERCENT POWER TO SEE WHAT WAS CAUSING WATER LEVEL FLUCTUATIONS AND WATER HAMMER. CHECK-VALVE HINGE ASSEMBLY HAD WORN.

*OPERATIONS REPORT, GENERAL + FAILURE, COMPONENT + HEAT EXCHANGER + OPERATING EXPERIENCE + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + TEST, LEAK RATE + VALVE + YANKEE

17-12229 YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 69 FOR THE MONTH OF SEPTEMBER 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON
12 PAGES, FIGURES, TABLES, SEPTEMBER 1966, DOCKET NO. 50-29, PDR

TWO WEEKS BEFORE SCHEDULED SHUTDOWN, THE COOLANT PH WAS LOWERED BY STOPPING AMMONIA INJECTION, AND THE LOOP BYPASS VALVES WERE OPENED. THIS SHOULD REDISTRIBUTE CRUD, REDUCING RADIATION LEVELS IN THE PRIMARY LOOPS, WHICH WOULD BE 3-5 TIMES HIGHER AFTER THE PREVIOUS SHUTDOWN IN THE HIGH-PH CONDITION. NINE RADIAL CRACKS 5/16-INCH DEEP WERE FOUND ON NO. 2 BOILER FEED PUMP BALANCING SLEEVE, APPARENTLY BECAUSE OF THE REVERSE FLOW IN AUGUST.

*OPERATIONS REPORT, GENERAL + CRUD + OPERATING EXPERIENCE + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + YANKEE

17-12230 YANKEE PROPOSED CHANGE 72 - PRESSURIZER GAS SPACE SAMPLING
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
3 PAGES, 3 FIGURES, AUGUST 1, 1966, DOCKET NO. 50-29, PDR

THERE IS SOME INDICATION OF GAS STRATIFICATION IN THE PRESSURIZER, AND GAS SAMPLES FROM THE TOP VENT REQUIRE THAT TWO MEN ENTER THE VAPOR CONTAINER FOR AN HOUR TO GET ONE SAMPLE. REROUTING THE SAMPLE LOCATION TO OUTSIDE THE VAPOR CONTAINER AND ADDING A SECOND SAMPLE TAP NEARER THE LIQUID-GAS INTERPHASE WOULD REDUCE THE RADIATION PROBLEM.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12230 *CONTINUED*

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + PRESSURIZER + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + SAMPLING + STEAM + YANKEE

17-12233 YANKEE PROPOSED CHANGE 74 - CORE VI REFUELING CHANGES

YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS

12 PAGES, 2 TABLES, 2 FIGURES, SEPTEMBER 1, 1966, DOCKET NO. 50-29, PDR

SAME 3-ZONE CORE RELOADING, AND SAME ROD WITHDRAWAL SEQUENCE (6,5,4-3,2-1) WILL BE FOLLOWED AS IN CORE V. MORE BORON SOLUBLE POISON WILL BE REQUIRED (1700 PPM RATHER THAN 1300). SIGNIFICANTLY LOWER DNB RATIOS (2.97 VS. 2.2) AND HEAT FLUX (435,000 BTU/HR-FT² SQ VS. 450,000) THAN PREVIOUS CORES. POWER WILL BE LIMITED TO 90 PERCENT UNTIL XENON BUILDS IN (WHILE ROD GROUPS 4-3 ARE CONTROLLING) BECAUSE OF POWER PEAKING.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *POWER DISTRIBUTION + *REFUELING + OPERATING EXPERIENCE + REACTOR, PRESSURIZED WATER + XENON + YANKEE

17-12235 PROPOSED CHANGE 76 - SUBSTITUTION OF CENTRAL ELEMENTS FOR ONES WITH DAMAGED STAINLESS STEEL WRAPPER

YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS

8 PAGES, 1 FIGURE, 2 TABLES, OCTOBER 20, 1966, DOCKET NO. 50-29, PDR

INSPECTION OF TWO ZIRCALOY-CLAD TEST ASSEMBLIES INTENDED (CHANGE 74) FOR THE CENTRAL REGION OF CORE VI INDICATES DAMAGE TO THE STAINLESS-STEEL WRAPPER, WHICH CANNOT BE EVALUATED BEFORE SCHEDULED STARTUP. TWO STAINLESS-CLAD ASSEMBLIES FROM CORE V (13,700 MWDT) WILL REPLACE THEM AND ACTUALLY REDUCE HOT-CHANNEL FACTORS.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + FAILURE, FUEL ELEMENT + REACTOR, PRESSURIZED WATER + YANKEE

17-12236 YANKEE PROPOSED CHANGE 77 - REDUCED NUMBER OF INCORE THERMOCOUPLES BECAUSE OF DAMAGE IN REFUELING

YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS

2 PAGES, OCTOBER 20, 1966, DOCKET NO. 50-29, PDR

DURING PRESENT REFUELING, A PROTECTIVE CAP (USED TO KEEP THERMOCOUPLE ENDS DRY AFTER THE THERMOCOUPLES ARE DETACHED) CAME OFF DURING HANDLING OPERATIONS. THIRTEEN THERMOCOUPLES MAY HAVE BEEN DAMAGED. PREVIOUS COMPARISONS OF ANALYTICAL PREDICTION WITH EXPERIMENTAL DATA HAVE SHOWN CONSISTENTLY GOOD AGREEMENT ON POWER DISTRIBUTION. TWENTY FLUX WIRES AND 14 THERMOCOUPLES ARE STILL AVAILABLE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + FAILURE, COMPONENT + INSTRUMENTATION, IN CORE + REACTOR, PRESSURIZED WATER + YANKEE

17-12238 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR FEBRUARY 1966

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING, INCORPORATED, WINDSOR, CONNECTICUT

37 PAGES, 5 TABLES, 7 FIGURES, FEBRUARY 1966, DOCKET NO. 115-4, PDR

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. IN ADDITION TO THE USUAL AVAILABILITY STATISTICS AND MW-HRS OF GENERATION, THERE ARE SECTIONS ON OPERATING EXPERIENCE, MEASUREMENTS AND TESTS, PRINCIPLE MAINTENANCE, LEAK-RATE TESTS, CHANGES IN PLANT ORGANIZATION, RADIOACTIVE-MATERIAL RELEASES, AND APPENDICES WITH SUPPORTING DATA.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + EFFLUENT + MAINTENANCE AND REPAIR + OPERATING EXPERIENCE + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + TEST, LEAK RATE

17-12239 SELECTED OPERATING EXPERIENCES

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT

6 PAGES, 2 TABLES, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 23 PAGES 2-7, FEBRUARY 1966, PDR

OF INTEREST ARE - AN OPERATOR CAUSED A FULL-POWER SCRAM WHEN TURBINE-TEST-VALVE MANIPULATION VIBRATED A MERCURIO SWITCH ON THE SAME BRACKET, GIVING A FALSE MAIN-STEAM-LINE LOW-PRESSURE SIGNAL. TWO MINUTES AFTER A REACTOR SCRAM BECAUSE OF A TRANSMISSION-LINE DISTURBANCE, THE LINE-PATROL CREW DISCONNECTED BONUS AT A SUBSTATION. DIESEL SUPPLIED POWER FOR 4 HOURS. ON TWO OCCASIONS, BORON ENTERED THE HOT-WELL THROUGH RELIEF VALVES SHORTLY AFTER POISON INJECTION TANK WAS REFILLED, PASSED THROUGH THE DEMINERALIZER INTO THE REACTOR. ON ONE OCCASION, THE TOTAL SOLID COUNT WAS THUS INCREASED TO 17 PPM, NECESSITATING A REACTOR SHUTDOWN DUE TO TECHNICAL SPECIFICATIONS LIMITATION (INTENDED FOR SEAWATER).

*OPERATIONS SUMMARY FOR AEC + ACCIDENT, LOSS OF POWER + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + COOLANT CHEMISTRY + FAILURE, DESIGN ERROR + FAILURE, MAINTENANCE ERROR + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SCRAM, SPURIOUS + SHUTDOWN SYSTEM, SECONDARY

17-12240 SELECTED OPERATING EXPERIENCES

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED,

ACCESSION NUMBER 17-12230 TO 17-12240

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12240 *CONTINUED*

WINDSOR, CONNECTICUT

8 PAGES, 3 TABLES, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 23 PAGES 7-14, FEBRUARY 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - AFTER THE FEBRUARY 15 OUTAGE, THE COOLANT LOOPS WERE AT 150 F, WHILE THE REACTOR WATER WAS AT 500 F. LOOP-1 FLOW WAS ABNORMALLY LOW, AND EXTENSIVE TESTING SHOWED INTERNAL LEAKAGE BETWEEN THE PIEZOMETER RINGS, SO THE LOW-FLOW ALARM SETPOINT WAS CHANGED. THE LOWER PORTION OF THE WATER-LEVEL COLUMN WAS OBSERVED, AND WHEN THE COLUMN-RECIRCULATION VALVE WAS OPENED MORE, THE COLUMN BOTTOM HEATED UP 70 F, THE INDICATED WATER LEVEL INCREASED SLOWLY, AND THE ACTUAL WATER LEVEL DECREASED 12 INCHES. THIS APPARENTLY ELIMINATED 2000 LB/HR OF CARRYOVER, CAUSING THE AVERAGE (SUPERHEATED) STEAM TEMPERATURE TO RISE 16.6 F TO 900 F. VARIOUS OTHER INSTRUMENTATION PROBLEMS ARE NOTED, LOW-WATER-LEVEL ALARMS, PERIOD ALARMS, EMERGENCY CONDENSER OPERATION INITIATED WHEN A SWITCH SET-SCREW LOOSENEED.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + FAILURE, INSTRUMENT + INSTRUMENTATION, FLOW + INSTRUMENTATION, LIQUID LEVEL DETECTION + OPERATING EXPERIENCE + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + STEAM

17-12241 SELECTED OPERATING EXPERIENCES

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT

20 PAGES, 10 TABLES, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 23, PAGES 15-21, AND A-1-A-13, FEBRUARY 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - (SECT. V). USE OF A SMALL BYPASS CHARCOAL FILTER ARRANGEMENT IN THE REACTOR OFF-GAS SYSTEM, INTENDED TO STUDY EFFECT OF MOISTURE ON I-131 RETENTION, SHOWED THE IODINE UNDETECTABLE, AND SR-91 AND BA-LA-140 PRESENT. ON FEBRUARY 21, THE STACK RELEASE RATES AT 50 MW(TH) WERE LESS THAN 2 MICROCURIES/SEC FISSION GASES, AND 200 MICROCURIES/SEC ACTIVATION GASES. (APPENDIX A). DURING VARIOUS PHASES OF SCRAM RECOVERY, LEAKING STEAM VALVES REQUIRE OPERATORS TO WEAR FACE MASKS. SEVERAL SUCH INCIDENTS ARE REVIEWED.

*OPERATIONS SUMMARY FOR AEC + AIRBORNE RELEASE + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTAINMENT, LOW PRESSURE + REACTOR OFFGAS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + TEST, FILTER SYSTEM

17-12242 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR MARCH 1966

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING, INCORPORATED, WINDSOR, CONNECTICUT

48 PAGES, 8 TABLES, 8 FIGURES, MARCH 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - SEVEN FALSE SCRAMS OCCURRED, AND AIRBORNE RELEASES INSIDE CONTAINMENT FOLLOWED. STEAM OUTLET TEMP. SCRAM DELAY OF 2 SECONDS WAS ADDED. A FEEDWATER HEATER GLASS LEAKED, AND EXTRACTION VALVE CLOSED TO STOP LEAK. FEEDWATER COOLED 62 F IN 8 MINUTES, REQUIRING 4 INCHES OF ROD INSERTION. A FALSE TRIP OF MFBV RESULTED IN VARIOUS OPERATOR ACTIONS AND LOW STEAM FLOW. MAIN STEAM STOP VALVE COULD NOT BE REOPENED NORMALLY FOLLOWING A SCRAM. TO AVOID FURTHER JAMMING, THE LIMIT SWITCHES WERE REWIRED TO STOP MOTOR ACTION BEFORE TORQUE SWITCH. MODIFICATION TO POISON TANK VENT PIPING HAS STOPPED BORON ENTERING THE HOT WELL AND ELIMINATED DAILY ADDITION OF WATER TO TANK. SEAL-WATER PUMP FAILED, AND SEALWATER BACKUP VALVE FAILED TO OPEN. IN THE RESULTANT SCRAM, TWO CONTROL RODS DROPPED SLOWLY BECAUSE OF LACK OF SEALWATER LUBRICATION.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + COOLANT CHEMISTRY + FAILURE, SCRAM MECHANISM + INSTRUMENTATION, TEMPERATURE + OPERATING EXPERIENCE + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SCRAM, SPURIOUS + SHUTDOWN SYSTEM, SECONDARY + VALVE

17-12243 SELECTED OPERATING EXPERIENCES

PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT

17 PAGES, 2 TABLES, 1 FIGURE, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 24 PAGES 16-28 AND 34-35, MARCH 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - SLIGHT EFFECT NOTED WHEN ANOTHER PRWRA PLANT, 82.5 MW(E), TRIPPED OUT. ANALYSIS SHOWS INCREASED WATER LEVEL CAUSES CARRYOVER AND A DROP IN STEAM OUTLET TEMPERATURE. CORE REACTIVITY IS DECREASING AT 1 PERCENT PER 5000 MWD. RADIATION LEVELS IN PLANT FOLLOWING SHUTDOWN ARE BEING STUDIED. MAIN RECIRCULATION PUMP FAILED WHEN A BRASS SPACER SEPARATING TWO BALL GUIDES FELL OUT AND THE SHAFT SEIZED.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CRUD + FAILURE, COMPONENT + FUEL BURNUP + PUMP + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + TEST, SYSTEM OPERABILITY

17-12244 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR APRIL, 1966

COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT + PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO

18 PAGES, 5 FIGURES, 8 TABLES, APRIL 1966, DOCKET NO. 115-4, PDR

OF INTEREST ARE - BONUS WAS SHUTDOWN MOST OF THE MONTH WHEN AN EXPLOSIVE MIXTURE OF HYDROGEN AND OXYGEN WAS DETECTED IN CONTROL-ROD-RACK HOUSINGS. A VENT LINE WAS DESIGNED, AND A TEST INDICATED A 0.05 SEC DELAY ON INSERTION DURING A SIMULATED VENT LINE BREAK. DURING CONTROL ROD BREAKAWAY TORQUE TESTS, 3 RODS FAILED TO SCRAM A TOTAL OF 11 TIMES. SEAL WATER PUMP PACKING WAS CHANGED TO BUNA-N, WHEN TEFLON-ASBESTOS SHOWN TO SCORE COLMONOY PLUNGERS. BECAUSE OF CONTINUED TROUBLE WITH STATIC INVERTER, AN M-G SET IS BEING CONSIDERED. POWER

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12244 *CONTINUED*
DISTRIBUTION CALCULATIONS REPORTED.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTROL ROD DRIVE + EMERGENCY POWER, ELECTRIC + FAILURE, SCRAM MECHANISM + OPERATING EXPERIENCE + POWER DISTRIBUTION + RADIOLYTIC GAS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-12246 RADIATION INCIDENT ON TRANSFERRING BONUS FUEL ELEMENT
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT
2 PAGES, 1 TABLE, BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT NO. 26, MAY 1966, PAGES 17-18, DOCKET NO. 115-4, PDR

SECTION IX-A, PAGES 17-18. - A THREE-FOOT EXTENSION CABLE WAS NOT USED ON THE FIRST FUEL REMOVAL, SO PART OF THE FUEL WAS ABOVE THE THICK PORTION OF THE FUEL SHIELD. HIGH RADIATION (10 R/HR) WAS DETECTED AFTER THE COFFIN WAS IN TRANSIT TO THE POOL, AND TRANSFER CONTINUED DESPITE 1.2 R/HR FIELD AT THE OPERATING STATION. DURING THE 19 MINUTES BETWEEN THE FUEL ASSEMBLIES RISE INTO THE COFFIN AND ITS DESCENT INTO THE POOL CHUTE, THE COFFIN OPERATOR AND HP TECHNICIAN RECEIVED 180 AND 110 MREM RESPECTIVELY. PROCEDURE NOW REQUIRES USE OF A CHIRPIE (POCKET DOSIMETER WITH AUDIBLE ALARM).

*FUEL HANDLING + *INCIDENT, ACTUAL, HUMAN ERROR + *OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + PERSONNEL PROTECTIVE DEVICE + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-12247 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR JUNE 1966
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT
18 PAGES, 5 FIGURES, 2 TABLES, JUNE 1966, DOCKET NO. 115-4, PDR

BONUS REMAINED SHUT DOWN TO WORK ON CONTROL-ROD PROBLEMS. THE CRACKED AND WARPED CENTRAL ROD WAS REPLACED AND WILL BE SECTIONED FOR ANALYSIS. SEVERAL RODS WERE GIVEN GAMMA SCANS FOR CO-58 TO DETERMINE RELATIVE FAST NEUTRON DOSES. CONTROL ROD DRIVE THREAD CRACKING MAY BE DUE TO DIFFERENTIAL EXPANSION OF RACK NUTS. FALSE SCRAM ANNUNCIATION OF A LOW-REACTOR-WATER-LEVEL SCRAM WAS DUE TO MISSING WASHERS (BETWEEN THE FLOAT-ROD AND THE MERCURIO BRACKET), WHICH ALLOWED MERCURIO ASSEMBLY VIBRATION. APPENDIX A IS A DESCRIPTION OF THE CONTROL-ROD-HOUSING VENT SYSTEM AND AN ANALYSIS OF POTENTIALLY HAZARDOUS CONDITIONS RESULTING FROM VENT-SYSTEM FAILURES.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTROL ROD BURNUP + CONTROL ROD DRIVE + RADIOLYTIC GAS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SCRAM, SPURIOUS + VENTILATION SYSTEM

17-12248 BONUS NUCLEAR POWER PLANT DRL MONTHLY REPORT FOR JULY 1966
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO + COMBUSTION ENGINEERING INCORPORATED, WINDSOR, CONNECTICUT
WRA-8-66-2 +. 17 PAGES, 2 FIGURES, 9 TABLES, JULY 1966, DOCKET NO. 115-4, PDR

BONUS REMAINED SHUT DOWN FOR REPAIR TO PIPING CONNECTIONS BETWEEN VESSEL AND SUPERHEATER ELEMENTS. OF INTEREST WERE - FIXED-POISON SHIMS WERE CHANGED TO INCREASE THE POWER GENERATED IN THE SUPERHEATER ELEMENTS TO OBTAIN 900 F STEAM WITH 354 F FEEDWATER. AFTER FINDING A LEAK FROM A ONE-INCH CRACK IN A SUPERHEATER STEAM LINE, OTHER PIPING WAS CHECKED. ULTRASONIC TESTS FOUND NO CRACKS, BUT FIVE WERE FOUND WITH DYE PENETRANT. BENCH TESTS ON ROD DRIVES SHOWED HIGH TORQUE, AND THE WATER-SEAL ASSEMBLIES WERE FOUND TO BE PRESSURE SENSITIVE. THE INLET SEAL WAS CHANGED FROM A THREADED JOINT TO AN O-RING SEAL. BONUS OPERATION IS NOW SOLELY BY PUERTO RICO WATER RESOURCES AUTHORITY. AN ORGANIZATION CHART IS INCLUDED.

*OPERATIONS SUMMARY FOR AEC + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CONTROL ROD DRIVE + CORE COMPONENTS, MISCELLANEOUS + FAILURE, FUEL ELEMENT + POWER DISTRIBUTION + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + STAFFING, TRAINING, QUALIFICATION

17-12253 LEIBY DW
CONTROL ASPECTS OF A LARGE, DUAL-PURPOSE NUCLEAR REACTOR PLANT
GENERAL ELECTRIC, HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
RL-NRD-105 +. 39 PAGES, 12 FIGURES, DECEMBER 1964, CFSTI \$4.00 CY, \$1.00 MN

FOR A BRIEF DESCRIPTION OF THE N-REACTOR PLANT AS BACKGROUND INFORMATION THE GENERAL CONTROL REQUIREMENTS ARE DEVELOPED. MAJOR ATTENTION IS DEVOTED TO DESCRIPTIONS OF SPECIFIC CONTROL REQUIREMENTS, DESIGN OF SYSTEMS TO MEET THESE REQUIREMENTS, AND THE PERFORMANCE OF THESE SYSTEMS IN THEORY AND PRACTICE AS INDICATED BY ANALYTICAL STUDIES AND BY ACTUAL PLANT OPERATION. INCLUDED ARE DESCRIPTIONS OF THE REACTOR CONTROL ROD DRIVES, THE PRIMARY COOLANT FLOW, PRESSURE, AND INVENTORY CONTROLS, THE STEAM GENERATOR LEVEL CONTROLS, THE SECONDARY SYSTEM PRESSURE, FLOW, AND WATER INVENTORY CONTROLS, AND METHODS OF DETERMINING BOTH OPERATING LIMITS AND PERFORMANCE CRITERIA.

*CONTROL SYSTEM + CONTROL ROD DRIVE + INSTRUMENTATION, CONTROL + MAIN COOLING SYSTEM + NPR (HANFORD NEW PRODUCTION REACTOR) + REACTOR, GRAPHITE MODERATED + REACTOR, PRESSURE TUBE

17-12304 YANKEE PROPOSED CHANGE 73 - REPLACEMENT CONTROL RODS WITH WELDED JOINT INSTEAD OF SNAP JOINT
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12304 *CONTINUED*
5 PAGES, 1 FIGURE, AUGUST 31, 1966, DOCKET NO. 1029.74, PDR

TWO CONTROL RODS REMOVED FROM CORE IN 1965 SHOWED WEAR IN THE SNAP-JOINT BETWEEN THE CONTROL ROD AND THE FOLLOWER, WHICH COULD PERMIT RELATIVE ROTATION AND FUEL-ELEMENT DAMAGE DURING A REFUELING SCRAM (WHEN THE UPPER CORE SUPPORT PLATE IS REMOVED). THEREFORE, A WELDED JOINT WILL BE USED INSTEAD OF THE SNAP-JOINT. SINCE INCONEL CLADDING OF THE AG-IN-CO RODS HAS PROVED EXCELLENT, ALL 24 NEW RODS WILL BE INCONEL-CLAD.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTROL ROD FABRICATION + FAILURE, SCRAM MECHANISM + REACTOR, PRESSURIZED WATER + REFUELING + YANKEE

17-12305 LARTY JE
RADIOGRAPHY INCIDENT AT B AND W PLANT, OCTOBER 10, 1966
BABCOCK AND WILCOX COMPANY
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 15-16 (NOVEMBER 21, 1966)

THE RADIOGRAPHER ENTERED THE WORK AREA PAST THE REMOTE SOURCE-CRANKING DEVICE WITHOUT CRANKING IN THE SOURCE OR MAKING A RADIATION SURVEY AND RECEIVED AN EXPOSURE OF 3.69 R (GAMMA). THE RADIOGRAPHER HAD 2 YEARS OF EXPERIENCE WITH X-RAY EQUIPMENT AND 6 MONTHS WITH THIS 150-CURIE CO-60 DEVICE. THE REASON GIVEN FOR THESE ACTIONS WAS PREOCCUPATION WITH PERSONAL PROBLEMS. AFTER HIS DOSE-RESTRICTION PERIOD IS COMPLETED, HE WILL BE GIVEN A REFRESHER COURSE IN SAFE PRACTICES.

*FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + *RADIOGRAPHY + COBALT + PERSONNEL EXPOSURE, RADIATION

17-12306 PALACIOS DE LOZANO MM
RADIATION OVEREXPOSURE AT GONZALES HOSPITAL, SAN JUAN, PUERTO RICO
GONZALES ONTOLOGICAL HOSPITAL, SAN JUAN, PUERTO RICO
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 16-17 (NOVEMBER 21, 1966)

THE SEPTEMBER FILM BADGE OF A WORKER READ 4.2 REMS. IN AUGUST, THE FILM SUPPLIER FAILED TO DELIVER FILM ON TIME, SO THE JULY FILMS WERE NOT DEVELOPED UNTIL THE END OF AUGUST. THE JULY-AUGUST FILM BADGE HOLDER OF THE WORKER WAS FOUND EMPTY, BUT DURING THOSE TWO MONTHS HE HAD BEEN ASSIGNED TO THE CO-60 AND CESIUM UNITS, WHERE HE WOULD NOT LIKELY HAVE RECEIVED AN APPRECIABLE EXPOSURE. IN SEPTEMBER, HE WORKED IN THE RADIUM AREA, WHERE THE OTHER TWO WORKERS RECEIVED SEPTEMBER DOSES OF 130 AND 110 REMS. THIS WORKER WORE HIS BADGE AT COLLAR-BONE LEVEL, WHERE THE LEAD-BRICK SHIELDING WAS NOT EFFECTIVE, BUT MEASUREMENTS AT THIS LEVEL DID NOT ACCOUNT FOR THE DOSE.

*INCIDENT, ACTUAL, GENERAL + *PERSONNEL EXPOSURE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL

17-12307 SMITH JA
OVEREXPOSURE AT HITTMAN ASSOCIATES
HITTMAN ASSOCIATES, BALTIMORE, MARYLAND
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 17 (NOVEMBER 21, 1966)

ON OCTOBER 17, 1966, HITTMAN ASSOCIATES CONTENDED THAT THE NEW YORK OFFICE COMPLIANCE REPORT WAS WRONG AND THAT AN INDIVIDUAL WHO HAD BEEN MAKING A 250-CURIE PM-147-ACTIVATED LIGHT SOURCE HAD NOT RECEIVED AN OVEREXPOSURE OF LOW ENERGY RADIATION TO HIS HANDS. SEVEN ENCLOSURES (INCLUDING FILM-BADGE REPORTS, DETAILED PROCEDURES, AND DOSE-RATE MEASUREMENTS) SUPPORTED THIS CONTENTION.

*PERSONNEL EXPOSURE, RADIATION + ACCIDENT ANALYSIS + INSPECTION AND COMPLIANCE + RADIATION SAFETY AND CONTROL

17-12309 POTENTIAL OVEREXPOSURE AT NUCLEAR FUEL SERVICES DURING DECONTAMINATION
NUCLEAR FUEL SERVICES, WEST VALLEY, NEW YORK
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 18 (NOVEMBER 21, 1966) DOCKET NO. 50-201

ON SEPTEMBER 29-30 AND OCTOBER 3, 1966, TWO SUBCONTRACTOR EMPLOYEES SANDBLASTED THE INTERIOR OF A CONCRETE WASTE-STORAGE TANK INTERIOR WHILE WEARING DUST HOODS INSTEAD OF ASSAULT MASKS, AS INSTRUCTED BY THEIR FOREMAN. ON OCTOBER 12, NFS COUNTED THE CHEST AREA OF THE MEN AND TWO CONTROLS WITH A THYROID MONITOR AND FOUND NO SIGNIFICANT DIFFERENCE. BEFORE THE SANDBLASTING, CHEMICAL STRIPPING HAD REDUCED THE SURFACE ACTIVITY OF THE CONCRETE TO 23 MR/HR. EFFECTIVE IMMEDIATELY, ALL SUBCONTRACT WORK WITHIN RESTRICTED AREAS WILL REQUIRE A SPECIAL WORK PERMIT (SWP).

*DECONTAMINATION + *FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + CONCRETE + FAILURE, ADMINISTRATIVE CONTROL + NFS (NUCLEAR FUEL SERVICES) + WASTE STORAGE

17-12310 KING JH
RADIATION OVEREXPOSURE AT OHMART CORPORATION
OHMART CORPORATION, CINCINNATI, OHIO
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGE 20 (NOVEMBER 21, 1966)

OHMART REPORTS THAT ONE EMPLOYEE RECEIVED 1-83 REMS IN THE THIRD QUARTER OF 1966 BECAUSE THE RADIATION-PATTERN CHECKING OF CERTAIN SPECIAL GAUGES REQUIRES THAT TOO MUCH TIME BE SPENT IN LOW-DOSE-RATE FIELDS.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12310 *CONTINUED*
*FAILURE, ADMINISTRATIVE CONTROL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL

17-12311 FORSCHER F
EXPOSURES TO AIRBORNE RADIOACTIVITY AT NUMEC
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION, APOLLO, PENNSYLVANIA
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 19-20 (NOVEMBER 21, 1966)

NUMEC REPORTS 2 INSTANCES.- (1) BETWEEN FEBRUARY 15, 1966 (WHEN NUMEC REQUESTED CREDIT FOR RESPIRATOR PROTECTION) AND JUNE 8, 1966 (WHEN AEC ALLOWED CREDIT), VARIOUS WORKERS WORE MASKS IN AIR ABOVE MPC LEVELS AND WERE THUS TECHNICALLY OVEREXPOSED. DETAILS GIVEN. (2) ON SEPTEMBER 27 THROUGH 29, THREE TECHNICIANS WERE EXPOSED TO PLUTONIUM UP TO 193 MPC (AIR) HOURS IN SCRAP RECOVERY DUE TO GLOVE-BOX GLOVE FAILURE, LEAKING PLASTIC BAG, AND INADEQUATE RETRAINING AFTER THE RETURN FROM SIX MONTHS OF MILITARY SERVICE.

*AIRBORNE RELEASE + *FAILURE, ADMINISTRATIVE CONTROL + *INHALATION +
ADMINISTRATIVE CONTROLS AND PRACTICES + PLUTONIUM + RADIATION SAFETY AND CONTROL

17-12313 CONSOLIDATED EDISON 10 YEAR PROGRAM TO MEET GROWING NEW YORK CITY ENERGY NEEDS AND REDUCE AIR POLLUTION
CONSOLIDATED EDISON COMPANY, NEW YORK
3 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(48), PAGES 2-4 (NOVEMBER 28, 1966)

CONSOLIDATED EDISON HAS SCHEDULED ONLY NUCLEAR REACTORS AFTER THE CORNWALL PUMPED-STORAGE PLANT BECOMES OPERATIONAL IN 1971. A THIRD NUCLEAR UNIT IS NEEDED IN 1971, AND A FOURTH IN 1976. THIS WOULD REDUCE CONSOLIDATED EDISON FORMED FOSSIL-FUEL AIR POLLUTANTS TO ONE-THIRD IN 1976 BECAUSE SOME OLDER PLANTS WOULD BE SHUTDOWN.

*AIR POLLUTION + INDIAN POINT 1 + INDIAN POINT 2 + REACTOR, PRESSURIZED WATER

17-12318 RUSSELL JA
DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION SYSTEM INSTALLED IN OAK RIDGE RESEARCH REACTOR BUILDING 3042
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-943 +. 22 PAGES, 2 TABLES, SEPTEMBER 15, 1964, CFSTI \$1.00 CY

A FACILITY RADIATION AND CONTAMINATION SYSTEM WAS INSTALLED IN THE OAK RIDGE RESEARCH REACTOR BUILDING 3042 TO CONTINUOUSLY AND AUTOMATICALLY MONITOR THE BETA-GAMMA RADIATION LEVEL AND AIR-CONTAMINATION LEVEL IN THE ENTIRE FACILITY AND TO REPORT THIS INFORMATION TO A CENTRAL CONTROL PANEL IN THE REACTOR OPERATION CONTROL ROOM. FIFTEEN MONITRONS AND NINE AIR MONITORS ARE CONNECTED IN THE INSTRUMENT NETWORK. A BUILDING EVACUATION SYSTEM AUTOMATICALLY OPERATES WHEN TWO OR MORE MONITRONS OR TWO OR MORE AIR MONITORS DETECT HIGH LEVEL RADIATION OF AIR CONTAMINATION.

*INSTRUMENTATION, PROTECTIVE + *MONITOR, RADIATION, AIR + *ORR (OAK RIDGE RESEARCH REACTOR) +
INSTRUMENTATION, RADIATION MONITORING + REACTOR, GENERAL + REACTOR, TEST +
RESEARCH AND DEVELOPMENT PROGRAM

17-12319 SELECTED OPERATING EXPERIENCES
POWER REACTOR DEVELOPMENT COMPANY
EF-28 +. 3 PAGES, POWER REACTOR DEVELOPMENT COMPANY, ENRICO FERMI ATOMIC POWER PLANT REPORT FOR DECEMBER 1965 PAGES 1-2 AND 10, DECEMBER 1965, DOCKET NO. 50-16

THE NUCLEAR TESTING AT LESS THAN 1 MW(TH) EXTENDED FROM AUGUST 1963 TO DECEMBER 1965. THE FIRST POWER INCREASE ABOVE 1 MW(TH) TOOK PLACE DECEMBER 29, 1965. THE NEW SOURCE-RANGE DETECTORS (INCLUDING TWO SURROUNDED BY ZIRCONIUM HYDRIDE) WORKED WELL. WHILE DAILY CHECKS OF ELECTRICAL PENETRATION LEAKAGE AT 5 PSIG WERE BELOW 50 SCF/DAY, TESTS AT 32 PSIG INDICATED 110.

USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATIONS SUMMARY FOR AEC + CONTAINMENT, HIGH PRESSURE + FERMI + INSTRUMENTATION, STARTUP RANGE +
REACTOR, FAST + REACTOR, LIQUID METAL COOLED + TEST, LEAK RATE

17-12342 CARVER JG
PLUTONIUM SUBCRITICAL EXPERIMENT PROGRAM. FIFTH QUARTERLY REPORT, JULY 1 THROUGH SEPTEMBER 30, 1965
GENERAL ELECTRIC COMPANY, SAN JOSE
GEAP-4965 + EURAEC-1495 +. 15 PAGES, OCTOBER 1, 1965, CFSTI \$1.00 CY, \$0.50 MN

THIS IS A PROGRESS REPORT. DISCUSSES THE STATUS OF THE PROGRAM TO EXPERIMENTALLY DETERMINE THE BASIC PHYSICS DATA FOR PLUTONIUM-ENRICHED UO2 FUEL LATTICES IN LIGHT WATER. A THEORETICAL MODEL IS TO BE CONSTRUCTED FOR PREDICTING THE EXPERIMENTAL RESULTS AND OPERATING CONDITIONS. THE NEED FOR ADDITIONAL DATA IS DUE TO THE PRONOUNCED RESONANCES IN PLUTONIUM AND UNCERTAINTIES IN THE VARIATION OF THE CAPTURE/FISSION RATIOS ACROSS THESE RESONANCES. WHEN THE SLOW NEUTRON SPECTRUM IS ESTABLISHED, EMPHASIS WILL BE GIVEN TO CALCULATING REACTION RATES. SINCE THE DATA OF INTEREST FOR LIGHT-WATER LATTICES IS TEMPERATURE-SENSITIVE, MEASUREMENTS WILL BE MADE AT ROOM TEMPERATURE AND AT 540 F IN A PRESSURE VESSEL.

*CROSS SECTION + CRITICALITY EXPERIMENT + PLUTONIUM + RESEARCH CONTRACT + RESONANCE OVERLAP +
TEST, PHYSICS + URANIUM DIOXIDE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-12347 INVESTIGATION OF LEAKING POLYETHYLENE BOTTLES
ATOMIC ENERGY COMMISSION
6 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 244, OCTOBER 12, 1966

THE ROCKY FLATS L-3 SHIPPING CONTAINER DEVELOPED LEAKS IN THE INNER POLYETHYLENE BOTTLE WHEN USED WITH PLUTONIUM OR URANYL NITRATE. ISOCEM HAS SINCE DETERMINED THAT THE NECKS OF THE BOTTLES WERE IMPROPERLY FINISHED AND OFFERED EIGHT RECOMMENDATIONS. SEALING PROCEDURE IS INCLUDED.

*SHIPPING CONTAINER + FAILURE, DESIGN ERROR + FUEL STORAGE + LIQUID FUEL + TEST, LEAK RATE + TRANSPORTATION AND HANDLING

17-12348 CAUTION WARRANTED IN USING POLYETHYLENE CONTAINERS IN CHEMICAL SERVICE
ATOMIC ENERGY COMMISSION
3 PAGES, AEC HEALTH AND SAFETY INFORMATION BULLETIN NO. 246, NOVEMBER 14, 1966

FOUR YEARS OF TESTING BY THE MANUFACTURING CHEMISTS ASSOCIATION ON ICC-SPECIFICATION POLYETHYLENE BOTTLES FILLED WITH NITRIC ACID (20-67.5 PERCENT) LED TO THE CONCLUSION RECOMMENDING AGAINST USE OF SUCH CONTAINERS FOR SHIPPING NITRIC ACID IN MULTIPLE-OR SINGLE-TRIP SERVICE. DATA INCLUDED. AEC IS STUDYING THE STORAGE OF VARIOUS CHEMICALS IN SUCH CONTAINERS.

*STORAGE CONTAINER + TEST, LEAK RATE + TRANSPORTATION AND HANDLING

17-12383 HESS JW
DESIGN AND OPERATING EXPERIENCE WITH THE CONTROL AND SAFETY ROD DRIVE MECHANISMS FOR THE ENRICO FERMI FAST BREEDER REACTOR
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT
APDA-301 +. 221 PAGES, 42 FIGURES, 6 TABLES, JUNE 1, 1966, CFSTI \$6.00 CY, \$1.25 MN

TRACES THE EVOLUTION OF THE DESIGN AND POLICY FOR THE CONTROL-ROD DRIVES. TESTING AND OPERATING EXPERIENCE ARE SUMMARIZED. DURING THE FIRST YEAR OF REACTOR OPERATION, ONLY TWO SIGNIFICANT MALFUNCTIONS OCCURRED - FAILURE OF A LATCH BELLOWS ALLOWED SODIUM TO FREEZE ONE SAFETY ROD, AND OPENING A BLOCKING VANE TOO FAST WITH A ROTARY SOLENOID DISTURBED THE LIMIT-SWITCH SETTINGS, SOLVED BY OPENING THE VANE WITH A SMALL GEAR MOTOR. EXPERIENCE WITH THESE UNITS ARE EVALUATED AND SUGGESTIONS MADE FOR IMPROVEMENT. MANY PROBLEMS RESULTED FROM LACK OF OPERATING EXPERIENCE, AND THE MOST SERIOUS DIFFICULTIES CAME FROM NOT TESTING COMPONENTS OR PROTOTYPES IN HOT SODIUM BEFORE ATTEMPTING TO INSTALL THEM IN THE REACTOR. EXPERIENCE TO DATE INDICATES THAT CONSIDERATION SHOULD BE GIVEN TO DETAILING PROCEDURES FOR OPERATION, CALIBRATION, AND TROUBLESHOOTING. 140 PAGES OF APPENDIXES PROVIDE DETAILED SPECIFICATIONS AND CALCULATIONS.

*CONTROL ROD DRIVE + *CONTROL ROD, SHIM SAFETY + *DESIGN STUDY + *OPERATING EXPERIENCE + CONTROL ROD SCRAM MECHANISM + FAILURE, SCRAM MECHANISM + FERMI + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + TEST, CONTROL ROD DRIVE

17-13232 INDIAN POINT I CORE B LOW FLOW TRACED TO CHANGED INSTRUMENT CALIBRATION
CONSOLIDATED EDISON CO. OF NEW YORK
3 PAGES, NOVEMBER 4, 1966, DOCKET NO. 50-3

DURING THE SEPTEMBER 1966 OUTAGE, RESISTANCE TEMPERATURE DETECTORS WERE RECALIBRATED DURING HEATUP. LOOSE CONNECTIONS WERE TIGHTENED. THE RESISTANCE-VS-TEMPERATURE CURVE HAD CHANGED. CORE A DATA WAS REEXAMINED, AND INCLUSION OF THE PROPER SECONDARY MOISTURE CARRYOVER SHOWS THAT CORE PRESSURE DROP, FLOW, AND PUMP CHARACTERISTICS ARE THE SAME FOR CORE A AND B. OXIDE ROUGHENING OF THE CORRUGATED-PLATE SCRUBBERS IN THE STEAM DRUM IMPROVES THEIR MOISTURE-REMOVAL EFFICIENCY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*INSTRUMENTATION, FLOW + *INSTRUMENTATION, TEMPERATURE + *OPERATING EXPERIENCE + *TEST, SYSTEM OPERABILITY + FLOW ORIFICE OR RESTRICTION + INDIAN POINT I + REACTOR, PRESSURIZED WATER + SCRUBBER + STEAM

17-13236 YANKEE CHANGE 76 - FUEL ELEMENT SUBSTITUTION
DIVISION OF REACTOR LICENSING
3 PAGES, NOVEMBER 1, 1966, DOCKET NO. 50-29, PDR

AEC ALLOWS CORE VI IRRADIATION OF TWO IRRADIATED (13,700 MWD/TON) STAINLESS-CLAD ASSEMBLIES IN PLACE OF TWO CORE V ASSEMBLIES WHOSE STAINLESS-STEEL WRAPPERS WERE DAMAGED DURING IRRADIATION.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + FAILURE, FUEL ELEMENT + REACTOR, PRESSURIZED WATER + REFUELING + YANKEE

17-13242 AEC CONSIDERING REVISION TO 10 CFR 20, SETTING PROTECTION FACTORS FOR RESPIRATORY EQUIPMENT
DIVISION OF REACTOR LICENSING
5 PAGES, 1 TABLE, NOVEMBER 14, 1966, DOCKET NO. 50-130

IN A LETTER ALLOWING PATHFINDER OPERATING PERSONNEL TO TAKE CREDIT FOR RESPIRATORY EQUIPMENT IN COMPUTING AIRBORNE-CONTAMINATION EXPOSURE, AEC NOTED THAT VARIOUS STUDY CONTRACTS AND COMMITTEES HAVE INDICATED STANDARD RESPIRATORY PROTECTION FACTORS SHOULD BE INCORPORATED IN

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-13242 *CONTINUED*
10 CFR 20. AEC IS CONSIDERING SUCH AN AMENDMENT TO 10 CFR 20.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL + *REGULATION, AEC + INHALATION

17-13350 NUCLEX 1966 - CONFERENCE REPORT--PART I
7 PAGES, 6 FIGURES, 2 TABLES, NUCLEAR ENGINEERING 11(125), PAGES 778-784, (OCTOBER 1966)

IN THIS FIRST REPORT ON THE CONFERENCE HELD IN BASLE IN CONJUNCTION WITH THE NUCLEX 1966 EXHIBITION ARE SUMMARIES OF THE SESSIONS ENTITLED RAW MATERIALS, NUCLEAR FUEL TECHNOLOGY, OPERATING POWER REACTOR SYSTEMS, RESEARCH REACTORS AND ADVANCED REACTORS. NOT ALL THE PAPERS PRESENTED ARE INCLUDED, PARTICULARLY THOSE DETAILING SPECIFIC DESIGNS. THE PUBLICATION OF FULL TEXTS WILL DEPEND UPON INDIVIDUAL AUTHORS INTENTIONS, AND IT IS RECOMMENDED THEREFORE THAT FURTHER INFORMATION BE SOUGHT FROM THEM DIRECT IF A FULL ACCOUNT IS DESIRED. A LIST OF AUTHORS AND QUOTED TITLES OF PAPERS APPEARS AT THE END OF THIS SUMMARY.

*MATERIAL + *OPERATING EXPERIENCE + *RADIOCHEMICAL PROCESSING + *REACTOR, RESEARCH

17-13353 NORDMAN DA + SMITH EE + WRIGHT JH
APPLICATION OF ADVANCED NUCLEAR REACTORS TO UTILITY SYSTEMS
WESTINGHOUSE ELECTRIC CORP.
27 PAGES, 12 FIGURES, 4 TABLES, PRESENTED AT AMERICAN NUCLEAR SOCIETY 1966 ANNUAL MEETING, JUNE 20-23, 1966, ANS TRANSACTIONS 9(1), PAGE 213

PRESENTS A STUDY OF THE ECONOMIC IMPACT OF THE BREEDER REACTOR ON THE ELECTRICAL GENERATING INDUSTRY ALONG WITH ECONOMIC ASPECTS OF TIMING OF THE PROGRAM. THE EFFECTS OF THE BREEDER REACTORS ON ORE CONSUMPTION AND ECONOMICS ARE DISCUSSED.

*ECONOMICS + *ELECTRIC POWER, GENERAL + REACTOR, FAST

17-13359 DIAZ A + KINTNER LL + MACKAY SD + THIE J
REPORT ON THE FULL POWER OPERATION OF THE ELK RIVER BOILING WATER REACTOR
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-64546 +. 90 PAGES, 30 FIGURES, 4 TABLES, JUNE 1964, DOCKET NO. 115-1

REPORT COVERS TESTS BETWEEN DECEMBER 1963 AND MARCH 1964, DURING POWER, ESCALATION AND WARRANTY-RUN PERIOD. FEEDWATER PULSING WAS NOTED AT 7 MW(TH). BIOLOGICAL SHIELDING AT FEEDWATER INLET WAS SUPPLEMENTED. SECONDARY-SYSTEM POWER CALIBRATION PROVED MORE ACCURATE AND COULD BE CHECKED WITH TURBINE CURVE. VARIOUS TESTS, INCLUDING NOISE ANALYSIS, WERE RUN TO SHOW REACTOR STABLE AGAINST FEEDWATER AND POWER-LEVEL CHANGES. SUBCOOLING MEASUREMENTS WERE MADE.

*OPERATIONS REPORT, ANALYSIS + *REACTOR STARTUP TESTING + CONTROL ROD PROGRAM + COOLANT CHEMISTRY + ELK RIVER + HYDRAULIC EFFECT + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, LIQUID LEVEL DETECTION + MEASUREMENT, NOISE + REACTOR STABILITY + REACTOR, BOILING WATER + TEST, SYSTEM OPERABILITY

17-13444 FITZGERALD JJ
SKIN OVEREXPOSURE AT CAMBRIDGE NUCLEAR CORPORATION, OCTOBER 10, 1966
CAMBRIDGE NUCLEAR CORPORATION, CAMBRIDGE, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGE 19 (DECEMBER 12, 1966)

A PERSON WORKING WITH RADIO-TRACER CHEMICALS RECEIVED A QUARTERLY SKIN EXPOSURE OF 9.234 REMS, JULY-SEPTEMBER 1966.

*PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + TRACER, RADIOACTIVE

17-13445 MEHANN RO
N S SAVANNAH TECHNICAL SPECIFICATION VIOLATION, OCTOBER 19, 1966
FIRST ATOMIC SHIP TRANSPORT, INC., NEW YORK
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGE 20 (DECEMBER 12, 1966), DOCKET NO. 50-238

FAST WAS CITED FOR ENTERING THE PORT AT BILBAO SPAIN MAY 5, 1966, (A) WITH THE POWER-LEVEL SAFETY CHANNELS IN COINCIDENCE MODE DESPITE THE INOPERATIVENESS OF ONE OF THE THREE CHANNELS, (B) WITH THE HEALTH PHYSICIST ASSIGNED TO THE ENGINE ROOM INSTEAD OF REPORTING DIRECTLY TO THE SHIPMASTER. ALSO, THE ACTIVATED-CHARCOAL FILTERS WERE HEAVILY CONTAMINATED WITH OXIDIZED LUBRICATING OIL.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ADMINISTRATIVE CONTROLS AND PRACTICES + CHARCOAL + FILTER + INSTRUMENTATION, COINCIDENT + N S SAVANNAH + REACTOR, MARITIME + REACTOR, PRESSURIZED WATER

17-13446 KILLIAN CB
TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGES 20-21 (DECEMBER 12, 1966)

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-13446 *CONTINUED*

(1) DURING THREE WEEKS IN EARLY OCTOBER 1966, A TECHNICIAN RECEIVED 0.4 REM INTERNAL EXPOSURE FROM TRITIUM DUE TO INADEQUATE AIR VELOCITY IN HOOD. THE RADIOLOGICAL SAFETY TECHNICIAN WILL NOW MEASURE AIR VELOCITY DURING ANY OPERATIONAL SURVEY. (2) DURING LATE OCTOBER, A JUNIOR CHEMIST RECEIVED AN INTERNAL TRITIUM EXPOSURE DUE TO IMPROPER DECONTAMINATION OF A VACUUM LINE BECAUSE HIS SUPERVISOR FAILED TO REVIEW THE OPERATION.

*PERSONNEL EXPOSURE, RADIATION + *TRITIUM + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

17-13447 PUECHL KH

EXPLOSION IN NUMEC PLUTONIUM LABORATORY, NOVEMBER 30, 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION, APOLLO, PENNSYLVANIA
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGE 21 (DECEMBER 12, 1966)

A YET UNEXPLAINED EXPLOSION DURING ROUTINE PROCESSING OF PLUTONIUM PEROXIDE BLEW OUT A GLOVE-BOX WINDOW AND RELEASED LESS THAN 0.1 GRAM OF PLUTONIUM. ONE EMPLOYEE IS IN THE HOSPITAL FROM BLAST EFFECTS. FIVE HOURS LATER, THE AIR WAS 100 TIMES THE MPC. TWENTY PERCENT OF THE PLANT IS CONTAMINATED.

*EXPLOSION + *GLOVE BOX + PERSONNEL EXPOSURE, RADIATION + PLUTONIUM

17-13479 DURANT WS

PERFORMANCE OF THE ACTIVATED CARBON BEDS IN SRP REACTOR CONFINEMENT FACILITIES
SAVANNAH RIVER LABORATORY
DP-1028 +. 27 PAGES, 4 FIGURES, 2 TABLES, JANUARY 1966

BED EFFICIENCIES FOR ELEMENTAL IODINE EXCEEDS 99.9% AFTER 2 YEARS OF CONTINUOUS SERVICE. BOTH CADMIUM-PLATED AND PAINTED MILD-STEEL FRAMES CORRODED FROM NO₂ AND SO₂, SO STAINLESS STEEL IS NOW USED. SIMILAR, NONUSED FRAMES IN STANDBY HWCTR DO NOT SHOW CORROSION. TEN TIMES THE IODINE, CHLORINE, AND SULPHUR WERE FOUND IN OLD BEDS. RADIOLYTIC DECOMPOSITION OF ATMOSPHERIC NITROGEN FORMS NO₂, WHICH IS REDUCED TO NO BY CARBON IN BED TO LOSE ADSORPTION SITES. IN-LINE FREON-112 TESTING IS USED DURING OPERATION. INCLUDES LATEST REVISED SPECIFICATIONS (DECEMBER 1965).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$2.00 COPY, \$0.50 MICROFICHE

*CONTAINMENT FILTERING SYSTEM + *FILTER + *OPERATING EXPERIENCE + CHARCOAL + SAVANNAH RIVER PLANT + TEST, FILTER SYSTEM

17-13485 LOSS-OF-FLOW INCIDENT WITHOUT DAMAGE AT PLUM BROOK TESTING REACTOR, NOVEMBER 22, 1966
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D.C.
1 PAGE, DECEMBER 2, 1966, DOCKET NO. 50-30, ATOMIC ENERGY CLEARING HOUSE 12(51), PAGE 8, (DECEMBER 19, 1966)

AFTER 7 DAYS AT FULL POWER (60 MW-TH), THE CONTROL POWER BREAKER WAS ACCIDENTALLY OPENED, INTERRUPTING DC TO BOTH MAIN AND SHUTDOWN PUMP BREAKERS AND SCRAMING THE REACTOR. FLOW COASTDOWN LASTED 30 SEC. FORCED FLOW WAS RESTORED WITHIN AN ADDITIONAL 45 SEC. ALL COMPONENTS EXAMINED SHOWED NO THERMAL DAMAGE. DC CIRCUITS HAVE BEEN REWIRED TO PROVIDE SEPARATE BREAKERS AND POWER SOURCES FOR SHUTDOWN PUMPS.

*ACCIDENT, LOSS OF FLOW + *ACCIDENT, LOSS OF POWER + *FAILURE, MAINTENANCE ERROR +
*INCIDENT, ACTUAL, HUMAN ERROR + EMERGENCY POWER, ELECTRIC + PLUM BROOK + REACTOR, TEST

17-13488 ARNOLD PC

TRAINING OF WELDING SUPERVISORS
NORTHERN STATES POWER COMPANY, MINNEAPOLIS, MINNESOTA
10 PAGES, 29 FIGURES, 11 TABLES, NOVEMBER 18, 1966, MONTICELLO AMENDMENT 2- DESIGN FABRICATION AND ERECTION OF THE REACTOR VESSEL, PAGES E-1-E-14, APPENDIX E, DOCKET NO. 50-263

RECOUNTS EXPERIENCE OF CHICAGO BRIDGE AND IRON COMPANY. SOON AFTER STARTING A WELDING-INSPECTOR SCHOOL, THEY FOUND WELDING-SUPERVISOR TRAINING MORE APPROPRIATE. A TWO-WEEK COURSE FOR EXPERIENCED WELDERS BEGINS THE PROCESS. VARIOUS WELDING EQUIPMENT AND INSPECTION TECHNIQUES DEMONSTRATED. ACTUAL INCIDENTS STUDIED TO DEMONSTRATE HOW PROPER INSPECTION COULD HAVE ELIMINATED VARIOUS EXPENSIVE FAILURES, E.G., NIL-DUCTILITY NOTCHES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*STAFFING, TRAINING, QUALIFICATION + *WELDING + BRITTLE FRACTURE + FAILURE, PRESSURE VESSEL + OPERATING EXPERIENCE

17-13518 DRAGON ON FULL POWER

UNITED KINGDOM ATOMIC ENERGY AUTHORITY
2 PAGES, ATOM 120, PAGES 217-218 (OCTOBER 1966)

THE REACTOR OPERATED FOR THREE MONTHS AT ITS DESIGN OUTPUT OF 20 MWT WITH AN AVAILABILITY OF OVER 98 PERCENT. THE FISSILE MATERIAL REACHED 1250 DEGREES C WITHOUT ANY RELEASE OF RADIOACTIVITY TO THE HELIUM COOLANT. THE GRAPHITE TUBES CONTAINING THE FUEL COMPACTS OPERATED UP TO 1000 C, WHICH MEANS THEY WERE WHITE-HOT.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-13518 *CONTINUED*

*DRAGON (UK) + FUEL ELEMENT + HIGH TEMPERATURE + OPERATING EXPERIENCE + REACTOR, GAS COOLED + UNITED KINGDOM

17-13519 BAINBRIDGE GR

OBSOLETE NUCLEAR POWER STATIONS

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

3 PAGES, 3 FIGURES, ATOM 120, PAGES 230-232 (OCTOBER 1966)

SUGGESTS THAT LOCATIONS OF OBSOLETE STATIONS WILL BE NEEDED BECAUSE OF THE SAME FEATURES THAT MADE THEM ATTRACTIVE IN THE FIRST PLACE. PRELIMINARY STUDIES OF RAZING THE CALDER HALL REACTORS INDICATE A FEW PERCENT ADDITIONAL COST IF SITE NEEDED IMMEDIATELY, BUT LESS THAN 1 PERCENT COST IF 30-50 YEARS DELAY POSSIBLE. DEMOLITION OF EVERYTHING BUT THE CONCRETE PRESSURE VESSEL AND ITS EARTH COVERAGE IS SUGGESTED.

*REACTOR DECOMMISSIONING EXPERIENCE + ECONOMICS + REACTOR, GAS COOLED + UNITED KINGDOM

17-13524 OPERATING EXPERIENCE OF THE N.S. SAVANNAH IN COMMERCIAL SERVICE

FIRST ATOMIC SHIP TRANSPORT, INC.

9 PAGES, 4 FIGURES, 3 TABLES, 10 REFERENCES, NUCLEAR SAFETY 6(1), PAGES 63-71 (FALL 1966) DOCKET NO. 50-238

DURING THE FIRST 6 MONTHS OF COMMERCIAL OPERATION, FOUR TRANSATLANTIC VOYAGES AND 42 PORT ENTRIES WERE MADE, AND THE REACTOR WAS CRITICAL 83 PERCENT OF THE TIME AND REACTOR POWER WAS AVAILABLE AT ALL TIMES WHILE THE SHIP WAS IN TRANSPORT. ONLY ONE SCRAM RESULTED FROM SHIP MOTION DURING SEVERE WEATHER CONDITIONS. THE POWER PLANT RESPONDED SATISFACTORILY TO 400 SIGNIFICANT CHANGES IN LOAD. PROBLEMS INCLUDED A VALVE FAILURE AND PUMP FAILURE ON THE EMERGENCY COOLING SYSTEM. THE VALVE STEM JAMMED AS A RESULT OF FOREIGN MATERIAL IN THE STEM NUT OF THE MOTOR OPERATION. THE CIRCULATING PUMP WAS WIRED SO THE PUMP RAN BACKWARD. THE VENTILATION SYSTEMS FILTERS HAD TO BE REPLACED BECAUSE OF CLOGGING DUE TO FREQUENT ODP TESTS. ONE PUMP WAS DEFORMED AS A RESULT OF OVERHEATING DUE TO HEATER CONTROL AND ALARM FAILURES. SOLENOID DETERIORATION ON THE CONTROL ROD DRIVE SYSTEM RESULTED FROM LOW VOLTAGE. AVERAGE RADIATION EXPOSURE TO PERSONNEL AMOUNTED TO 31 MREMS. THE MAXIMUM DOSE RECEIVED IN THE 6 MONTH PERIOD WAS 870 MREMS. THIS WAS ACQUIRED BY THE STAFF HEALTH PHYSICIST PRIMARILY AS A RESULT OF CALIBRATION OF RADIATION INSTRUMENTS.

*OPERATING EXPERIENCE + CONTROL ROD DRIVE + EMERGENCY COOLING CONSIDERATIONS + FAILURE, EQUIPMENT + N S SAVANNAH + PERSONNEL EXPOSURE, RADIATION + REACTOR, PRESSURIZED WATER + TEST, FILTER + VENTILATION SYSTEM

17-13530 AEC AUTHORIZES DISMANTLING OF ALLIS CHALMERS CRITICAL EXPERIMENT FACILITY

DIVISION OF REACTOR LICENSING, U. S. ATOMIC ENERGY COMMISSION

4 PAGES, DECEMBER 8, 1966, DOCKET NO. 50-108

LISTS CONDITIONS FOR DETERMINING CONTAMINATION AND DISPOSAL OF NON-FUEL PORTION OF CRITICAL-EXPERIMENT-FACILITY EQUIPMENT.

USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY EVALUATION + CRITICAL ASSEMBLY FACILITY + REACTOR DECOMMISSIONING EXPERIENCE

17-13535 ENRICO FERMI ATOMIC POWER PLANT REPORT FOR JULY 1966

POWER REACTOR DEVELOPMENT COMPANY

PRDC-EF-35 +. 11 PAGES, JULY 1966

FOUR HEAT-BALANCE TESTS SHOW THAT THE NUCLEAR INSTRUMENT READ 12' HIGH AT 100 MW(TH), AFTER CORRECTIONS MADE TO SODIUM FLOW INSTRUMENTS (WHICH HAD NEVER BEEN CALIBRATED IN HOT SODIUM). THE STEAM-DUMP-TO-CONDENSER SYSTEM WAS FOUND ADEQUATE FOR ONLY 50' POWER. TWO UNSCHEDULED SCRAMS DURING TESTING OCCURRED WHEN WATER BOILING TOO SOON IN STEAM GENERATORS CAUSED FLOW INSTABILITIES, AND THUS HIGH SODIUM TEMPERATURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

FERMI + HEAT TRANSFER, BOILING + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, FLOW + OPERATIONS SUMMARY FOR AEC + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + SCRAM, SPURIOUS

17-13614 MONTHLY OPERATING REPORT FOR OCTOBER 1966 FOR THE ELK RIVER REACTOR

RURAL COOPERATIVE POWER ASSOCIATIONS

COO-651-37 +. 27 PAGES, 5 FIGURES, OCTOBER 1966, DOCKET NO. 115-1

EVAPORATOR 1 STILL HAS TUBE LEAKS (70 GAL/DAY). REROUTING OFF-GAS TO DISCHARGE SIDE OF DILUTION FAN AVOIDS BLOWING GAS INTO CONTAINMENT. OFF-GAS MOISTURE CARRYOVER IS PARTIALLY DUE TO INCORRECTLY INSTALLED WATER TRAP. RELOCATION OF THE FISSION-PRODUCT MONITOR DECREASED ITS SENSITIVITY TO N-16. COOLANT IODINE LEVELS INDICATE SOME 9 GRAMS OF U235 ARE EXPOSED. BOWED FUEL RODS WERE INSPECTED AND BOWING ASSESSED TO AN INTERFERENCE FIT BETWEEN THE INCONEL SPACER GRID AND FUEL RODS. THUS RODS DID NOT SLIP THROUGH GRID, AND RESTRAINT CAUSED BOWING.

USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATIONS REPORT, GENERAL + ELK RIVER + FAILURE, FUEL ELEMENT + INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + REACTOR OFFGAS + REACTOR, BOILING WATER +

ACCESSION NUMBER 17-13518 TO 17-13614

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-13614 *CONTINUED*
THERMAL MECHANICAL EFFECT

17-13615 POOR INSTRUMENTATION CAUSES CONTAINMENT ACTIVITY RELEASE AT ELK RIVER
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-37 +. 1 PAGE, OCTOBER 1966, PAGE 12 OF ELK RIVER REACTOR 48TH MONTHLY OPERATING REPORT, DOCKET
NO. 115-1

BOTH THE IMMEDIATE AND DELAYED CONTAINMENT AIR ACTIVITY TRIGGER THE SAME CONTROL ROOM
ANNUNCIATOR, SO THAT THERE IS NO CHANGE TO THE ANNUNCIATOR (IF ALREADY IN ALARM STATE BECAUSE
OF DELAYED SITUATION) IF AN INCREASE IN ACTIVITY CAUSES VENTILATION DAMPER CLOSURE AND
OFF-GAS SYSTEM TRIP. WHEN THIS OCCURRED, THE OFF-GAS SYSTEM WAS RESTARTED WITHOUT KNOWING
THE DAMPER HAD CLOSED, AND GAS ENTERED CONTAINMENT INSTEAD OF VENTILATION EXHAUST.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*FAILURE, DESIGN ERROR + AIRBORNE RELEASE + ELK RIVER + FAILURE, OPERATOR ERROR + REACTOR OFFGAS +
REACTOR, BOILING WATER

17-13785 EXPERIMENTAL BERYLLIUM OXIDE REACTOR (EBOR) TERMINATED BEFORE COMPLETION
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGE 1 (DECEMBER 26, 1966)

AEC IS TERMINATING EBOR BECAUSE OF DIMINISHED CONTRIBUTION TO US CURRENT HIGH-TEMPERATURE
GAS-COOLED REACTOR PROGRAM, AS GOOD GRAPHITE OPERATING EXPERIENCE HAS REDUCED IMPORTANCE OF
DEVELOPING BERYLLIUM OXIDE. VARIOUS DELAYS SINCE CONSTRUCTION BEGAN IN MAY 1963 DELAYED THE
STARTUP OF THE 10 MWTH REACTOR, INCLUDING A 5 MONTHS STRIKE AND A MAIN COOLANT CIRCULATOR
BEARING FAILURE WHICH CONTAMINATED THE REACTOR INTERNALS WITH LUBE OIL.

*REACTOR DECOMMISSIONING EXPERIENCE + BERYLLIUM + CONTAMINATION +
EBOR (EXPERIMENTAL BERYLLIUM OXIDE REACTOR) + FAILURE, COMPONENT + MODERATOR + PUMP +
REACTOR, BEO MODERATED + REACTOR, GAS COOLED

17-13786 NAVAL SCHOOL REPORTS EXCESSIVE PRESSURE INSIDE AGN=201 CONTROL RODS
U. S. NAVY, NAVAL POSTGRADUATE SCHOOL
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 46-47 (DECEMBER 26, 1966)

EARLY IN 1966, THEY ESTIMATED THAT AN EXPOSURE OF 25 KW-MINUTES WOULD INCREASE THE INTERNAL
PRESSURE FROM 1 TO 5 PSIG OF THE COARSE CONTROL AND SAFETY RODS. THE ROD PRESSURES WERE BLEED
OFF EVERY 20 KW-MINUTES OF OPERATION. IN NOVEMBER 1966, FUEL DISCS WERE ADDED TO THE RODS,
REDUCING FREE VOLUME BY 11 PERCENT. AT THE NEXT BLEEDOFF, PRESSURES OF 6.5 AND 8 WERE
OBSERVED. PROBABLY THE EARLIER POWER CALCULATIONS WERE GREATER THAN THE ACTUAL RUNS, AS
SHOWN BY THE CORRESPONDINGLY LARGER CORE-TANK PRESSURES WHICH REACHED 5.2 PSI. PRESSURE WILL
NOW BE BLEED OFF AT 12 KW-MINUTES EXPOSURE.

*CONTROL ROD RIPIRUP + AGN (TRAINING REACTOR, AEROJET-GEN. NUCLEONICS) + CONTROL ROD + FAILURE, EQUIPMENT +
REACTOR, TRAINING

17-13898 KIRCHNER RA + FREIBERG KJ + PUTZIER EA
GLOVEBOX HANDLING OF GRAM QUANTITIES OF CM-244 AT ROCKY FLATS
DOW CHEMICAL CO., GOLDEN, COLO.
RFP-811 +. 6 PAGES, 1 FIGURE, 3 TABLES, SEPTEMBER 1966

APPROXIMATELY 3 G OF CURIUM-244 WERE PROCESSED FROM OXIDE TO METAL IN A STANDARD GLOVEBOX,
WHICH INDICATES IT CAN BE HANDLED SAFELY IN THIS MANNER. THE AVERAGE WHOLE-BODY EXPOSURE FOR
11 PERSONS WAS 298 MREMS, AND, AS A RESULT, ROUTINE WORK WITH AMOUNTS OF CURIUM-244 GREATER
THAN 100 MILLIGRAMS IS DISCOURAGED UNLESS PERMANENT SHIELDING OR REMOTE-HANDLING FACILITIES
ARE PROVIDED. THE AVERAGE NEUTRON EXPOSURE (250 MREMS/HR) WAS ALMOST THREE TIMES THE AVERAGE
GAMMA EXPOSURE. NO AIRBORNE ACTIVITY, NOR ALPHA CONTAMINATION EXTERNAL TO THE GLOVEBOX WAS
NOTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS,
U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$1.00 CY, \$0.50 MN

*CURIUM + *GLOVE BOX + *OPERATING EXPERIENCE + RADIATION SAFETY AND CONTROL + RADIOCHEMICAL PROCESSING

17-13902 MCGOVERN JJ
UNION CARBIDE REPORTS BEAM HOLE PLUG DAMAGE, DECEMBER 19, 1966
UNION CARBIDE CORPORATION, TUXEDO, NEW YORK
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(1) PAGE 9, (JANUARY 2, 1967), DOCKET NO. 50-54

FOLLOWING RECEIPT OF A DRAFT REPORT OF BEAM-HOLE PRESSURE DAMAGE AT PUERTO RICO NUCLEAR
CENTER, THE STERLING FOREST REACTOR WAS CHECKED. VARIOUS ALUMINUM-CANNED CONCRETE PLUGS HAD
SEVERELY DISTORTED FACES OR CRACKED WELOS. ALL CANS WERE DRILLED FOR PRESSURE RELIEF AND
WIRE LANYARDS INSTALLED TO PREVENT ACCIDENTAL PLUG PLACEMENT TOO CLOSE TO THE REACTOR.

*BEAM HOLE + *RADIATION DAMAGE + *SHIELDING + OPERATING EXPERIENCE + PRESSURE, INTERNAL +
REACTOR, POOL TYPE + REACTOR, RESEARCH

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14363 BERG GE
FINAL SNAPSHOT PERFORMANCE REPORT
ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA
NAA-SR-11934 +. 289 PAGES, 81 FIGURES, 41 TABLES, 48 REFERENCES, AUGUST 15, 1966

PRESENTS A DETAILED EVALUATION OF THE OVERALL SYSTEM AND PERFORMANCE OF INDIVIDUAL COMPONENTS DURING ALL PHASES OF THE WORLD'S FIRST NUCLEAR-REACTOR SPACE-POWER-SYSTEM FLIGHT TEST. SPECIAL EMPHASIS IS PLACED ON THE EFFECT OF LAUNCH AND SPACE ENVIRONMENTS ON THE PERFORMANCE OF THE NUCLEAR THERMOELECTRIC SYSTEM. THE SYSTEM OPERATED ALMOST EXACTLY AS INTENDED. THE ONLY SIGNIFICANT DEVIATION OF SNAP 10A WAS THE MORE RAPID DECREASE IN CONVERTER RESISTANCE-TO-GROUND THAN EXPECTED, ATTRIBUTED TO POOR EXPERIMENTAL DATA FROM TESTS ON THE PROTOTYPE. THE AUTOMATIC STARTUP OF THE REACTOR WAS FLAWLESS.

AVAILABILITY - CLEARING HOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*DIRECT ENERGY CONVERSION DEVICES + *OPERATIONS REPORT, ANALYSIS +
*SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + OPERATING EXPERIENCE + SPACECRAFT

17-14364 RUSSELL JL + CROSBIE KL
ACCELERATOR-PULSED FAST-ASSEMBLY OPERATING EXPERIENCE
GENERAL ATOMIC
2 PAGES, 1 FIGURE, 2 REFERENCES, ANS TRANSACTIONS 8(2) PAGES 437-438 (1965 WINTER MEETING)

THE PURPOSE OF THE DEVICE IS TO PRODUCE SHORT INTENSE BURSTS OF NEUTRONS FOR STUDY OF TRANSIENT RADIATION EFFECTS ON ITEMS SUCH AS ELECTRONIC COMPONENTS IN AN ENVIRONMENT NOT PREVIOUSLY AVAILABLE. EXPERIMENTS WERE PERFORMED TO VERIFY THE THEORY AND TO DEMONSTRATE THE PRACTICABILITY OF OPERATING TOGETHER A FAST CRITICAL ASSEMBLY AND A LINAC AS A NEUTRON SOURCE. THE GENERAL BEHAVIOR WAS THAT ANTICIPATED. CONCLUSIONS FROM THE EXPERIMENTS ARE - (1) NO UNUSUAL PROBLEMS, (2) CRITICAL MASS - 54.9 KG, 93 PERCENT ENRICHED U-235, (3) PROMPT NEUTRON LIFETIME, 6.4 NSEC, (4) 35-R GAMMA DOSE AT 1 METER FOR 10 TO THE 16TH FISSIONS, (5) NEUTRON YIELD 36 PERCENT LESS THAN PREDICTED, (6) PEAK POWER LEVEL 300 MW FOR 5 MICROSEC, (7) MECHANICAL EXPANSION NO PROBLEM FOR SMALL-SCALE FACILITIES, BUT RESPONSE TO BEAM HEATING MAY BE SERIOUS FOR LARGER FACILITIES.

*ACCELERATOR + *PULSED NEUTRON TECHNIQUE + INSTRUMENTATION, GENERAL + OPERATING EXPERIENCE +
RADIATION EFFECT + REACTOR, FAST BURST + TEST, SYSTEM OPERABILITY

17-14365 GERKEN WW + WEST JM + JAMESON AS + WITHERS WT
BONUS REACTOR-OPERATING PERFORMANCE
COMBUSTION ENGINEERING + PUERTO RICO WATER RESOURCES AUTHORITY
2 PAGES, ANS TRANSACTIONS 8(2) PAGES 604-605 (1965 WINTER MEETING)

EXPERIENCES WHILE ACCUMULATING 37,600 MW HOURS (1TH) ARE REPORTED. WATERLOGGING OF SUPERHEATER FUEL ELEMENTS THROUGH MINUTE WELD CRACKS EXTENDED THE STARTUP. GOOD CONTROL OF STEAM TEMPERATURE WAS ACHIEVED BY BLADE CONTROL-ROD MOVEMENT. RELEASE OF I-131 FROM CONTAINMENT HAS NEVER EXCEEDED 3×10 (TO THE 12TH) MICROCURIES PER CUBIC CENTIMETER. AN AIR TEST OF THE SUPERHEATED STEAM PIPING INSIDE THE REACTOR VESSEL REVEALED SEVERAL LEAKS. THE PIPING CARBON CONTENT EXCEEDED THAT OF 304L STAINLESS CALLED FOR IN THE SPECIFICATIONS. THE CAUSE OF THE CRACKING WAS PARTIALLY DUE TO SENSITIZATION RESULTING FROM CARBIDE PRECIPITATION.

*OPERATING EXPERIENCE + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + FAILURE, ADMINISTRATIVE CONTROL +
FAILURE, FUEL ELEMENT + FAILURE, PIPE + REACTOR, SUPERHEAT + REACTOR, SUPERHEAT + SOURCE, CONTINUOUS

17-14366 WEMPLE BD + JACKSON DC + LAROCQUE DD
OPERATING EXPERIENCE WITH THE KAPL-RADIOACTIVE MATERIALS LABORATORY METALLOGRAPHY FACILITY
KNOLLS ATOMIC POWER LABORATORY
2 PAGES, 2 REFERENCES, ANS TRANSACTIONS 8(2) PAGES 628-629 (1965 WINTER MEETING)

AFTER 2 YEARS OF OPERATION, CHANGES WERE MADE IN THE SAMPLE-PROCESSING EQUIPMENT AND PROCEDURES WERE INCORPORATED TO IMPROVE OPERATION. THE MAJOR CHANGES ARE - (1) SAMPLE GRINDER REPLACED WITH A FASTER ONE, (2) DEVELOPMENT OF SAMPLE-PREPARATION PROCEDURES, (3) DEVELOPMENT OF AN EXAMINATION PROCEDURE, (4) IMPROVEMENTS IN OPTICAL QUALITY OF METALLOGRAPHS, (5) DESIGN AND FABRICATION OF NEW ELECTRON-MICROSCOPE REPLICATING AND VACUUM-MOUNTING EQUIPMENT.

*HOT CELL + *METAL + *OPERATING EXPERIENCE + EXAMINATION + PROCEDURES AND MANUALS

17-14367 RAHE EP + CLARK WS + BATCH ML + BALL RM + DEUTSCH RW
MEASUREMENT AND ANALYSIS OF SM-1A CORE-3
HITTMAN ASSOCIATES, INC. + BABCOCK AND WILCOX + CATHOLIC UNIVERSITY OF AMERICA
2 PAGES, 1 FIGURE, 1 TABLE, 1 REFERENCE ANS TRANSACTIONS 8(2) PAGES 528-529 (1965 WINTER MEETING)

CALCULATIONAL AND MEASURING METHODS ARE DISCUSSED AND RESULTS COMPARED FOR CRITICAL BANK HEIGHTS, EXCESS REACTIVITY, DIFFERENTIAL AND INTEGRAL ROD WORTHS, TOTAL-CORE POWER GENERATION, RADIAL AND AXIAL POWER TRANSVERSES, TEMPERATURE COEFFICIENTS, AND NEUTRON FLUXES EXTERNAL TO THE CORE, DONE IN A CRITICAL FACILITY. THE ANALYSIS WAS EXTRAPOLATED TO THE HOT OPERATING CONDITION, AND LIFETIME CHARACTERISTICS PREDICT AN INITIAL EXCESS REACTIVITY OF 3.5 PERCENT AT 435 F AND EQUILIBRIUM XENON, A REACTIVITY MAXIMUM AFTER 12 MW YEARS OF OPERATION, A LIFETIME OF 32 MW YEARS, AND A CAPABILITY OF SHUTDOWN THROUGHOUT LIFE WITH ANY TWO RODS WITHDRAWN.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14367 *CONTINUED*

*MEASUREMENT, REACTIVITY + *TEST, PHYSICS + COMPARISON, THEORY AND EXPERIENCE + CONTROL ROD WORTH + CRITICAL ASSEMBLY FACILITY + FLUX DISTRIBUTION + NEUTRON + POISON, BURNABLE + POWER DISTRIBUTION + REACTOR, ARMY + REACTOR, PRESSURIZED WATER + SHUTDOWN MARGIN + SM 1A (STATIONARY MEDIUM POWER PLANT, ALASKA) + TEMPERATURE COEFFICIENT

17-14370 KENDRICK ED + FISHER JR
ELK RIVER LIFETIME-PREDICTED AND OBSERVED
ALLIS-CHALMERS MANUFACTURING COMPANY

2 PAGES, 1 FIGURE, 5 REFERENCES, ANS TRANSACTIONS 8(2) PAGES 523-524 (1965 WINTER MEETING)

WITH AN AVERAGE FUEL BURNUP OF 3800 MWD/T AFTER SLIGHTLY MORE THAN 1/2 THE CORE LIFETIME, A COMPARISON WAS MADE OF ACTUAL VERSUS PREDICTED BURNUP RATES AND SHOWED EXCELLENT AGREEMENT. THE CALCULATIONAL MODEL CONSISTS OF A SPECTRUM-DEPENDENT POINT DEPLETION COUPLED WITH A ONE-GROUP THREE-DIMENSIONAL ANALYSIS.

*FUEL BURNUP + COMPARISON, THEORY AND EXPERIENCE + ELK RIVER + REACTOR, BOILING WATER

17-14389 CORDES OL
COMPARISON OF FISSION PRODUCT RELEASE FROM THE DESTRUCTIVE TESTS OF TWO SNAP 10A/2 REACTORS
PHILLIPS PETROLEUM COMPANY

12 PAGES, 19 FIGURES, 1 TABLE, 7 REFERENCES, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

TWO SNAP 10A/2 REACTORS WERE, BY DELIBERATE EXCURSIONS OF NEARLY $\pm 4-5$, TO DEMONSTRATE PUBLIC SAFETY, ONE IN AIR AND ONE IN WATER. 96 PERCENT OF THE NOBLE GASES AND 100 PERCENT OF THE HALOGENS, TELLURIUM AND SOLIDS WERE RETAINED IN THE WATER-IMMERSION TEST, BECAUSE THE QUENCHING OF THE LOW-TEMPERATURE BULK WATER CAUSED GAS ATOMS TO BE TRAPPED IN THE FUEL MATRIX. COMPLETE RETENTION OF IODINE WAS DUE EITHER TO SORPTION IN WATER, OR COMBUSTION WITH THE FUEL-ELEMENT HYDROGEN. IN THE AIR TEST, 45 PERCENT OF THE TELLURIUM WAS RELEASED, DEMONSTRATING THAT TELLURIUM SHOULD BE CLASSED AS A SOLID ONLY WHEN THE REACTOR CORE STAYS IMMERSSED IN WATER. THESE TESTS INDICATE THAT THE EXPENSIVE INTEGRAL-REACTOR-DESTRUCTION EXPERIMENTS YIELD BETTER DATA THAN SCALING UP CONSERVATIVELY SMALL CAPSULE DATA.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, 1967

*FISSION GAS RELEASE + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT RETENTION + ACCIDENT ANALYSIS + ACCIDENT, REACTIVITY + FISSION PRODUCT, IODINE + NOBLE GAS + REACTOR, SPACE + SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER) + TELLURIUM

17-14412 RUBIN BF
EXAMINATION OF A FAILED ROD OPERATING WITH MOLTEN UO₂-ZRO₂-CAO FUEL
BETTIS ATOMIC POWER LABORATORY

WAPD-TM-593 +. 75 PAGES, 6 TABLES, 47 FIGURES, 11 REFERENCES, DECEMBER 1966

A FUEL ROD CONTAINING DISHED-END PELLETS OF ZRO₂ PLUS 6.1 W/O CAO PLUS 33.2 W/O UO₂ RUPTURED AFTER 4.3 EFPD (30 HOURS) OPERATION IN THE ETR L-12 LOOP, AT 1.4×10^6 TO THE 6TH BUJ/HK-FT2. THE ROD OPERATED AT FULL POWER FOR 25 MIN AFTER FAILURE TOOK PLACE. THE ROD WAS TO OPERATE WITH 50 PERCENT OF THE FUEL VOLUME WAS MOLTEN, EXTENDING WITHIN 31 MILS OF THE PELLET O.D. DURING A SHUTDOWN, FUEL SHIFTED DOWN TO THE AXIAL FLUX MINIMUM, THE REGION OF FAILURE, THEN MOLTEN FUEL PENETRATED A RADIAL CRACK WITHIN THE PELLET AND MELTED THROUGH THE TUBING. THE FUEL REACTED WITH STEAM, AND THE FUEL-SHEATH CONTACT CONDUCTANCE WAS REDUCED TO 1/6TH, WHEREUPON THE FUEL BECAME LOCALLY MOLTEN NEARLY TO THE PELLET OUTER DIAM. INTENSIVE CLAD HYDRIDING TOOK PLACE FROM RADIOLYTIC DECOMPOSITION IN THE BOTTOM OF THE FUEL STACK, RESULTING IN A LONGITUDINAL CLAD RUPTURE ALONG THE BOTTOM SEVEN PELLETS. IT IS CONCLUDED THAT OPERATION WITH SIGNIFICANT AMOUNTS OF MOLTEN ZRO₂-CAO-UO₂ FUEL MAY LEAD TO TUBING BURN-THROUGHS AND ROD FAILURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*CENTERLINE MELTING + *FAILURE, CLADDING + *FAILURE, FUEL ELEMENT + *URANIUM DIOXIDE + EMBRITTLEMENT + ETR (ENGINEERING TEST REACTOR) + HEAT CONDUCTANCE, FUEL TO CLAD + HYDROGEN + IN PILE LOOP + REACTOR, TEST

17-14414 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
PATHFINDER ATOMIC POWER PLANT. BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS
ALLIS-CHALMERS MANUFACTURING COMPANY

ACNP-65599 +. 79 PAGES, 30 TABLES, 22 FIGURES, 11 REFERENCES, AUGUST 31, 1966 DOCKET NO. 50-130

REACTIVITY WORTHS OF FUEL AND CONTROL RODS OBTAINED BETWEEN INITIAL-SLAB CORE AND FULL-CORE LOADING. REVIEWS COMPLEX CORE-MATERIAL ARRANGEMENT AND RESULTANT CHANGES TO INTRICATE CALCULATIONAL TREATMENT BASED ON SLAB-CORE TESTS. (A SYNTHESIS OF RZ AND XY USED FOR SUPERHEATER AND UPPER/LOWER BOILER DIFFERENCES INSTEAD OF A 3D CODE).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + ANALYTICAL MODEL + COMPARISON, THEORY AND EXPERIENCE + CONTROL ROD WORTH + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SHUTDOWN MARGIN

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14415 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
FUEL HANDLING PRACTICES
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-65599 +. 5 PAGES, 1 TABLE, 3 FIGURES, PATHFINDER ATOMIC POWER PLANT, BOILER CORE AND FULL CORE
CRITICAL EXPERIMENTS, PAGES 3-4 THRU 3-7 AND PAGE 5-1, AUGUST 31, 1966, DOCKET NO. 50-130

BOILER ELEMENTS WITH 32 SHIMS (BORON, STAINLESS STEEL) WERE ADDED TO THE UNMODERATED SLAB CORE UNTIL THE COMPLETE BOILER CORE WAS ASSEMBLED. ANALYSIS PREDICTED THAT THE UNSHIMMED, ALL-RODS-OUT CORE WOULD BE CRITICAL WITH 18 INCHES OF WATER. WITH 4 PERCENT WORTH OF RODS COCKED, WATER WAS SLOWLY ADDED AND 1/M DATA PLOTTED FOR FOUR INCORE BF3. DATA SHOWED THE COUNTING RATE WENT THRU A MINIMUM AT 6 INCHES, A MAXIMUM AT 21 INCHES, AND A SHALLOW DECREASE TO AN ASYMPTOTE AT 36 INCHES (HALF CORE HEIGHT). TEST 314 VERIFIED THAT BOILER FUEL ELEMENT REMOVAL LOST REACTIVITY, AND MEASURED EFFECT OF SUBSTITUTION OF 3.2 W/O ELEMENT FOR 2.2 W/O ELEMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + FUEL HANDLING + MEASUREMENT, SUBCRITICALITY + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14416 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
REACTIVITY AND INSTRUMENT ANOMOLIES
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-65599 +. 5 PAGES, PATHFINDER ATOMIC POWER PLANT, BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS, PAGES 3-7, 3-14, 4-8 4-6 AND 4-18, AUGUST 31, 1966, DOCKET NO. 50-130

1/M PLOTS AS WATER LEVEL RAISED SHOWED A DIP AT 6 INCHES, A PEAK AT 21 INCHES, AND ASYMPTOTIC AT 36 IN. (HALF CORE HEIGHT). USING SUBCRITICAL COUNT RATE DATA WITH REACTIVITY WORTH CURVES GROSSLY OVERESTIMATED THE SHUTDOWN MARGIN, BY A FACTOR OF TWO. A CRUDE ROD-DROP TECHNIQUE OVERPREDICTED THE SHUTDOWN MARGIN BY 1.7. DETECTOR VS SOURCE GEOMETRY AFFECTED RESULTS ALSO. ROD CALIBRATION SHOWED DIPS AT 18, 36, AND 54 INCHES DUE TO FISSION-GAS SPACE AND FLUX SUPPRESSORS. IN CERTAIN CONFIGURATIONS, WITH THE OUTER RING RODS BANKED FOR CRITICALITY, THESE RODS WERE WORTH LITTLE OR NOTHING IF BUMPED FROM THE 8-ROD BANK ACROSS THE CORE, FROM A FULLY WITHDRAWN INNER-RING ROD. (THIS ILLUSTRATES A PROBLEM WITH SHUTDOWN-MARGIN CALCULATIONS FOR A ROD STUCK OUT).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*TEST, PHYSICS + CONTROL ROD WORTH + INSTRUMENTATION, ABNORMAL INDICATION + MEASUREMENT, REACTIVITY + OPERATIONS REPORT, ANALYSIS + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SHUTDOWN MARGIN

17-14418 LACY PS + KERN RC + LEWELLEN JW + SMITH JA
SHUTDOWN MARGIN PROBLEM
ALLIS-CHALMERS MANUFACTURING COMPANY
ACNP-65599 +. 2 PAGES, PATHFINDER ATOMIC POWER PLANT, BOILER CORE AND FULL CORE CRITICAL EXPERIMENTS, PAGES 7.1 - 7.2, AUGUST 31, 1966, DOCKET NO. 50-130

CALCULATIONS APPEAR TO OVER PREDICT (BY ONE TENTH) INDIVIDUAL REACTIVITY ADDITIONS BY FUEL CHANGE, CONTROL ROD POSITION, SHIMS ETC. HOWEVER, COMBINATIONS OF TWO CHANGES HAVE BEEN PREDICTED ACCURATELY. VARIOUS ATTEMPTS WERE UNSUCCESSFUL IN INCREASING K EFFECTIVE WHILE MAINTAINING SHUTDOWN MARGIN (ONE ROD STUCK OUT) ABOVE 0.3 PERCENT. THE FINAL LOADING GIVES AN AVAILABLE EXCESS REACTIVITY OF 9.8 PERCENT, WHILE 9.7 PERCENT IS ESTIMATED NEEDED FOR FULL POWER WITH EQUILIBRIUM XENON AND SAMARIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *TEST, PHYSICS + PATHFINDER + REACTIVITY, EXCESS + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SHUTDOWN MARGIN

17-14440 N S SAVANNAH SHUTDOWN
FIRST ATOMIC SHIP TRANSPORT, INC.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGE 1 (JANUARY 30, 1967) DOCKET NO. 50-238

LAYUP OF N S SAVANNAH AS OF AUGUST 20, 1967, WAS ATTRIBUTED TO \$3M PER YEAR GOVERNMENT EXPENSES (ABOVE REVENUES) BECAUSE OF HIGH EXPENSES ASSOCIATED WITH ENSURING ULTIMATE SAFETY, SUCH AS MAINTENANCE, CREWING, AND TECHNICAL STAFFING REQUIREMENTS.

*OPERATING EXPERIENCE + MAINTENANCE AND REPAIR + N S SAVANNAH + REACTOR, MARITIME + REACTOR, PRESSURIZED WATER + STAFFING, TRAINING, QUALIFICATION

17-14450 PM 2-A VESSEL FINALLY FRACTURES
2 PAGES, NUCLEONICS WEEK 8(3), PAGE 5 (JANUARY 19, 1967)

THE VESSEL FRACTURED AT 4,475 PSIG AND MINUS 20 F, WITH A NOTCH MACHINED 1-1/4 IN. DEEP (INTO THE 2-3/8 IN.-THICK VESSEL) AND 11 INCHES LONG. THE NOTCH HAD BEEN TREATED WITH ACID FOR TWO HOURS TO SHARPEN ITS POINT. WAPD-TM-640 BY J. M. MONAHAN AND T. J. WALKER CONTAINS DETAILS.

*BRITTLE FRACTURE + *CONTAINMENT, PRESSURE VESSEL + NDT DATA (NIL DUCTILITY TRANSITION) + PM 2A (PORTABLE MEDIUM NUCLEAR POWER PLANT) + REACTOR, ARMY + REACTOR, PRESSURIZED WATER +

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14450 *CONTINUED*
REACTOR, PRESSURIZED WATER + SAFETY STUDY

17-14591 QUESTION G-1. STEAM LINE ISOLATION FOLLOWING A RUPTURE
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.1.1 TO G.1.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS,
NOVEMBER 10, 1966, DOCKET NO. 50-259/260

SIX QUESTIONS REGARDING THIS ACCIDENT, THE ISOLATION VALVES, AND DOSE CALCULATION. (1) ISOLATION-VALVE SINGLE-FAILURE PROTECTION, (2) ALTERNATIVE VALVE-CLOSURE INSTRUMENTATION AND DELAY TIMES, (3) ANALYSIS OF CONSEQUENCES VS VALVE-CLOSURE DELAY TIME, (4) RE-ANALYZE DOSE WITH DIFFERENT PLUME-RISE EQUATION, (5) TESTING OF ISOLATION VALVES IN ACCIDENT CONDITIONS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + DOSE CALCULATION, EXTERNAL + HEIGHT OF RISE + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER + SYSTEM OPERABILITY IN ACCIDENT CONDITIONS + VALVE

17-14597 QUESTION G-2. POST-INCIDENT RECOVERY PLANS AND SPECIAL DESIGN FEATURES
TENNESSEE VALLEY AUTHORITY
ONE PAGE, PAGE G.2.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

AN INSTRUCTION MANUAL FOR EMERGENCY ACTION WILL DETAIL IMMEDIATE AND FOLLOWUP STEPS FOR RECOVERY. THE RECOVERY PLAN (CONTROLLED CLEANUP TO PERMIT REENTRY TO REACTOR BUILDING AND DRY-WELL) WILL PROVIDE A BASIS FOR ACTION BY A CAREFULLY TRAINED RECOVERY CREW.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + INCIDENT, ACTUAL, RECOVERY FROM + PROCEDURES AND MANUALS + REACTOR, BOILING WATER

17-14606 QUESTION H-2A. DESCRIBE FILTER-DEMINERALIZER. DOES IT BRING A HIGH PRESSURE LINE OUTSIDE CONTAINMENT.
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES H.2.1 TO H.2.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

SYSTEM IS SAME AS DRESDEN 1, ETC., EXCEPT FOR USE OF CARTRIDGE-TYPE PRESSURE-PRECOAT FILTER. RESINS (2 PARTS CATION TO 1 PART ANION) ARE COATED ONTO FILTERS IN THE REACTOR CLEANUP 1250-PSIG SYSTEM. BIG ROCK POINT EXPERIENCE SHOWS THAT TOTAL SOLIDS IS FACTOR-OF-10 HIGHER THAN WHEN USED IN COOLER CONDENSATE SERVICE. RESINS ARE BACKFLUSHED TO WASTE AND RECOATED WITH FRESH RESIN WHEN PRESSURE DROP APPROACHES 20 PSIG.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CONTAINMENT, GENERAL + COOLANT PURIFICATION SYSTEM + OPERATING EXPERIENCE + REACTOR, BOILING WATER

17-14607 QUESTION H-2B. ACTIVITIES PRESENT IN SPENT RESIN
TENNESSEE VALLEY AUTHORITY
PAGE H.2.4 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

WITH NO FUEL LEAKS, CORROSION PRODUCTS ARE MAINLY PRESENT (CO-58, CO-60, CR-51, FE-59, ETC). WITH FUEL LEAKS, THE IODINES, TC-MO-99, AND NOBLE-GAS DAUGHTERS WILL BE PRESENT. SHIELDING DESIGN IS BASED ON 9 MICROCURIES/CC

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACTIVATION PRODUCT + BROWNS FERRY + COOLANT PURIFICATION SYSTEM + FISSION PRODUCT RETENTION + REACTOR, BOILING WATER + RESIN

17-14741 NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 19, 1966 - NOV. 19, 1966
NORTHERN STATES POWER COMPANY
NSP-6603 +. 80 PAGES, 25 FIGURES, 3 TABLES, 19 REFERENCES, JANUARY 9, 1967, DOCKET NO. 50-130

THIS REPORT IS SUBTITLED, INITIAL STEAM-FLOW TESTING TO 40 PERCENT POWER. REVIEWS STEAM-FLOW TEST DATA (ROD WORTH AND POWER SPLIT, SYSTEM RESPONSE TO TRIPS AND SCRAMS), EQUIPMENT PERFORMANCE (PRESSURE CONTROL BY TURBINE BYPASS VALVE WITH SLIGHT FLOW, CONTROLLED TURBINE AIR LEAKAGE TO MINIMIZE OFF-GAS HYDROGEN). CAUSES OF 107 SCRAMS IN THE 6 MONTHS ARE LISTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATIONS SUMMARY FOR AEC + *REACTOR STARTUP EXPERIENCE, INITIAL + FAILURE, EQUIPMENT + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SCRAM, REAL + TEST, PLANT RESPONSE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14742 PATHFINDER - STEAM LINE ISOLATION VALVE LEAKAGE
NORTHERN STATES POWER COMPANY
NSP-6603 +. 3 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 19, 1966 - NOVEMBER 19, 1966, PAGES 8, 71-72, JANUARY 9, 1967, DOCKET NO. 50-130

STEAM-LINE ISOLATION VALVES WERE DIFFICULT TO MAINTAIN WITHIN ACCEPTABLE LEAK RATES ON SEVERAL TESTS. AS LATE AS APRIL 1966, WELDING SLAG DAMAGED SEATING SURFACES. INCREASED BUILDING PRESSURE CAUSES STEAM-LINE MOVEMENT, WHICH DISTORTS THE VALVE BODY. THE INCREASED NUMBER OF POWER RUNS APPEARS TO HAVE FINALLY SWEEPED OUT THE FOREIGN MATERIAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*CONTAINMENT PENETRATION, CLOSURE OF + *DAMAGE + *TEST, LEAK RATE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14743 PATHFINDER - POWER DISTRIBUTION AND REACTIVITY
NORTHERN STATES POWER COMPANY
NSP-6603 +. 6 PAGES, 4 TABLES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 6, 19-23, JANUARY 9, 1967, DOCKET NO. 50-130

XENON-FOLLOW TESTS AT 40 AND 60 PERCENT VERIFY CALCULATIONS. XENON BUILDUP DECREASES SUPERHEATER POWER FRACTION ON RESTART. VOID REACTIVITY APPEARED TO BE OVERESTIMATED AT 20 PERCENT POWER. NEW ESTIMATES FIT WELL AT 40 PERCENT. HOWEVER, AT 40 PERCENT POWER, THE CORE REACTIVITY LOSS APPEARS TO BE 0.2 PERCENT DELTA K LESS THAN PREDICTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*POWER DISTRIBUTION + *REACTIVITY EFFECT, ANOMALOUS + *XENON + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTIVITY EFFECT + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14744 PATHFINDER - SELECTED OPERATING EXPERIENCES, INSTRUMENTATION
NORTHERN STATES POWER COMPANY
NSP-6603 +. 4 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 6, 14-16, JANUARY 9, 1967, DOCKET NO. 50-130

SINCE INSTALLING THE ROD OSCILLATOR WOULD REQUIRE REMOVAL OF THE HOLDDOWN MECHANISM AND ENDANGER THE SUPERHEATER THERMOCOUPLES, THESE TESTS WERE POSTPONED UNTIL AFTER 100 PERCENT POWER. NOISE ANALYSIS TO 60 PERCENT POWER GIVES NO INDICATION OF UNSTABLE TENDENCIES. HEAT BALANCES AT 40 MW(TH) GAVE 34-40 MW, DEPENDING ON THE FLOWMETER USED. PRESSURIZATION RESULTS IN A DECREASED NEUTRON-CHAMBER CURRENT, AS CONTROL-ROD AND VOID-CHANGE EFFECTS (1.25 INCREASE FACTOR) ARE LESS THAN THE INCREASED REFLECTOR DENSITY (1.39 DECREASE FACTOR).

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*INSTRUMENTATION, ABNORMAL INDICATION + *NOISE ANALYSIS + *OSCILLATOR, REACTIVITY + INSTRUMENTATION, POWER RANGE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + PRESSURE, INTERVAL + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14745 PATHFINDER RESPONSE TO SYSTEM CHANGES IN THE 10 TO 40 PERCENT POWER RANGE
NORTHERN STATES POWER COMPANY
NSP-6603 +. 25 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 17-41, JANUARY 9, 1967, DOCKET NO. 50-130

MAJOR STEPS WERE 20 PERCENT AND 40 PERCENT (76 MWTH) POWER, WITH SHORT TESTS AT INTERMEDIATE POWER LEVELS. TESTS INCLUDED SETPOINT CHANGES TO PRESSURE, FEEDWATER FLOW AND TEMP., CONTROL-ROD POSITION, AND RECIRCULATION FLOW. INSTRUMENT RESPONSE AND DATA AT EQUILIBRIUM STATES NOTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATIONS SUMMARY FOR AEC + *TEST, PLANT RESPONSE + PATHFINDER + REACTOR STABILITY + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14746 PATHFINDER - RECIRCULATION FLOW RATE TESTS
NORTHERN STATES POWER COMPANY
NSP-6603 +. 6 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT. INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 27, 31-35, JANUARY 9, 1967, DOCKET NO. 50-130

FLOW-CHANGE RESULTS AT LOW POWER WERE AS PREDICTED. THE SAME FLOW CHANGE AT HIGHER POWER PRODUCES A LARGER EFFECT BECAUSE THERE ARE MORE VOIDS TO BE AFFECTED. DURING THE RECIRCULATION-FLOW-CHANGE TEST AT 40 PERCENT POWER WITH THE GANGED-VALVE CHANGED FROM 100 PERCENT OPEN TO 45 PERCENT OPEN, THE FINAL VALVE POSITION WAS INCREASED TO 60 PERCENT OPEN WHEN IT BECAME APPARENT THAT THE POWER/FLOW SCRAM WOULD OCCUR. HEAT BALANCES GAVE 73.3 MWTH (100 PERCENT VALVE OPEN) AND 60.8 MWTH AT 60 PERCENT OPEN. *****SINGLE-PUMP TRIPS ATTEMPTED, TWO WERE SCRAMMED OUT ON HIGH STEAM TEMPERATURE. BECAUSE REVERSE FLOW THROUGH THE PARTIALLY OPEN DISCHARGE VALVES IS GREATER THAN CALCULATED, THE RATE OF FLOW INCREASES AS THE VALVE CLOSES APPROACHES THE TECH.-SPEC. LIMIT (455 GPM, 2.8 CENTS/SEC). TESTS CAN BE RUN FROM THE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14746 *CONTINUED*

60-PERCENT-OPEN POSITION, BUT A PUMP-TRIP SCRAM HAS BEEN TEMPORARILY ADDED PENDING FUTURE TESTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*FLOW, RECIRCULATION + *PUMP + *TEST, PLANT RESPONSE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14747 PATHFINDER - DIFFICULTIES WITH TURBINE INLET VALVES ON AUTO PRESSURE CONTROL

NORTHERN STATES POWER COMPANY

NSP-6603 +. 3 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.

INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 35-37, JANUARY 9, 1967, DOCKET NO. 50-130

PATHFINDER WAS SHUT DOWN NOVEMBER 8 TO 29 TO REVIEW DIFFICULTIES CAUSED BY THE INADEQUATE PNEUMATIC POSITIONER OF THE TURBINE-INLET VALVES. THE SOLUTION WAS TO LEAVE THE INLET VALVES ON LOAD-LIMIT CONTROL, WHILE LOWERING THE TURBINE-BYPASS-VALVES SETPOINT LOWER TO CONTROL PRESSURE, WITH SOME FLOW TO CONDENSER. THIS ARRANGEMENT WAS CHECKED ON THE ANALOG COMPUTER, AND THREE SCRAMS ADDED (INLET VALVES CLOSED AND BYPASS VALVE CLOSED LESS THAN 4.5 PERCENT, HIGH STEAM LINE PRESSURE, AND HIGH STEAM TEMPERATURE). A LOW-STEAM-FLOW SCRAM WAS ADDED AS BACKUP PROTECTION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*CONTROLLER + *FAILURE, DESIGN ERROR + *PRESSURE, INTERNAL + *SAFETY ANALYSIS + ACCIDENT, LOSS OF FLOW + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14748 PATHFINDER - COOLANT CHEMISTRY AND RADIATION BACKGROUND

NORTHERN STATES POWER COMPANY

NSP-6603 +. 5 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.

INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 57-61, JANUARY 9, 1967, DOCKET NO. 50-130

AFTER A DISCUSSION WITH THE AEC, COOLANT-CHEMISTRY MONITORING NOW DEPENDS ON IN-LINE INSTRUMENTS, WITH LAB ANALYSES TO MONITOR THE SYSTEMS PERIODICALLY. ON TWO OCCASIONS AFTER A STARTUP, CHLORIDE ION PEAKED AT 90 PPB AND THEN AVERAGED NEAR THE DETECTABLE LIMIT (12). GROSS BETA (ACTIVATED CORROSION PRODUCTS) IS INCREASING. THE PURIFICATION FLOW DOES NOT REMOVE THE ACTIVITY WHEN THERE IS NO OTHER PRIMARY SYSTEM FLOW. ****MEASUREMENTS AT 76 MWTH INDICATED 1.4 R/HR NEUTRONS IN PRIMARY PUMP VAULTS. AT 115 MWTH, THE AIR EJECTOR READ 1.5 R/HR. GENERAL BACKGROUND IS UP, AND ADDITIONAL SHIELDING MAY BE NEEDED. PURIFICATION FLOW LINE NEEDED SHIELDING, AND THE HAND/FOOT BACKGROUND COUNTER WAS RELOCATED. ****TURBINE BUILDING AND EXHAUST BUILDING EXHAUST DUCT MONITORS READ 1.5 DECADES ABOVE SAMPLED ACTIVITY DUE TO STEAM-CHASE SHINE. COUNTING-ROOM BACKGROUND HAS INCREASED 50 PERCENT. ****HOLDERS WERE MODIFIED TO BETTER SHADE AND VENTILATE OFF-SITE-MONITORING FILM BADGE, DUE TO A FILM-DARKENING PROBLEM.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*COOLANT CHEMISTRY + *CRUD + MONITOR, RADIATION, AIR + OPERATIONS SUMMARY FOR AEC + PATHFINDER + RADIATION SAFETY AND CONTROL + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14749 PATHFINDER - OFFGAS SYSTEM DIFFICULTIES

NORTHERN STATES POWER COMPANY

NSP-6603 +. 2 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.

INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 61 AND 76, JANUARY 9, 1967, DOCKET NO. 50-130

THE RECOMBINER LOW EFFICIENCY ALLOWED HYDROGEN LEVELS TO APPROACH 3 PERCENT, REQUIRING CONTROLLED CONDENSER AIR INLEAKAGE. THE CATALYST WAS CLEANED AND ITS CASING INSULATED AND STEAM-HEATED. NOT FULLY SATISFACTORY. ABOVE 40 MWTH, THE CATALYST EFFICIENCY INCREASES. ***OFF-GAS FLOW SURGES WHEN PULLING THE CONDENSER VACUUM (OR CHANGING AUXILIARIES) WITH THE WET AIR HAVE LOADED THE FIRST ABSOLUTE FILTER, BLOWING IT OUT FROM HIGH PRESSURE DROP. A SECOND FILTER, DOWNSTREAM OF THE HOLDUP TANKS MAINTAINS THE SYSTEM INTEGRITY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*FILTER, DAMAGED + *REACTOR OFFGAS + FILTER, HIGH EFFICIENCY + OPERATING EXPERIENCE + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14750 PATHFINDER - WRONG SAFETY SYSTEM BYPASS USAGE

NORTHERN STATES POWER COMPANY

NSP-6603 +. 2 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.

INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 69-70, JANUARY 9, 1967, DOCKET NO. 50-130

A COMPLIANCE CITATION WAS ISSUED 8/22/66. A REFRESHER COURSE ON THE TECH.-SPEC. SECTION RELATING TO BYPASS SYSTEM USAGE WAS GIVEN TO SUPERVISORS, AND WE NOW REQUIRE WRITTEN AUTHORIZATION FROM THE OPERATIONS SUPERVISOR FOR EACH USAGE, WITH DETAILS AS TO ITS USAGE AND PERTINENT REACTOR CONDITIONS.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14750 *CONTINUED*
AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*INSPECTION AND COMPLIANCE + ADMINISTRATIVE CONTROLS AND PRACTICES + FAILURE, ADMINISTRATIVE CONTROL + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14751 PATHFINDER - INADVERTANT LIFTING OF ROD DRIVE FROM VESSEL DURING SHUTDOWN WORK
NORTHERN STATES POWER COMPANY
NSP-6603 +. 2 PAGES, NORTHERN STATES POWER COMPANY PATHFINDER ATOMIC POWER PLANT SIX MONTH REPORT.
INITIAL STEAM FLOW TESTING THROUGH 40 PERCENT POWER TESTING - MAY 9, 1966 - NOVEMBER 19, 1966, PAGES 73-74, JANUARY 9, 1967, DOCKET NO. 50-130

ON SEPTEMBER 12, ALL CONTROL RODS WERE UNLATCHED TO REMOVE NO. 3 DRIVE. NO. 10 DRIVE WAS DISCONNECTED IN EXPECTATION IT TOO WOULD BE REMOVED, BUT THIS DISCONNECTION WAS NEITHER LOGGED NOR TOLD SUPERVISION. DAYS LATER, WHEN THE REACTOR WAS PRESSURIZED TO 50-100 PSIG FOR PURIFICATION, THE WATER FORCE LIFTED THE DRIVE (BUT NOT THE ROD) 3 FEET. NO DAMAGE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*FAILURE, OPERATOR ERROR + *INCIDENT, ACTUAL, HUMAN ERROR + ACCIDENT, CONTROL ROD EJECTION + OPERATIONS SUMMARY FOR AEC + PATHFINDER + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

17-14826 QUESTION 1D - PROVIDE A RESUME OF ACTUAL EXPERIENCE IN LIMITING AXIAL AND RADIAL POWER PEAKING
TENNESSEE VALLEY AUTHORITY
PAGE 8 OF BROWNS FERRY, AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

DPESDEN 1, GARIGLIANO, HUMBOLDT BAY, AND BIG ROCK POINT OPERATING CYCLES DEMONSTRATED GROSS POWER PEAKING FACTORS LESS THAN 2.1. APPENDIX 3 (FIG. G2) IS TAKEN FROM GARIGLIANO PERFORMANCE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ADMINISTRATIVE CONTROLS AND PRACTICES + BROWNS FERRY + CONTROL ROD PROGRAM + POWER DISTRIBUTION + REACTOR, BOILING WATER

17-14829 QUESTION 2 - PROVIDE SUMMARY REPORT OF PERFORMANCE TESTING TO CONFIRM THERMAL DESIGN BASIS.
PROVIDE STARTUP TEST PROGRAM OBJECTIVES.
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES 11-12 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

ANSWER STATES NAMES OF REACTORS WHERE 8 VARIOUS TESTS HAVE BEEN PERFORMED. (EG. 4 HIGH POWER DENSITY--BIG ROCK POINT) STARTUP TEST PROGRAM WILL INCLUDE VARIOUS TESTS AS IN PRESENT PLANT STARTUP.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + HEAT TRANSFER ANALYSIS + REACTOR STARTUP TESTING + REACTOR, BOILING WATER + TEST, PLANT RESPONSE

17-14852 SMITH RJ
REACTOR SAFETY - A LITERATURE SEARCH
DIVISION OF TECHNICAL INFORMATION
TID-3525 (REV. 5, SUPPL. 2) +. 64 PAGES, 671 REFERENCES, AUGUST 1965

A TOTAL OF 671 REFERENCES TO UNCLASSIFIED REPORTS IS PRESENTED ON REACTOR SYSTEMS, MATERIALS, AND OPERATION DESIGNED TO PROVIDE MAXIMUM SAFETY FOR THE REACTOR, REACTOR PERSONNEL, AND ENVIRONS. INFORMATION IS INCLUDED CONCERNING INCIDENTS AND CONDITIONS OF OPERATION CONSIDERED HAZARDOUS. AUTHOR, REACTOR, AND REPORT-NUMBER-AVAILABILITY INDEXES ARE PROVIDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT ANALYSIS + *ACCIDENT, GENERAL + *BIBLIOGRAPHY + *CONTAINMENT, GENERAL + *OPERATIONS REPORT, GENERAL + *PERSONNEL PROTECTIVE DEVICE

17-14855 ARGONNE NATIONAL LABORATORY. REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT.
ARGONNE NATIONAL LABORATORY
ANL-7286 +. 84 PAGES, 23 FIGURES, 23 TABLES, JANUARY 26, 1967

ARGONNE NATIONAL LABORATORY PROGRESS REPORT FOR DEC. 1966. THIS REPORT IS ONE OF A SERIES OF REPORTS ON THE FOLLOWING TOPICS - IRRADIATION OF FUEL PINS, TREAT MELTDOWN TEST, INTEGRAL SODIUM LOOP, FAST REACTOR SAFETY CONTAINMENT, EQUATION OF STATE OF REFRACTORIES SUCH AS UO2, METAL-WATER REACTIONS, AND PLUTONIUM VOLATILITY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

CONTAINMENT DESIGN + EQUATION OF STATE + FUEL MELTDOWN + METAL WATER REACTION + PLUTONIUM +

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14855 *CONTINUED*

REACTOR DYNAMICS + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, TEST + SODIUM + TREAT (TRANSIENT TEST REACTOR FACILITY) + URANIUM OXIDE

17-14889 UNION CARBIDE PROPOSES CHANGE TO IRRADIATION EXPERIMENT LIMITS

UNION CARBIDE, TUXEDO, NEW YORK

7 PAGES, DECEMBER 23, 1966, DOCKET NO. 50-54

STERLING FOREST REQUESTS THAT IRRADIATION LIMITS BE INCREASED TO 200 G OF SOURCE AND 50 G OF SPECIAL NUCLEAR MATERIAL, ON THE GROUNDS THAT THE ORIGINAL LIMITS WERE ARBITRARY AND SELF-IMPOSED. INCLUDED IN THE DISCUSSION ARE 23 LIMITATIONS ON (E.G., TOTAL WORTH OF EXPERIMENTS 2' DELTA K/K, INDIVIDUAL WORTH 0.5' DELTA K/K, DOUBLE ENCAPSULATION OF SODIUM).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + IN PILE LOOP + REACTOR, POOL TYPE + REACTOR, RESEARCH + SAFETY PRINCIPLES AND PHILOSOPHY

17-14916 LUMB RF + MACPHEE J

THE ECONOMICS OF UO₂ FUEL FOR RESEARCH REACTORS

WESTERN NEW YORK NUCLEAR RESEARCH CENTER, BUFFALO, NEW YORK + AMF ATOMICS, YORK, PENNSYLVANIA

10 PAGES, 8 TABLES, 4 FIGURES, 10 REFERENCES, NUCLEAR APPLICATIONS 3(3) PAGES 157-166 (MARCH 1967)

A LOW-ENRICHED UO₂ CORE FOR A SWIMMING-POOL REACTOR IS ECONOMICALLY BETTER THAN U-AL FUEL FOR USES ABOVE 250 MWD/YEAR. (THIS GIVES ADDED PROTECTION AGAINST REACTIVITY ACCIDENTS, OR ALLOWS PULSING OPERATION). THE ECONOMIC ANALYSIS IS PRESENTED. SINCE TRIGA ELEMENTS ARE NOT REPROCESSED, COMPARISON IS MORE FAVORABLE.

*ECONOMICS + *FUEL BURNUP + REACTOR, POOL TYPE + URANIUM DIOXIDE

17-14917 DICKERMAN CE + ROBINSON LE + BLUMENTHAL B + STEWART R

BEHAVIOR OF TH-20 WT/PERCENT U FAST-REACTOR FUEL UNDER TRANSIENT HEATING TO FAILURE

ARGONNE NATIONAL LABORATORY

10 PAGES, 10 FIGURES, 2 TABLES, 17 REFERENCES, NUCLEAR APPLICATIONS 3(1) PAGES 9-17 (JANUARY 1967)

SODIUM-BONDED TH-20 WT % U EBR II FUEL ELEMENTS WERE STUDIED IN TRANSIENT MELTDOWN EXPERIMENTS RANGING UP TO COMPLETE SAMPLE MELTDOWN, CONDUCTED IN TREAT. THE HIGH-MELTING THORIUM MATRIX SUPPORTED THE FUEL DURING TRANSIENT HEATING AT TEMPERATURES SIGNIFICANTLY BEYOND THE SOLIDUS. BECAUSE THE FUEL WAS STILL RELATIVELY INTACT AT THE TEMPERATURES OF CLADDING FAILURE, INTERNAL PRESSURE WAS NOT EFFECTIVE IN EJECTING FUEL UPON FAILURE. THE DOMINANT MECHANISM OF FUEL MOVEMENT WAS GRAVITY.

*FUEL MELTDOWN + *TEMPERATURE TRANSIENT + *TREAT (TRANSIENT TEST REACTOR FACILITY) + REACTOR, FAST + REACTOR, GRAPHITE MODERATED + REACTOR, LIQUID METAL COOLED

17-14920 SELECTED STUDIES

LAWRENCE RADIATION LABORATORY

UCRL-50007-66-1 +. 22 PAGES, 19 FIGURES, 3 TABLES, 13 REFERENCES, FROM HAZARDS CONTROL PROGRESS REPORT NO. 25 (APRIL-AUGUST 1966), PAGES 11-14, 28-43, 55-56, 1966

A THERMISTOR-INSTRUMENTED TOWER INDICATES ATMOSPHERE STABILITY FOR LOCAL-DISASTER REACTIONS. THERMOLUMINESCENT MATERIAL WAS TESTED AS A DOSIMETER FOR HANDS IN A GLOVE BOX. BEO DESERVES MORE WORK. CYCLOTRON WORKERS BECOMING CONTAMINATED WITH ZN65, AS SHOWN BY THE WHOLE-BODY COUNTER. SEASONAL VARIATION IN THORON AND RADON CONTENT WAS STUDIED. A LIGHT STEAM-DETERGENT DECONTAMINATION GUN WAS DEVELOPED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*OPERATIONS REPORT, GENERAL + *RADIATION SAFETY AND CONTROL + ACCELERATOR + DECONTAMINATION + DOSIMETRY, THERMOLUMINESCENCE + GLOVE BOX + LAPSE RATE, STABLE + LRL (LAWRENCE RADIATION LABORATORY) + RADON + THORON

17-14921 SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING AUGUST 31, 1966 - MOLTEN SALT REACTOR PROGRAM

OAK RIDGE NATIONAL LABORATORY

ORNL-4037 +. 242 PAGES, 94 FIGURES, 37 TABLES, 102 REFERENCE, JANUARY 1967

XENON IS ONLY 0.35 THE EXPECTED VALUE, AS HELIUM GAS SCRUBS IT OUT. A 0.3 PERCENT ZERO-POWER REACTIVITY DISCREPANCY EXISTS. A MAIN RADIATOR BLOWER CATASTROPHICALLY FAILED. MATERIALS STUDIES AND BREEDER-REACTOR STUDIES DESCRIBED, AS WELL AS MSRE OPERATIONS AND COMPONENT DEVELOPMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*OPERATIONS REPORT, ANALYSIS + *RESEARCH AND DEVELOPMENT PROGRAM + ECONOMICS + MATERIAL + MSRE (MOLTEN SALT REACTOR EXPERIMENT) + REACTIVITY EFFECT, ANOMALOUS + REACTOR, BREEDER + REACTOR, CIRCULATING FUEL + REACTOR, MOLTEN SALT + XENON

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-14923 USAEC ENGINEERING MATERIALS LIST - SUPPLEMENT 36
DIVISION OF TECHNICAL INFORMATION EXTENSION, OAK RIDGE, TENNESSEE
TID-4100 (SUPPL. 36) +. 60 PAGES, DECEMBER 1966

OF INTEREST ARE INTERFEROMETERS, NEUTRON SPECTROMETERS, THE ELK RIVER FUEL ELEMENT, AND THE
ORR BOILING DETECTOR EXPERIMENT IN-CORE BOILING HEATER. THIS ISSUE INCLUDES A SUBJECT INDEX
FOR THIS AND ALL PREVIOUS ISSUES.

AVAILABILITY - USAEC DIVISION OF TECHNICAL INFORMATION, OAK RIDGE, TENNESSEE, FREE

*ENGINEERING DRAWING LIST + ELK RIVER + FUEL ELEMENT + NUCLEATE BOILING +
ORR (OAK RIDGE RESEARCH REACTOR) + REACTOR, BOILING WATER

17-14924 OPERATIONS REPORT OF THE DIAMOND ORDNANCE RADIATION FACILITY NUCLEAR REACTOR. REPORT NO. 1
FEBRUARY 1, 1962-DECEMBER 30, 1966
U. S. ARMY MATERIAL COMMAND, HARRY DIAMOND LABS
6 PAGES, 1966

THE ORIGINAL AL-CLAD H/ZR-EQUAL-1 ELEMENTS WERE LIMITED TO \$2.65 BECAUSE OF FUEL-ELEMENT
GROWTH. A CLAD FAILURE OCCURRED IN OCT. 1963. A NEW STEEL-CLAD CORE HAS SATISFACTORILY
OPERATED SINCE JUNE 1964, ALTHOUGH \$0.40 HAS BEEN LOST. GA ATTRIBUTES A SIMILAR CHANGE AT
FLAIR (WITH STEADY-STATE OPERATION) TO REDUCED HEAT TRANSFER FOLLOWING PULSING. FACILITY
MODIFICATIONS LISTED.

AVAILABILITY - SAFETY OFFICE, OFFICE OF THE CHIEF OF ENGINEERS, DEPT. OF THE ARMY, WASHINGTON, D.C.

*MODIFICATION, SYSTEM OR EQUIPMENT + *OPERATIONS REPORT, GENERAL + CLAD + FAILURE, FUEL ELEMENT +
FUEL BURNUP + MAINTENANCE AND REPAIR + REACTIVITY EFFECT, ANOMALOUS + REACTIVITY, EXCESS + REACTOR, ARMY +
REACTOR, PULSED + REACTOR, RESEARCH + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

17-14925 ANNUAL REPORT ON THE OPERATIONS AND MODIFICATION OF THE WHITE SANDS MISSILE RANGE FAST BURST
REACTOR FACILITY - REPORT NO. 1, AUGUST 1964 THRU DECEMBER 1966
U. S. ARMY MATERIALS AND RESEARCH AGENCY, HARRY DIAMOND LAB
7 PAGES, 1966

18 CHANGES LISTED. (C) ORIGINAL CIRCULATING-BALL NUT ROD-DRIVE CHANGED TO LEAD SCREW AND NUT
DRIVE, AS SHOCK FROM A BURST CAUSED THE BALLS TO BRINNELL THE LEADSCREW. (J) THE
SAFETY-BLOCK SCRAM-MAGNET ARMATURE PLATE WAS REDESIGNED. (P) CLOSE VISUAL INSPECTION OF THE
CORE RARELY FOUND A PROBLEM BEFORE FAILURE, THUS UNNECESSARILY EXPOSING PERSONNEL. DAILY
CHECKS AT THE CORE HAVE BEEN ELIMINATED.

AVAILABILITY - SAFETY OFFICE, OFFICE OF THE CHIEF OF ENGINEERS, DEPT. OF THE ARMY, WASHINGTON, D.C.

*MODIFICATION, SYSTEM OR EQUIPMENT + *OPERATIONS REPORT, GENERAL + CONTROL ROD DRIVE + EXAMINATION +
FAILURE, COMPONENT + FAILURE, SCRAM MECHANISM + RADIATION SAFETY AND CONTROL + REACTOR, ARMY +
REACTOR, FAST BURST

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-03614 SCHREIBER RE + ALLIO RJ
GAMMA HEATING IN REACTOR
WESTINGHOUSE ELECTRIC CORPORATION
6 PAGES, 5 FIGURES, 3 TABLES, 5 REFERENCES, NUCLEONICS, 22(8), PP.120-125 (AUGUST 1964)

THE IMPORTANT SOURCES OF GAMMA HEATING IN A MATERIAL PLACED IN OR NEAR THE REACTOR CORE ARE SHOWN. WE PRESENT A HAND-CALCULATION METHOD HERE FOR MAKING A GOOD ESTIMATE OF THE GAMMA-HEAT GENERATION IN IN-PILE EXPERIMENTS.

HEAT GENERATION, INTERNAL + IN PILE EXPERIMENT + IRRADIATION TESTING

18-05303 SUMMARY SAFEGUARDS REPORT FOR THE GENERAL ELECTRIC NUCLEAR TEST REACTOR
GENERAL ELECTRIC COMPANY, SAN JOSE
APCD-4444 +. 118 PAGES, 26 FIGURES, FEBRUARY 1, 1965, DOCKET NO. 50-73, PDR

REPORT UPDATES INFORMATION ON GRAPHITE-MODERATED, WATER-COOLED, 30-KW REACTOR (CRITICAL IN 1957), A DESCENDANT OF KAPL TTR. 16 FUEL ASSEMBLIES (EACH BEING 40 FUEL DISCS, SKEWERED ON A SHAFT) ARE ASSEMBLED AROUND A CYLINDER OF GRAPHITE WITH A CENTRAL SAMPLE HOLE. HORIZONTAL SPRING-ASSISTED SCRAM RODS. MCA DOES NOT EXCEED SITE CRITERIA. VARIOUS LOSS OF FLOW AND REACTIVITY ACCIDENTS ARE ANALYZED.

*SAFETY ANALYSIS REPORT, GENERAL + ACCIDENT ANALYSIS + ACCIDENT, CONTROL ROD WITHDRAWAL + ACCIDENT, LOSS OF COOLANT + ACCIDENT, LOSS OF FLOW + ACCIDENT, MAXIMUM CREDIBLE (MCA) + ADMINISTRATIVE CONTROLS AND PRACTICES + CONTAINMENT PENETRATION + CONTROL ROD + DOSE + FIRE + FUEL HANDLING + GE-NTR (GE NUCLEAR TEST REACTOR) + HEAT TRANSFER + INHALATION + INSTRUMENTATION, NUCLEAR + MONITOR, RADIATION, GENERAL PRACTICE + REACTOR, RESEARCH + SAFETY ANALYSIS REPORT, METEOROLOGY + SEISMOLOGY + SOURCE, NEUTRON + VENTILATION SYSTEM + WASTE DISPOSAL, GENERAL

18-05804 WARD DL + PEARCE DG + MERRETT DJ
LIQUID-HYDROGEN EXPLOSIONS IN CONTAINMENT VESSELS. INTERIM REPORT
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-R-4312 +. 18 PAGES, 8 FIGURES, 3 TABLES, JULY 1963, ADVANCES IN CRYOGENIC ENG., 9, PP. 390-400 (1964)

THIS INTERIM REPORT DESCRIBES WORK CARRIED OUT TO MEASURE PRESSURE-TIME RELATIONSHIPS OF A MIXTURE OF LIQUID HYDROGEN AND SOLID AIR EXPLODED WITHIN A LARGE, REINFORCED, VACUUM VESSEL. UP TO 1300 CC OF LIQUID HYDROGEN WERE USED WITH 10 AND 100 PERCENT OF A STOICHIOMETRIC PROPORTION OF SOLID AIR. SINCE THE WORK IS STILL PROCEEDING, NO FINAL CONCLUSIONS HAVE BEEN DRAWN, ALTHOUGH PRELIMINARY RESULTS HAVE BEEN ASSESSED. A FURTHER REPORT WILL BE ISSUED AT THE END OF THE PROGRAM.

*CONTAINMENT STRUCTURE + *EXPLOSION + *HYDROGEN + *PRESSURE, INTERNAL + *TESTING + AIR

18-07725 SCHMITT RC + TOOLE CR
EXPERIMENTAL INVESTIGATION OF DEPARTURE FROM NUCLEATE BOILING
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
5 PAGES, 4 FIGURES, AMERICAN NUCLEAR SOCIETY CONFERENCE ON REACTOR OPERATING EXPERIENCE, JACKSON LAKE LODGE, WYOMING, JULY 28-29, 1965, ANS TRANSACTIONS, SUPPLEMENT TO VOLUME 8, PAGE 24

SPERT II WAS OPERATED TO ACHIEVE DNB (FOLLOWING A POWER BURST IN QUASI EQUILIBRIUM OPERATION. PARTIAL MELTING OCCURRED AT THE PERIPHERY OF THE CORE. SEVERAL WELL-KNOWN CORRELATIONS PREDICTED DNB HEAT FLUXES 2 OR 3 TIMES THE OBSERVED HEAT FLUX. EVIDENCE EXISTS THAT (A) DNB HEAT FLUXES MAY BE EXCEEDED IN POWER BURSTS WITHOUT MELTING, (B) DNB HEAT FLUXES USING AVERAGE CORE HYDRODYNAMICS HAVE BEEN INADEQUATE BECAUSE MODELS DO NOT ACCOUNT FOR INDIVIDUAL CHANNEL FLOW INSTABILITIES IN LOCAL BOILING.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + *FUEL MELTDOWN + *HEAT TRANSFER, BOILING + *OPERATING EXPERIENCE + IN PILE EXPERIMENT + REACTOR, TEST + SPERT 2 (SPECIAL POWER EXCURSION REACTOR TEST)

18-08665 PURPOSE, ORGANIZATION, AND CONTENTS OF HAZARDS SUMMARY REPORTS FOR POWER REACTORS
DIVISION OF LICENSING AND REGULATION
114 PAGES, AEC LICENSING GUIDE NO. 13, AUGUST 28, 1962, GPO \$0.45 CY

THIS DRAFT PROVIDES A LIST OF CHAPTERS AND DETAILED SUBHEADINGS WITH DISCUSSION OF WHAT IS TO BE EXPECTED IN EACH.

*REACTOR, POWER + *REGULATION, AEC + *SAFETY ANALYSIS REPORT, GENERAL + SAFETY REVIEW (OPERATIONS, EXPERIMENTS)

18-10318 HAEFELE W + SMIDT D + WIRTZ K
THE KARLSRUHE REFERENCE DESIGN OF A 1000 MWE SODIUM COOLED FAST BREEDER REACTOR
KERNFORSCHUNGSZENTRUM, KARLSRUHE, WEST GERMANY
KFK-369 +. 51 PAGES, OCTOBER 1965, DEP.MN

THE KARLSRUHE FAST BREEDER PROJECT EXTENDS TO 1967 AND IS AIMED TOWARDS THE INVESTIGATION OF THE FEASIBILITY OF 1000 MWE FAST REACTORS. THE PRINCIPAL COOLANT BEING CONSIDERED IS SODIUM. THE PURPOSE OF THE PRESENT KARLSRUHE STUDY CALLED NA-1, OF A 1000 MWE SODIUM COOLED BREEDER REACTOR WAS TO SERVE AS A REFERENCE DESIGN. ON THE BASIS OF THIS REFERENCE DESIGN THE FREQUENTLY DISCUSSED COMPETITION BETWEEN BREEDING, SAFETY AND ECONOMY IS BEING EXPLORED IN A FASHION WHICH IS AS QUANTITATIVE AS POSSIBLE. IT IS IN PARTICULAR THE IMPACT OF SAFETY ON BREEDING AND ECONOMY WHICH IS BEING STUDIED. IT IS THE PURPOSE OF THIS PAPER TO DESCRIBE

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-10318 *CONTINUED*

THE PRESENT NA-1 DESIGN AND ITS SAFETY FEATURES WITH RESPECT TO INCIDENTS, THE MAXIMUM HYPOTHETICAL ACCIDENT (MHA) AND THE DESIGN BASIS ACCIDENT (DBA), IN VIEW OF THE FORTHCOMING NA-2 STUDY.

*DESIGN STUDY + *GERMANY + *REACTOR, BREEDER + *REACTOR, FAST + *REACTOR, LIQUID METAL COOLED

18-10355 BASSO G + HERBERT JE + SWANSON NJ
DESIGN AND PERFORMANCE OF ORGANIC COOLED REACTORS
COMITATO NAZIONALE PER L ENERGIA NUCLEARE, ROME, ITALY
RT/ING(65)10 +. 71 PAGES, SEPTEMBER 1965, DEP.MN

SOME DISTINGUISHING ECONOMIC FEATURES OF PLANTS POWERED BY ORGANIC REACTORS AS COMPARED TO LIGHT WATER REACTORS, ARE LESS-EXPENSIVE STRUCTURAL MATERIALS MAY BE USED FOR THE ORGANIC SYSTEMS (E.G., CARBON STEEL INSTEAD OF STAINLESS), LOWER OPERATIONAL PRESSURES MAY BE USED FOR THE PRIMARY LOOPS, LIGHTER GAGE MATERIAL MAY BE USED, HIGHER TEMPERATURE STEAM, WITH A CERTAIN DEGREE OF SUPERHEATING, MAY BE PRODUCED, LOW HEAT-EXCHANGE COEFFICIENTS WITH LOW CORE-POWER DENSITIES LEAD TO LARGER SIZES OF THE PRIMARY-SYSTEM COMPONENTS, INSTRUMENTATION IS MORE COMPLEX AND THEREFORE MORE EXPENSIVE, AUXILIARY SYSTEMS ARE MORE EXPENSIVE (PURIFICATION, DEGASSING, FILTRATION, ETC.). THE FUEL CYCLE COSTS ARE ESSENTIALLY THE SAME. OPERATIONAL AND MAINTENANCE COSTS FOR ORGANIC REACTORS ARE HIGHER. THIS PAPER IS AN ATTEMPT TO DESCRIBE THE PRESENT STATUS OF ORGANIC-REACTOR TECHNOLOGY AND TO SHOW ITS POTENTIAL.

*DESIGN STUDY + *ECONOMIC STUDY + *REACTOR, ORGANIC COOLED + CONTROL, GENERAL + COOLANT CHEMISTRY + INSTRUMENTATION, GENERAL + MAINTENANCE AND REPAIR + REACTOR KINETICS

18-10356 SAUVAGE M + GUMUCHIAN M
1000-MWE REACTOR DESIGN STUDY OF A HANDLING CELL
COMMISSARIAT A L ENERGIE ATOMIQUE, CADARACHE, FRANCE, CENTRE D ETUDES NUCLEAIRES
ORNL-TR-988 + PNR/SEPR/65,008 +. 41 PAGES, FEBRUARY 18, 1965, JCL, \$4.60 FS, \$1.43 MF

THIS REPORT REPRESENTS A SUPPLEMENTARY CHAPTER TO THE 1000 MW REACTOR DESIGN AS PRESENTED IN GENEVA (CEA REPORT 2554). IT DESCRIBES A DESIGN MAKING USE OF A CELL INSTEAD OF ROTATING PLUGS TO CARRY OUT HANDLING. THE PURPOSE OF A STUDY OF THIS VARIANT IS TO PROPOSE A REACTOR DESIGN TO SERVE AS A BASIS FOR A MORE-DETAILED STUDY WITHIN THE SCOPE OF A DESIGN PROJECT. THUS, THE PROBLEMS POSED BY THE REACTOR BLOCK, STORAGE, HANDLING AND THE HANDLING CELL, HAVE BEEN EXAMINED, WITH THE STRESS PLACED ON THE LAST TWO POINTS, WHICH PRESENT THE GREATEST DIFFICULTIES. MUCH REMAINS UNKNOWN ABOUT THE CONTAMINATION OF THIS CELL BY SODIUM AT THE TIME OF HANDLING. METHODS ARE PROPOSED TO LIMIT THIS CONTAMINATION TO THE MAXIMUM. A PROGRAM FOR STUDY AND TESTS HAS BEEN SUGGESTED WHICH SHOULD PERMIT AN EVALUATION OF THE EFFICIENCY OF THE PLANNED SYSTEMS. A 1000-MW(E) REACTOR IN WHICH HANDLING TAKES PLACE WITHIN THE PROTECTION OF A CELL, CALLED THE HANDLING CELL, ABOVE THE REACTOR IS INVESTIGATED. THIS STUDY CONSTITUTES A VARIANT OF THAT CONDUCTED AT THE TIME OF THE 1964 GENEVA CONFERENCE, WHICH DEALT WITH A 1000-MW(E) REACTOR WITH HANDLING DONE THROUGH ROTATING PLUGS (CEA REPORT 2554). THE PRINCIPAL ADVANTAGES ARE THE FOLLOWING - (A) HANDLING TAKES PLACE WITHIN SIGHT, BY MEANS OF A SIMPLIFIED AND LIGHTER MACHINE. THIS VISIBILITY IN CERTAIN CASES IS DIRECT THROUGH PORT HOLES PROVIDED IN THE CELL, OR INDIRECT BY MEANS OF PERISCOPES OR TELEVISION CAMERAS. (B) SINCE THIS CELL IS LEAK-PROOF AND FILLED WITH ARGON, THE PROBLEMS OF TIGHTNESS BETWEEN REACTOR AND CELL ARE CONSIDERABLY SIMPLIFIED. (C) THIS CELL ALSO PERMITS HANDLING OF CONTAMINATED EQUIPMENT WITHOUT REQUIRING THE USE OF AUXILIARY, HIGHLY SHIELDED PROTECTIVE EQUIPMENT, WHICH WOULD BE VERY HEAVY. (D) FINALLY, THE CELL PLAYS THE ROLE OF A TIGHT CHAMBER WHICH CAN RETAIN ACTIVE PRODUCTS, ITS STRUCTURE PERMITS IT TO OFFER CONTAINMENT OF A REACTOR EXPLOSION.

*DESIGN CRITERIA + *HOT CELL + *REACTOR, FAST + CONTAINMENT, GENERAL + MAINTENANCE AND REPAIR + REACTOR, LIQUID METAL COOLED

18-10476 NICKEL HC
ANSWERS TO QUESTIONS ABOUT LACBWR RECEIVED FROM THE DIVISION OF REACTOR LICENSING
ALLIS-CHALMERS, BETHESDA, MARYLAND
ACNP-66548 +. 6 PAGES, 2 FIGURES, JUNE 1966, AMENDMENT NO. 26, DOCKET 115-5, PP. V-2-1 THROUGH V-2-4, PDR

ANSWER V-2 LISTS THE ADDITIONAL VALVES AND CONTROLS NECESSARY FOR REDUNDANCY. OF EACH PAIR OF VALVES, ONE IS IN A MAKE-UP CIRCUIT AND ONE IS IN A DROPOUT CIRCUIT ON HIGH STEAM PRESSURE.

*EMERGENCY COOLING CONSIDERATIONS + *REDUNDANCE + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + *VALVE + LACROSSE + REACTOR, BOILING WATER

18-10478 NICKEL HC
ANSWERS TO QUESTIONS ABOUT LACBWR RECEIVED FROM THE DIVISION OF REACTOR LICENSING
ALLIS-CHALMERS, BETHESDA, MARYLAND
ACNP-66548 +. 2 PAGES, JUNE 1966, AMENDMENT NO. 26, DOCKET 115-5, PP. IV-10-1 THROUGH IV-10-2, PDR

ANSWER IV-10-1 DESCRIBES THE FOUR MEMBER COMPOSITION AND FUNCTION OF THE PLANT SAFETY COMMITTEE WHICH WILL FUNCTION UNTIL DAIRYLAND POWER COOPERATIVE TAKES OVER FROM ALLIS-CHALMERS. MEMBERS ARE EITHER ASSIGNED AT (OR AVAILABLE AT) LA CROSSE.

*SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ADMINISTRATIVE CONTROLS AND PRACTICES + LACROSSE + REACTOR, BOILING WATER

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-10516 RESEARCH AND TEACHING WITH UNIVERSITY REACTORS. A EUROPEAN SURVEY
10 PAGES, FIGURES, EURONUCLEAR, 3(4), PP. 173-182 (APRIL 1966)

A BRIEF DESCRIPTION OF REACTORS AND RESEARCH IN AUSTRIA, BELGIUM, GERMANY, FRANCE, ITALY, NETHERLANDS, SPAIN, SWITZERLAND, AND UNITED KINGDOM.

*IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + *REACTOR DESCRIPTION + *REACTOR, RESEARCH

18-11406 JAERSCHKY R + TAURIT R
KRB GUNDREMMINGEN NUCLEAR POWER STATION
AEG, FRANKFURT/MAIN
16 PAGES, 15 FIGURES, EURONUCLEAR 3(5) PAGES 211-226 (MAY 1966)

THE GUNDREMMINGEN NUCLEAR POWER STATION (GERMANY) IS A BWR OF 237 MW(E) NET, 801 MW(T), FUELED WITH ZIRCALOY-CLAD SINTERED UO₂ POWER, AVERAGE ENRICHMENT 2.2 PERCENT. THE REACTOR HAS A DEMINERALIZER SYSTEM, A SHUTDOWN COOLING SYSTEM, CORE SPRAY, EMERGENCY CONDENSER, 14 PERCENT SODIUM PERBORATE LIQUID POISON, AND CONTAINMENT SPRAY.

*DESIGN STUDY + *GERMANY + *REACTOR DESCRIPTION + *REACTOR, BOILING WATER +
*SAFETY ANALYSIS REPORT, GENERAL + CONTAINMENT SPRAY + CORE SPRAY + EMERGENCY COOLING CONSIDERATIONS + POISON, SOLUBLE

18-11513 GROVER GM
PANCAKE REACTOR
UNITED STATES ATOMIC ENERGY COMMISSION
US PATENT 3,243,513 +. 6 PAGES, 4 FIGURES, MARCH 29, 1966, PATENT (U.S.)

SERIES OF FUEL PLATES (EMITTERS) AND HEAT PIPES (COLLECTORS) COMPRISING A REACTOR FOR DIRECT CONVERSION OF HEAT TO ELECTRICITY. CAPILLARY ACTION IN THE HEAT PIPE YIELDS VERY HIGH HEAT TRANSFER WITH MINIMAL TEMPERATURE DROP.

*DIRECT ENERGY CONVERSION DEVICES + HEAT TRANSFER + REACTOR, SPACE

18-11852 SAFETY EVALUATION BY DRL OF GETR
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
4 PAGES, AUGUST 30, 1966, DOCKET NO. 50-70, PAGES 1-4, PDR

ON PAGES 1-4, THE OPERATING HISTORY IS REVIEWED. SIGNIFICANT DIFFICULTIES AND MODIFICATIONS INCLUDE (1) CONTROL-ROD-DROP FAILURES AND MODIFICATIONS TO ASSEMBLIES, (2) TWO OPERATOR ERRORS RESULTING IN ERRONEOUS INDICATION OF A LATCHED ROD, (3) RUPTURE-DIAPHRAM FAILURES ON PRIMARY PIPING (4) CRACKING OF A SEAM ON THE PRIMARY PIPING DUE TO INADEQUATE DESIGN OF A Y JUNCTION, (5) SPURIOUS SCRAMS DUE TO BACKGROUND HYDRAULIC NOISE, (6) EMERGENCY-POWER DIESEL-GENERATOR FAILURE DUE TO FAULTY GOVERNOR AND FUEL DEPLETION (7) ALUMINUM-TUBE FAILURES IN PRIMARY AND POOL HEAT EXCHANGERS REQUIRING STEEL-TUBE REPLACEMENTS, (8) CONTAINMENT BREACH (BOTH AIRLOCK DOORS OPENED) AS A RESULT OF INADEQUATE MAINTENANCE, (9) CONTAINMENT ISOLATION RELIABILITY - 350 TEST AND 70 REQUIRED ISOLATIONS OCCURRED WITHOUT A FAILURE.

*OPERATING EXPERIENCE + ACCIDENT, LOSS OF COOLANT + CONTAINMENT INTEGRITY + FAILURE, DESIGN ERROR + FAILURE, EQUIPMENT + FAILURE, MAINTENANCE ERROR + FAILURE, OPERATOR ERROR + FAILURE, SCRAM MECHANISM + GETR (GENERAL ELECTRIC TEST REACTOR) + REACTOR, TEST + REVIEW + SAFETY ANALYSIS REPORT, GENERAL

18-11853 SAFETY EVALUATION BY DRL OF GETR
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
1 PAGE, DOCKET NO. 50-70, PAGE 2, AUGUST 30, 1966, PDR

PAGE 2 - AS A RESULT OF FIVE ISOLATED INSTANCES (THROUGH 1962) IN WHICH SINGLE CONTROL RODS FAILED TO SCRAM FULLY WHEN REQUIRED, THE FOLLOWING MODIFICATIONS WERE MADE - (1) THE RODS WERE MODIFIED TO USE SANDWICH-TYPE CONSTRUCTION FROM THE BORON STAINLESS STEEL, (2) BOTH LATCHES BETWEEN THE FUEL FOLLOWER AND POISON SECTIONS, AND (3) THE ROD ROLLERS WERE REPLACED WITH ONES SIMILAR TO THOSE USED AT THE ETR. SINCE THESE CHANGES THERE HAVE BEEN TWO FAILURES TO SCRAM, ONCE DUE TO PRESENCE OF METAL CHIPS AND ONCE DUE TO THE PRESENCE OF A ONE-INCH LONG SCREW IN THE DRIVE ASSEMBLY. THERE WAS ONE INSTANCE IN WHICH THE ROD DROP WAS DELAYED DUE TO CORROSION OF THE ACTUATING ROD WHICH HAD NOT BEEN CHROMIUM PLATED.

*FAILURE, SCRAM MECHANISM + *MODIFICATION, SYSTEM OR EQUIPMENT + CONTROL ROD + GETR (GENERAL ELECTRIC TEST REACTOR) + OPERATING EXPERIENCE + REACTOR, TEST + REVIEW + SAFETY ANALYSIS REPORT, GENERAL

18-11855 SAFETY EVALUATION BY DRL OF GETR
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
26 PAGES, DOCKET NO. 50-70, AUGUST 30, 1966, PDR

THE FAVORABLE EVALUATION WAS MADE AFTER A REQUEST FOR POWER UPGRATING FROM 33 MW(T) TO 50. MODIFICATIONS REQUIRED FOR SAFETY INCLUDED PROVISIONS FOR EMERGENCY COOLANT, A SECONDARY SHUTDOWN SYSTEM, REDUNDANT CONTAINMENT-ISOLATION VALVES AND IMPROVED TESTING, AND IMPROVED SAFETY INSTRUMENTATION. LIQUID METALS WILL BE LIMITED TO 1 KG PER EXPERIMENT, BASED ON TEST RESULTS WHICH SHOW THAT 1 KG OF NAK INJECTED INTO A WATER-FILLED CORE MOCKUP WOULD NOT RESULT IN SERIOUS DAMAGE. THE MAXIMUM REACTIVITY OF AN EXPERIMENT WILL BE LIMITED TO 1.4 PERCENT, FOR WHICH RESULTS OF AN ACCIDENT ARE LESS THAN THE MAXIMUM CREDIBLE. FOR THE MAXIMUM CREDIBLE ACCIDENT, A REDUCTION FACTOR OF 3 IS ALLOWED FOR IODINE DEPOSITION AT THE SITE

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SAFETY ANALYSIS AND DESIGN REPORTS

18-11855 *CONTINUED*
BOUNDARY SINCE IT HAS BEEN MEASURED MANY TIMES.

*REVIEW + *SAFETY ANALYSIS REPORT, GENERAL + ACCIDENT, LOSS OF COOLANT +
GETR (GENERAL ELECTRIC TEST REACTOR) + METAL WATER REACTION + METAL, LIQUID +
NAK (SODIUM POTASSIUM ALLOY) + OPERATING EXPERIENCE + POWER UPGRATING + REACTOR, TEST +
SHUTDOWN SYSTEM, SECONDARY

18-11912 ADNAMS DJ + SALT KJ + WINTLE CA
METHODS OF DETECTING THE ONSET OF BURN-OUT IN ROD CLUSTERS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH
AEEW-R-432 +. 15 PAGES, DECEMBER 1965, HMSO

WITH THE ADVENT OF CONDUCTING SPACERS FOR ROD CLUSTERS, IT BECAME NECESSARY TO REVIEW OTHER POSSIBLE METHODS OF DETECTING THE ONSET OF BURN-OUT. UNDER THESE CONDITIONS ANY INSTRUMENTATION FOR PROTECTION AGAINST BURN-OUT MUST BE PLACED INSIDE THE RODS AND MUST BE INSERTED BEFORE THE END CONDUCTORS ARE FIXED IN POSITION, WITH THE LEADS BROUGHT OUT THROUGH A SMALL DIAMETER HOLE IN THE CONDUCTOR. THIS REPORT DESCRIBES EXPERIMENTAL COMPARISONS BETWEEN A VARIETY OF DESIGNS OF DETECTING ELEMENTS - THERMOCOUPLES, RESISTANCE ELEMENTS, COMPENSATED RESISTANCE ELEMENTS, RADIANT HEAT DETECTORS, AND THERMOPILES.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + BURNOUT HEAT FLUX + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + INSTRUMENTATION, GENERAL + INSTRUMENTATION, TEMPERATURE

18-11932 CARTWRIGHT H
THE STEAM-GENERATING HEAVY-WATER REACTOR
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY
TRG-1246(R) +. 9 PAGES, 5 FIGURES, 1966, UKAEA

THE MAIN FEATURES OF THE STEAM-GENERATING HEAVY-WATER REACTOR (FUELED WITH NATURAL URANIUM) ARE DESCRIBED, PARTICULARLY THOSE LEADING TO LOW COST WITH A HIGH DEGREE OF SAFETY. THE 100-MW(E) PROTOTYPE BEING BUILT AT WINFRITH AND EXTENSIVE DESIGN STUDIES HAVE DEMONSTRATED THE TECHNICAL AND ECONOMIC ATTRACTIVENESS. ITS DEVELOPMENT POTENTIAL IS GOOD, AND IT SEEMS LIKELY TO BE A COMPETITOR OF OTHER REACTOR SYSTEMS AT ALL SIZES. DESIGNS ARE AVAILABLE FOR IMMEDIATE APPLICATION FROM 100 MW(E), TO 300 MW(E), AND LARGER SIZES CAN BE DEVELOPED WHICH MAY WELL COMPARE FAVOURABLY WITH PRESENT US AND UK DESIGNS BASED ON EITHER WATER OR GAS COOLANT.

*REACTOR DESCRIPTION + REACTOR, BOILING WATER + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, SUPERHEAT + UNITED KINGDOM

18-11933 HOSKINS RE
CORE DESIGN AND CONTAINMENT COST STUDY FOR GAS COOLED FAST REACTOR STUDIES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1194 +. 124 PAGES, 33 FIGURES, 16 TABLES, SEPTEMBER 1966, CFSTI \$4.00 CY, \$0.75 MN

THIS REPORT CONTAINS SOME OF THE SUPPORTING ANALYTICAL WORK PERFORMED AT OAK RIDGE NATIONAL LABORATORY IN 1963 AND 1964 TO DEVELOP CONCEPTS OF GAS-COOLED FAST-BREEDER REACTORS. HEAT-TRANSFER CALCULATIONS ARE GIVEN FOR THE VARIOUS CORE CONFIGURATIONS CONSIDERED, AND THESE CONFIGURATIONS ARE COMPARED ON THE BASIS OF SPECIFIC-POWER AND PUMPING-POWER REQUIREMENTS. SOME ALTERNATIVE FUEL DESIGNS ARE DISCUSSED, ONE OF WHICH IS THE CONCEPT OF COOLANT CIRCULATING INSIDE TUBES THAT ARE SURROUNDED BY FUEL. THERMAL BOWING AND FLOW-INDUCED VIBRATIONS IN FUEL PINS ARE ANALYZED. OPTIMIZATION STUDIES OF SECONDARY CONTAINMENT ARE ALSO INCLUDED.

*DESIGN STUDY + *ECONOMIC STUDY + *REACTOR, FAST + *REACTOR, GAS COOLED + CONTAINMENT ANALYSIS + ORNL (OAK RIDGE NATIONAL LABORATORY)

18-12007 ASTLEY ER + HALAS DR + FINCH LM + HOFMANN PL + LITTLE WM
SAFETY AND NUCLEAR CONSIDERATIONS IN THE DESIGN OF THE FTR
BATTTELLE-NORTHWEST, RICHLAND
ANL-7120 +. 12 PAGES, 13 FIGURES, 4 TABLES, 4 REFERENCES, PAGES 141-152 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS, AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.15 MN.

NUCLEAR AND SAFETY FEATURES OF THE CONCEPTUAL DESIGN OF THE FAST TEST REACTOR (FTR) ARE DISCUSSED. IT WILL BE SODIUM COOLED AND PLUTONIUM-OXIDE--STAINLESS-STEEL FUELED. OPERATION AT 300 MW(T) SHOULD PRODUCE A PEAK FLUX OF 10 TO THE 16 AT THE CORE CENTER. IN-CORE CONTROL WITH POISON RODS HAS BEEN SELECTED.

*REACTOR DESCRIPTION + DESIGN STUDY + FRCTF (FAST REACTOR CORE TEST FACILITY) + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, TEST

18-12008 LINK LE + AYER JE + HUB KA + MECHAM WJ + TRICE WG + WEILLS JT
A LARGE METAL-FUELED FAST REACTOR STUDY. PART II. CORE DESIGN AND FUEL CYCLE
ARGONNE NATIONAL LABORATORY, ARGONNE
ANL-7120 +. 10 PAGES, 8 FIGURES, 4 TABLES, 12 REFERENCES, PAGES 94-103 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS, AND CORE DESIGN IN LARGE TEST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

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SAFETY ANALYSIS AND DESIGN REPORTS

18-12008 *CONTINUED*

THE CORE DESIGN FOR A 1000-MW(E) FAST-BREEDER REACTOR IS DISCUSSED (SEE ALSO ANL-7120, PG 85). THE PERIOD OF THE REFUELING CYCLE FOR THIS REACTOR IS 206 DAYS, WITH A PLANT LOAD FACTOR OF 80 PERCENT AND 6 PERCENT AVERAGE BURNUP. RECENT IRRADIATION DATA INDICATES 7 PERCENT AVERAGE BURNUP IS POSSIBLE. DESCRIBES THE FUEL CYCLE FOR FISSION-PRODUCT REMOVAL AND RESTORATION OF THE IRRADIATED FUEL TO A FORM SUITABLE FOR RETURN TO THE REACTOR.

*RADIOCHEMICAL PROCESSING + *REACTOR DESCRIPTION + DESIGN STUDY + FUEL BURNUP + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, POWER

18-12009 BUTLER DK + LOEWENSTEIN WB + MENEGHETTI D + PHILLIPS KE

A LARGE METAL-FUELED FAST REACTOR STUDY. PART 1. NEUTRONICS CALCULATIONS FOR A 1,000-MWE

PLUTONIUM-URANIUM, METAL-FUELED, FAST BREEDER REACTOR

ARGONNE NATIONAL LABORATORY, ARGONNE

ANL-7120 +. 9 PAGES, 3 FIGURES, 11 TABLES, 5 REFERENCES, PAGES 85-93 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY, FUELS, AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

CALCULATED RESULTS OF THE NUCLEAR AND REACTIVITY PROPERTIES OF THE CONCEPTUAL REACTOR ARE GIVEN. THE GENERAL DESIGN IS THAT OF A RING OF SIX CYLINDRICAL CORE MODULES SEPARATED BY AND SURROUNDED BY A FERTILE BLANKET. A BERYLLIUM REGION WAS INSERTED AT THE CORE-BLANKET INTERFACES OF THE MODULES. TWO-ZONE ENRICHMENT IS USED. THE EFFECTS OF THE BE REGIONS AND FERTILE-BLANKET THICKNESS ARE DISCUSSED. REACTIVITY COUPLING BETWEEN MODULES IS SMALL. RESULTS OF THERMAL EXPANSION ON REACTIVITY COEFFICIENTS ARE SUMMARIZED. THE DYNAMIC BEHAVIOR OF THE MODULES IS DISCUSSED FOR BOTH RAMP INSERTIONS OF REACTIVITY AND LOSS OF COOLANT FLOW. RESULTS INDICATE FEEDBACK FROM STAINLESS-STEEL EXPANSION IS GREATER THAN THE DOPPLER EFFECT. ALL LOSS-OF-COOLANT-FLOW STUDIES INDICATED INITIAL BOILING NEAR THE AXIAL CORE BOUNDARY, RESULTING IN NEGATIVE VOID REACTIVITY (SEE ALSO ANL-7120, PAGE 94).

*DESIGN STUDY + ACCIDENT, LOSS OF COOLANT + COUPLED CORES + DOPPLER EFFECT + EXPANSION REACTIVITY EFFECT + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, POWER + VOID COEFFICIENT

18-12010 FARMER WS + STRAWSON DG

A RE-EXAMINATION OF DESIGN FACTORS FOR A 1000-MWE FAST BREEDER REACTOR

ALLIS-CHALMERS MFG., CO., BETHESDA

ANL-7120 +. 6 PAGES, 1 FIGURE, 2 TABLES, 9 REFERENCES, PAGES 124-29 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS, AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

FOUR DIFFERENT DESIGNS OF A LARGE FAST-BREEDER REACTOR ARE REVIEWED. THREE CORE GEOMETRIES WERE CONSIDERED - AN ANNULAR, TWO PANCAKED, AND ONE MODULAR. NO ONE GEOMETRY APPEARED TO BE BEST. EACH DESIGN RESULTED IN A BREEDING RATIO GREATER THAN 1.2. FUEL-CYCLE COSTS RANGED FROM A MINIMUM OF 0.43 MILL PER KWH TO A MAXIMUM OF 0.85. THE MAJOR SAFETY CONSIDERATION IN THESE DESIGNS WAS THE REACTIVITY EFFECT OF VOIDS IN THE SODIUM COOLANT. IT IS CONCLUDED THAT THE HIGH PLUTONIUM INVENTORY AND LARGE OUTSIDE DIAMETER OF THE ANNULAR CORE IS NOT A DISADVANTAGE.

*REACTOR DESCRIPTION + DESIGN STUDY + ECONOMICS + PLUTONIUM + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, POWER

18-12011 HAFELE W + SMIDT D + WIRTZ K

THE KARLSRUHE REFERENCE DESIGN OF A 1000 MWE SODIUM-COOLED FAST BREEDER REACTOR

KERNFORSCHUNGSZENTRUM KARLSRUHE, GERMANY

ANL-7120 + 23 PAGES, 8 FIGURES, 5 TABLES, PAGES 162-84 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1966, CFSTI \$9.25 CY, \$3.75 MN.

DESCRIBES THE DESIGN AND SAFETY FEATURES OF A REACTOR CONCEPT. THE FUEL IS UO₂-PUO₂, CLAD WITH INCOLOY 800. THE EXPECTED FUEL-CYCLE COST IS 0.7 MILL/KWH. THE CAPITAL COSTS ARE 100 DOLLARS/KWH, THE BREEDING RATIO 1.4, AND THE DOUBLING TIME 7 YEARS. AN ANALYSIS OF POSSIBLE ACCIDENTS IS GIVEN IN WHICH THE FOLLOWING ARE CONSIDERED - (1) LOSS OF COOLANT FLOW, (2) REACTIVITY RAMP INSERTIONS, (3) MAJOR BREAKS IN PIPES CONTAINING THE COOLANT AND (4) PLUGGING OF THE CENTRAL SUBASSEMBLY.

*REACTOR DESCRIPTION + ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + DESIGN STUDY + GERMANY + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, POWER

18-12012 COHEN KP + O NEIL GL

SAFETY AND ECONOMIC CHARACTERISTICS OF A 1000-MWE FAST SODIUM-COOLED REACTOR DESIGN

GENERAL ELECTRIC, SAN JOSE

ANL-7120 +. 20 PAGES, 12 FIGURES, 19 TABLES, 6 REFERENCES, PAGES 185-204 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS, AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

A DESIGN FOR A 1000-MWE FAST BREEDER IS PRESENTED. EMPHASIS HAS BEEN PLACED ON SAFETY AND ASSURANCE OF TECHNICAL FEASIBILITY. ACCIDENT ANALYSES HAVE BEEN PERFORMED IN SUFFICIENT DETAIL TO DETERMINE THE CHARACTERISTIC BEHAVIOR OF THE PLANT IN COMMON ACCIDENT SITUATIONS AND TO DEMONSTRATE THAT THE DESIGN SATISFIES THE SAFETY CRITERIA. FUEL COSTS HAVE BEEN CALCULATED. CALCULATIONS OF CAPITAL AND OPERATING COSTS HAVE NOT BEEN PERFORMED, EXCEPT INsofar AS PREVIOUS ESTIMATES FOR SIMILAR DESIGNS MAY BE APPLICABLE. SOME CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF UNCERTAINTIES IN THE PHYSICS DATA AND FUEL PERFORMANCE ON ECONOMICS.

*REACTOR DESCRIPTION + ACCIDENT ANALYSIS + DESIGN STUDY + ECONOMICS + REACTOR, FAST +

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SAFETY ANALYSIS AND DESIGN REPORTS

18-12012 *CONTINUED*
REACTOR, LIQUID METAL COOLED + REACTOR, POWER

18-12013 WRIGHT JH + GUNSON WE + HECK FM + DALEAS RS
CONCEPTUAL DESIGN AND PRELIMINARY ACCIDENT ANALYSIS OF A SODIUM-COOLED, CARBIDE-FUELED, LARGE MODULAR FAST REACTOR
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH
ANL-7120 +. 25 PAGES, 14 FIGURES, TABLES, PAGES 205-29 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS, AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

PRESENTS THE CONCEPTUAL DESIGN AND DISCUSSES THE ADVANTAGES OF THE MODULAR CONCEPT, POTENTIAL ACCIDENTS ARE REVIEWED (PIPE RUPTURE, LOSS OF PUMP POWER, FLOW BLOCKAGE, MELTDOWN, EXPULSION OF A CONTROL ROD, AND FUEL SLUMPING). GIVES A BRIEF SUMMARY OF THE FUEL-CYCLE-COST ANALYSES.

*DESIGN STUDY + *REACTOR DESCRIPTION + ACCIDENT ANALYSIS + REACTOR, FAST + REACTOR, LIQUID METAL COOLED

18-12014 FORTESCUS P + SHANSTROM R + STEIN JM + BAXTER A + FENECH H
SAFETY CHARACTERISTICS OF LARGE GAS-COOLED FAST POWER REACTORS
GENERAL ATOMIC, SAN DIEGO
ANL-7120 +. 30 PAGES, 33 FIGURES, 2 TABLES, 9 REFERENCES, PAGES 230-260 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS, AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

THE MAJOR FAVORABLE CLAIM FOR USE OF GAS AS COOLANT IS ITS SMALL INTERACTION WITH THE NUCLEAR PERFORMANCE. OTHER POINTS FOR GAS COOLING INCLUDE - VOIDS AT THE CENTER ARE IMPOSSIBLE, TOTAL LOSS OF COOLANT RESULTS IN LESS THAN A DOLLAR INCREASE IN REACTIVITY, AND GASES TAKE MORE TIME TO BE EXPELLED FROM A CORE THAN LIQUID BECAUSE THE ENTIRE PRIMARY SYSTEM VOLUME IS INVOLVED. THE MAIN WORRY WITH GAS COOLING IS OVER THE EFFECT OF A SUBSTANTIAL LOSS IN ITS HEAT-TRANSFER CAPABILITIES BY A LOSS OF PRESSURE. THE REFERENCE DESIGN OF THE REACTOR IS GIVEN, FOLLOWED BY AN ANALYSIS OF SELECTED ACCIDENTS, WHICH IS CONCERNED WITH THE RATE OF COOLANT PRESSURE LOSS WITHOUT CORE DAMAGE. THE INHERENT STABILITY OF THE REACTOR IS BRIEFLY CONSIDERED, AND THE MAXIMUM ENERGY RELEASE FROM SERIOUS ACCIDENTS IS REVIEWED.

*REACTOR DESCRIPTION + *REACTOR, GAS COOLED + ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + DESIGN STUDY + REACTOR, FAST + REACTOR, POWER + SAFETY PRINCIPLES AND PHILOSOPHY

18-12015 HANNUM WH
NUCLEAR DESIGN OF MPBE
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS
ANL-7120 +. 7 PAGES, 3 FIGURES, 6 TABLES, 8 REFERENCES, PAGES 759-765 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

DESCRIBES THE DESIGN OF THE MOLTEN PLUTONIUM BURNUP EXPERIMENT TO BE USED FOR DETERMINING THE PROPERTIES OF A MOLTEN PLUTONIUM FUEL DURING AND AFTER HIGH BURNUP. THE DESIGN CRITERIA ARE DISCUSSED, AND SOME OF THE EXPECTED PERFORMANCE FEATURES OF THE CORE ARE PRESENTED.

*DESIGN STUDY + FUEL BURNUP + MOLTEN FUEL + PLUTONIUM + REACTOR, FAST

18-12016 PERSIANI PJ + BUMP TR + KANN WJ
FARET CORE-I REFERENCE DESIGN
ARGONNE NATIONAL LABORATORY, ARGONNE, ILL.
ANL-7120 +. 10 PAGES, 4 FIGURES, 7 TABLES, 7 REFERENCES, PAGES 766-775 FROM PROCEEDINGS OF THE CONFERENCE ON SAFETY FUELS AND CORE DESIGN IN LARGE FAST POWER REACTORS, OCTOBER 11-14, 1965, CFSTI \$9.25 CY, \$3.75 MN.

PRESENTS THE FUEL-IRRADIATION PROGRAM AND REFERENCE CORE FOR THE FIRST EXPERIMENT IN THE FAST REACTOR TEST FACILITY. FUEL ELEMENTS WILL BE TESTED UNDER CONDITIONS ASSOCIATED WITH LARGE, FAST, POWER BREEDERS. BY SELECTION OF CORE POSITION AND VARYING THE U-235 ENRICHMENT, THE FUEL ASSEMBLIES CAN BE TESTED OVER A RANGE OF CONDITIONS.

*IRRADIATION TESTING + FARET (FAST ARGONNE REACTOR EXPERIMENT TEST) + FUEL ELEMENT + REACTOR, FAST + REACTOR, TEST

18-12030 MURPHY PM
THE INFLUENCE OF PLUTONIUM ON THE DESIGN OF ADVANCE REACTORS
GENERAL ELECTRIC COMPANY
19 PAGES, 3 FIGURES, 5 TABLES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS 9(1), PAGES 1-19, (JUNE 1966)
PRESENTED AT ANS 12TH ANNUAL MEETING DENVER, COLORADO, JUNE 20-23, 1966

LARGE PLUTONIUM RESERVES BY 1980 WILL PROVIDE AN INCENTIVE TO UPGRADE PLUTONIUM VALUES THROUGH ITS USE IN FAST REACTORS RATHER THAN IN THERMAL RECYCLE. THE LONG DEVELOPMENT REQUIREMENTS OF THE SODIUM-COOLED SYSTEM PROVIDE TIME FOR THE EFFECTIVE APPLICATION OF AN ALTERNATIVE PLUTONIUM-FUELED FAST REACTOR HAVING LESS ADVANCED NUCLEAR PERFORMANCE, PROVIDED THAT IT HAS ATTRACTIVE ECONOMICS. THE STEAM-COOLED FAST REACTOR SHOWS PROMISE OF MEETING THESE REQUIREMENTS ON A SCHEDULE THAT ACCOMMODATES THE NEEDS OF THE PRESENT ACCELERATED GROWTH OF THE NUCLEAR POWER BUSINESS. BASED ON THE PLUTONIUM THAT WILL BE AVAILABLE THROUGH MID-1980, THERE WILL BE AN INTERIM MARKET FOR AN EARLY FAST-REACTOR SYSTEM (ABOUT 50,000,000 KW - SEVERAL TIMES THE SIZE OF THE NUCLEAR BUSINESS IN 1966).

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12030 *CONTINUED*
*DESIGN STUDY + *PLUTONIUM + *REACTOR, BREEDER

18-12031 THE ARMY NUCLEAR REACTOR HEALTH AND SAFETY PROGRAM
ARMY MATERIALS RESEARCH AGENCY, WATERTOWN, MASSACHUSETTS
3 PAGES, 1965, OCE

DEPARTMENT OF THE ARMY IS RESPONSIBLE FOR CERTAIN POWER AND RESEARCH REACTORS, AND THE CORPS OF ENGINEERS (SAFETY OFFICE) HAS REACTOR HEALTH AND SAFETY RESPONSIBILITY. THE ARMY-REACTOR COMMITTEE FOR HEALTH AND SAFETY (ARCHS) IS THE REGULATORY BODY, WHILE THE INSPECTOR GENERAL IS THE COMPLIANCE BODY. SAFETY OFFICE MAINTAINS LIASON WITH AEC. ARCHS REVIEWS VARIOUS FACILITIES, PRIOR TO OPERATION AND AS SIGNIFICANT CHANGES ARE MADE.

*ADMINISTRATIVE CONTROLS AND PRACTICES + REACTOR, ARMY + REGULATION, ACC

18-12071 SAFETY ANALYSIS REPORT FOR TRIGA MARK I NUCLEAR REACTOR
THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN
69 PAGES, 15 FIGURES, TABLES, JULY 21, 1966, DOCKET NO. 50-264, PDR

THE REACTOR IS TO BE LOCATED AT THE DOW CHEMICAL PLANT, MIDLAND, MICH., TO BE COMPLETED BETWEEN JAN. 1, 1967 AND NOV. 1, 1970. IT IS A 100-KW GRAPHITE-REFLECTED REACTOR TO BE USED IN ACTIVATION ANALYSIS AND OTHER RADIOCHEMISTRY. ELEMENTS MAY BE THE OLD ALUMINUM CLAD OR THE NEW STAINLESS CLAD. THE ANALYSIS WAS BASED ON THE OLD TYPE. THE USUAL TRIGA ANALYSES WERE MADE (LOSS OF WATER GIVES 585 F AS MAXIMUM FUEL-CLAD TEMPERATURE, AND THE WATER TABLE BEGINS 7 FEET ABOVE THE CORE TOP). PREVIOUS TRIGA EXPERIENCE SHOWS 2-DOLLAR PULSING TO BE SAFE AND THAT THE EXCESS REACTIVITY WILL BE LIMITED TO 2 DOLLARS. THE MCA IS THE USUAL 2-DOLLAR TRANSIENT WITH SINGLE FUEL-ROD RUPTURE. REFERENCE TO A PREVIOUS INCIDENT WAS USED (RATHER THAN CALCULATION) TO SHOW NO CREW OR PUBLIC PROBLEMS. HALF THE REPORT IS A DOW RADIATION-PROTECTION MANUAL.

*SAFETY ANALYSIS REPORT, GENERAL + HEALTH PHYSICS TRAINING + PROCEDURES AND MANUALS + REACTOR, RESEARCH + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-12096 AMENDMENT 30 TO LACROSSE CONSTRUCTION AUTHORIZATION ADDITIONAL
ALLIS-CHALMERS COMPANY
ACNP-66572 +. 18 PAGES, 2 TABLES, OCTOBER 1966, DOCKET NO. 115-5, PDR

(1) RECORDS ADDITIONAL INFORMATION THAT WAS SUBMITTED TO ACRS SUBCOMMITTEE. (2) EFFECTS OF RECIRCULATION AND STEAM-LINE BREAKS FOR COMPLETE SPECTRUM OF BREAK AREAS, WITH FAILURE OF HIGH-PRESSURE CORE SPRAY. METHOD OF ANALYSIS GIVEN. WHERE REACTOR IS DEPRESSURIZED BELOW 100 PSIA WITHIN 4 MIN, THE FUEL AND CLADDING WILL NOT EXCEED 2500 F. FOR SMALLER BREAKS, WHERE DEPRESSURIZATION TIME IS GREATER THAN 4 MIN (BREAK AREA 6 TO 11 SQ. IN.), DETAILED CALCULATION SHOWED THAT THE CORE IS NOT UNCOVERED (BEFORE FEEDWATER OR LOW-PRESSURE INJECTION RECOVERS CORE) LONG ENOUGH FOR FUEL AND CLADDING TO REACH 2500 F. (3) BAFFLE PLATE SKIRT-HEIGHT BASIS - A 3-IN. SKIRT GIVES ADEQUATE HEAD (PREVENTS CORE-SPRAY-WATER RUNOFF) TO GIVE FULL 900 GPM FLOW AGAINST BACKPRESSURE OF RISING STEAM. (4) TWO EMERGENCY VENT VALVES ADDED TO SHUTDOWN CONDENSER WILL BE ADDED TO VENT AIR FROM THE REACTOR VESSEL IN CASE IT IS NECESSARY TO FLOOD THE REACTOR BUILDING TO REFLOOD THE CORE.

*ACRS (ADVISORY COMMITTEE ON REACTOR SAFEGUARDS) + ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + COOLING, SHUTDOWN + CORE COMPONENTS, MISCELLANEOUS + CORE SPRAY + LACROSSE + REACTOR, BOILING WATER

18-12097 SUPPLEMENTARY INFORMATION ON POST-ACCIDENT SAFEGUARDS PROVISIONS FOR THE LACROSSE BOILING WATER REACTOR
ALLIS-CHALMERS COMPANY, BETHESDA, MARYLAND
ACNP-66564.1 +. 6 PAGES, 1 TABLES, 2 FIGURES, OCTOBER 1966, DOCKET NO. 115-5, PDR

(1) ADDITIONAL INFORMATION ON AMENDMENT 29 FOR DRL. (2) CONTROL ROD WILL NOT BUCKLE NOR SHEATH TEAR DURING A RECIRCULATION-LINE RUPTURE. TEST SHOWED THAT ROD DRIVES CAN WITHSTAND A 6000-LB FORCE WHEN BOTH HYDRAULIC AND ELECTRIC MOTORS ARE ON. (3) ONE OF TWO VALVE MOTORS FOR ALTERNATE CORE-SPRAY SYSTEM WILL BE CONNECTED TO PLANT STORAGE BATTERIES INSTEAD OF TO A-C EMERGENCY BUS. (4) A YEARLY TEST OF THE CHECK VALVES IN THE ALTERNATE CORE-SPRAY SYSTEM IS DESCRIBED. (5) AT YEARLY INTERVALS, THE CORE-SPRAY TUBES WILL BE TESTED (TO ENSURE THAT THEY ARE NOT BLOCKED) BY AN ADDED D-P CELL. CALCULATIONS GIVEN OF INCREASED DP WITH VARIOUS SPRAY TUBES BLOCKED. (6) 100 PERCENT RELEASE OF FISSION PRODUCTS MEANS 100 PERCENT OF GASES, 50 OF HALOGENS, 1 OF SOLIDS.

ACCIDENT, LOSS OF COOLANT + CONTROL ROD + CORE SPRAY + EMERGENCY POWER, ELECTRIC + LACROSSE + OPERATING LICENSE PROCESS + REACTOR, BOILING WATER + TEST, SYSTEM OPERABILITY

18-12099 CASHWELL RJ
HAZARDS SUMMARY REPORT FOR THE UNIVERSITY OF WISCONSIN NUCLEAR REACTOR
UNIVERSITY OF WISCONSIN, MADISON, WISCONSIN
160 PAGES, 10 TABLES, 53 FIGURES, JULY 1966, DOCKET NO. 50-156, PDR

THE ORIGINAL PLATE-TYPE CORE, OPERATED AT 250 KW, WILL BE REPLACED BY STAINLESS-CLAD TRIGA-TYPE ELEMENTS AND OPERATED AT 1 MW STEADY STATE OR WITH 3-DOLLAR PULSES. NATURAL-CONVECTION COOLING WILL BE ASSISTED BY DIFFUSER JETS INTENDED TO DEFLECT THE RISING WATER AND REDUCE N-16 ACTIVITY. FOUR FLAT-BLADE CONTROL RODS UNCHANGED, BUT STANDARD TRIGA PULSE ROD ADDED. DIFFERENCES IN REACTOR CHARACTERISTICS DISCUSSED. SINCE 4.9 PERCENT

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12099 *CONTINUED*

REACTIVITY IS NEEDED FOR 1-MW OPERATION, THE WORST REACTIVITY ACCIDENT IS TO BRING FOUR BLADE RODS OUT (LOSING ABOUT 2.45 PERCENT) AND THEN START A PULSE OF 2.1 PERCENT. THE RESULTANT PEAK TEMPERATURE WOULD BE 859 C, WELL BELOW THE 1000 C AT WHICH HYDROGEN PRESSURE WOULD RUPTURE THE CLADDING. DOSE CALCULATIONS WERE MADE ON FISSION-GAS RELEASE.

*MODIFICATION, SYSTEM OR EQUIPMENT + *POWER UPRATING + *SAFETY ANALYSIS REPORT, GENERAL + REACTOR, POOL TYPE + REACTOR, PULSED + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-12104 MORISON WG

PROGRESS REPORT ON THE PICKERING GENERATING STATION
ATOMIC ENERGY OF CANADA LIMITED

66-CNA-303 + CONF-660516-14 +. 23 PAGES, 1 TABLE, 9 FIGURES, MAY 1966, PAPER PRESENTED AT THE ANNUAL CNA MEETING, WINNIPEG, MAY 29-JUNE 1, 1966 (AUGUST 1966) DEP.MN

PRESENTS BRIEF DESCRIPTION OF THE FACILITY WHICH IS TO BE A MULTI-UNIT POWER STATION. TWO 500-MW(E) UNITS ARE DESIGNED, USING HEAVY-WATER MODERATOR, PRESSURIZED HEAVY-WATER COOLANT, NATURAL-URANIUM-DIOXIDE-FUELLED HORIZONTAL PRESSURE-TUBE REACTORS. GEOLOGICAL FEATURES OF THE SITE ARE DESCRIBED. REACTOR PARAMETERS ARE LISTED.

*REACTOR DESCRIPTION + CANADA + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE + REACTOR, PRESSURIZED WATER

18-12105 HANNUM WH

NUCLEAR DESIGN OF MPBE

LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO

LA-DC-7475 + CONF-651009-8 +. 18 PAGES, 2 TABLES, (1965), CFSTI \$1.00 CY, \$0.50 MN

DESCRIBES THE DESIGN OF A MOLTEN PLUTONIUM BURNING EXPERIMENT (MPBE) TO BE USED TO DETERMINE THE PROPERTIES OF A MOLTEN PLUTONIUM FUEL DURING AND AFTER HIGH BURNUP. PARAMETERS OF THE FAST REACTOR CORE TEST FACILITY ARE INCLUDED IN WHICH THE EXPERIMENT IS TO BE CONDUCTED. PERFORMANCE FEATURES OF THE MPBE ARE INCLUDED.

*DESIGN STUDY + FUEL BURNUP + MPBE (MOLTEN PLUTONIUM BURNUP EXPERIMENT) + PLUTONIUM

18-12106 ADDENDUM TO SM-1A HAZARDS SUMMARY REPORT FOR CORE III

HITTMAN ASSOCIATES, INC., BALTIMORE, MARYLAND

HIT-3534-1 + HIT-165 +. 88 PAGES, JUNE 30, 1965, CFSTI \$3.00 CY, \$0.75 MN

EVALUATES THE EFFECTS OF REPLACING THE PRESENT CORE WITH CORE III, WHICH CONTAINS THE SAME NUMBER OF FUEL ASSEMBLIES BUT THICKER PLATES AND HIGHER FUEL AND POISON LOADING. THE LIFETIME IS DOUBLED. THE RESULTS OF AN ANALYSIS OF POSSIBLE ACCIDENTS ARE GIVEN. ACCIDENTS CONSIDERED ARE REACTIVITY INSERTIONS, LOSS OF COOLANT FLOW, COLD-WATER ACCIDENT, AND LOSS OF COOLANT DUE TO SIMULTANEOUS RUPTURE OF THE PRIMARY AND SECONDARY SYSTEMS. THE RESULTS SHOW THAT THE MCA IS THE LOSS-OF-COOLANT ACCIDENT, WHICH IS THE SAME AS REPORTED IN THE HAZARDS SUMMARY REPORT. THE PROBABILITY OF ITS OCCURRENCE AND THE EFFECTS ARE THE SAME.

*SAFETY ANALYSIS REPORT, GENERAL + ACCIDENT, COLD COOLANT + ACCIDENT, LOSS OF COOLANT + ACCIDENT, MAXIMUM CREDIBLE (MCA) + ACCIDENT, REACTIVITY + REACTOR, ARMY + REACTOR, PRESSURIZED WATER + SM 1A (STATIONARY MEDIUM POWER PLANT, ALASKA)

18-12107 DRL AND CONSOLIDATED EDISON FILE BRIEFS DEFENDING INDIAN POINT 2 CONSTRUCTION PERMIT AGAINST INTERVENTION APPEAL TO COMMISSION

CONSOLIDATED EDISON COMPANY

9 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(45), PAGES 6-14 (NOVEMBER 7, 1966) DOCKET NO. 50-247

AFTER POINTING OUT THE LEGAL REASONS WHY THE APPEAL SHOULD BE DISMISSED, BOTH DRL AND CONSOLIDATED EDISON POINTED OUT THAT 10 CFR 50.35 DOES NOT REQUIRE DESIGN DETAILS FOR CONSTRUCTION PERMIT IF THERE IS REASONABLE ASSURANCE THAT THE DATA WILL BE PROVIDED AT THE OPERATING-LICENSE STAGE. DRL QUOTES FROM JERSEY CENTRAL DECISION (MAY 6, 1965) THAT 50.35 DOES NOT REQUIRE ALL DESIGN DETAILS BE SUPPLIED ASLB OR THAT EVERY SAFETY QUESTION BE RESOLVED AT THE CONSTRUCTION-PERMIT STAGE. CONSOLIDATED EDISON REFUTES THE ASSERTED LACK OF TIME BY THE CONSERVATION CENTER TO STUDY SAFETY REPORTS BY POINTING TO THEIR DETAILED 10-PAGE REVIEW (SEPTEMBER 8, 1966) AND SUGGESTS THAT IT IS HARDLY CREDIBLE THAT THOSE WHO PRODUCED SUCH A DETAILED DOCUMENT WOULD HAVE FAILED TO COMPREHEND AEC RULES OF PRACTICE AND THAT THIS SEQUENCE OF EVENTS INDICATES A CONTINUING AND FLAGRANT DISREGARD OF AEC PROCEDURAL REQUIREMENTS.

*CONSTRUCTION PERMIT PROCESS + *LAW + INDIAN POINT 2 + REACTOR, PRESSURIZED WATER

18-12108 LEWIS H

CONSOLIDATED EDISON STOCKHOLDER SUIT FILED IN NEW YORK SUPREME COURT AGAINST INDIAN POINT CONSTRUCTION
CONSOLIDATED EDISON

5 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(45), PAGES 2-6 (NOVEMBER 7, 1966) DOCKET NO. 50-247

SUIT REVIEWS CONSOLIDATED EDISON CONSTRUCTION PLANS BEGINNING WITH RAVENSWOOD AND ASSERTS THAT INDIAN POINT I, FERMI, AND OTHER STATIONS HAVE HAD VARYING DEGREES OF EXPENSIVE FAILURES. QUOTES WELL-KNOWN NAMES TO SHOW THE DANGER OF NUCLEAR POWER PLANTS AND ASKS THE COURT TO RESTRAIN CONSOLIDATED EDISON FROM CONSTRUCTION OF INDIAN POINT II AND TO REQUIRE CONSOLIDATED EDISON TO EXPLORE OTHER METHODS OF OBTAINING POWER. THE SUIT WAS BROUGHT AGAINST THE BOARD OF TRUSTEES, ALLEGING THAT THESE BUSY MEN OF AFFAIRS HAVE NEGLIGENTLY AND RECKLESSLY FAILED

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12108 *CONTINUED*

TO INFORM THEMSELVES OF DANGERS AND POTENTIAL DANGERS AND ASKS THE COURT TO DIRECT THE BOARD TO PAY CONSOLIDATED EDISON EXPENSES INCURRED IN CONNECTION WITH THE INDIAN POINT II LICENSE APPLICATION.

*CONSTRUCTION PERMIT PROCESS + *LAW + INDIAN POINT 2 + REACTOR, PRESSURIZED WATER

18-12138 GEIER JD

FAST REACTOR TEST FACILITY (FARET), VOL. I-DESCRIPTION AND PROGRAM

ARGONNE NATIONAL LABORATORY, ARGONNE, ILL.

ANL-7168 VOL. I +. 343 PAGES, 123 FIGURES, 21 TABLES, 6 REFERENCES, MARCH 1966, CFSTI \$7.00 CY

IT IS NOT A DESIGN REPORT, BUT IT GIVES DESCRIPTION AND DRAWINGS AS OF THE TIME THAT THE PROJECT WAS TERMINATED BY AEC (DEC. 1965). THE 50-MW(TH) FARET WOULD USE A VARIETY OF FUELS AS STANDARD ELEMENTS (THUS GIVING A LONG-TERM PROOF TEST) WHILE HAVING IRRADIATION LOOPS (TO TEST ADVANCED FUEL). IN-CORE INSTRUMENTS WOULD GIVE BETTER DATA ON IRRADIATION CONDITIONS OF STANDARD FUEL. FARET MARKEDLY RESEMBLES EBR I AND II.

*REACTOR DESCRIPTION + FARET (FAST ARGONNE REACTOR EXPERIMENT TEST) + REACTOR, AEC OWNED + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REACTOR, TEST

18-12139 INDIAN POINT STATION STARTUP PHYSICS TEST PROGRAM RESULTS CORE B

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

89 PAGES, 38 FIGURES, 8 TABLES, SEPTEMBER 30, 1966, PDR

ONE-HUNDRED AND TWENTY ELEMENTS WERE LOADED IN 2 WEEKS BEGINNING FEB. 25, AND CRITICALITY ACHIEVED ON MARCH 27. ALL RODS BUT GROUP D WERE RUN FULL OUT, AND SOLUBLE POISON DILUTED TO 10,850 PPM. REACTOR THEN MADE CRITICAL ON GROUP D. 1/M PLOTS SHOWN. AN ANALOG COMPUTER WAS USED TO OBTAIN REACTIVITY DIRECTLY FOR VARIOUS TESTS (HOT AND COLD) OF ROD, BORON, AND MODERATOR EFFECTS. OVER THE RANGE OF ROD POSITIONS, NO SIGNIFICANT DIFFERENCES NOTED IN ROD WORTH BETWEEN HOT ZERO-POWER AND PARTIAL-POWER CONDITIONS. AUTOMATIC PLANT CONTROLLER TESTED WITH 25-MW(E)/MIN AND 50-MW(E) STEPS BY CHANGING TURBINE CONTROL-VALVE POSITION. INVESTIGATION OF SEVERAL DISCREPANCIES IN COLD DIRECTLY-MEASURED DIFFERENTIAL ROD WORTHS LED TO THE CONCLUSION THAT THEY WERE IN ERROR BECAUSE OF DIFFERENT CORE-ROD-DETECTOR GEOMETRIES USED IN HOT AND COLD MEASUREMENTS. A AND C GROUP WITHDRAWAL RATES WERE DECREASED TO MAINTAIN SPECIFIED LIMITS.

*OPERATIONS SUMMARY FOR AEC + *REACTOR STARTUP EXPERIENCE, INITIAL + CONTROL ROD WORTH + INDIAN POINT 1 + REACTOR, PRESSURIZED WATER + REFUELING + TEST, PHYSICS + TEST, PLANT RESPONSE

18-12140 MURPHY WP

SITING EVALUATION FOR THE ABERDEEN PULSED REACTOR FACILITY (APRF)

DEPARTMENT OF THE ARMY

3 PAGES, 2 REFERENCES, OCTOBER 11, 1966

ARCHS PRE-OPERATIONAL REVIEW OF THE FACILITY MUST CONSIDER THIS FACILITY UNACCEPTABLE BECAUSE SUFFICIENT INFORMATION WAS NOT GIVEN ON PERSONNEL CONTROL WITHIN THE COMPLEX FENCED-OFF AREA.

*SAFETY REVIEW (OPERATIONS, EXPERIMENTS) + ADMINISTRATIVE CONTROLS AND PRACTICES + RADIATION SAFETY AND CONTROL + REACTOR, ARMY + REACTOR, FAST BURST

18-12141 COLUMBIA UNIVERSITY SUBMITS TECHNICAL SPECIFICATIONS FOR REACTOR BUILDING CONFINEMENT SYSTEM FOR IRL

COLUMBIA UNIVERSITY

17 PAGES, 1 FIGURE, 2 TABLES, 13 REFERENCES, SEPTEMBER 28, 1966, DOCKET NO. 50-17, PDR

SIX SPECIFICATIONS SUBMITTED FOR IRL REACTOR INCLUDE (1) MCA - OVERPRESSURE UNFILTERED LEAKAGE WILL NOT EXCEED 0.0045 OF BUILDING VOLUME, AND (6) EMERGENCY EXHAUST CHARCOAL FILTERS WILL HAVE AN EFFICIENCY GREATER THAN 97 PERCENT WHEN TESTED WITH ELEMENTAL IODINE. TESTING INTERVALS SET AT 6 MONTHS. BASIS FOR THIS INCLUDES SYSTEM DESCRIPTION, AN MCA ANALYSIS BASED ON TID-14844, WHICH SHOWS 2-HR THYROID DOSE AT SITE BOUNDARY TO BE 300 REMS.

*CONTAINMENT FILTERING SYSTEM + *CONTAINMENT PENETRATION, CLOSURE OF + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTAINMENT, PRESSURE VENTING + REACTOR, RESEARCH

18-12142 PROPOSED CHANGE 9 FOR THERMAL CRITICAL ASSEMBLY

GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

4 PAGES, OCTOBER 10, 1966, DOCKET NO. 50-24

JOB-TITLE CHANGE OF FACILITY-SUPERVISORS SUPERVISOR FROM MANAGER, PHYSICS, TO MANAGER, BUILDING 105 OPERATIONS, BECAUSE OF THE DIVERSIFICATION OF BUILDING 105 ACTIVITIES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ADMINISTRATIVE CONTROLS AND PRACTICES + CRITICAL ASSEMBLY FACILITY

18-12143 MORRIS PA

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12143 *CONTINUED*
HUMBOLDT BAY CHANGE 21 (NEW DESIGN FOR POISON CURTAINS) GRANTED
DIVISION OF REACTOR LICENSING, USAEC
6 PAGES, 2 TABLES, OCTOBER 20, 1966, DOCKET NO. 50-133, PDR

DUE TO EXTENSIVE REPLACEMENT OF DETERIORATED STAINLESS-STEEL FUEL ASSEMBLIES WITH ZIRCALOY FUEL ASSEMBLIES, POISON-CURTAIN DESIGN BORON CONTENT WAS INCREASED FROM 900 TO 3700 PPM. CHANGES WERE MADE IN THE SEC.-V.A.I.C POISON-CURTAIN DESIGN. TABLE V-2 LISTS THE PRINCIPAL CALCULATED THERMAL AND HYDRAULIC CHARACTERISTICS, AND TABLE V-3 SHOWS THE PRINCIPLE CALCULATED NUCLEAR CHARACTERISTICS.

*CONTROL ROD WORTH + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + *SAFETY EVALUATION + HUMBOLDT BAY + REACTOR, BOILING WATER

18-12144 AMENDMENT 22. ANSWERS TO QUESTIONS IN AEC LETTER OF DECEMBER 2 AND 29, 1965
ALLIS CHALMERS MANUFACTURING COMPANY
ACNP-66530 +. 17 PAGES, 2 FIGURES, 3 REFERENCES, APRIL 1966, PDR

QUESTION III-6 - (A) EVEN THOUGH CALCULATIONS SHOW THAT A CORE PRESSURE DROP OF 12.5 PSI IS REQUIRED TO LIFT THE FUEL WHEN NO HOLD-DOWN DEVICE EXISTS, AND CALCULATIONS SHOW 5 PSI IS MOST TO BE EXPECTED IN ACCIDENT CONDITIONS, A SIMPLE MODIFICATION TO THE CORE-SPRAY STRUCTURE WILL PROVIDE HOLD-DOWN. (B) DESIGN BASIS AND OTHER DETAILS GIVEN FOR CHOICE OF 348H STAINLESS-STEEL FUEL CLADDING. (C) DESIGN BASIS FOR DISHEDEND UO₂ FUEL PELLETS GIVEN. 120 PERCENT OVERPOWER WOULD GIVE A PEAK CENTERLINE TEMPERATURE BELOW MELTING, AND A PEAK AVERAGE FUEL TEMPERATURE 2850 F (115 CAL/GRAM). QUESTION IV-7 - CONTROL ROD SHROUD DEFLECTION AT 25-PSI CORE DIFFERENTIAL PRESSURE WILL NOT EXERT ENOUGH FORCE TO WITHSTAND THE 6000-LB FORCE OF THE ROD-DRIVE MOTORS.

*SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + CLAD + CONTROL ROD DRIVE + CORE COMPONENTS, MISCELLANEOUS + FUEL ELEMENT + LACROSSE + REACTOR, BOILING WATER

18-12145 HARDE R + STOHR KW
THE SODIUM-COOLED EXPERIMENTAL ATOMIC POWER STATION KNK
7 PAGES, 9 FIGURES, 1 TABLE, ATOMWIRTSCHAFT 11(7), PAGES 354-360 (JULY 1966)

BRIEF DESCRIPTION OF 20-MW(E) SODIUM-COOLED, ZIRCONIUM-HYDRIDE-MODERATED REACTOR DUE TO BEGIN OPERATION IN 1969. IT IS A PROTOTYPE FOR A 300-MW(E) STATION.

*REACTOR DESCRIPTION + GERMANY + HYDRIDE + REACTOR, LIQUID METAL COOLED + ZIRCONIUM

18-12146 LEVINE S
CHANGE 1 TO UCLA ARGONAUT
DIVISION OF REACTOR LICENSING, USAEC
5 PAGES, SEPTEMBER 20, 1966, DOCKET NO. 50-142, PDR

CHANGE GRANTED TO (1) RAISE THE EXCESS REACTIVITY FROM 0.6 TO 2.3 PERCENT, (2) ENLARGE VERTICAL ACCESS TUBES IN THE GRAPHITE ISLAND, (3) PERMIT CRITICALITY ON ANY OF THE FOUR CONTROL BLADES, (4) DELEGATE CERTAIN OPERATIONAL RESPONSIBILITY TO SENIOR REACTOR OPERATORS BECAUSE OF 16-HOUR-PER-DAY USAGE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + ARGONAUT (ARGONNE NUC ASSEMBLY, UNIV TRAINING) + IN PILE EXPERIMENT + POWER UPGRATING + REACTOR, RESEARCH

18-12147 HAUETER RL
BIG ROCK POINT REQUESTS AUTHORITY TO USE VIBRATORY COMPACTED UO₂ POWDER FUEL
CONSUMERS POWER COMPANY, JACKSON
19 PAGES, 3 FIGURES, 3 TABLES, JULY 29, 1966, DOCKET NO. 50-155, PDR

REQUESTS USE OF 85-PERCENT-THEORETICAL-DENSITY VIBRATION-COMPACTED FUEL IN ZIRCALOY-2 CLADDING IN PLACE OF 94-PERCENT-DENSITY PELLET FUEL IN STAINLESS CLADDING. REVIEWS EXPERIENCE OF HIGH-POWER-DENSITY PROGRAM AS APPLICABLE. MANY OTHER REACTORS HAVING SUCCESS. INTEGRAL K_{0T} SHOWN TO BE 49 W/CM, INSTEAD OF PELLET 59 W/CM, BUT OFFSET BY GREATER CLADDING CONDUCTANCE (3000 VS 1000 FOR PELLETS) TO GIVE SAME 19 KW/FT FOR INCIPIENT MELTING. RECENT EXAMINATION SHOWS THAT CLADDING REMAINS APPRECIABLY DUCTILE WITH HIGH EXPOSURE, SO CLADDING WOULD COLLAPSE ON THE FUEL RATHER THAN BREAK. MENTIONS THE RIDGING OBSERVED WITH PELLET FUEL.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + BIG ROCK POINT + CLAD + OPERATING EXPERIENCE + REACTOR, BOILING WATER + STRESS + VIBRATION

18-12148 HAUETER RL
BIG ROCK POINT REQUESTS AUTHORITY TO USE VIBRATORY COMPACTED UO₂ POWDER FUEL
CONSUMERS POWER COMPANY, JACKSON
19 PAGES, 3 FIGURES, 3 TABLES, JULY 29, 1966, DOCKET NO. 50-255, PDR

IN A REQUEST TO CHANGE FROM PELLET FUEL TO VIBRATORY-COMPACTED FUEL, BIG ROCK POINT PEOPLE STATED THAT THE PROMISE THAT FUEL-CLADDING MECHANICAL INTERACTIONS CAN BE ELIMINATED COMPLETELY BY THE USE OF FREESTANDING CLADDING WITH A NOMINAL CLEARANCE BETWEEN THE PELLETS AND THE CLADDING IS NOT VALID. A SIGNIFICANT ASPECT OF RECENT MEASUREMENTS IS THAT CIRCUMFERENTIAL RIDGING OCCURS IN ALL PELLET FUEL RODS OF CURRENT DESIGNS, EVEN THOUGH THE CLADDING IS FREESTANDING WITH DIAMETRAL GAPS OF UP TO 0.013 IN. BETWEEN THE PELLETS AND THE

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18-1214P *CONTINUED*

CLADDING. MEASUREMENTS MADE ON VARIOUS TYPES OF FREESTANDING CLADDING, INCLUDING ZIRCALOY-2, STAINLESS STEEL, INCOLOY, AND INCONEL, SHOW RIDGING AT THE PELLET INTERFACES WHEN OPERATED AT NOMINAL POWER LEVELS. RIDGING OF FREESTANDING, ZIRCALOY-2-CLAD FUEL RODS OPERATED FOR A SHORT TIME IN THE BIG ROCK POINT REACTOR HAS BEEN MEASURED. THE RIDGES ARE VISUALLY ACCENTUATED BY SELECTIVE CRUD DEPOSITION ON THE CLADDING SURFACE. THE MAGNITUDE OF THE RIDGING APPEARS TO BE A FUNCTION OF INITIAL COLD GAP AND FUEL ROD SPECIFIC POWER. RIDGES OF UP TO 0.001 IN. IN HEIGHT HAVE BEEN MEASURED IN 0.425 IN. OD, ZIRCALOY-2-CLAD FUEL RODS HAVING A WALL THICKNESS OF 0.030 IN., AN AS-FABRICATED PELLET-CLADDING GAP OF 0.007 IN., AND OPERATED AT A PEAK SURFACE HEAT FLUX OF UP TO 350,000 BTU/HR-SQ.FT.

*CLAD + *DAMAGE + *FUEL ELEMENT + *STRESS + BIG ROCK POINT + OPERATING EXPERIENCE + REACTOR, BOILING WATER + SURFACE FILM DEPOSIT

18-12150 MORRIS PA
CHANGE 10 GRANTED ALLOWING VIBRATORY COMPACTED UO2 FUEL
CONSUMERS POWER COMPANY
10 PAGES, 1 FIGURE, 1 TABLE, OCTOBER 7, 1966, DOCKET NO. 50-155, PDR

RELOAD C FUEL IS UO2 POWDER PACKED IN THE ZIRCALOY TUBE TO 85 PERCENT OF THEORETICAL DENSITY. REDUCED DENSITY ALLOWS HIGHER FUEL BURNUP BUT GIVES LOWER THERMAL CONDUCTIVITY, WHICH IS OFFSET BY INCREASED CLAD-FUEL CONDUCTANCE (FROM 1000 TO 3,000 BTU/HR-SQ. FT-F). THE WORST CREDIBLE ROD-DROP ACCIDENT (4-5 PERCENT) WAS REEVALUATED TO TAKE INTO ACCOUNT BETTER HEAT TRANSFER TO THE COOLANT IF CLAD BROKE AND RELEASED POWDER. THIS WAS SHOWN TO BE BELOW THE VESSEL-DAMAGE THRESHOLD.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + *SAFETY EVALUATION + ACCIDENT, CONTROL ROD WITHDRAWAL + BIG ROCK POINT + CONTAINMENT, PRESSURE VESSEL + FUEL ELEMENT + REACTOR, BOILING WATER + VIBRATION

18-12151 OKRENT D
ACRS REPORT ON PEACH BOTTOM STATION
U.S. ATOMIC ENERGY COMMISSION
PRESS REL. J-243 +. 3 PAGES, 12 REFERENCES, OCTOBER 21, 1966, DOCKET NO. 50-171, DPI

ACRS APPROVED FULL-POWER OPERATION FOR PEACH BOTTOM. THE REVIEW INCLUDED MENTION OF SOME FAILURES. (1) STRESS-CORROSION-CRACKED STEEL SUPERHEATER TUBES WERE REPLACED WITH INCONEL. (2) FUEL-TRANSFER MACHINE HAD BINDING PROBLEMS IN HOT HELIUM. (3) FOUR CONTROL-ROD DRIVES HAD ERRATIC STICKING BECAUSE OF FRACTURED BALLS IN THE BALL-NUT ASSEMBLIES, ALTHOUGH THIS DID NOT IMPAIR THE ABILITY TO SCRAM.

*ACRS (ADVISORY COMMITTEE ON REACTOR SAFEGUARDS) + *OPERATING EXPERIENCE + FAILURE, PIPE + FAILURE, SCRAM MECHANISM + FUEL HANDLING MACHINE + PEACH BOTTOM 1 + REACTOR, GAS COOLED + REACTOR, GRAPHITE MODERATED

18-12152 STEELE H
FAST REQUESTS N S SAVANNAH'S PROCEDURE BE APPROVED BY LOWER JOB CLASSIFICATION
FIRST ATOMIC SHIP TRANSPORT INC.
2 PAGES, OCTOBER 24, 1966, DOCKET NO. 50-238, PDR

REQUESTS THAT N S SAVANNAH TECHNICAL-SPECIFICATIONS SECTION 1.3A BE CHANGED SO THAT THE MANAGER OF THE SHIP OPERATIONS APPROVES EQUIPMENT OR PROCEDURAL CHANGES, INSTEAD OF THIS APPROVAL BEING MADE BY THE VICE PRESIDENT FOR OPERATIONS.

*ADMINISTRATIVE CONTROLS AND PRACTICES + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *STAFFING, TRAINING, QUALIFICATION + N S SAVANNAH + REACTOR, MARITIME + REACTOR, PRESSURIZED WATER

18-12161 COMPARISON OF COAL-FIRED AND NUCLEAR POWER PLANTS FOR THE IVA SYSTEM
TENNESSEE VALLEY AUTHORITY
36 PAGES, FIGURES, TABLES, JUNE 1966, SOURCE

THE BOILING-WATER REACTOR WOULD PROVIDE THE LOWEST COST ENERGY TO THE SYSTEM IN THE INITIAL 12-YR PERIOD. IT WOULD BE 0.17 MILL/KWH LOWER THAN THE PRESSURIZED-WATER REACTOR, AND 0.51 MILL/KWH LOWER THAN THE COAL-FIRED PLANT AT CUMBERLAND CITY. THE ADVANTAGES, EXPRESSED AS TOTAL LEVELIZED COST DIFFERENCES FOR THE OUTPUT OF THE TWO-UNIT PLANT, ARE 2.7 MILLION AND 8.1 MILLION RESPECTIVELY. THE BWR HAS OTHER ADVANTAGES WHICH ARE ALSO DISCUSSED.

*BROWNS FERRY + *DESIGN STUDY + *ECONOMIC STUDY + REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER

18-12162 ABBOTT WE + BECKJORD ES + FARBMAN GH
DESIGN FEATURES OF THE MODERN PRESSURIZED WATER REACTOR
WESTINGHOUSE ELECTRIC CORPORATION, PITTSBURGH, PENNSYLVANIA
13 PAGES, 7 FIGURES, 1 TABLE, PAGES 248-260 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE, ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

BRIEF SIMPLE DESCRIPTION OF 1965 PWR, AS SEEN BY WESTINGHOUSE. DESCRIBES FUEL ELEMENT AND FINGER-TYPE CONTROL RODS, NUCLEAR DESIGN, AND TYPICAL COMPONENTS.

*REACTOR DESCRIPTION + CONTROL ROD + REACTOR, PRESSURIZED WATER

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18-12163 RICHARDS RB
THE 1965 BOILING WATER REACTOR
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
9 PAGES, 6 FIGURES, 2 TABLES, PAGES 261-269 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE, ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

BRIEF, SIMPLE DESCRIPTION OF 1965 BWR, AS SEEN BY GENERAL ELECTRIC. COMPARES DRESDEN I AND DRESDEN II DATA TO SHOW PROGRESS. WHILE THE NUCLEAR CORE HAS GONE FROM 28 TO 37 KW(IE) PER LITER, THE PRIMARY SYSTEMS VOLUME HAS BEEN STRIKINGLY REDUCED (GOING FROM 13 TO 33.5 KW(IE) PER CUBIC FT OF SYSTEM). DESIGN IS CONTINUING TO ACHIEVE 60 KW PER LITER AND 45 KW PER CUBIC FT.

*REACTOR DESCRIPTION + MAIN COOLING SYSTEM + REACTOR, BOILING WATER

18-12164 GAINES AL
NUCLEAR REACTOR VESSELS-1965 STATUS
COMBUSTION ENGINEERING, INC., CHATTANOOGA, TENNESSEE
10 PAGES, 5 FIGURES, 1 TABLE, 9 REFERENCES, 26 BIBLIOGRAPHIES, PAGES 292-301 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE, ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

GENERAL REVIEW OF REACTOR VESSELS, SIZE TRENDS, AND CONSTRUCTION TRENDS.

*CONTAINMENT, PRESSURE VESSEL + *REACTOR DESCRIPTION + REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER

18-12165 DAVIES DK
NUCLEAR STEAM GENERATORS
THE BABCOCK AND WILCOX COMPANY, BARBERTON, OHIO
11 PAGES, 6 FIGURES, 1 REFERENCE, PAGES 302-312 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE, ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

REVIEWS VARIOUS KINDS OF BOILERS. DESCRIBES RECENT TESTS WHICH SHOW THAT, IN HIGH-VELOCITY (GREATER THAN 60 FT/SEC) ONCE-THROUGH BOILERS, NUCLEATE BOILING CAN BE MAINTAINED UP TO 85 PERCENT QUALITY, WITH LOW MASS FLOWS AND HEAT FLUXES LESS THAN 150,000 BTU/HR-FT SQ. DESCRIBES SODIUM-HEATED-BOILER EFFORTS.

*HEAT EXCHANGER + *REACTOR DESCRIPTION + NUCLEATE BOILING + REACTOR, LIQUID METAL COOLED + REACTOR, PRESSURIZED WATER

18-12166 BUNKE AL + BALL RE
PUMPS FOR NUCLEAR SERVICE
BYRON JACKSON PUMPS, INC., BORG-WARNER CORPORATION, LOS ANGELES, CALIFORNIA
14 PAGES, 11 FIGURES, 2 TABLES, 5 REFERENCES, PAGES 313-326 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

BRIEFLY REVIEWS PRESENT DESIGN OF SHAFT-SEALED PUMPS FOR WATER REACTORS, AND OTHER DESIGNS FOR OTHER COOLANTS. EXPERIENCE SHOWS IT MANDATORY TO MAKE A FACTORY TEST-RUN OF 500-5000 HOURS ON THE FIRST UNIT OF A GROUP AT FULL SPEED UNDER ACTUAL CONDITIONS. THE REMAINDER MUST THEN BE TESTED FOR ONLY 200 HOURS.

*OPERATING EXPERIENCE + *PUMP + REACTOR, POWER

18-12167 HOSE AV + PRESCOTT NF
VALVES FOR NUCLEAR SERVICE IN POWER SYSTEMS
ATWOOD AND MORRILL COMPANY, SALEM, MASSACHUSETTS
8 PAGES, 6 FIGURES, PAGES 327-334 OF PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL. 27, AMERICAN POWER CONFERENCE, TWENTY-SEVENTH ANNUAL MEETING CHICAGO, ILLINOIS, APRIL 27-29, 1965, PUBLISHED BY AMERICAN POWER CONFERENCE, ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, ILLINOIS, \$10.00

BRIEF DESCRIPTION OF VALVES FOR POWER REACTORS.

*VALVE + REACTOR DESCRIPTION + REACTOR, POWER

18-12172 ANDERSON LE + GIBBONS JF + GRUBELICH FT + MEINERT W + TAYLOR WC + ZUROMSKY G
ADVANCED BONUS CORE THERMAL CYCLE TEST REPORT
COMBUSTION ENGINEERING INC., WINDSOR
CEND-259 +. 197 PAGES, DECEMBER 1965, DOCKET NO. 115-4, CFSTI \$2.00 CY, \$1.00 MN

RESULTS ARE GIVEN OF THERMAL-CYCLE TESTING FROM 500 F TO 1200 F OF COMBINATION BOILING-SUPERHEATING FUEL ELEMENTS TO REPLACE THE BONUS REACTOR CORE. THE FIRST CORE HAD ONE ELEMENT FOR BOILING AND ANOTHER FOR SUPERHEATING. TWO TYPES OF ELEMENTS WERE TESTED, A FIXED AND A FLOATING TUBE-SHEET DESIGN. 2026 THERMAL CYCLES WERE MADE. PERMANENT COMPRESSIVE DISTORTION OCCURRED IN THE FIXED ELEMENT. NO DISTORTION OCCURRED WITH THE FLOATING ELEMENT. FATIGUE DAMAGE WAS NOTED IN THE THERMAL SLEEVES OF THE SECOND-PASS TUBES WHICH RESULTED FROM CONTAMINATION INTRODUCED DURING FABRICATION. CONCLUSIONS ARE - FIXED OR FLOATING TUBE SHEETS

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18-12172 *CONTINUED*

CAN BE MADE FOR REACTOR USE WHICH WILL WITHSTAND 2000 THERMAL CYCLES.

*FLUCTUATION + *FUEL ELEMENT + *TEMPERATURE TRANSIENT + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + STRUCTURAL INTEGRITY

18-12177 AMENDMENT 2 TO BROWNS FERRY PRELIMINARY SAFETY ANALYSIS REPORT - EMERGENCY COOLING SYSTEMS
TENNESSEE VALLEY AUTHORITY
200 PAGES, FIGURES, TABLES, NOVEMBER 1966, PDR

AMENDMENT 2 CONSISTS OF (1) APPENDIX J, EMERGENCY COOLING SYSTEMS, AND (2) 7 PAGES CONTAINING CHANGES, SOME OF WHICH ARE MARKED. APPENDIX J DESCRIBES THE CONTAINMENT SPRAY COOLING SYSTEM, THE EMERGENCY CORE COOLING SYSTEMS (TWO HIGH-FLOW-RATE LOW-PRESSURE CORE-SPRAY SYSTEMS, TWO CORE-REFLOODING SYSTEMS (ONE HIGH PRESSURE AND ONE LOW PRESSURE) AUTOMATIC PRESSURE RELIEF VALVES TO ASSIST THE LOW-PRESSURE SYSTEMS, AND THE CONDENSATE PUMP SYSTEM, AND DESCRIBES THEIR INTEGRATED PERFORMANCE UNDER POSTULATED LOSS-OF-COOLANT ACCIDENTS. DESIGNER CONCLUDES, EVEN WITH NO EXTERNAL POWER SUPPLY, THAT CONTAINMENT CAN ACCOMMODATE SEVERAL ORDERS OF MAGNITUDE MORE THAN A 0.6 PERCENT METAL-WATER REACTION AND THAT THERE ARE AT LEAST TWO PROCESSES ADEQUATE FOR COOLING THE CORE FOR ANY SIZE OF BREAK.

*SAFETY ANALYSIS REPORT, PRELIMINARY + BROWNS FERRY + CONTAINMENT SPRAY + CONTAINMENT VESSEL LOADING + CORE REFLOODING SYSTEM + CORE SPRAY + REACTOR, BOILING WATER

18-12178 ELK RIVER REACTOR FORTY-SEVENTH MONTHLY OPERATING REPORT SEPTEMBER 1966
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-36 +. 26 PAGES, 4 FIGURES, DOCKET 115-1, SEPTEMBER 1966, PDR

OF INTEREST ARE - 43 TUBES WERE PLUGGED IN NO. 1 EVAPORATOR FOLLOWING A SERIES OF TESTS. TEN WERE FOUND USING RUBBER PLUGS AND FINDING WATER ON THE PLUGS. SEVEN MORE WERE FOUND ON A HYDRO TEST. SIX MORE WERE FOUND ON A HELIUM TEST, ANOTHER SIX ON A SECOND HELIUM TEST, AND SIX MORE ON A THIRD HELIUM TEST. FOLLOWING THE SEPTEMBER 14 STARTUP, THE TURBINE AIR EJECTOR ACTIVITY WAS ONLY 50,000 CPM (VS 125,000), AND PRIMARY MAKEUP WAS 70 GAL/DAY (VS 500 GAL/DAY). LEAKS WERE REPAIRED IN THE REACTOR OFF-GAS SYSTEM, BUT CONTAINMENT AIR ACTIVITY STILL INCREASES WHEN THE SYSTEM IS PUT IN SERVICE. RADIOIODINE WAS DETECTED IN THE STACK DISCHARGE, AND A CHARCOAL ADSORBER CARTRIDGE WAS INSTALLED FOR WEEKLY MONITORING. IODINE IN PRIMARY COOLANT INCREASES FOLLOWING A STARTUP OR SHUTDOWN AS IODINE, HIDDEN-OUT IN THE PRIMARY SYSTEM, IS RELEASED DURING A PRESSURE-TEMPERATURE CYCLE. FUEL BURNUP, CORRECTED FOR PA-233 AND SAMARIUM TRANSIENTS, APPEARS TO BE ABOUT 0.00071 DOLLAR/MWD.

*OPERATING EXPERIENCE + *OPERATIONS SUMMARY FOR AFC + ELK RIVER + FISSION PRODUCT, IODINE + HEAT EXCHANGER + MAIN COOLING SYSTEM + REACTOR OFFGAS + REACTOR, BOILING WATER + SOURCE, CONTINUOUS + TEST, LEAK RATE

18-12179 MORRIS PA
ELK RIVER CHANGE 9 - DEFERRED CONTAINMENT LEAKAGE TEST
DIVISION OF REACTOR LICENSING, USAEC
2 PAGES, NOVEMBER 7, 1966, DOCKET NO. 115-1, PDR

DRL AUTHORIZES A FOUR-MONTH DELAY IN CONTAINMENT-LEAKAGE TESTING (NOT LATER THAN MARCH 1, 1967) TO TAKE ADVANTAGE OF A SCHEDULED SHUTDOWN AND A REDESIGNED REFERENCE-CHAMBER SYSTEM.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTAINMENT, HIGH PRESSURE + ELK RIVER + REACTOR, BOILING WATER + TEST, LEAK RATE

18-12185 BUCK KE
RISE. RADIOISOTOPE SUBMERSIBLE ENGINE
AEROJET-GENERAL NUCLEONICS, SAN RAMON
AGN-8128 +. 90 PAGES, TABLES, JANUARY 7, 1965, CFSTI \$3.00 CY, \$0.50 MN

THE INCREASED AVAILABILITY AND DECREASED COST OF RADIOISOTOPE ENERGY SOURCES WILL MAKE POSSIBLE THE USE OF RADIOISOTOPE ENGINES OF MUCH HIGHER POWER LEVELS THAN WERE PREVIOUSLY CONSIDERED FEASIBLE. ENGINES PRODUCING TENS OF KILOWATTS OF SHAFT POWER APPEAR TO BE PRACTICAL. ONE OF THE MOST INTERESTING APPLICATIONS OF SUCH AN ENGINE IS THE PROPULSION OF SMALL (15 TO 150 TONS) SUBMERSIBLES. SUBSTITUTION OF A RADIOISOTOPE ENGINE FOR THE EXISTING BATTERY POWER SUPPLY WILL GIVE SIGNIFICANTLY LONGER ENDURANCE TO A VEHICLE DESIGNED FOR LONG ENDURANCE WHICH IS LARGE ENOUGH AND HABITABLE FOR THE CREW FOR LONG PERIODS.

*DESIGN STUDY + *ISOTOPIC GENERATOR + *RADIOISOTOPE + *REACTOR, MARITIME + ENERGY SOURCE

18-12186 BELLERMANN W + NEBGEN K + WITTCHOW G
SPECIAL FEATURES OF CIVIL CONSTRUCTION
1 PAGE, ATOMWIRTSCHAFT 11(5) PAGE 231, (MARCH 1966)

THE AVR EXPERIMENTAL NUCLEAR POWER PLANT HAS TWO MAIN BUILDINGS - THE GENERATOR BUILDING AND THE REACTOR BUILDING. THE LATTER HAS A NUMBER OF UNUSUAL CONSTRUCTIONAL FEATURES. THE MOST PROMINENT IS THE 38-METER-HIGH CONCRETE TOWER OF THE OUTER BIOLOGICAL SHIELD, WHICH RESTS ON AN EARTHQUAKE-RESISTANT REINFORCED CONCRETE PAD. INSIDE THIS SHIELD IS A STEEL SAFETY VESSEL, WHICH IN TURN ENCLOSES THE OUTER REACTOR VESSELS, THE INNER BIOLOGICAL SHIELD, AND THE INNER REACTOR VESSEL, AND THE THERMAL SHIELD. NEUTRON AND GAMMA FLUX DISTRIBUTION THROUGH THE ASSEMBLY IS SHOWN.

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18-12186 *CONTINUED*

*CONTAINMENT, GENERAL + *SHIELDING + CONTAINMENT, PRESSURE VESSEL + EARTHQUAKE + GERMANY + REACTOR, GAS COOLED + REACTOR, GRAPHITE MODERATED + REACTOR, PEBBLE BED

18-12187 VON DER DECKEN CB + HANTKE JH + RAUSCH W
EXPERIMENTS ON PLANT COMPONENTS AND EQUIPMENT
1 PAGE, ATOMWIRTSCHAFT, 11(5), PAGE 269 (MARCH 1966)

FOR THE DEVELOPMENT AND CONSTRUCTION OF AVR REACTORS THERE MUST BE CARRIED OUT MANY EXPERIMENTS ON THE EQUIPMENT UNITS TO FIND THE BEST CONSTRUCTION SOLUTIONS AND TO ASCERTAIN THE ENDURANCE BEHAVIOR UNDER OPERATING CONDITIONS. THESE EXPERIMENTS (PRIMARILY ASSOCIATED WITH THE UNIQUE PEBBLE-BED CORE) ESSENTIAL TO THE FINAL CONSTRUCTION INCLUDE THE MECHANICS OF THE CORE, THE FUEL-HANDLING MACHINERY, THE GAS FLOW AND THE HEAT-TRANSFER COEFFICIENT, THE FUEL BURNUP, THE ROD DISCONNECTS, THE DENSITY AND THE HOLD UP OF THE CORE.

*COATED PARTICLE + *FUEL ELEMENT + *OUT OF PILE LOOPS AND EXPERIMENTS + FUEL HANDLING + GERMANY + HEAT TRANSFER ANALYSIS + HYDRODYNAMIC ANALYSIS + REACTOR, GAS COOLED + REACTOR, GRAPHITE MODERATED + REACTOR, PEBBLE BED

18-12188 EHLERS VK + MARNET C
FUEL ELEMENTS
1 PAGE, ATOMWIRTSCHAFT 11(5) PAGE 237 (MARCH 1966)

TWO PARTICULAR ADVANTAGES OF THE AVR REACTOR - THE AVOIDANCE OF METALLIC FUEL-ELEMENT JACKETS AND POWER PRODUCTION WITHOUT EXCESS REACTIVITY - DEPEND ON THE DESIGN AND CONSTRUCTION OF THE FUEL ELEMENTS. AFTER A LONG PERIOD OF DEVELOPMENT, THE CURRENT AVR ELEMENT CONSISTS OF A HOLLOW GRAPHITE SPHERE CLOSED BY A GRAPHITE SCREW PLUG. THE SPHERE IS FILLED WITH HIGHLY ENRICHED URANIUM IN THE FORM OF COATED URANIUM-THORIUM DICARBIDE PARTICLES, MIXED WITH GRAPHITE POWDER AND A BINDER. THESE SPHERES ARE THEN UTILIZED IN A PEBBLE-BED DESIGN.

*COATED PARTICLE + *FUEL ELEMENT + *THORIUM + *URANIUM CARBIDE + GERMANY + REACTOR, GAS COOLED + REACTOR, GRAPHITE MODERATED + REACTOR, PEBBLE BED

18-12190 TECHNICAL SPECIFICATION CHANGES REQUESTED FOR PULSTAR TESTS
WESTERN NEW YORK NUCLEAR RESEARCH CENTER, INC., NEW YORK
4 PAGES, JULY 8, 1966, DOCKET NO. 50-57, PDR

DETAILS GIVEN FOR (1) NATURAL-CIRCULATION POWER LIMIT OF A PULSTAR ELEMENT. THERMOCOUPLES WILL BE ATTACHED TO CLAD OF AN ELEMENT LOCATED IN REFLECTOR AND CLAD TEMPERATURE RESTRICTED TO 280 F. WORTH EXPECTED TO BE 1 PERCENT DELTA K/K. (2) SILVER-CADMIUM-INDIUM CRUCIFORM ROD WILL BE INSERTED INTO A SPECIAL PULSTAR ELEMENT TO COMPARE WITH CALCULATED WORTH IN VARIOUS PORTIONS OF THE CORE. ROD WILL NOT HAVE A DRIVE. (3) REACTIVITY WORTH AND FLUX DEPRESSION OF A COBALT STRIP WILL BE MEASURED.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CIRCULATION, NATURAL (LOOPS AND REACTORS) + CONTROL ROD WORTH + CRITICALITY EXPERIMENT + REACTOR, PULSED + TEST, PHYSICS

18-12191 BLACK JE
AMENDMENT 10, REQUEST TO RAISE POWER LEVEL FROM 1 TO 2 MW TH
U.S. ARMY
3 PAGES, MARCH 4, 1966, DOCKET NO. 50-47, PDR

REQUESTS LICENSE CHANGE TO 2 MW THERMAL AS A STEP TO 10 MW(TH), NO INCREASE IN 1000-GPM FLOW OR SYSTEM. MAXIMUM HEAT FLUX FOR 21-ELEMENT CORE WOULD BE 3.2 TIMES 10(4TH) BTU/HR-FT SQ. VARIOUS DATA PUBLISHED AFTER ORIGINAL HAZARDS REPORT INDICATES THAT THE 1-MW ANALYSIS WAS CONSERVATIVE BY A FACTOR OF TWO, AT LEAST. LOSS-OF-WATER TESTS IN OTHER REACTORS INDICATE PREVIOUS PESSIMISM ON DOSE RATE WITHOUT WATER SHIELDING, AND THAT FUEL-ELEMENT MELTING WITHOUT COOLANT WOULD NOT BE A PROBLEM BELOW 2.25 MW.

*POWER UPGRATING + ACCIDENT, LOSS OF COOLANT + REACTOR, ARMY + REACTOR, POOL TYPE + REACTOR, RESEARCH + SHIELDING

18-12193 MORRIS PA + BOYD RS
AMENDMENT 7 - TEMPORARY STORAGE OF WATERTOWN ARSENAL FUEL ELEMENTS
U.S. ARMY
8 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-47, PDR

GRANTS REQUEST TO STORE FUEL IN A CYLINDER (OF 6 FT DIA.) WHILE PLACING A POOL LINER IN PLACE

*FUEL STORAGE + *SAFETY EVALUATION + POWER UPGRATING + REACTOR, ARMY + REACTOR, POOL TYPE + REACTOR, RESEARCH

18-12194 LEVINE S
TECHNICAL SPECIFICATION CHANGE ALLOWS TORREY PINES TRIGA III TO RUN FUELED THERMIONIC DEVICES OPEN CIRCUIT
GENERAL ATOMIC DIVISION, GENERAL DYNAMICS CORP.
3 PAGES, OCTOBER 28, 1966, DOCKET NO. 50-227, PDR

DRL ALLOWS TECHNICAL SPECIFICATION CHANGE TO ALLOW OPEN-CIRCUIT OPERATION OF FUELED THERMIONIC

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18-12194 *CONTINUED*

DEVICES, LIMITING FISSION POWER SO THAT TEMPERATURES WILL BE LOWER THAN THOSE PREVIOUSLY EXPERIENCED.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + DIRECT ENERGY CONVERSION DEVICES + REACTOR, PULSED + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-12196 CHANGE REQUEST 8 - REVISED PLANT PARTICULATE MONITOR ALARM SETTING
RURAL COOPERATIVE POWER ASSOCIATION
2 PAGES, OCTOBER 5, 1966, DOCKET NO. 115-1, PDR

UNDER EXISTING CONDITIONS (RADON AND FISSION-GAS DAUGHTERS), THE PLANT AIR-PARTICULATE MONITOR IS NEARLY ALWAYS IN THE ALARM CONDITION. SINCE THE MAJOR ACTIVITIES ARE CONSIDERED KNOWN (RB-88 AND CS-138) THE REQUEST IS MADE TO CHANGE THE SETTING SO THAT THE INSTRUMENT MAY WARN OF INCREASED ACTIVITY LEVELS. DETAILED INFORMATION IN NUS-TM-5-35.

*MONITOR, RADIATION, AIR + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ELK RIVER + REACTOR, BOILING WATER

18-12197 SMITH ER
CONTAINMENT AIR PARTICULATE ACTIVITY IN ELK RIVER REACTOR
RURAL COOPERATIVE POWER ASSOCIATION
3 PAGES, AUGUST 6, 1966, DOCKET NO. 115-1, PDR

THE PLANT PARTICULATE AIR MONITOR USES A MOVING FILTER PAPER, WITH DETECTORS PLACED FOR INSTANTANEOUS AND FOR 6-HOUR-DECAY ALARMS. THE INSTANTANEOUS DETECTOR IS NEARLY ALWAYS ALARMING BECAUSE ITS SETTING IS 3 TIMES 10 (MINUS 10TH) MICRO C/CC, THE MPC FOR UNIDENTIFIED BETA-GAMMA EMITTERS. SINCE THE OBSERVED FILTER PAPER HALF-LIFE FOR THE FIRST FOUR HOURS IS 22 MIN, AND SPECTRUM ANALYSIS SHOWS PREDOMINANTLY KR-88 AND CS-138 IN THE AIR, THE ALARM SETTING SHOULD BE CHANGED TO 6 TIMES 10 (MINUS 8TH) MICRO C/CC (1/10TH THE MPC FOR KR-88 AND CS-138) SO THE ALARM WILL MEAN SOMETHING.

*MONITOR, RADIATION, AIR + *OPERATING EXPERIENCE + AIRBORNE RELEASE + CONTAINMENT, GENERAL + ELK RIVER + NOBLE GAS + REACTOR, BOILING WATER

18-12198 ELK RIVER JANUARY SHUTDOWN PLANS
RURAL COOPERATIVE POWER ASSOCIATION
2 PAGES, OCTOBER 10, 1966, DOCKET NO. 115-1, PDR

IN A LETTER TO AEC-DRL, THE RURAL COOPERATIVE POWER ASSOCIATION (THE ELK RIVER OPERATING AGENCY) INDICATES PLANS FOR AN EARLY 1967 SHUTDOWN TO (A) INSPECT BORON-STAINLESS-STEEL CONTROL RODS, WHEN THE NEW B4C RODS ARE DELIVERED, AND (B) TO INSTALL A CALIBRATED-ORIFICE LEAK-RATE SOURCE AND TO REDESIGN THE REFERENCE CHAMBER SYSTEM, SO A MORE MEANINGFUL CONTAINMENT TEST MAY BE MADE.

*CONTAINMENT, HIGH PRESSURE + *CONTROL ROD + *TEST, LEAK RATE + CONTAINMENT REFERENCE MEASURING SYSTEM + ELK RIVER + MATERIAL + REACTOR, BOILING WATER

18-12199 REQUEST FOR CHANGE IN THE TECHNICAL SPECIFICATIONS FOR THE ELK RIVER REACTOR - CHANGE REQUEST NO. 9
RURAL COOPERATIVE POWER ASSOCIATION
14 PAGES, 1 FIGURE, OCTOBER 3, 1966, DOCKET NO. 115-1, PDR

PROPOSED TECHNICAL SPECIFICATION CHANGES ARE - SECTION 31(5) - ALLOWABLE LEAK RATE TO BE CHANGED FROM 0.1 PERCENT PER DAY (AT 21 PSIG) TO 0.45 PERCENT PER DAY BECAUSE THE LOWER LEAK RATE IS SO LOW AS TO BE WITHIN THE MEASUREMENT LIMITS OF ACCURACY. APPENDED CALCULATIONS INDICATE THAT A LEAK RATE OF 1.35 PERCENT PER DAY WOULD GIVE 300 RADS THYROID DOSE AT THE EXCLUSION DISTANCE. SECTION 3.4 - THIS SECTION IS COMPLETELY REPLACED WITH A SET OF TEST FREQUENCIES, TEST METHODS, AND ACCEPTANCE CRITERIA FOR LEAKAGE RATE AND LEAK DETECTION OF CONTAINMENT AND VARIOUS KINDS OF PENETRATIONS. INTEGRATED-LEAK-RATE TEST WOULD BE PERFORMED WITHIN 4 MONTHS OF THE PREVIOUSLY FIXED EVERY-18-MONTHS.

*CONTAINMENT, HIGH PRESSURE + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *TEST, LEAK LOCATION + *TEST, LEAK RATE + ELK RIVER + REACTOR, BOILING WATER

18-12200 CONTAINMENT ISOLATION VALVE REVIEW
RURAL COOPERATIVE POWER ASSOCIATION
19 PAGES, 9 FIGURES, 2 TABLES, OCTOBER 10, 1966, DOCKET NO. 115-1, PDR

THIS REVIEW WAS REQUESTED BY AEC. FIVE CRITERIA WERE ESTABLISHED (E.G., LINES OPEN TO CONTAINMENT OR PRIMARY SYSTEM WILL HAVE 2 VALVES IN SERIES, AT LEAST ONE VALVE WILL CLOSE AUTOMATICALLY ON HIGH CONTAINMENT PRESSURE OR ON BACK FLOW). THESE CRITERIA WERE COMPARED TO YANKEE, BIG ROCK POINT, DRESDEN II, AND ROCHESTER GAS AND ELECTRIC DESIGNS, WHERE CONSIDERABLE VARIATION WAS SHOWN. THEN THE 30 ACTUAL CONTAINMENT PIPE-OR-DUCT-PENETRATIONS WERE COMPARED TO THE CRITERIA AND CHANGES SCHEDULED WHERE NECESSARY.

*CONTAINMENT PENETRATION, CLOSURE OF + *DESIGN CRITERIA + *MODIFICATION, SYSTEM OR EQUIPMENT + ELK RIVER + REACTOR, BOILING WATER

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12201 REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
17 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PDR

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. ITEMS INCLUDE (A-B-C) THE USUAL AVAILABILITY AND CAPACITY-FACTOR DATA, (D) SITE MONITORING FOR RADIOACTIVITY, (E) MEASURED RADIOACTIVITY IN PLANT SYSTEMS, (F) ROUTINE DISCHARGES OF RADIOACTIVITY, (G) PRINCIPLE MAINTENANCE AND FACILITY CHANGES, (H) SIGNIFICANT TESTS PERFORMED, (I) SUMMARY OF METEOROLOGICAL DATA, AND (J) SIGNIFICANT PLANT ORGANIZATION CHANGES. APPENDIXES CARRY THE BULK OF DETAILED DATA.

*OPERATIONS SUMMARY FOR AEC + EFFLUENT + FISSION PRODUCT RETENTION + HUMBOLDT BAY + MAIN COOLING SYSTEM + MAINTENANCE AND REPAIR + REACTOR, BOILING WATER + STAFFING, TRAINING, QUALIFICATION + SURVEY, RADIATION, ENVIRONMENTAL + TEST, SYSTEM OPERABILITY + WIND STATISTICS

18-12202 APPENDIX III 1 - PRINCIPAL MAINTENANCE PERFORMED
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
1 PAGE, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGE 1 OF APPENDIX III FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966, PDR

THE ROD DRIVES ON ACCUMULATOR 8 FAILED TO SCRAM ON A QUARTERLY TEST. THE MASTER SCRAM SOLENOID VALVES, MODIFIED DURING THE 1965 REFUELING OUTAGE, WERE REPLACED TWICE, WITHOUT FUNCTIONING PROPERLY. TESTING REVEALED THAT THE SOLENOID CORE WOULD NOT MOVE BECAUSE THE PILOT GUIDE TUBE BENT WHEN THE COVER WAS TIGHTENED, AS A SLIGHT ROTATIONAL MISALIGNMENT OF COVER AND CASE EXISTED. OTHER DRIVES WERE CHECKED. THE VALVE-INSTALLATION MANUAL DID NOT WARN OF THE EFFECTS OF THIS MISALIGNMENT. THE VENDOR WILL NOW USE DECALS TO SHOW PROPER ALIGNMENT, AND IS CONSIDERING MODIFYING THE VALVE DESIGN.

*FAILURE, INSTALLATION ERROR + *FAILURE, SCRAM MECHANISM + *OPERATIONS SUMMARY FOR AEC + CONTROL ROD DRIVE + HUMBOLDT BAY + MAINTENANCE AND REPAIR + REACTOR, BOILING WATER

18-12203 APPENDIX III. 2 AND 5 - PRINCIPAL MAINTENANCE PERFORMED
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 2-3 OF APPENDIX III FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16 THROUGH AUGUST 15, 1966, PDR

A LOG-N NEGATIVE-HIGH-VOLTAGE SUPPLY SHORTED, AND THE SPARE SUPPLY COULD NOT SUPPLY MORE THAN 250 VOLTS (NORMALLY 800) BECAUSE OF LOW CABLE RESISTANCE. THE READING WAS UNAFFECTED BECAUSE OF HIGH NEUTRON-TO-GAMMA CURRENT RATIO. A STARTUP CHANNEL WAS FOUND FAILED ON A TEST RESTART, AS A MICROSWITCH FAILURE ALLOWED THE CHAMBER OVERTRAVEL TO BREAK THE SIGNAL CABLES. ON A MONTHLY DIESEL TEST, THE ENGINE TRIPPED OUT ON HIGH TEMPERATURE BECAUSE OF LOW-RADIATION-WATER CONTENT. TESTING IS NOW BIWEEKLY. LATER, A LOW-BATTERY-VOLTAGE CONDITION DID NOT ALLOW A START ON TEST. THE REVERSE CURRENT RELAY CONTACT (IN THE VOLTAGE REGULATOR) STUCK, CAUSING THE BATTERY TO DISCHARGE.

*FAILURE, DESIGN ERROR + *FAILURE, INSTRUMENT + *OPERATIONS SUMMARY FOR AEC + EMERGENCY POWER, ELECTRIC + GENERATOR, DIESEL + HUMBOLDT BAY + INSTRUMENTATION, INTERMEDIATE RANGE + INSTRUMENTATION, STARTUP RANGE + REACTOR, BOILING WATER

18-12204 APPENDIX IV - PRINCIPAL CHANGES MADE IN FACILITY
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 1-2 OF APPENDIX IV FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966, PDR

SPENT-FUEL POOL-WATER ACTIVITY HAS INCREASED (BECAUSE OF ZN-65) SO THAT THE COOLERS AND DEMINERALIZE PIPES WERE SHIELDED. THE STAINLESS-STEEL POOL LINER (WHICH REPLACED THE LEAKY CARBOLINE-PAINTED CONCRETE) DRAINS TO A SUMP TO TAKE LINER LEAKAGE. IN MARCH, THE LEAKAGE INCREASED TO 80 GAL/DAY, TOO MUCH FOR THE LIQUID WASTE SYSTEM. THEREFORE, THE SPACE BETWEEN LINER AND CONCRETE WALL WAS FILLED WITH DEMINERALIZED WATER AND MAINTAINED 1/4 INCH HIGHER THAN POOL-WATER LEVEL. THREE TEST WELLS WERE DUG OUTSIDE. SAMPLES FROM SUMPS, ETC., INDICATE NO SIGNIFICANT RADIOACTIVITY IS ESCAPING.

*CLAD + *FUEL STORAGE + *OPERATIONS SUMMARY FOR AEC + *TEST, LEAK LOCATION + HUMBOLDT BAY + REACTOR, BOILING WATER

18-12205 APPENDIX V. 1 - DISCUSSION OF SIGNIFICANT TESTS
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
1 PAGE, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGE 1 OF APPENDIX V FROM REPORT ON THE OPERATION OF HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966, THROUGH AUGUST 15, 1966, PDR

REACTOR IS BACK TO FULL POWER FOLLOWING EVALUATION OF THE FLOW REDUCTION (DUE TO SPALLED SCALE TRAPPED ON FUEL ROD SPACERS) WHICH REDUCED THE MINIMUM BURNOUT RATIO AT 125 PERCENT POWER IN THE PEAK CHANNEL FROM 3.1 TO 2.9. AFTER AN APRIL SCRAM AND 3.5-DAY OUTAGE, A CHANGE IN CRITICAL CONTROL ROD POSITION (HALF THE ADDITIONAL ROD MOVEMENT NEEDED TO OVERCOME THE FLOW REDUCTION WAS NO LONGER NEEDED) INDICATED THAT SOME OF THE SPALLED SCALE HAD BEEN WASHED OUT. FLOW MEASUREMENTS OF 10.6 TIMES 10(6TH) POUNDS PER HOUR WERE BETWEEN NORMAL (11.3) AND LOWEST FLOW WITH SPALLED SCALE (9.6). IN JUNE, FLOW BEGAN A DOWNWARD TREND, REACHING 9.9 IN AUGUST.

*FLOW BLOCKAGE + *INCIDENT, ACTUAL, GENERAL + *SURFACE FILM DEPOSIT + HUMBOLDT BAY + REACTIVITY EFFECT, ANOMALOUS + REACTOR, BOILING WATER

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18-12206 APPENDIX V. 2 - DISCUSSION OF SIGNIFICANT TESTS
PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO
2 PAGES, SEPTEMBER 26, 1966, DOCKET NO. 50-133, PAGES 2-3 OF APPENDIX V FROM REPORT ON THE OPERATION OF
HUMBOLDT BAY POWER PLANT UNIT NO. 3, COVERING THE PERIOD FEBRUARY 16, 1966 THROUGH AUGUST 15, 1966, PDR

CONTINUOUS LEAK-RATE MONITORING SYSTEM INDICATES (BY MEASURING NITROGEN INJECTION) SUPPRESSION
CHAMBER 0.035 PERCENT/DAY AT 10 INCHES WATER PRESSURE AND DRY WELL AS 0.052 PERCENT PER DAY
AT 20 INCHES WATER (VS 0.05 AND 0.07 FROM LAST INTEGRATED LEAK-RATE TEST). AS AN INDICATION
OF THIS ABILITY OF THIS SYSTEM TO QUICKLY EXPOSE ABNORMAL LEAKAGE RATES, SUPPRESSION-CHAMBER
PRESSURE WAS FOUND FALLING FASTER THAN NORMAL IN APRIL, THREE DAYS AFTER A STARTUP. AFTER
REPEATED OPERATION OF THE VENT VALVES TO GET DIRT OUT OF THE SEATS, THE LEAKAGE RETURNED TO
NORMAL. THE EXCESSIVE LEAK RATE WAS KEPT WELL BELOW SPECIFICATIONS AND FOUND WITHIN A DAY
AFTER THE VENTING OPERATION.

*CONTAINMENT, PRESSURE SUPPRESSION + *OPERATIONS SUMMARY FOR AEC + *TEST, LEAK RATE + HUMBOLDT BAY +
REACTOR, BOILING WATER

18-12208 SAXTON NUCLEAR EXPERIMENTAL CORPORATION - OPERATIONS REPORT FOR AUGUST 1966
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
44 PAGES, FIGURES, TABLES, OCTOBER 21, 1966, DOCKET NO. 50-146, PDR

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. SEMIANNUAL
REPORT IS A COMPILATION ON MONTHLY REPORTS. MONTHLY REPORT HAS SECTIONS (1) SHORT
DESCRIPTION OF REACTOR OPERATION, (2) EXPERIMENTAL PROGRAM - FUEL CHANGES, REACTIVITY TESTS,
(3) OPERATIONAL TESTS ON SYSTEMS AND COMPONENTS, (4) MAINTENANCE PERFORMED, MECHANICAL,
ELECTRICAL AND INSTRUMENT, (5) COOLANT CHEMISTRY DATA, (6) RADIATION AND CONTAMINATION
READINGS AT VARIOUS EQUIPMENT, WASTE DISCHARGES, AND PERSONNEL DOSIMETER READINGS.

*OPERATIONS SUMMARY FOR AEC + COOLANT CHEMISTRY + IRRADIATION TESTING + MAINTENANCE AND REPAIR +
RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + SAXTON + TEST, SYSTEM OPERABILITY +
WASTE DISPOSAL, GENERAL

18-12209 SAXTON NUCLEAR EXPERIMENTAL CORPORATION - OPERATIONS REPORT FOR MARCH 1 THROUGH AUGUST 31, 1966
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
44 PAGES, FIGURES, TABLES, OCTOBER 21, 1966, DOCKET NO. 50-146, PDR

(APRIL) - TEST FUEL ELEMENTS REPLACED. NUCLEAR HEATUP BEGAN APRIL 14 AFTER A COLD
COOLANT-LOOP LEAK TEST. THREE DAYS AND THREE SYSTEM HEATUPS WERE REQUIRED BECAUSE OF
SIMMERING PRESSURIZER SAFETY VALVES. (MAY) - THE PH-VS-REACTIVITY TESTS (HOT PH REDUCED FROM
7.07 TO 5.38) DECREASED MAIN COOLANT TEMPERATURE 9.8 F. (JUNE) - REACTOR SHUTDOWN FOR IBFW
STRIKE. A PH REDUCTION FROM 7.12 TO 5.38 GAVE A COEFFICIENT OF 0.118 PERCENT REACTIVITY PER
PH UNIT. (AUGUST) - SEVERAL TEST ELEMENTS WERE SHUFFLED, AND FUEL RODS WERE SENT OUT FOR
EXAMINATION. FULL CORE-FLUX MAP AND FULL SET OF THERMAL AND HYDRAULIC MEASUREMENTS MADE.
CONTAINMENT-INTEGRAL-LEAK-RATE TEST (80 HOURS AT AN AVERAGE OF 10.19 PSIG) GAVE 3.076 PERCENT
OF NET FREE VOLUME PER DAY, ALMOST HALF THE SPECIFIED LIMIT.

*OPERATIONS SUMMARY FOR AEC + AFL-CIO + CONTAINMENT, HIGH PRESSURE + REACTIVITY EFFECT, ANOMALOUS +
REACTOR, PRESSURIZED WATER + SAXTON + TEST, LEAK RATE + VALVE

18-12210 METHOD FOR DISPOSAL OF ALLIS CHALMERS CRITICAL FACILITY
ALLIS-CHALMERS
4 PAGES, OCTOBER 18, 1966, DOCKET NO. 50-108, PDR

THE LAST EXPERIMENT WAS PERFORMED ON JULY 20, 1962. SURVEYS SHOW NO TRANSFERABLE
CONTAMINATION AND NEGLIGIBLE RADIATION. AFTER AEC APPROVAL, THE FACILITY WILL BE DISMANTLED,
PIECES WILL BE DECONTAMINATED AS NECESSARY AND THEN SOLD, DONATED TO SCHOOLS, OR SCRAPPED.

*REACTOR DECOMMISSIONING EXPERIENCE + CRITICAL ASSEMBLY FACILITY + DECONTAMINATION

18-12211 MEHANN RO
TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL
FIRST ATOMIC SHIP TRANSPORT INC., NEW YORK
6 PAGES, OCTOBER 31, 1966, DOCKET NO. 50-238, PDR

PREVIOUSLY, TRITIUM WAS NOT MENTIONED. NO TRITIUM-ANALYSIS EQUIPMENT IS CARRIED ON SHIP, SO
CONCENTRATION CHANGES WILL BE ESTIMATED AS 1.2 TIMES $10(-5TH)$ MICROCURIE PER MILLILITER PER
MEGAWATT-HOUR OF OPERATION, BASED ON A PRODUCTION RATE OF 0.019 CURIE PER MW-DAY. DISCHARGE
LIMIT OF 100 CURIES OF TRITIUM PER MONTH SET. AT SEA, DISCHARGING THE MONTHLY LIMIT TO THE
VOLUME DISPLACED IN THE SHIPS PASSAGE, WITH NO FURTHER DILUTION, WOULD GIVE A FACTOR OF 30
BELOW THE MPC FOR DRINKING WATER.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + N S SAVANNAH + REACTOR, MARITIME +
REACTOR, PRESSURIZED WATER + TRITIUM + WASTE DISPOSAL, OCEAN

18-12212 CHANGE 27, TESTS OF PULSTAR REACTIVITY EFFECTS AND NATURAL CIRCULATION POWER LIMITATION ALLOWED
WESTERN NEW YORK RESEARCH CENTER, BUFFALO
5 PAGES, NOVEMBER, 1966, DOCKET NO. 50-57, PDR

AFC. ALLOWS SIX MONTHS FOR THREE TESTS TO BE MADE AT WESTERN NEW YORK RESEARCH CENTER. (1) AN
INSTRUMENTED FUEL ASSEMBLY WILL BE PLACED IN REFLECTOR, AND REACTOR OPERATED TO 1.15 MW (IN

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12212 *CONTINUED*

FORCED-CONVECTION COOLING). SIX THERMOCOUPLES WILL BE USED, AND THE CLAD TEMPERATURE WILL BE LIMITED TO 280 F. DNB UNLIKELY. (2) NINE FUEL PINS WILL BE REMOVED FROM A FUEL ELEMENT SJ A CO-IN-AG CRUCIFORM CONTROL ROD MAY BE TESTED. REACTIVITY COULD EXCEED 1.5 PERCENT BUT NOT 2.5. (3) REACTIVITY WORTH OF A COBALT STRIP WITHIN THE ELEMENT WILL BE MEASURED.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + CONTROL ROD WORTH + HEAT TRANSFER, NATURAL CONVECTION + REACTOR, PULSED + REACTOR, RESEARCH + TEST, PHYSICS

18-12213 RUDDER E

TEXAS A AND M REQUESTS TECHNICAL SPECIFICATIONS CHANGE ALLOWING USE OF RADIATION CELL

TEXAS A AND M UNIVERSITY, COLLEGE STATION

5 PAGES, 1 FIGURE, OCTOBER 20, 1966, DOCKET NO. 50-128, PDR

DESCRIBES DRY CELL MADE BY ERECTING A WALL AND STAINLESS-STEEL LINER ACROSS THE LARGE POOL AND PROVIDING A WINDOW FOR REACTOR RADIATION SIMILAR TO GROUND TEST REACTOR. A BORAL SHEET WILL ABSORB THERMAL NEUTRONS. SEPARATE VENTILATION WILL EXHAUST AN-41 FROM SHIELDED CAVE CONSTRUCTED AROUND EACH EXPERIMENT. FUEL ELEMENTS WILL NOT BE LOADED IN CORE ROW AGAINST WINDOW. GTR SHIELDING DATA INDICATE THAT A 4-FT-THICK CONCRETE ROOF IS ADEQUATE. THE CELL IS TO BE USED FOR GAMMA AND FAST-NEUTRON IRRADIATION OF ANIMALS, PLANTS, AND MECHANICAL SYSTEMS.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + IRRADIATION TESTING + REACTOR, POOL TYPE + TEST, COMPONENT

18-12214 DODGEN HW

WASHINGTON STATE REQUESTS PERMISSION TO PARTITION CONTROL ROOM FROM REACTOR POOL

WASHINGTON STATE UNIVERSITY, PULLMAN

3 PAGES, 1 FIGURE, OCTOBER 17, 1966, DOCKET NO. 50-27, PDR

PARTITION WITH WINDOWS WILL ISOLATE OPERATOR FROM POOLSIDE NOISE AND HUMIDITY, YET ALLOW HIM TO MAINTAIN CONTACT WITH OPERATIONS. VENTILATION AIR WILL FLOW FROM THE CONTROL ROOM TO THE ROOM THAT HOUSES THE POOL.

*BUILDING + REACTOR, POOL TYPE + REACTOR, RESEARCH + VENTILATION SYSTEM

18-12215 IRL WISHES TO CARRY OUT SHIPPING CASK SUBCRITICALITY STUDIES FOR POOL TYPE REACTOR ELEMENTS

COLUMBIA UNIVERSITY, NEW YORK

86 PAGES, FIGURES, TABLES, JULY 8, 1966, DOCKET NO. 50-17, PDR

NATIONAL LEAD CO. HAS A 28-ELEMENT SHIPPING CASK FOR SPENT, POOL-TYPE REACTOR ELEMENTS, POISONED WITH 1/4-IN. BORAL PLATES. MULTIPLICATION MEASUREMENTS MADE EARLIER WERE OVERLY CONSERVATIVE BECAUSE OF PU-BE HIGH-ENERGY NEUTRONS. THIS SET OF CRITICALITY MEASUREMENTS IS INTENDED TO IMPROVE CALCULATIONAL TECHNIQUES AND PROVIDE ACCURATE MEASUREMENTS OF SUBCRITICALITY IN VARIOUS ARRAYS OF 18-PLATE, PARTIALLY SPENT IRL ELEMENTS, WITH ELEMENT ROWS SEPARATED BY BORAL. REVIEWS OF PREVIOUS DATA, SIMILAR EXPERIMENTS, AND HEAT-TRANSFER CALCULATIONS.

*CRITICALITY EXPERIMENT + *MEASUREMENT, SUBCRITICALITY + FUEL STORAGE + REACTOR, POOL TYPE + SHIPPING CONTAINER

18-12216 ELK RIVER REACTOR 45TH MONTHLY OPERATING REPORT JULY 1966

RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINNESOTA

COO-651-34 +. 21 PAGES, 3 FIGURES, JULY 1966, DOCKET NO. 115-1, PDR

REACTOR WAS STARTED UP JULY 8 FOLLOWING REFUELING. III-E - DURING HEATUP, TEMPERATURE COEFFICIENT WAS MEASURED BETWEEN 100 F (MINUS 0.49 CENT/DEG F) AND 450 F (MINUS 2.02 CENTS/DEG F). DURING POWER ESCALATION, CHECKS OF 12 ROD BANK POSITION CHANGE FOR KNOWN CHANGES BETWEEN XENON EQUILIBRIA STATES WERE COMPARED WITH PREVIOUS CORE I, SHOWING NO ANOMALOUS REACTIVITY EFFECTS. POWER ESCALATION WAS HALTED AT 30 AND 50 MW (TH) TO ALLOW XENON GROWTH--THIS ENSURED THAT HEAT-FLUX LIMITS WERE NOT EXCEEDED BECAUSE OF THE SMALLER EFFECTIVE CORE (CENTER ROD MAINTAINED AT 12 INCHES INSTEAD OF 0 INCHES AS IN CORE I STARTUP). PHOTONEUTRONS WERE OBSERVED FOR 16-50 MINUTES AFTER THE 55-MW SCRAM, BUT STARTUP CHANNELS RESPONDED PROPERLY TO MULTIPLICATION.

*OPERATIONS REPORT, GENERAL + ELK RIVER + INSTRUMENTATION, STARTUP + POWER DISTRIBUTION + REACTIVITY EFFECT, ANOMALOUS + REACTOR, AEC OWNED + REACTOR, BOILING WATER + REFUELING

18-12221 ENGINEERING MATERIALS LIST

DIVISION OF TECHNICAL INFORMATION

TID-4100 SUPPL. 35 +. 67 PAGES, OCTOBER 1966, DTIC, FREE

DRAWINGS FOR A VARIETY OF EQUIPMENT USED IN GOVERNMENT CONTRACT RESEARCH. RANGE FROM SODIUM-HEATED STEAM GENERATOR (B AND W) TO BAG-PASSOUT SYSTEM (UCRL) THROUGH WOODEN OVERCOAT (SAND).

*ENGINEERING DRAWING LIST

18-12224 DOAN RL

ACCESSION NUMBER 18-12212 TO 18-12224

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12224 *CONTINUED*
OREGON STATE UNIVERSITY RECEIVES CONSTRUCTION PERMIT FOR TRIGA II AT CORVALLIS, OREGON
OREGON STATE UNIVERSITY
3 PAGES, AUGUST 16, 1966, DOCKET NO. 50-243, PDR

COMPLETION DATE IS LISTED AS BETWEEN OCTOBER 1, 1966, AND APRIL 1, 1967.

*CONSTRUCTION PERMIT PROCESS + REACTOR, RESEARCH + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-12225 DRESDEN ASKS CHANGE IN CONTROL ROD DRIVE INSPECTION FREQUENCY
COMMONWEALTH EDISON COMPANY
2 PAGES, AUGUST 9, 1966, DOCKET NO. 50-10, PDR

DRESDEN REQUESTS THAT THE TIMING OF THE THOROUGH EXAMINATION OF TWO CONTROL-ROD DRIVE MECHANISMS BE CHANGED FROM EVERY MONTH TO EVERY REFUELING OUTAGE. NORMALLY, THE OPERATING CYCLE IS 12-18 MONTHS, BUT REPLACEMENT OF TYPE-II FUEL EXTENDS IT TO 19-20 MONTHS.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTROL ROD DRIVE + DRESDEN 1 + DRESDEN 2 + EXAMINATION + REACTOR, BOILING WATER

18-12226 YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 67 FOR THE MONTH OF JULY 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
9 PAGES, 2 TABLES, 2 FIGURES, AUGUST 19, 1966, DOCKET NO. 50-29, PDR

THIS REPORT IS ONE OF A SERIES OF SUCH REPORTS ON THE SUBJECTS ENUMERATED BELOW. AFTER A SHORT SUMMARY OF PLANT OPERATIONS, VARIOUS SUBHEADINGS INCLUDE - PLANT AND REACTOR MAINTENANCE, PLANT AND REACTOR PERFORMANCE, WATER CHEMISTRY, HEALTH AND SAFETY, AND DESIGN CHANGES.

*OPERATIONS REPORT, GENERAL + COOLANT CHEMISTRY + MAINTENANCE AND REPAIR + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + TEST, SYSTEM OPERABILITY + WASTE DISPOSAL, GENERAL + YANKEE

18-12227 SELECTED OPERATING EXPERIENCES
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
1 PAGE YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 67 FOR THE MONTH OF JULY 1966 PAGE 1, AUGUST 19, 1966, DOCKET NO. 50-29, PDR

OF INTEREST ARE THE FOLLOWING - LIGHTNING STORMS ON THE SYSTEM MADE IT ADVISABLE TO REDUCE POWER 10 PERCENT SO A BREAKER TRIP ON ONE POWER LINE WILL NOT CAUSE A SCRAM (DUE TO ONE PUMP LOSING POWER). COOLANT WAS AMMONIATED ON THE 14TH, AND THE REACTIVITY GAIN WAS 0.5 PERCENT. SINCE HEAT-EXCHANGER-TUBING LEAKAGE IS CALCULATED USING TRITIUM VALUES, THE SEVERAL LOAD REDUCTIONS CAUSED PRIMARY-LOOP TRITIUM CONCENTRATIONS TO VARY AND MIGHT HAVE CAUSED A HIGH INDICATED LEAK RATE (7.8 GAL/DAY FROM THE NO. 3 STEAM GENERATOR).

*OPERATIONS REPORT, GENERAL + COOLANT CHEMISTRY + HEAT EXCHANGER + REACTIVITY EFFECT, ANOMALOUS + REACTOR, PRESSURIZED WATER + TEST, LEAK RATE + YANKEE

18-12228 YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 68 FOR THE MONTH OF AUGUST 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON
11 PAGES, 2 FIGURES, TABLES, SEPTEMBER 20, 1966, DOCKET NO. 50-29, PDR

COPE STRETCHOUT HAS BEGUN. CLEANING CONDENSER TUBES GAVE 5.5 MW(E) MORE. SODIUM INJECTION INTO PRIMARY COOLANT INDICATES NO. 1 STEAM GENERATOR NOW HAS A LEAK, PROBABLY GREATER THAN NO. 3. ON THE 25TH, WHEN A BOILER FEED PUMP WAS TAKEN OUT OF SERVICE, ITS CHECK VALVE STAYED OPEN. RECIRCULATION OF FEEDWATER FROM THE OTHER PUMPS CAUSED A LOW-STEAM-GENERATOR-WATER-LEVEL TURBINE TRIP AND SCRAM. ON STARTUP, NO. 3 LOOP WAS INSPECTED (GENERAL AREA, 150-600 MR/HR) AT 10 PERCENT POWER TO SEE WHAT WAS CAUSING WATER LEVEL FLUCTUATIONS AND WATER HAMMER. CHECK-VALVE HINGE ASSEMBLY HAD WORN.

*OPERATIONS REPORT, GENERAL + FAILURE, COMPONENT + HEAT EXCHANGER + OPERATING EXPERIENCE + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + TEST, LEAK RATE + VALVE + YANKEE

18-12229 YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 69 FOR THE MONTH OF SEPTEMBER 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON
12 PAGES, FIGURES, TABLES, SEPTEMBER 1966, DOCKET NO. 50-29, PDR

TWO WEEKS BEFORE SCHEDULED SHUTDOWN, THE COOLANT PH WAS LOWERED BY STOPPING AMMONIA INJECTION, AND THE LOOP BYPASS VALVES WERE OPENED. THIS SHOULD REDISTRIBUTE CRUD, REDUCING RADIATION LEVELS IN THE PRIMARY LOOPS, WHICH WOULD BE 3-5 TIMES HIGHER AFTER THE PREVIOUS SHUTDOWN IN THE HIGH-PH CONDITION. NINE RADIAL CRACKS 5/16-INCH DEEP WERE FOUND ON NO. 2 BOILER FEED PUMP BALANCING SLEEVE, APPARENTLY BECAUSE OF THE REVERSE FLOW IN AUGUST.

*OPERATIONS REPORT, GENERAL + CRUD + OPERATING EXPERIENCE + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + YANKEE

18-12230 YANKEE PROPOSED CHANGE 72 - PRESSURIZER GAS SPACE SAMPLING
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
3 PAGES, 3 FIGURES, AUGUST 1, 1966, DOCKET NO. 50-29, PDR

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12230 *CONTINUED*

THERE IS SOME INDICATION OF GAS STRATIFICATION IN THE PRESSURIZER, AND GAS SAMPLES FROM THE TOP VENT REQUIRE THAT TWO MEN ENTER THE VAPOR CONTAINER FOR AN HOUR TO GET ONE SAMPLE. REROUTING THE SAMPLE LOCATION TO OUTSIDE THE VAPOR CONTAINER AND ADDING A SECOND SAMPLE TAP NEARER THE LIQUID-GAS INTERPHASE WOULD REDUCE THE RADIATION PROBLEM.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + PRESSURIZER + RADIATION SAFETY AND CONTROL + REACTOR, PRESSURIZED WATER + SAMPLING + STEAM + YANKEE

18-12231 BOYD RS
CHANGE 5 UNION CARBIDE REACTOR INCREASED LOG N REVERSE SETTING
DIVISION OF REACTOR LICENSING
2 PAGES, NOVEMBER 12, 1966, DOCKET NO. 50-54, PDR

AEC APPROVES CHANGE INCREASING LOG-N REVERSE SETTING FROM 115 PERCENT TO 125 PERCENT OF RATED POWER LEVEL, AS REQUESTED BECAUSE XENON AND ROD-SHADOWING EFFECTS CAUSE FREQUENT UNNECESSARY CHAMBER ADJUSTMENT. DRL INDEPENDENT EVALUATION OF 125 PERCENT POWER AT 2200 GPM INDICATES THAT THE HOTTEST CORE TEMPERATURE IS BELOW THE INCIPENT BOILING POINT.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + INSTRUMENTATION, INTERMEDIATE RANGE + REACTOR, POOL TYPE + REACTOR, RESEARCH

18-12232 YANKEE CHANGE 73 - REPLACEMENT CONTROL RODS WITH WELDED JOINTS INSTEAD OF SNAP JOINT
ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING, WASHINGTON, D. C.
3 PAGES, SEPTEMBER 29, 1966, DOCKET NO. 50-29, PDR

AEC AGREES THAT CHANGE WOULD IMPROVE SAFETY OF REACTOR OPERATIONS. CHANGE IS TO PREVENT WEAR-INDUCED ROTATION OF SNAP-JOINT BETWEEN CONTROL ROD AND FOLLOWER FROM DAMAGING FUEL ELEMENT DURING A REFUELING SCRAM.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + CONTROL ROD FABRICATION + REACTOR, PRESSURIZED WATER + YANKEE

18-12233 YANKEE PROPOSED CHANGE 74 - CORE VI REFUELING CHANGES
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
12 PAGES, 2 TABLES, 2 FIGURES, SEPTEMBER 1, 1966, DOCKET NO. 50-29, PDR

SAME 3-ZONE CORE RELOADING, AND SAME ROD WITHDRAWAL SEQUENCE (6,5,4-3,2-1) WILL BE FOLLOWED AS IN CORE V. MORE BORON SOLUBLE POISON WILL BE REQUIRED (1700 PPM RATHER THAN 1300). SIGNIFICANTLY LOWER DNB RATIOS (2.97 VS. 2.2) AND HEAT FLUX (435,000 BTU/HR-FT SQ VS. 450,000) THAN PREVIOUS CORES. POWER WILL BE LIMITED TO 90 PERCENT UNTIL XENON BUILDS IN (WHILE ROD GROUPS 4-3 ARE CONTROLLING) BECAUSE OF POWER PEAKING.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *POWER DISTRIBUTION + *REFUELING + OPERATING EXPERIENCE + REACTOR, PRESSURIZED WATER + XENON + YANKEE

18-12234 YANKEE CHANGE 74 - CORE VI REFUELING CHANGES
ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING, WASHINGTON, D. C.
3 PAGES, SEPTEMBER 29, 1966, DOCKET NO. 50-29, PDR

REQUEST GRANTED. SAFETY MARGIN FOR DNB HEAT FLUXES, ETC., ARE GREATER THAN FOR PREVIOUS CORES. LESS-NEGATIVE VALUE OF MODERATOR TEMPERATURE COEFFICIENT WILL NOT INTERFERE WITH DOPPLER EFFECT IN REACTIVITY TRANSIENTS. CENTER-REGION A WILL CONTAIN 2 EACH HIGH BURNUP (AV. 13,000-14,000 MWD/T) STAINLESS-STEEL AND ZIRCALOY-CLAD ELEMENTS. REGION B WILL HAVE 36 CORE-V ASSEMBLIES (7,000 MWD/T), AND REGION C (PERIPHERAL) WILL HAVE UNIRRADIATED STAINLESS-CLAD 4.94-PERCENT ENRICHED ASSEMBLIES.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + *SAFETY EVALUATION + REACTOR, PRESSURIZED WATER + YANKEE

18-12235 PROPOSED CHANGE 76 - SUBSTITUTION OF CENTRAL ELEMENTS FOR ONES WITH DAMAGED STAINLESS STEEL WRAPPER
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
8 PAGES, 1 FIGURE, 2 TABLES, OCTOBER 20, 1966, DOCKET NO. 50-29, PDR

INSPECTION OF TWO ZIRCALOY-CLAD TEST ASSEMBLIES INTENDED (CHANGE 74) FOR THE CENTRAL REGION OF CORE VI INDICATES DAMAGE TO THE STAINLESS-STEEL WRAPPER, WHICH CANNOT BE EVALUATED BEFORE SCHEDULED STARTUP. TWO STAINLESS-CLAD ASSEMBLIES FROM CORE V (13,700 MWD/T) WILL REPLACE THEM AND ACTUALLY REDUCE HOT-CHANNEL FACTORS.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *REFUELING + FAILURE, FUEL ELEMENT + REACTOR, PRESSURIZED WATER + YANKEE

18-12236 YANKEE PROPOSED CHANGE 77 - REDUCED NUMBER OF INCORE THERMOCOUPLES BECAUSE OF DAMAGE IN REFUELING
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
2 PAGES, OCTOBER 20, 1966, DOCKET NO. 50-29, PDR

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-12236 *CONTINUED*

DURING PRESENT REFUELING, A PROTECTIVE CAP (USED TO KEEP THERMOCOUPLE ENDS DRY AFTER THE THERMOCOUPLES ARE DETACHED) CAME OFF DURING HANDLING OPERATIONS. THIRTEEN THERMOCOUPLES MAY HAVE BEEN DAMAGED. PREVIOUS COMPARISONS OF ANALYTICAL PREDICTION WITH EXPERIMENTAL DATA HAVE SHOWN CONSISTENTLY GOOD AGREEMENT ON POWER DISTRIBUTION. TWENTY FLUX WIRES AND 14 THERMOCOUPLES ARE STILL AVAILABLE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + FAILURE, COMPONENT + INSTRUMENTATION, IN CORE + REACTOR, PRESSURIZED WATER + YANKEE

18-12249 BONUS PROPOSED TECHNICAL SPECIFICATIONS CHANGES 1 AND 2
PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO
3 PAGES, AUGUST 2, 1966, DOCKET NO. 115-4, PDR

BONUS REQUESTS (1) ALLOWING REACTOR TO OPERATE UNTIL CONSULTANT CAN ADVISE ON ACRS-RECOMMENDED CHANGES TO REACTOR SAFETY SYSTEM. REVIEW SCHEDULED FOR COMPLETION APRIL 30, 1967, AFTER WHICH COMPONENT PROCUREMENT AND INSTALLATION WILL BE REQUIRED. (2) CRITICALITY EXPERIMENT, UPPER-PRESSURE LIMIT SHOULD BE CHANGED FROM 900 PSIG TO 950, TO ALLOW DATA GATHERING AS CLOSE TO ACTUAL CONDITIONS AS POSSIBLE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ACRS (ADVISORY COMMITTEE ON REACTOR SAFEGUARDS) + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + CRITICALITY EXPERIMENT + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT

18-12250 BONUS CHANGE 1 TO TECHNICAL SPECIFICATIONS
ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING, WASHINGTON, D. C.
4 PAGES, AUGUST 12, 1966, DOCKET NO. 115-4, PDR

CRITICALITY EXPERIMENTS MAY BE PERFORMED FROM 0-950 PSIG, AND (PERMANENT) REACTOR PROTECTIVE SYSTEM MODIFICATIONS SHALL BE COMPLETED NO LATER THAN JULY 1, 1967. AS NOTED IN STAFF SAFETY EVALUATION DATED JUNE 6, 1966, A BACKUP SCRAM-RELAY SYSTEM HAS BEEN ADDED TO CAUSE A SCRAM WHEN EITHER OF TWO ELECTRONIC SCRAM CHANNELS ARE TRIPPED.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + BONUS (BOILING NUCLEAR SUPERHEAT PROJECT) + INSTRUMENTATION, COINCIDENT + REACTOR SAFETY SYSTEM + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + REDUNDANCE

18-12302 CLEMENTS FK + FEINAUER E
ANALYSIS OF SAFETY CONSIDERATIONS FOR TRANSIENT TESTING OF PBF PROTOTYPE FUEL RODS IN TREAT
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
100-17056 + PTR-690 +. 38 PAGES, APRIL 17, 1964, CFSTI \$2.00 CY

A DESCRIPTION OF THE EXPERIMENT EQUIPMENT AND AN ANALYSIS OF THE SAFETY CONSIDERATIONS PERTINENT TO THE TRANSIENT TESTING OF PBF PROTOTYPE FUEL RODS IN TREAT ARE PRESENTED IN THIS REPORT. THE ANALYSIS INCLUDES AN INVESTIGATION OF THE NUCLEAR EFFECTS OF INSERTING THE EXPERIMENT IN THE TREAT FACILITY AND A SUMMARY OF THE CONSEQUENCES OF POSTULATED ACCIDENT SITUATIONS.

*FUEL ELEMENT + *IN PILE EXPERIMENT + *REACTOR SAFETY SYSTEM + *TREAT (TRANSIENT TEST REACTOR FACILITY) + PBF (POWER BURST FACILITY) + REACTOR, GRAPHITE MODERATED + REACTOR, TEST

18-12304 YANKEE PROPOSED CHANGE 73 - REPLACEMENT CONTROL RODS WITH WELDED JOINT INSTEAD OF SNAP JOINT
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
5 PAGES, 1 FIGURE, AUGUST 31, 1966, DOCKET NO. 1029.74, PDR

TWO CONTROL RODS REMOVED FROM CORE IN 1965 SHOWED WEAR IN THE SNAP-JOINT BETWEEN THE CONTROL ROD AND THE FOLLOWER, WHICH COULD PERMIT RELATIVE ROTATION AND FUEL-ELEMENT DAMAGE DURING A REFUELING SCRAM (WHEN THE UPPER CORE SUPPORT PLATE IS REMOVED). THEREFORE, A WELDED JOINT WILL BE USED INSTEAD OF THE SNAP-JOINT. SINCE INCONEL CLADDING OF THE AG-IN-CD RODS HAS PROVED EXCELLENT, ALL 24 NEW RODS WILL BE INCONEL-CLAD.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CONTROL ROD FABRICATION + FAILURE, SCRAM MECHANISM + REACTOR, PRESSURIZED WATER + REFUELING + YANKEE

18-12331 KASTEN PR + BETTIS ES + ROBERTSON RC
DESIGN STUDIES OF 1000-MW(E) MOLTEN SALT BREEDER REACTORS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3996 +. 152 PAGES, 30 FIGURES, 62 TABLES, 30 REFERENCES, AUGUST 1966, CFSTI \$5.00, \$1.00 MN

THE REFERENCE DESIGN IS A TWO-REGION TWO-FLUID SYSTEM, WITH FUEL SALT SEPARATED FROM THE BLANKET SALT BY GRAPHITE TUBES. THE FUEL SALT CONSISTS OF URANIUM FLUORIDE DISSOLVED IN A CARRIER SALT OF LITHIUM AND BERYLLIUM FLUORIDES, AND THE BLANKET SALT CONTAINS THORIUM FLUORIDE DISSOLVED IN A SIMILAR CARRIER SALT. THE ENERGY GENERATED IN THE REACTOR FLUID IS TRANSFERRED TO A SECONDARY COOLANT-SALT CIRCUIT, WHICH COUPLES THE REACTOR TO A SUPERCRITICAL STEAM CYCLE. ON-SITE FUEL-RECYCLE PROCESSING IS EMPLOYED, WITH FLUORIDE-VOLATILITY AND VACUUM-DISTILLATION OPERATIONS USED FOR THE FUEL FLUID, AND DIRECT-PROTACTINIUM-REMOVAL PROCESSING APPLIED TO THE BLANKET STREAM. THE RESULTING POWER COST FOR THE REFERENCE PLANT IS LESS THAN 2.7 MILLS/KWH(IE). THE SPECIFIC FISSILE-MATERIAL INVENTORY IS ONLY 0.7 KG/MW(IE), THE FUEL DOUBLING TIME IS ABOUT 13 YEARS, AND THE FUEL-CYCLE COST IS 0.35 MILL/KWH(IE).

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SAFETY ANALYSIS AND DESIGN REPORTS

18-12331 *CONTINUED*
*DESIGN STUDY + *ECONOMIC STUDY + *REACTOR, BREEDER + *REACTOR, MOLTEN SALT +
ORNL (OAK RIDGE NATIONAL LABORATORY)

18-12332 GRAY KJ + GRAHAM RJ
WR-1 DESIGN AND CONSTRUCTION
CANADIAN NUCLEAR ASSOCIATION, TORONTO, ONTARIO + GENERAL ELECTRIC COMPANY, LTD.
66-CNA-309 + CONF-660516-11 +. 14 PAGES, 1966, FROM ANNUAL CONFERENCE ON ORGANIC AND HEAVY WATER
REACTORS, WINNIPEG, CANADA, DEP. MN

THE REACTOR ASSEMBLY CONSISTS OF THE CALANDRIA, FUEL CHANNELS, SIDE THERMAL SHIELD AND BOTTOM AND TOP SHUTDOWN SHIELDS, WITH TOP AND BOTTOM SERVICE SPACES FOR SHUTDOWN ACCESS AND A ROTATING DECK PLATE AT OPERATING FLOOR LEVEL FOR ACCESS TO THE TOP OF THE REACTOR. TWO INDEPENDENT COOLANT CIRCUITS HAVE BEEN SUPPLIED INITIALLY WITH ADDITIONAL FUEL SITES FOR A THIRD CIRCUIT WHICH MAY OR MAY NOT EMPLOY ORGANIC FLUIDS AS THE COOLANT. THE BUILDING IS DESIGNED TO ACCOMMODATE AUXILIARIES FOR THE INSTALLATION OF FIVE TEST LOOPS IN WHICH A WIDE VARIETY OF COMPONENTS MAY BE OPERATED. THE REACTOR CALANDRIA TUBES CAN ACCOMMODATE EITHER A 4 OR A 3.25 IN. PRESSURE TUBE, PERMITTING DEVELOPMENT WORK TO PROCEED IN CONNECTION WITH THE HIGHER RATING OF POWER REACTORS CURRENTLY UNDER DEVELOPMENT. WR-1 REPRESENTS A UNIQUE COMBINATION OF ESTABLISHED TECHNOLOGY PLUS SOME RELATIVELY UNDEVELOPED AREAS, AND MANY OF THE BASIC PARAMETERS WERE ARRIVED AT BY CALCULATION, LITTLE TIME BEING AVAILABLE FOR A CONFIRMING TEST PROGRAM. THE FACT THAT THE PLANT HAS GONE INTO OPERATION WITH A MINIMUM OF DIFFICULTY HAS BEEN A SOURCE OF SATISFACTION.

*CANADA + *DESIGN STUDY + *REACTOR DESCRIPTION + *WR 1 (WHITESHELL REACTOR NO. 1, CANADA)

18-12344 SCHULTEN R
HISTORY OF THE AVR REACTOR
1 PAGE, ATOMWIRTSCHAFT 11(5), PAGE 218, MAY 1966

THE AVR-REACTOR IS, LIKE SIMILAR DEVELOPMENTS IN GREAT BRITAIN AND THE USA, A NEW REACTOR CONCEPT. ONE PECULIARITY OF THIS GAS-COOLED HIGH TEMPERATURE REACTOR IS THE SPHERICAL FUEL ELEMENTS. THE BASIC DESIGN BEGAN IN 1956-58 AND PROCEEDED FROM SIMPLE FUEL ELEMENTS ASSUMING CONTAMINATION OF THE PRIMARY LOOP. THE SUDDEN DEVELOPMENT OF COATED PARTICLES FOR GAS-COOLED REACTORS RESULTED IN THE ABANDONMENT OF A LARGE PORTION OF THE NOW CURRENT SECONDARY LOOPS.

*REACTOR DESCRIPTION + GERMANY + REACTOR, GAS COOLED + REACTOR, PEBBLE BED

18-12345 MULLER HW + SCHWEIGER F + STURMER W
PLANNING AND CONSTRUCTION PROBLEMS OF THE AVR PROTOTYPE NUCLEAR POWER STATION
1 PAGE, ATOMWIRTSCHAFT 11(5), PAGE 223, (MAY 1966), IN GERMAN

DESIGN, CONSTRUCTION, AND ERECTION OF THE AVR REACTOR OFFER A PRIME EXAMPLE OF THE PROBLEMS RESETTING THE DEVELOPMENT OF A COMPLETELY NEW TYPE OF REACTOR. THEY AROSE FIRST IN THE BASIC DESIGN AND LATER IN NOVEL CONSTRUCTION AND TESTING, AS A RESULT OF THE PARTICULARLY GENEROUS SAFETY REQUIREMENTS FOR THIS PROTOTYPE IN THE BUNDESREPUBLIK. SELECTION OF THE SITE POSED ADDITIONAL PROBLEMS.

*REACTOR DESCRIPTION + *SITING, REACTOR + GERMANY + REACTOR, GAS COOLED + REACTOR, PEBBLE BED

18-12346 BRAUN H + CLEVE U + KNUFER H + OBERKLUS J
GENERAL CONSTRUCTION
1 PAGE, ATOMWIRTSCHAFT 11(5), PAGE 226 (MAY 1966), IN GERMAN

THESE INTRODUCTORY SURVEYS OFFER A BRIEF DESCRIPTION OF THE AVR PROTOTYPE (A GAS-COOLED, SPHERICAL-FUEL-ELEMENT, HIGH-TEMPERATURE REACTOR). THEY INCLUDE THE MAIN POINTS OF DESIGN, THE PRIMARY LOOP, AUXILIARY EQUIPMENT, WHOSE MOST IMPORTANT PARTICULARS ARE TREATED IN DETAIL IN THE CONCLUDING ARTICLES OF THIS ISSUE.

*REACTOR DESCRIPTION + GERMANY + REACTOR, GAS COOLED + REACTOR, PEBBLE BED

18-13228 BROWNS FERRY AMENDMENT 3 - ANSWERS TO AEC QUESTIONS, AND CONSTRUCTION PERMIT CRITERIA ANALYSIS
TENNESSEE VALLEY AUTHORITY
1 PAGE, NOVEMBER 10, 1966, DOCKET NO. 50-259 AND 50-260, PDR

AMENDMENT 3 CONSISTS OF APPENDIX H TO THE PRELIMINARY SAFEGUARDS REPORT (CONSISTING OF A COMPARATIVE EVALUATION OF BROWNS FERRY WITH AEC DESIGN CRITERIA) AND ANSWERS TO AEC QUESTIONS. QUESTION B-3, RELATING TO THE AEC CONSTRUCTION-PERMIT CRITERIA, IS THUS ANSWERED IN APPENDIX H.

*AEC CONSTRUCTION PERMIT CRITERIA + *CONSTRUCTION PERMIT PROCESS + BROWNS FERRY + REACTOR, BOILING WATER

18-13229 AMENDMENT 11 - TRIGA AMERICIUM SOURCES AND FISSION PRODUCT MONITOR
DIVISION OF REACTOR LICENSING
9 PAGES, NOVEMBER 15, 1966, DOCKET NO. 50-170, PDR

AEC APPROVES SUBSTITUTION OF AN AMERICIUM OXIDE STARTUP SOURCE FOR THE PRESENT POLONIUM-BERYLLIUM ONE, AND REMOVAL OF THE WATER FISSION-PRODUCTS MONITOR. THIS MONITOR HAS

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18-13229 *CONTINUED*

BEEN UNSTABLE AND DIFFICULT TO MAINTAIN, WAS THE LAST TO DETECT LEAKING FUEL ELEMENTS IN THE ORIGINAL ALUMINUM-CLAD CORE, AND IS NO LONGER USED IN LATER TRIGA MODELS. THERE ARE TWO OTHER SIMILAR INSTRUMENTS - A CONTINUOUS AIR MONITOR ABOVE THE REACTOR POOL, AND A G-M TUBE IN THE PURIFICATION SYSTEM.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + AMERICIUM + INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + REACTOR, RESEARCH + SOURCE, NEUTRON + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-13230 LEVINE S

TORREY PINES TRIGA CHANGE 2 - COATED PARTICLE FUEL ELEMENT IRRADIATION
DIVISION OF REACTOR LICENSING
4 PAGES, NOVEMBER, DOCKET NO. 50-89, PDR

AEC APPROVES IRRADIATION OF COATED-PARTICLE FUEL ELEMENTS AT 2000 C FOR 2 TIMES 10(16TH) FISSIONS, WITH HIGHER HELIUM PURGE RATES.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + COATED PARTICLE + IN PILE LOOP + REACTOR, RESEARCH + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-13233 CONSOLIDATED EDISON REQUESTS DELETION OF INDIAN POINT I TECHNICAL SPECIFICATION PROVISION FOR A MINIMUM PRIMARY COOLANT FLOW FOR EACH PUMP
CONSOLIDATED EDISON COMPANY OF NEW YORK
3 PAGES, NOVEMBER 4, 1966, DOCKET NO. 50-3

CONSOLIDATED EDISON SUMMARIZES ANALYSIS PRESENTED TO ALLOW LOW FLOW TESTING (CHANGE 25) AND REASSERTS THAT, FOR THE LOWER CORE FLOW, THE DNB RATIO OF 2.0 WILL NOT BE EXCEEDED AT STEADY STATE AND THAT THE LOSS-OF-FLOW ACCIDENT RESULTS IN A DNB RATIO OF 1.33. THEY POINT OUT THAT PRIMARY FLOW IS NOT A LIMITING FACTOR IN ITSELF, BUT ONE OF THE FACTORS IN THE DNB RATIO.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ACCIDENT, LOSS OF FLOW + INDIAN POINT I + REACTOR, PRESSURIZED WATER

18-13235 CORE B MEASUREMENTS REQUIRE REVISION TO INDIAN POINT I ROD WITHDRAWAL ACCIDENT
CONSOLIDATED EDISON
5 PAGES, SEPTEMBER 14, 1966, DOCKET NO. 50-3

CORE B PHYSICS TESTS SHOWED THE MAXIMUM SINGLE-ROD WORTH WAS 3.8 PERCENT REACTIVITY (WITH ALL OTHER RODS INSERTED), WHILE LESS THAN 2 PERCENT WITHDRAWN IN NORMAL SEQUENCE. THEY REQUEST THAT THE TECH. SPEC. PARAGRAPH RELATING TO MAXIMUM SINGLE-ROD WORTH BE CHANGED FOR CLARITY. THE HOT STARTUP ACCIDENT WAS RECOMPUTED TO SHOW THAT POWER REACHES 1090 PERCENT, BUT (WITH OVERPOWER SCRAM) HEAT FLUX DOES NOT EXCEED 52 PERCENT, FUEL DOES NOT EXCEED 950 F, NOR WATER EXCEED 460 F.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*ACCIDENT ANALYSIS + *ACCIDENT, CONTROL ROD WITHDRAWAL + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + INDIAN POINT I + REACTOR, PRESSURIZED WATER + TEST, PHYSICS

18-13237 YANKEE CHANGE 77 - REDUCTION IN THE NUMBER OF INCORE THERMOCOUPLES
DIVISION OF REACTOR LICENSING
3 PAGES, OCTOBER 29, 1966, DOCKET NO. 50-29, PDR

SINCE YANKEE HAS A SYMMETRICAL LOADING AND LARGE SAFETY MARGIN, CHEMICAL SHIM CAUSES CONTROL RODS TO BE OUT OF CORE, REMOVING THE SOURCE OF SUDDEN POWER REDISTRIBUTIONS. FOURTEEN THERMOCOUPLES AND 20 FLUX WIRES REMAIN. AEC ALLOWS OPERATION WITH FEWER COUPLES DUE TO REFUELING DAMAGE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + DAMAGE + INSTRUMENTATION, IN CORE + REACTOR, PRESSURIZED WATER + YANKEE

18-13238 PRDC REQUESTS CHANGE 11 FOR FERMI
POWER REACTOR DEVELOPMENT COMPANY
5 PAGES, NOVEMBER 10, 1966, DOCKET NO. 50-16

PRDC REQUESTS 6 MONTHS AUTHORITY TO DISCONNECT ELECTRICAL LEADS TO MAIN MOTORS TO PREVENT A FALSE START FROM RAISING FUEL ELEMENTS OUT OF CORE, AS CORE HOLD-DOWN PLATE MUST BE RAISED FOR FUEL HANDLING. PONY MOTORS WOULD MAINTAIN DECAY-HEAT-REMOVAL FLOW.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + CORE COMPONENTS, MISCELLANEOUS + FERMI + PUMP + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REFUELING

18-13239 FERMI CHANGE 11 - MAIN PUMP DISCONNECTION WITH CORE HOLD DOWN PLATE RAISED

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18-13239 *CONTINUED*
DIVISION OF REACTOR LICENSING
4 PAGES, NOVEMBER 21, 1966, DOCKET NO. 50-16, PDR

AEC ALLOWS PRIMARY PUMP ELECTRICAL LEADS TO BE DISCONNECTED (WITH FLOW MAINTAINED BY PONY MOTORS) WITH THE HOLD-DOWN PLATE RAISED, TO PREVENT PUMP STARTING AND WASHING FUEL ELEMENTS OUT OF THE CORE DURING INVESTIGATION OF CORE MELTDOWN.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + CORE COMPONENTS, MISCELLANEOUS + FERMI + PUMP + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + REFUELING

18-13240 MORRIS PA
CHANGE 12 - CHANGES IN OPERATING GROUP ORGANIZATION CHART
DIVISION OF REACTOR LICENSING
2 PAGES, NOVEMBER 15, 1966, DOCKET NO. 50-144, PDR

AEC ALLOWS CVTR TO COMBINE OPERATING AND MAINTENANCE GROUPS INTO ONE GROUP, RETITLING THE ORIGINAL SUBDIVISIONS AS SECTIONS, AND HAVING THE PLANT OPERATIONS GROUP SUPERVISOR REPORT TO THE MANAGER FOR BOTH OPERATIONS AND MAINTENANCE.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + ADMINISTRATIVE CONTROLS AND PRACTICES + CVTR (CAROLINAS VIRGINIA TUBE REACTOR) + REACTOR, HEAVY WATER + REACTOR, PRESSURE TUBE

18-13241 PATHFINDER ALLOWED PROTECTION FACTORS FOR RESPIRATORY EQUIPMENT
DIVISION OF REACTOR LICENSING
5 PAGES, 1 TABLE, NOVEMBER 14, 1966, DOCKET NO. 50-130

AEC ALLOWS PATHFINDER OPERATING CREW TO TAKE CREDIT, AS PROVIDED FOR IN 10 CFR 20, FOR RESPIRATORY EQUIPMENT IN COMPUTING INHALATION DOSES. NO PROTECTION FACTOR IS GREATER THAN 1000, TRITIUM OXIDE FACTOR IS 2, FULL FACE MASK IS 100, AND AIR-SUPPLY DEVICES RANGE FROM 100 TO 1000.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*INHALATION + *OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *PERSONNEL PROTECTIVE DEVICE + PATHFINDER + RADIATION SAFETY AND CONTROL + REACTOR, BOILING WATER + REACTOR, SUPERHEAT + SAFETY EVALUATION

18-13242 AEC CONSIDERING REVISION TO 10 CFR 20, SETTING PROTECTION FACTORS FOR RESPIRATORY EQUIPMENT
DIVISION OF REACTOR LICENSING
5 PAGES, 1 TABLE, NOVEMBER 14, 1966, DOCKET NO. 50-130

IN A LETTER ALLOWING PATHFINDER OPERATING PERSONNEL TO TAKE CREDIT FOR RESPIRATORY EQUIPMENT IN COMPUTING AIRBORNE-CONTAMINATION EXPOSURE, AEC NOTED THAT VARIOUS STUDY CONTRACTS AND COMMITTEES HAVE INDICATED STANDARD RESPIRATORY PROTECTION FACTORS SHOULD BE INCORPORATED IN 10 CFR 20. AEC IS CONSIDERING SUCH AN AMENDMENT TO 10 CFR 20.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL + *REGULATION, AEC + INHALATION

18-13243 BOYD RS
CHANGE 9 TO GE THERMAL CRITICAL ASSEMBLY-JOB TITLE CHANGE
DIVISION OF REACTOR LICENSING
2 PAGES, NOVEMBER 15, 1966, DOCKET NO. 50-24, PDR

AEC ALLOWS CHANGE IN TECHNICAL SPECIFICATIONS OF THE TITLE MANAGER OF PHYSICS TO MANAGER-BUILDING 105 ACTIVITIES. THE TCA SUPERVISORS SUPERVISOR REPORTS TO THIS PERSON.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + ADMINISTRATIVE CONTROLS AND PRACTICES + CRITICAL ASSEMBLY FACILITY

18-13316 AMENDMENT NO. 13, HIGH TEMPERATURE REACTOR LATTICE IN REFLECTOR REGION OF GE - NUCLEAR TEST REACTOR
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
45 PAGES, 13 FIGURES, 5 TABLES, NOVEMBER 5, 1965, DOCKET NO. 50-73

THIS EXPERIMENT FACILITY IS PART OF A PLUTONIUM SUBCRITICAL PROGRAM. A 36-INCH-ID PRESSURE VESSEL ON TOP OF THE NTR GRAPHITE REFLECTOR STACK WILL CONTAIN THE LATTICE AT 1050 PSI AND 540 F. A URANIUM FISSION PLATE BETWEEN THE GRAPHITE AND THE LATTICE WILL DRIVE THE LATTICE, WHICH IS AT 0.98 K EFFECTIVE, TO FLUXES OF 10 TO THE 10 AND LESS THAN 100 WATTS OF POWER. THE MCA WAS ASSUMED TO BE A PIPE RUPTURE, WITH RELEASE OF PLUTONIUM FROM ONE DEFECTIVE ROD. THE RELEASE TO THE EXPERIMENT CELL WOULD BE LESS THAN AN MPC.

*SAFETY ANALYSIS REPORT, GENERAL + IN PILE EXPERIMENT + IN PILE LOOP + PLUTONIUM + REACTOR, RESEARCH

18-13396 APPLICATION FOR LICENSES FPCE PLANT AMENDMENT NO. 3
ISOICHEM, INC.
4 PAGES, NOVEMBER 1966, DOCKET NO. 50-258

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-13396 *CONTINUED*

AMENDMENT 3 CONTAINS (I) A DESCRIPTION OF REVISIONS IN THE FEED AND WASTE SECTION OF THE PLANT, (II) AN EVALUATION OF THE EFFECT OF THESE CHANGES ON THE PREVIOUSLY SUBMITTED SAFETY ANALYSIS, AND (III) A SUMMARY OF THE EFFECT OF THESE CHANGES ON THE TEXT OF THE APPLICATION. THE REVISIONS TO THE FEED AND WASTE SYSTEM CONSIST OF (I) A REDUCTION IN THE VOLUME OF FEED AND CERTAIN WASTE TANKS, (II) REMOVAL OF INTERIOR PARTITIONS IN THE VAULT AREA, (III) RELOCATION OF THE REMOTE-MAINTENANCE FACILITY TO A POSITION OVER THE FEED AND WASTE VAULT, AND (IV) PIPING AND EQUIPMENT CHANGES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*ISOCHEM, INC. + APPLICATION FOR AEC LICENSE + CERIUM + CESIUM + FISSION PRODUCT, SEPARATION FROM WASTE + HAZARDS ANALYSIS + PROMETHIUM + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + SAFETY ANALYSIS REPORT, GENERAL + STRONTIUM

18-13484 AEC LETTER ON EMERGENCY CORE COOLING SENT DECEMBER 8 TO CONSOLIDATED EDISON AND NORTHERN STATES POWER
CONSOLIDATED EDISON CO. OF NEW YORK, INC. + NORTHERN STATES POWER COMPANY
1 PAGE, DECEMBER 8, 1966, DOCKET NO. 50-247 AND 50-263, ATOMIC ENERGY CLEARING HOUSE 12(51), PAGE 7, (DECEMBER 19, 1966)

DRL REQUESTS TWO ANALYSES IN ADDITION TO PRESENT CONSIDERATION OF THE NEED FOR EMERGENCY CORE COOLING. (1) LOSS-OF-COOLANT ANALYSES FOR VARIOUS PIPE SIZES TO DEFINE THE LIMITING CONDITIONS, HEAT SINKS, AND EFFECTS ON REACTOR VESSEL INTEGRITY. (2) ANALYSES TO DETERMINE SYSTEM PERFORMANCE REQUIREMENTS TO PREVENT CORE MELTDOWN.

*EMERGENCY COOLING CONSIDERATIONS + INDIAN POINT 2 + MONTICELLO + REACTOR, BOILING WATER + REACTOR, PRESSURIZED WATER

18-13486 INDUSTRY COMMENTS ON AEC PROPOSED NEW TECHNICAL SPECIFICATIONS
AMERICAN NUCLEAR SOCIETY + ATOMIC INDUSTRIAL FORUM, INC. + PUBLIC SERVICE CO., COLORADO
8 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(51) PAGES 9-16 (DECEMBER 19, 1966)

COMMENTS FROM AMERICAN NUCLEAR SOCIETY (REACTOR OPERATIONS DIVISION), ATOMIC INDUSTRIAL FORUM, GENERAL ELECTRIC, PUBLIC SERVICE CO. OF COLORADO, AND UNION CARBIDE CORP. ATTITUDE IS GENERALLY FAVORABLE, WITH EXCEPTIONS TO REPORTS FOR EACH TEST, DESIGN DETAILS, LACKING DEFINITIONS OF TECHNICAL SPECIFICATIONS AND SAFETY MARGIN, INCLUSION OF SAFEGUARDS REPORT GUIDE AS PART OF REGULATION.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + REGULATION, AEC

18-13487 MONTICELLO AMENDMENT 2 - DESIGN FABRICATION AND ERECTION OF THE REACTOR VESSEL
NORTHERN STATES POWER COMPANY, MINNEAPOLIS, MINNESOTA
350 PAGES, 152 FIGURES, 13 TABLES, NOVEMBER 18, 1966, DOCKET NO. 50-263

DESCRIBES THE PROCESS OF FIELD FABRICATION, STARTING WITH HALF CYLINDERS AND FLANGES. LARGE CLAMPSON MILLING AND BORING MACHINES ARE NOT NEW. PREVIOUS CB AND I EXPERIENCE SUMMARIZED. TRAINING OF LOCAL WELDERS PROVIDED FOR, UNION AGREES NON-LOCAL WELDER MAY BE BROUGHT IN. SHIPPING AN ASSEMBLED VESSEL WOULD BE ALMOST IMPOSSIBLE BECAUSE OF VESSEL CLEARANCES, UNDERWATER OBSTACLES, AND ROAD BEDS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + CONTAINMENT, PRESSURE VESSEL + FABRICATION + MONTICELLO + QUALITY CONTROL + REACTOR, BOILING WATER

18-13488 ARNOLD PC
TRAINING OF WELDING SUPERVISORS
NORTHERN STATES POWER COMPANY, MINNEAPOLIS, MINNESOTA
10 PAGES, 29 FIGURES, 11 TABLES, NOVEMBER 18, 1966, MONTICELLO AMENDMENT 2- DESIGN FABRICATION AND ERECTION OF THE REACTOR VESSEL, PAGES E-1-E-14, APPENDIX E, DOCKET NO. 50-263

RECOUNTS EXPERIENCE OF CHICAGO BRIDGE AND IRON COMPANY. SOON AFTER STARTING A WELDING-INSPECTOR SCHOOL, THEY FOUND WELDING-SUPERVISOR TRAINING MORE APPROPRIATE. A TWO-WEEK COURSE FOR EXPERIENCED WELDERS BEGINS THE PROCESS. VARIOUS WELDING EQUIPMENT AND INSPECTION TECHNIQUES DEMONSTRATED. ACTUAL INCIDENTS STUDIED TO DEMONSTRATE HOW PROPER INSPECTION COULD HAVE ELIMINATED VARIOUS EXPENSIVE FAILURES, E.G., NIL-DUCTILITY NOTCHES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*STAFFING, TRAINING, QUALIFICATION + *WELDING + BRITTLE FRACTURE + FAILURE, PRESSURE VESSEL + OPERATING EXPERIENCE

18-13530 AEC AUTHORIZES DISMANTLING OF ALLIS CHALMERS CRITICAL EXPERIMENT FACILITY
DIVISION OF REACTOR LICENSING, U. S. ATOMIC ENERGY COMMISSION
4 PAGES, DECEMBER 8, 1966, DOCKET NO. 50-108

LISTS CONDITIONS FOR DETERMINING CONTAMINATION AND DISPOSAL OF NON-FUEL PORTION OF CRITICAL-EXPERIMENT-FACILITY EQUIPMENT.

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-13530 *CONTINUED*
USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY EVALUATION + CRITICAL ASSEMBLY FACILITY + REACTOR DECOMMISSIONING EXPERIENCE

18-13531 IRL SUPPLIES ADDITIONAL FUEL HANDLING INFORMATION
COLUMBIA UNIVERSITY
4 PAGES, NOVEMBER 11, 1966, DOCKET NO. 50-17

IN RESPONSE TO DRL REQUEST, IRL STATES THAT FUEL HANDLING FOR THE SUBCRITICALITY TEST WILL BE PERFORMED (1) BY LICENSED REACTOR OPERATORS, (2) WITH ONLY ONE ELEMENT AT A TIME, (3) WITH ONLY 1 FUEL TOOL AVAILABLE, DESIGNED SO ELEMENT CANNOT SLIP OFF, (4) WITH IDENTIFIED FUEL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + FUEL HANDLING + REACTOR, POOL TYPE

18-13532 N S SAVANNAH TECHNICAL SPECIFICATION CHANGE 8 - BURNOUT SAFETY FACTOR, AND OPERATION WITH STUCK RODS
FIRST ATOMIC SHIP TRANSPORT INC.
7 PAGES, 11 FIGURES, 2 TABLES, DECEMBER 5, 1966, DOCKET NO. 50-238

SAVANNAH REQUESTS THAT BURNOUT SAFETY FACTOR BE REDUCED TO 1.8 (REALLY 2.33 BY CONSERVATIVE APPROACH) AND THAT FIVE CRITERIA RELATING TO SHUTDOWN MARGIN BE ADDED. INCLUDED IS A PDQ STUDY ON POWER PEAKING, WITH 6 ROD CONFIGURATIONS. THE RESULT OF THE CHANGES IS TO PLACE THE LIMITING BURNOUT SAFETY FACTOR ON THE STUCK-ROD CONDITION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + BURNOUT HEAT FLUX + CONTROL ROD DRIVE + N S SAVANNAH + POWER DISTRIBUTION + REACTOR, PRESSURIZED WATER + SHUTDOWN MARGIN

18-13533 TORREY PINES CHANGE 4 - REACTOR ROOM VISITORS, AND THERMIONIC CELL IRRADIATION
DIVISION OF REACTOR LICENSING, USAEC
2 PAGES, DECEMBER 2, 1966, DOCKET NO. 50-227

AEC ALLOWS CHANGE TO PERMIT OPEN-CIRCUIT TESTING OF THERMIONIC CONVERSION DEVICES, PURGE GAS OF ANY MIXTURE OF HELIUM OR ARGON, AND VISITORS IN REACTOR ROOM WITH WRITTEN PERMISSION OF PHYSICIST-IN-CHARGE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + DIRECT ENERGY CONVERSION DEVICES + RADIATION SAFETY AND CONTROL + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-13535 ENRICO FERMI ATOMIC POWER PLANT REPORT FOR JULY 1966
POWER REACTOR DEVELOPMENT COMPANY
PRDC-EF-35 +. 11 PAGES, JULY 1966

FOUR HEAT-BALANCE TESTS SHOW THAT THE NUCLEAR INSTRUMENT READ 12' HIGH AT 100 MW(TH), AFTER CORRECTIONS MADE TO SODIUM FLOW INSTRUMENTS (WHICH HAD NEVER BEEN CALIBRATED IN HOT SODIUM). THE STEAM-DUMP-TO-CONDENSER SYSTEM WAS FOUND ADEQUATE FOR ONLY 50' POWER. TWO UNSCHEDULED SCRAMS DURING TESTING OCCURRED WHEN WATER BOILING TOO SOON IN STEAM GENERATORS CAUSED FLOW INSTABILITIES, AND THUS HIGH SODIUM TEMPERATURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

FERMI + HEAT TRANSFER, BOILING + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, FLOW + OPERATIONS SUMMARY FOR AEC + REACTOR, FAST + REACTOR, LIQUID METAL COOLED + SCRAM, SPURIOUS

18-13595 BEALL SE + GUYMON RH
MSRE DESIGN AND OPERATIONS REPORT. PART VI. OPERATING SAFETY LIMITS FOR THE MOLTEN SALT REACTOR EXPERIMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-733(2ND REV.) +. 9 PAGES, 3 REFERENCES, SEPTEMBER 19, 1966

LIMITS ARE SET FOR CONTAINMENT, COOLANT SYSTEM, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$1.00 COPY, \$0.50 MICRONEGATIVE

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + MSRE (MOLTEN SALT REACTOR EXPERIMENT) + REACTOR, CIRCULATING FUEL + REACTOR, MOLTEN SALT

18-13611 DRL ASKS 19 QUESTIONS ABOUT THE NBS RESEARCH REACTOR
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING
5 PAGES, DECEMBER 7, 1966, DOCKET NO. 50-184

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-13611 *CONTINUED*

DRL SENDS 19 QUESTIONS ON THE OCTOBER 1, 1966, FINAL SAFETY ANALYSIS OF THE NATIONAL BUREAU OF STANDARDS REACTOR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + REACTOR, HEAVY WATER + REACTOR, RESEARCH

18-13612 GEORGIA TECH REACTOR. CHANGE 8 LESS-NEGATIVE MODERATOR COEFFICIENT
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING
2 PAGES, DECEMBER 13, 1966, DOCKET NO. 50-160

DRL ALLOWS OPERATION WITH MODERATOR TEMPERATURE COEFFICIENT AS SMALL AS MINUS 1.0 TIMES 10 TO THE MINUS 2 PERCENT PER DEGREE C. THE MEASURED VALUE AT 91 F IS MINUS 3.0. RESULTS OF SAFETY ANALYSIS NOT SIGNIFICANTLY ALTERED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + MODERATOR COEFFICIENT + OPERATING EXPERIENCE + REACTOR, HEAVY WATER + REACTOR, RESEARCH

18-13613 AMENDMENT 5 TO BROWNS FERRY CONSTRUCTION PERMIT APPLICATION - MISCELLANEOUS
TENNESSEE VALLEY AUTHORITY
39 PAGES, 8 TABLES, 11 FIGURES, NOVEMBER 25, 1966, DOCKET NO. 50-259 AND 50-260

REVISIONS MADE FOLLOWING A SEPTEMBER 22, 1966 MEETING WITH DRL APPEARS TO CONSIST OF (1) INCREASED RECREATIONAL POPULATION (2) OFF-GAS FILTER DESIGN TEMPERATURES OF 500 F, (3) HALVING THE FLOW RATE AND THYROID DOSE FOLLOWING A MAIN-STEAM-LINE RUPTURE, (4) HIGHER DRYWELL PRESSURE RESULTING FROM ONLY 1 OF 4 CONTAINMENT COOLING PUMPS OPERATING. ILLUSTRATIONS REVISED APPROPRIATELY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CHARCOAL + CONTAINMENT DESIGN + FILTER + POPULATION DISTRIBUTION + REACTOR, BOILING WATER

18-13664 AEC CHAIRMAN REPLIES TO SEN. MURPHYS (CALIF) LETTER ON MALIBU REACTOR
UNITED STATES ATOMIC ENERGY COMMISSION
4 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGES 7-10 (DECEMBER 12, 1966) DOCKET NO. 50-214

IN A LETTER DATED DECEMBER 6, 1966, CHAIRMAN SEABORG SAID IT WAS NOT YET APPROPRIATE TO COMMENT ON THE REVIEW OF THE ATOMIC SAFETY AND LICENSING BOARDS DECISION, POINTS OUT THAT OTHER REGULATORY AGENCIES MAY FILE EXCEPTIONS TO THEIR LICENSING BOARDS DECISIONS, AND STATES THAT AEC IS OBLIGED TO CONSIDER ALL APPLICATIONS FOR A CONSTRUCTION PERMIT. (ARTICLE REPRINTS SEN. MURPHYS LETTER.).

*CONSTRUCTION PERMIT PROCESS + MALIBU + REACTOR, PRESSURIZED WATER

18-13706 NAVAL SCHOOL REPORTS EXCESSIVE PRESSURE INSIDE AGN=201 CONTROL RODS
U. S. NAVY, NAVAL POSTGRADUATE SCHOOL
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 46-47 (DECEMBER 26, 1966)

EARLY IN 1966, THEY ESTIMATED THAT AN EXPOSURE OF 25 KW-MINUTES WOULD INCREASE THE INTERNAL PRESSURE FROM 1 TO 5 PSIG OF THE COARSE CONTROL AND SAFETY RODS. THE ROD PRESSURES WERE BLED OFF EVERY 20 KW-MINUTES OF OPERATION. IN NOVEMBER 1966, FUEL DISCS WERE ADDED TO THE RODS, REDUCING FREE VOLUME BY 11 PERCENT. AT THE NEXT BLEEDOFF, PRESSURES OF 6.5 AND 8 WERE OBSERVED. PROBABLY THE EARLIER POWER CALCULATIONS WERE GREATER THAN THE ACTUAL RUNS, AS SHOWN BY THE CORRESPONDINGLY LARGER CORE-TANK PRESSURES WHICH REACHED 5.2 PSI. PRESSURE WILL NOW BE BLED OFF AT 12 KW-MINUTES EXPOSURE.

*CONTROL ROD BURNUP + AGN (TRAINING REACTOR, AEROJET-GEN. NUCLEONICS) + CONTROL ROD + FAILURE, EQUIPMENT + REACTOR, TRAINING

18-13787 AEC DENIES CONSERVATION CENTER APPEAL ON INDIAN POINT 2
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 19-20 (DECEMBER 26, 1966)

CC HAD APPEALED ATOMIC SAFETY AND LICENSING BOARDS RECOMMENDATION FOR ISSUANCE OF A CONSTRUCTION PERMIT. AEC RULED THE INTERVENTION WAS NOT TIMELY FILED, HAD NOT SHOWN AN INTEREST WHICH MIGHT BE AFFECTED, AND SHOWED NO REASON FOR DEPARTURE FROM THE ORDERLY HEARING PROCESS. (COMPLETE TEXT OF THE DECEMBER 20 DENIAL GIVEN).

*CONSTRUCTION PERMIT PROCESS + INDIAN POINT 2 + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REACTOR, PRESSURIZED WATER

18-13788 CONSOLIDATED EDISON COMPANY FILES DEFENSE OF INDIAN POINT 2 WITH NEW YORK SUPREME COURT IN STOCKHOLDER SUIT
CONSOLIDATED EDISON COMPANY

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-13788 *CONTINUED*
10 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(52) PAGES 20-29 (DECEMBER 26, 1966)

CONSOLIDATED EDISON DEFENSE OF ITS BUSINESS JUDGEMENT POINTED OUT ITS INDIVIDUAL AND CORPORATED EXPERIENCE WITH NUCLEAR POWER, THE PROVEN TECHNOLOGY ASPECT OF MANY OTHER PWRS AND THE DESIGNER (WESTINGHOUSE), THE BREAKDOWN OF ALTERNATE-ELECTRICAL-SOURCE NEGOTIATIONS, AND THE GENERAL UTILITY-ACCEPTANCE OF REACTORS. (COMPLETE TEXT OF DECEMBER 19 AFFIDAVIT GIVEN).

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + INDIAN POINT 2 + LAW + REACTOR, PRESSURIZED WATER

18-13901 FORTY PROPERTY OWNERS PROTEST QUAD CITIES 1 AND 2 REACTORS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(1), PAGES 7-8 (JANUARY 2, 1967), DOCKET NOS. 50-254 AND 50-265

FORTY PROPERTY OWNERS RESIDE ONE-QUARTER MILE SOUTH OF A FERTILIZER PLANT (SIMILAR TO THE ONE WHICH DESTROYED TEXAS CITY) AND ONE QUARTER MILE NORTH OF THE QUAD-CITIES REACTOR, HEMMED IN BY THE MISSISSIPPI ON THE WEST, AND WITH ONLY ONE ACCESS ROAD (IMPASSABLE USUALLY DUE TO PARKED CARS) OBJECT TO THE NUCLEAR POWER PLANT. THE 40 CANNOT FIND A LOCAL ATTORNEY WHO KNOWS THE PROPER FORMAT FOR A PROTEST, AND DISTRUST THE UTILITIES AND PUBLIC OFFICIALS.

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + *SITING, REACTOR + CONSTRUCTION PERMIT PROCESS + QUAD CITIES 1 AND 2 + REACTOR, BOILING WATER

18-14045 APPLICATION FOR LICENSE TO CONSTRUCT AND OPERATE A MODEL AGN-201, SERIAL NO. 112 NUCLEAR REACTOR ON THE UNIVERSITY OF NEW MEXICO CAMPUS IN ALBUQUERQUE, NEW MEXICO
UNIVERSITY OF NEW MEXICO
52 PAGES, FIGURES, APRIL 4, 1966, DOCKET 50-252, PDR

SERIAL 112 IS TO BE TRANSFERRED FROM UNIVERSITY OF CALIFORNIA, BERKELEY, TO THE UNIVERSITY OF NEW MEXICO (UNM). UNM SUBMITS INFORMATION FOR A CONSTRUCTION PERMIT IN ORDER TO ACQUIRE LEGAL TITLE.

*SAFETY ANALYSIS REPORT, GENERAL + AGN (TRAINING REACTOR, AEROJET-GEN. NUCLEONICS) + REACTOR, TRAINING

18-14409 ARCELLA FG + FOAD HY + HABEGGER LJ + HOCHREITER LE + NARDI AJ + PRICKETT WZ
THE DESIGN AND EVALUATION OF A 1000-MW(E) CENTRAL STATION POWER-PLANT WITH A CIRCULATING FUEL GASEOUS CORE REACTOR. A STUDY CARRIED OUT AS PART OF THE FIRST GRADUATE NUCLEAR ENGINEERING DESIGN SEMINAR, JUNE 15-AUGUST 7, 1964
PURDUE UNIVERSITY
TID-22225 +. 304 PAGES, 1964

STUDY CONSIDERED UF6 OPERATING IN A THORIUM FUEL CYCLE (BECAUSE PUF6 IS UNSTABLE AND WOULD PLATE OUT). A NONCIRCULATING GASEOUS FUEL REACTOR WOULD HAVE TOO MUCH HEAT-TRANSFER METAL INSIDE THE CORE. THORIUM WOULD HAVE TO BE IN A SOLID/LIQUID BLANKET.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$7.00 COPY, \$1.50 MICRONEGATIVE

*DESIGN STUDY + REACTOR, CIRCULATING FUEL + REACTOR, GAS COOLED

18-14410 FINAL HAZARDS SUMMARY REPORT FOR AMES LABORATORY RESEARCH REACTOR
AMF ATOMICS
TID-22204 +. 348 PAGES, MARCH 1964

5-MW AMF-BUILT RESEARCH REACTOR SIMILAR TO CP-5. THE MCA IS A QUIET MELTDOWN FOLLOWING LOSS OF O2O COOLANT (RELEASING 60 PERCENT NOBLE GAS, 25 PERCENT HALOGEN, AND 1 PERCENT PARTICLES). DOWNWIND DOSES IN FUMIGATION, INVERSION, AND RAINOUT (INCLUDING STRONTIUM EFFECTS ON AGRICULTURE) DOES NOT AFFECT PUBLIC HEALTH AND SAFETY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$7.00 COPY, \$1.75 MICRONEGATIVE

*SAFETY ANALYSIS REPORT, GENERAL + REACTOR, HEAVY WATER + REACTOR, RESEARCH

18-14411 237-MW KRB NUCLEAR POWER PLANT. QUARTERLY REPORT NO. 7. OCTOBER 1-DECEMBER 31, 1964
KERNKRAFTWERK RWE-BAYERWERK G.M.B.H., GUNDREMMINGEN, WEST GERMANY
TID-22223 + KRB-1964/4 +. 125 PAGES, 1964

THIS REPORT IS ONE OF A SERIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$4.00 COPY, \$0.75 MICRONEGATIVE

*OPERATIONS REPORT, GENERAL + GERMANY + REACTOR, BOILING WATER

18-14413 COHN CE + ROSENBERG GS + DATES LR + LOEWENSTEIN WB + GOLDEN GH
SAFETY ANALYSIS FOR THE ZPR-9 FACILITY. AN ADDENDUM TO ANL-6271, SAFETY ANALYSIS REPORT, ARGONNE FAST CRITICAL FACILITY (ZPR-6)
ARGONNE NATIONAL LABORATORY

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14413 *CONTINUED*
ANL-7166 +. 14 PAGES, 2 TABLES, 2 FIGURES, 4 REFERENCES, FEBRUARY 1966, CFSTI, \$1.00 CY \$0.50 MV

THIS DOCUMENT EXAMINES THE SAFETY OF ZPR-9 FOR THE SAME CLASS OF EXPERIMENTS THAT HAVE ALREADY BEEN APPROVED FOR ZPR-6, AS A BASIS FOR APPROVAL OF ZPR-9 OPERATION. THIS CLASS COMPRISES UNMODERATED SYSTEMS RANGING FROM SMALL, HIGHLY ENRICHED CORES TO LARGE, DILUTE CONFIGURATIONS HAVING CORE VOLUMES UP TO ABOUT 1500 LITERS. THE PHYSICS OF METAL, OXIDE, AND CARBIDE CORES, THE EFFECTS OF HETEROGENEITY, AND THE REACTIVITY OF HYPOTHETICAL CORE-MELTDOWN CONFIGURATIONS ARE SOME OF THE INVESTIGATIONS ANTICIPATED IN THIS PROGRAM. THE EXPERIMENTAL PROGRAM ON ZPR-9 INVOLVES TUNGSTEN-BASED CORES, FUELED WITH U-235 AND DILUTED WITH ALUMINUM AND/OR GRAPHITE. THE REFLECTOR MATERIAL WILL BE ALUMINUM, LOW-CARBON STEEL, OR DEPLETED URANIUM. ALUMINUM DRAWERS WERE ANALYZED FOR VARIOUS SAGGING AND DEFORMATION CHARACTERISTICS. DEFLECTION TESTS ALLOW USE OF A FUEL-PLATE EXPANSION COEFFICIENT AS A RELIABLE SHUTDOWN MECHANISM.

*ANL (ARGONNE NATIONAL LABORATORY) + *CRITICAL ASSEMBLY FACILITY + *REACTIVITY EFFECT, SLUMP + *REACTOR, FAST + *SAFETY ANALYSIS REPORT, GENERAL

18-14443 REQUEST FOR A PUBLIC HEARING ON COLUMBIA UNIVERSITY REACTOR
COLUMBIA UNIVERSITY
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGES 15-16 (JANUARY 30, 1967) DOCKET NO. 50-208

A JANUARY 16, 1967, LETTER FROM THE MORNINGSIDE RENEWAL COUNCIL INDICATED THEY WERE SHOCKED TO LEARN FROM TV THAT COLUMBIA UNIVERSITY WAS BUILDING A TRIGA IN SUCH A DENSELY POPULATED AREA OF NEW YORK CITY. A NUMBER OF COLUMBIA UNIVERSITY PROFESSORS ARE OPPOSED TO THIS AND LEAKED THE INFORMATION. COUNCIL REQUESTS A PUBLIC HEARING IN THE BOROUGH OF MANHATTAN.

*CONSTRUCTION PERMIT PROCESS + *RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REACTOR, RESEARCH + TRIGA (TRAINING REACTOR, ISOTOPES, G.A.)

18-14444 NUCLEAR POWER BRIEFING CONFERENCE, JANUARY 1967
UNITED STATES ATOMIC ENERGY COMMISSION
4 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(5) PAGES 21-24 (JANUARY 30, 1967)

COMMENTS INCLUDED. (COMMISSIONER RAMEY) WE LEARNED EARLY THAT THE CHANCES OF GETTING QUALITY PERFORMANCE ARE GREATLY ENHANCED BY GETTING COMPETITIVE PROPOSALS FROM A SELECTED LIST OF QUALIFIED CONTRACTORS. THIS PRACTICE GOT LOST IN SOME FALLACIOUS DEFERENCE TO THE CONVENTIONAL WISDOM OF FORMAL COMPETITIVE BIDDING. (REP. HOSMER) THE BUILDING OF PAPER REVIEWS AND PROCEDURES IS NOT ONLY WASTEFUL BUT DANGEROUS, BECAUSE IT CAN LULL US INTO A FALSE SENSE OF SECURITY. WE MUST BE CAREFUL TO AVOID FALLING INTO THE TRAP OF THINKING WE CAN REDUCE RISKS BY ADDING MORE AND MORE BACKUP CIRCUITS. ACTUALLY THIS MIGHT TEND TO INCREASE THE RISKS.

*REGULATION, AEC + CONSTRUCTION PERMIT PROCESS + ENGINEERED SAFEGUARD + QUALITY CONTROL

18-14591 QUESTION G-1. STEAM LINE ISOLATION FOLLOWING A RUPTURE
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES G.1.1 TO G.1.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

SIX QUESTIONS REGARDING THIS ACCIDENT, THE ISOLATION VALVES, AND DOSE CALCULATION. (1) ISOLATION-VALVE SINGLE-FAILURE PROTECTION, (2) ALTERNATIVE VALVE-CLOSURE INSTRUMENTATION AND DELAY TIMES, (3) ANALYSIS OF CONSEQUENCES VS VALVE-CLOSURE DELAY TIME, (4) RE-ANALYZE DOSE WITH DIFFERENT PLUME-RISE EQUATION, (5) TESTING OF ISOLATION VALVES IN ACCIDENT CONDITIONS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + DOSE CALCULATION, EXTERNAL + HEIGHT OF RISE + INSTRUMENTATION, PROCESS + REACTOR, BOILING WATER + SYSTEM OPERABILITY IN ACCIDENT CONDITIONS + VALVE

18-14594 QUESTION G-1C. PARAMETER STUDY OF ISOLATION VALVE DELAY TIME CONSEQUENCES
TENNESSEE VALLEY AUTHORITY
5 PAGES, 1 FIGURE, PAGES G.1.4 TO G.1.8 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

VALVE-CLOSURE TIME IS ADJUSTED BETWEEN 3-10 SEC BY ORIFICES. DETAILED CALCULATIONS SHOW THAT CORE WOULD BE ONLY PARTIALLY UNCOVERED IF VALVE CLOSED AFTER 10 SEC. EFFECTS OF WATER FLASHING TO STEAM AND DISRUPTING RECIRCULATION FLOW PUMPS WAS CONSIDERED. FUEL CLAD WILL NOT EXCEED SATURATION TEMPERATURE BY 15 F, SO THE CONSEQUENCES ARE UNCHANGED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT ANALYSIS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + REACTOR, BOILING WATER

18-14596 QUESTION G-1E. TESTING OF ISOLATION VALVES WITH SIMULATED ACCIDENT CONDITIONS
TENNESSEE VALLEY AUTHORITY

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14596 *CONTINUED*

3 PAGES, PAGES G.1.11 TO G.1.13 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1967, DOCKET NO. 50-259/260

MANUFACTURERS TESTS WILL BE DONE IN NONFLOWING SYSTEMS. VALVE DISK AND SEAT ARE SUCH THAT STEAM FLOW TENDS TO CLOSE THE VALVE. SINCE THERE ARE FOUR STEAM LINES TO THE TURBINE, A VALVE CAN BE TESTED DURING NORMAL OPERATION AND THE CLOSURE TIME DETERMINED. LEAK RATE OF CLOSED VALVE CAN BE DETERMINED WITH THE PLANT SHUT DOWN.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, STEAM LINE RUPTURE + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + REACTOR, BOILING WATER + SYSTEM OPERABILITY IN ACCIDENT CONDITIONS + TEST, SYSTEM OPERABILITY

18-14601 QUESTION G-6. JUSTIFY SELFPOINT OF NEUTRON LEVEL SCRAM AT INCIPIENT CENTERLINE MELTING TENNESSEE VALLEY AUTHORITY

2 PAGES, PAGES G.6.1 TO G.6.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

THE INITIAL SETTING OF 120' WAS CHOSEN ON THE EXPECTATION THAT FINAL DESIGN ANALYSIS WOULD SHOW THAT THIS WAS ADEQUATE. APPENDIX G ATTEMPTED TO DISTINGUISH BETWEEN CENTERLINE MELTING AT 22 KW/FT AND DAMAGE AT 28 KW/FT. A LOAD-REJECTION TRANSIENT PRODUCING A 150-180' NEUTRON FLUX TRANSIENT IS OF SUCH SHORT DURATION THAT THE HEAT FLUX OVERSHOOT IS ONLY 1'. A SLOW INCREASE WOULD BE STOPPED BY A 108' ROD BLOCK OR BY A HIGH-PRESSURE SCRAM WELL BEFORE 120' POWER. THE OBSERVED FREQUENCY IS 2 IN EVERY 10 REACTOR-YEARS FOR LARGE-BWR TRANSIENTS TO THE 110' LEVEL.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CENTERLINE MELTING + INSTRUMENTATION, POWER RANGE + OPERATING LIMITS/TECHNICAL SPECIFICATIONS + PERFORMANCE LIMIT + REACTOR SAFETY SYSTEM + REACTOR TRANSIENT + REACTOR, BOILING WATER

18-14602 QUESTION G-7. HOW MUCH FUEL MELTING OCCURS FOLLOWING REACTIVITY ACCIDENTS TENNESSEE VALLEY AUTHORITY

3 PAGES, PAGES G.7.1 TO G.7.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GOOD BACKGROUND DISCUSSION. ROD-DROPOUT ACCIDENTS (THOROUGHLY REPORTED IN UNCERTAINTY ANALYSIS IN DRESDEN 3 AMENDMENT 3) IS STUDIED TO ENSURE PRIMARY-SYSTEM INTEGRITY, AND SOME FUEL MELTING AND CLADDING-STRAIN RUPTURE ACCEPTED. ROD-WITHDRAWAL ACCIDENT FROM THE COLD CONDITION GIVES A PEAK FUEL TEMPERATURE OF 2500 F, WELL BELOW CLAD-FAILURE THRESHOLD OF 3900 F. ROD-WITHDRAWAL ACCIDENT AT POWER IS ASSUMED TO BE VERY SLOW. INCIPIENT MELTING AT 22 KW/FT AND GROSS MELTING AT 28 KW/FT OCCURS. THE MAXIMUM TRANSIENT HEAT FLUX IS ONLY 16' ABOVE STEADY-STATE VALUE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD DROPOUT + ACCIDENT, CONTROL ROD WITHDRAWAL + BROWNS FERRY + CENTERLINE MELTING + REACTOR, BOILING WATER + SAFETY PRINCIPLES AND PHILOSOPHY

18-14603 QUESTION G-8. DOES INCREASED POWER CHANGE ROD DROPOUT ACCIDENT CONCLUSION. DO LOW WORTH RODS GIVE HIGHER ENTHALPY INCREASES BECAUSE THEY ARE NEAR FLUX PEAKS.

TENNESSEE VALLEY AUTHORITY
3 PAGES, 1 FIGURE, PAGES G.8.1 TO G.8.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

GRAPH OF FUEL-CENTERLINE ENTHALPY VS DELTA K OF NEARBY CONTROL FOR INITIAL AND FOR EXCURSION INCREMENT SHOWS THAT THE SUM (FINAL ENTHALPY) IS APPROXIMATELY CONSTANT (220-210 CAL/G) UP TO 0.04 DELTA K. EVEN THOUGH THE BASE INITIAL ENTHALPY IS 20 CAL/G HIGHER FOR BROWNS FERRY, THIS IS AT ZERO DELTA K. NEAR PROMPT CRITICALITY, THE DIFFERENCE FROM DRESDEN 2 IS ONLY 5 CAL/G, AND THE RESULTANT 220 IS WELL BELOW THE 280-CAL/G FULLY MOLTEN CONDITION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD DROPOUT + BROWNS FERRY + CENTERLINE MELTING + PERFORMANCE LIMIT + REACTOR, BOILING WATER

18-14605 QUESTION H-1. DESIGN BASES FOR SHARING OF SPARE ROD DRIVE PUMP TENNESSEE VALLEY AUTHORITY

PAGE H.1.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

PIPING ARRANGEMENT (FIG. XI-2 OF DAR) IS SUCH THAT EACH PUMP HAS 100% SYSTEM CAPABILITY FOR ONE REACTOR, AND ANY TWO PUMPS SUPPLY ANY TWO REACTORS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +

CATEGORY 10
SAFETY ANALYSIS AND DESIGN REPORTS

18-14605 *CONTINUED*
CONTROL ROD DRIVE + INDEPENDENCE + PUMP + REACTOR, BOILING WATER + SHARED COMPONENTS

18-14606 QUESTION H-2A. DESCRIBE FILTER-DEMINERALIZER. DOES IT BRING A HIGH PRESSURE LINE OUTSIDE CONTAINMENT.
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES H.2.1 TO H.2.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

SYSTEM IS SAME AS DRESDEN 1, ETC., EXCEPT FOR USE OF CARTRIDGE-TYPE PRESSURE-PRECOAT FILTER. RESINS (2 PARTS CATION TO 1 PART ANION) ARE COATED ONTO FILTERS IN THE REACTOR CLEANUP 1250-PSIG SYSTEM. BIG ROCK POINT EXPERIENCE SHOWS THAT TOTAL SOLIDS IS FACTOR-OF-10 HIGHER THAN WHEN USED IN COOLER CONDENSATE SERVICE. RESINS ARE BACKFLUSHED TO WASTE AND RECOATED WITH FRESH RESIN WHEN PRESSURE DROP APPROACHES 20 PSIG.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + CONTAINMENT, GENERAL + COOLANT PURIFICATION SYSTEM + OPERATING EXPERIENCE + REACTOR, BOILING WATER

18-14607 QUESTION H-2B. ACTIVITIES PRESENT IN SPENT RESIN
TENNESSEE VALLEY AUTHORITY
PAGE H.2.4 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

WITH NO FUEL LEAKS, CORROSION PRODUCTS ARE MAINLY PRESENT (CO-58, CO-60, CR-51, FE-59, ETC). WITH FUEL LEAKS, THE IODINES, TC-MO-99, AND NOBLE-GAS DAUGHTERS WILL BE PRESENT. SHIELDING DESIGN IS BASED ON 9 MICROCURIES/CC

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACTIVATION PRODUCT + BROWNS FERRY + COOLANT PURIFICATION SYSTEM + FISSION PRODUCT RETENTION + REACTOR, BOILING WATER + RESIN

18-14608 QUESTION H-2C. ARE THERE PROBLEMS FOLLOWING RELIEF VALVE OPERATION
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES H.2.4 TO H.2.5 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

FILTER-DEMINERALIZER RELIEF VALVES RELIEVE WATER TO A DRAIN TANK AND THEN TO THE LIQUID WASTE SYSTEM. HEATER RELIEF VALVES DISCHARGE TO THE REACTOR-BUILDING DRAIN SYSTEM, WHICH IS VENTED TO STACK.

AVAILABILITY - PUBLIC DOCUMENT ROOM, USAEC, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + COOLANT PURIFICATION SYSTEM + REACTOR, BOILING WATER + VALVE

18-14609 QUESTION H-3. WILL USE OF STEAM DRIVEN FEEDWATER PUMPS BE UNEFFECTIVE IN LOSS-OF-COOLANT ACCIDENT
TENNESSEE VALLEY AUTHORITY
PAGE H.3.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

TURBINE-DRIVEN PUMPS WOULD BE ISOLATED (DUE TO STEAM-SUPPLY LOSS) FOLLOWING LOSS-OF-COOLANT ACCIDENT. ONCE REACTOR PRESSURE DECAYS TO 300 PSI, THE CONDENSATE PUMPS WILL BE ABLE TO DISCHARGE TO REACTOR.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF COOLANT + BROWNS FERRY + CORE REFLOODING SYSTEM + REACTOR, BOILING WATER

18-14610 QUESTION H-4. SKETCH PIPING LAYOUT FOR SERVICE WATER SYSTEMS
TENNESSEE VALLEY AUTHORITY
2 PAGES, 1 FIGURE, PAGES H.4.1 TO H.4.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

SKETCH GIVEN.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + REACTOR, BOILING WATER

18-14611 QUESTION H-5. LEAK RATE AND HEAD CURVES OF PUMPS AND VALVES IN ENGINEERED SAFEGUARDS. ADDITIVES FOR HALOGEN RETENTION

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14611 *CONTINUED*
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES H.5.1 TO H.5.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

HEAD AND FLOW DESIGN NUMBERS GIVEN FOR VARIOUS PUMPS, WITH MAXIMUM LEAK RATE 1 GAL/HR.
ALLOWABLE VALVE LEAK RATES ARE 2 CC/HR PER INCH OF SEAT DIAMETER. WATER HAS A HIGH
CAPABILITY FOR HALOGEN RETENTION. NO PLANS TO USE ADDITIVES.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
CONTAINMENT SPRAY + DESIGN CRITERIA + ENGINEERED SAFEGUARD + FISSION PRODUCT RETENTION +
REACTOR, BOILING WATER

18-14612 QUESTION H-6. BACKUP WATER SUPPLY FOR ENGINEERED SAFEGUARDS
TENNESSEE VALLEY AUTHORITY
PAGE H.6.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966,
DOCKET NO. 50-259/260

NORMAL SUPPLY IS FROM SUPPRESSION POOL, WITH BACKUP FROM CONDENSATE SYSTEM THROUGH MAKEUP AND
TESTING LINES. THE POOL (CONTAINING OVER 8 MILLION POUNDS OF WATER) IS SPECIFICALLY DESIGNED
FOR EMERGENCY COOLING PURPOSES, IS SHIELDED FROM MISSILES, IS DESIGNED TO RESIST BOTH
EARTHQUAKE AND ACCIDENT, AND IS A RELIABLE SOURCE OF WATER.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
CONTAINMENT, PRESSURE SUPPRESSION + ENGINEERED SAFEGUARD + REACTOR, BOILING WATER + STORAGE CONTAINER +
WATER, GENERAL

18-14613 QUESTION H-7. MAIN CONDENSER FLOW RATE AND DELTA T.
TENNESSEE VALLEY AUTHORITY
PAGE H.7.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966,
DOCKET NO. 50-259/260

EACH UNIT HAS A CONDENSER COOLING WATER FLOW OF 600,000 GPM, WITH AN EXPECTED TEMPERATURE RISE
OF 24.8 F.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
FLOW, TUBE + HEAT SINK + HIGH TEMPERATURE + REACTOR, BOILING WATER

18-14614 QUESTION H-8. DESIGN BASES AND SELFPOINTS OF PRIMARY PRESSURE RELIEF VALVES
TENNESSEE VALLEY AUTHORITY
PAGE H.8.1 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966,
DOCKET NO. 50-259/260

RELIEF VALVES SIZED TO PREVENT SAFETY VALVE DISCHARGE TO DRY-WELL UPON A REACTOR ISOLATION.
CAPACITY IS 60' STEAM FLOW, SETTING IS 80 PSI ABOVE OPERATING PRESSURE. SAFETY VALVES (150'
STEAM FLOW, SET LINEARLY BETWEEN 1210 AND 1250 PSIG) WILL KEEP PEAK VESSEL PRESSURE WITHIN
ASME CODE LIMITS UPON ISOLATION, NO SCRAMS, NO RELIEF VALVE ACTION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS +
ACCIDENT, LOSS OF LOAD + BROWNS FERRY + CONTAINMENT PENETRATION, CLOSURE OF + DESIGN CRITERIA +
REACTOR, BOILING WATER + VALVE

18-14615 QUESTION H-9. PROVIDE VARIOUS DETAILS OF STANDBY GAS TREATMENT FILTERS, INCLUDING IGNITION
CHARACTERISTICS
TENNESSEE VALLEY AUTHORITY
3 PAGES, PAGES H.9.1 TO H.9.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS,
NOVEMBER 10, 1966, DOCKET NO. 50-259/260

PERFORMANCE AND TESTING (DOP AND FREON F-112) CRITERIA FOR FILTERS SUMMARIZED. CHARCOAL
BURNING WILL BE NO PROBLEM. CALCULATIONS SHOW THE MAXIMUM TEMPERATURE OF THE CHARCOAL TO BE
LESS THAN 300 F WITH VALVES CLOSED AND ONLY CONVECTION COOLING. IGNITION TEMPERATURE IS
SPECIFIED AS 800 C.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
CHARCOAL + DESIGN CRITERIA + FILTER + FIRE + REACTOR OFFGAS + REACTOR, BOILING WATER

18-14616 QUESTION I-1. DISCUSS REACTOR STABILITY IN LIGHT OF INCREASED EXIT QUALITY AND OTHER
DIFFERENCES FROM DRESDEN-II-CLASS REACTORS
TENNESSEE VALLEY AUTHORITY
5 PAGES, 1 FIGURE, PAGES I.1.1 TO I.1.5 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC

ACCESSION NUMBER 18-14611 TO 18-14616

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14616 *CONTINUED*
QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

A STABILITY PARAMETER STUDY SET 8 DESIGN-GUIDE VALUES OF WHICH ONLY THE VALUE FOR THE EXIT QUALITY IS EXCEEDED AT BROWNS FERRY. HOWEVER, GAIN AND PHASE MARGINS ARE GREATER THAN REQUIRED (13 DB AND 55 DEG). THE EFFECT OF NINE ITEMS ON STABILITY IS DISCUSSED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + DESIGN CRITERIA + REACTOR STABILITY + REACTOR, BOILING WATER

18-14617 QUESTION I-2. EVALUATE OFF-NORMAL CONDITIONS ON REACTOR STABILITY
TENNESSEE VALLEY AUTHORITY
2 PAGES, 1 FIGURE, PAGES 1.2.1 AND 2.2 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

AN OFF-NORMAL EVENT WILL EITHER CAUSE A SCRAM OR THE REACTOR WILL SETTLE TO A NEW OPERATING CONDITION. PRELIMINARY ANALOG ANALYSIS OF A 10-PSI REACTOR-PRESSURE SETPOINT CHANGE SHOWS A MOMENTARY NEUTRON FLUX INCREASE TO 109% IN 4 SEC, AN INCREASE TO 103% IN SURFACE HEAT FLUX, AND 9% DROPS IN STEAM FLOW AND PRESSURE, FOLLOWED BY PEAKS TO 105%.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + REACTOR STABILITY + REACTOR, BOILING WATER

18-14618 QUESTION I-3. DISCUSS XENON OSCILLATION AND IDENTIFY LIMITING MODE
TENNESSEE VALLEY AUTHORITY
3 PAGES, 2 FIGURES, PAGES 1.3.1 TO 1.3.3 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

L/D RATIO MAKES BROWNS FERRY MOST SUSCEPTIBLE TO AZIMUTHAL MODE. MODAL EXPANSION TECHNIQUES SHOW MARGIN TO INSTABILITY ADEQUATE BY A FACTOR OF 2-4 IN POWER COEFFICIENT. EFFECT OF GROSS POWER FLATTENING WAS CONSIDERED.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + POWER COEFFICIENT + POWER DISTRIBUTION + REACTOR, BOILING WATER + XENON OSCILLATION

18-14651 WUSTNER R
RAPSDIE, AN EXPERIMENTAL FAST BREEDER REACTOR
CENTRE D'ETUDES NUCLEAIRES CADARACHE, FRANCE
EURFNR-93F + EUR-1699.F +. 30 PAGES, 1963

RAPSDIE, UNDER CONSTRUCTION AT CADARACHE SINCE 1961, WILL BE THE FIRST REACTOR OF THIS TYPE IN CONTINENTAL EUROPE. AS A LOGICAL CONSEQUENCE OF FRENCH PLUTONIUM PRODUCTION AND FRENCH EXPERIENCE IN LIQUID METAL TECHNOLOGY, IT WILL BE A PLUTONIUM FUELED, SODIUM-COOLED REACTOR. MASURCA AND HARMONIE, RESPECTIVELY A CRITICAL ASSEMBLY AND A FAST-SOURCE REACTOR, WILL BE THE MAIN TOOLS FOR NEUTRON STUDIES OF THE LARGE FAST POWER STATIONS OF THE FUTURE. THIS ARTICLE GIVES A BRIEF DESCRIPTION OF THE RAPSDIE REACTOR, SOME DETAILS OF THE HISTORY AND PRESENT STATUS OF THE PROJECT, AND OUTLINES THE FUTURE DEVELOPMENT OF A FAST-REACTOR PROGRAM.

AVAILABILITY - JOHN CRERAR LIBRARY, 35 WEST 33RD ST., CHICAGO, ILLINOIS 60616, \$2.60 COPY

*REACTOR DESCRIPTION + FRANCE + PLUTONIUM + REACTOR, FAST + REACTOR, LIQUID METAL COOLED

18-14823 QUESTION 1A - PERCENTAGE OF FUEL RODS AT MCHF RATIOS LESS THAN 1 FOR HIGH POWER OPERATIONS.
TENNESSEE VALLEY AUTHORITY
3 PAGES, 2 FIGURES, PAGES 1-3, BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

AT 124% POWER, ALL RODS ARE ABOVE A 1.0 MAXIMUM CRITICAL HEAT FLUX RATIO. AT 130%, 2.8% ARE BELOW. AT 140%, 5.7% ARE BELOW. INITIAL CORE EXCESS REACTIVITY WITH EQUILIBRIUM XENON IS INSUFFICIENT TO ALLOW STEADY-STATE OPERATION ABOVE 130%. TWO FIGURES PROVIDE PERCENT OF FUEL RODS VS MCHF RATIO FOR 130 AND 140% POWER.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY + BURNOUT HEAT FLUX + REACTOR, BOILING WATER

18-14824 QUESTION 1B - DISCUSS METHODS OF ANALYZING POWER DISTRIBUTION AND UNCERTAINTIES
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES 4-5 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

POWER DISTRIBUTION USED RESULT FROM CALCULATIONS AND MEASUREMENTS, VERIFIED BY (E.G.) CARIGLIANO REACTOR TESTS. VARIOUS MARGINS ARE INCLUDED IN ANALYSIS (E.G., 0.2 PSI PRESSURE LOSS AT INLET TO LIMITING CHANNEL ALLOWANCE FOR GREATER COOLANT PATH LENGTH, NO CREDIT TUBES FOR FUEL-ROD SPACERS INCREASING THE CRITICAL HEAT FLUX). UNCERTAINTIES ARE TREATED BY

ACCESSION NUMBER 18-14616 TO 18-14824

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14824 *CONTINUED*
STATISTICAL ANALYSIS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
HEAT TRANSFER ANALYSIS + POWER DISTRIBUTION + REACTOR, BOILING WATER

18-14825 QUESTION 1C - ACTUAL AND CRITICAL HEAT FLUXES ALONG THE LIMITING CHANNEL
TENNESSEE VALLEY AUTHORITY
2 PAGES, 1 FIGURE, PAGES 6-7 OF BROWNS FERRY AMENDMENT 4, NOV. 1966, DOCKET NO. 50-259/260

FIGURE SHOWS THAT SURFACE HEAT FLUX PEAKS AT 450,000 BTU/HR/SQ. FT AND 47' HEIGHT. CRITICAL
HEAT FLUX REMAINS 980,000 UNTIL QUALITY EXCEEDS 6' AT 43' HEIGHT, AND THEN DROPS TO 425,000
AT EXIT WHERE SURFACE HEAT FLUX IS 50,000 (POWER LEVEL UNSPECIFIED).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
BURNOUT HEAT FLUX + HOT CHANNEL + REACTOR, BOILING WATER

18-14826 QUESTION 1D - PROVIDE A RESUME OF ACTUAL EXPERIENCE IN LIMITING AXIAL AND RADIAL POWER PEAKING
TENNESSEE VALLEY AUTHORITY
PAGE 8 OF BROWNS FERRY, AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

DRESDEN 1, GARIGLIANO, HUMBOLDT BAY, AND BIG ROCK POINT OPERATING CYCLES DEMONSTRATED GROSS
POWER PEAKING FACTORS LESS THAN 2.1. APPENDIX G (FIG. G2) IS TAKEN FROM GARIGLIANO
PERFORMANCE.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS +
ADMINISTRATIVE CONTROLS AND PRACTICES + BROWNS FERRY + CONTROL ROD PROGRAM + POWER DISTRIBUTION +
REACTOR, BOILING WATER

18-14827 QUESTION 1E - SPECIFY MASS FLOW RATE APPROPRIATE IN APED-5286 CORRELATION
TENNESSEE VALLEY AUTHORITY
PAGE 9 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

THE DATA USED IN OBTAINING THE LIMIT LINES RANGE FROM 0.2 TO 1.6 X (0 (6TH) LB/HR-SQ FT. AT
BROWNS FERRY THE FLOW WILL BE BETWEEN 0.2 AND 1.3 X 10(6TH).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
HEAT TRANSFER CORRELATION + REACTOR, BOILING WATER

18-14828 QUESTION 1F - SPECIFY MCHF RATIO AND POWER LEVEL
TENNESSEE VALLEY AUTHORITY
PAGE 10 OF BROWNS FERRY, AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260.

FOR THE 2H POWER-DISTRIBUTION CURVE IN FIGURE G-3 OF AMENDMENT 1, WITHOUT INITIAL
COMPENSATION, THE MCHF RATIO WOULD BE 1.55 AT 100' WITH A RELATIVE ASSEMBLY POWER OF 1.40.
AT 118' POWER, THE MCHF RATIO WOULD BE UNITY.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
BURNOUT HEAT FLUX + POWER DISTRIBUTION + REACTOR, BOILING WATER

18-14829 QUESTION 2 - PROVIDE SUMMARY REPORT OF PERFORMANCE TESTING TO CONFIRM THERMAL DESIGN BASIS.
PROVIDE STARTUP TEST PROGRAM OBJECTIVES.
TENNESSEE VALLEY AUTHORITY
2 PAGES, PAGES 11-12 OF BROWNS FERRY AMENDMENT 4, NOVEMBER 1966, DOCKET NO. 50-259/260

ANSWER STATES NAMES OF REACTORS WHERE 8 VARIOUS TESTS HAVE BEEN PERFORMED. (EG. 4 HIGH POWER
DENSITY--BIG ROCK POINT) STARTUP TEST PROGRAM WILL INCLUDE VARIOUS TESTS AS IN PRESENT PLANT
STARTUP.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, PRELIMINARY + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + BROWNS FERRY +
HEAT TRANSFER ANALYSIS + REACTOR STARTUP TESTING + REACTOR, BOILING WATER + TEST, PLANT RESPONSE

18-14835 AMENDMENT NUMBER 11 TO LICENSE APPLICATION DOCKET NO. 50-213
CONNECTICUT YANKEE ATOMIC POWER COMPANY
72 PAGES, FIGURES, TABLES, REFERENCES, OCTOBER 6, 1966, DOCKET NO. 50-213

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14835 *CONTINUED*

REPLIES TO AEC DRL LETTER OF SEPT. 27, 1966, REGARDING RECENT CHANGES IN METHODS AND REGULATORY ATTITUDES TOWARD (1) OFF-SITE DOSE, (2) EMERGENCY CORE COOLING, (3) CONTAINMENT, (4) CONTROL-ROD EJECTION, (5) CORE THERMAL AND HYDRAULIC DESIGN. AMPLIFIES ANALYSES IN FINAL SAFEGUARDS REPORT (JULY 1966).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, CONTROL ROD EJECTION + AIRBORNE RELEASE + CONTAINMENT, GENERAL + DOSE + EMERGENCY COOLING CONSIDERATIONS + HYDRODYNAMIC ANALYSIS + REACTOR, PRESSURIZED WATER + THERMAL ANALYSIS

18-14836 EFFECTIVENESS OF CONTAINMENT AIR FILTRATION IN REDUCING OFFSITE DOSE

CONNECTICUT YANKEE ATOMIC POWER COMPANY

12 PAGES, 9 FIGURES, PAGES A-1 TO A-12 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

THYROID DOSE COMPUTATION (AT SITE BOUNDARY AND LOW POPULATION RADIUS) ARE GIVEN FOR VARIOUS COMBINATIONS OF CONTAINMENT AIR-RECIRCULATION RATES AND FILTER EFFECTIVENESS. WITH A LEAK RATE (0.3'/DAY) THREE TIMES THE DESIGN LEAK RATE AND NO FILTRATION AT ALL, THE SITE BOUNDARY DOSE IS 450 REMS. WITH ONE FAN/FILTER COMBINATION, THE DOSE IS APPROXIMATELY 170 REMS. IN ADDITION, TRACER TESTS ON-SITE SHOW CONCENTRATIONS LESS THAN 1/10TH THOSE USED IN TID 14844, WHILE THE MODELS USED IN SAFETY ANALYSES USED OVER 4 TIMES THE CONCENTRATION SHOWN BY TRACER TESTS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + AIRBORNE RELEASE + CONTAINMENT FILTERING SYSTEM + DOSE + FISSION PRODUCT, IODINE + REACTOR, PRESSURIZED WATER + TRACER, GENERAL + WIND STATISTICS

18-14837 EXTENDED LOSS OF COOLANT ANALYSIS EXTENDED TO SEVERAL BREAK SIZES

CONNECTICUT YANKEE ATOMIC POWER COMPANY

17 PAGES, 14 FIGURES, PAGES B-1 TO B-17 FROM CONNECTICUT YANKEE ATOMIC POWER COMPANY, AMENDMENT 11 TO LICENSE APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

LOSS-OF-COOLANT ANALYSIS WAS EXTENDED TO CONSIDER VARIOUS BREAK SIZES, AMOUNTS OF COOLING WATER AVAILABLE, TRIP DELAY TIME, AND STEAM HEAT-TRANSFER COEFFICIENT. FOR THE LARGEST PIPE RUPTURE, THE CORE IS UNCOVERED IN 6 SEC AND RE-COVERED IN 170 SEC, AND CLAD MELTING IS 13' WITH ONLY ONE DELUGE PUMP OPERATING AND LESS THAN 5' WITH 3 SYSTEMS OPERATING. EFFECTS OF TRIP DELAY TIME, HEAT-TRANSFER COEFFICIENT, AND BLOWDOWN RATE ARE INSIGNIFICANT.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT, LOSS OF COOLANT + CORE REFLOODING SYSTEM + HADDAM NECK + REACTOR, PRESSURIZED WATER

18-14939 LOSS-OF-COOLANT CONTAINMENT PRESSURE BUILDUP AND QUENCHING WITH ONLY 1 DELUGE PUMP OPERATING.

CONNECTICUT YANKEE ATOMIC POWER COMPANY

10 PAGES, 7 FIGURES, 1 TABLE, PAGES C-1 TO C-10 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION, DOCKET NO. 50-213, DECEMBER 6, 1966

THE MAXIMUM PRESSURE REACHED IS 32 PSIG WITH ONLY 1 DELUGE PUMP OPERATING, WHILE DESIGN PRESSURE IS 40. A 40' SS-H₂O REACTION WITH HYDROGEN BURNED WOULD ADD 5 PSIG. HEAT ABSORPTION BY STRUCTURE NOT USED. CURVES GIVE HEAT-REMOVAL CAPABILITY OF CONTAINMENT AIR RECIRCULATION AND SPRAY SYSTEMS.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + CONTAINMENT AIR COOLING + CONTAINMENT SPRAY + CONTAINMENT, HIGH PRESSURE + METAL WATER REACTION + PRESSURE, INTERNAL + REACTOR, PRESSURIZED WATER

18-14840 DETAILS OF ROD EJECTION ANALYSIS

CONNECTICUT YANKEE ATOMIC POWER COMPANY

19 PAGES, 14 FIGURES, 5 REFERENCES, PAGES D-1 TO D-19 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE APPLICATION DOCKET NO. 50-213, OCTOBER 6, 1966

PARAMETER STUDIES ARE REPORTED FOR 1,2. INITIAL POWER LEVEL, ZERO OR 1880 MWTH, AND ROD WORTH. (FUEL-ELEMENT ENTHALPY RISE IS LESS THAN 200 BTU/LB FOR MOST ROD-PLUS-MODERATOR REACTIVITY ADDITIONS. MODERATOR ADDITIONS STRONGLY AFFECT THIS, WITH 200 BEING REACHED AT 1' RODS PLUS 1.5' MODERATOR AT 1880 MWTH. WORSE CASE IS AT POWER, BUT ROD WORTH IS THEN MINIMIZED BY CHEMICAL SHIM.) 3. DOPPLER WEIGHTING FACTOR (A FACTOR OF 1.2 INSTEAD OF THE 1.6 USED WOULD INCREASE ENTHALPY BY 40 IN WORST CASE). 4. MODERATOR REACTIVITY INSERTION (STRONGLY DEPENDENT ON WORTH OF EJECTED ROD.) 5. SCRAM DELAY TIME (DELAY TIME OF 1.5 SEC RATHER THAN 1 SEC WOULD ADD 20 BTU/LB IN WORST CASE). SAMPLE CALCULATION SHOWS A 0.7' EJECTION AT 1880 MWTH WOULD GIVE A MAXIMUM OF 3' FUEL DISPERSION.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS + ACCIDENT ANALYSIS + ACCIDENT, CONTROL ROD EJECTION + FUEL MELTDOWN + MODERATOR COEFFICIENT + REACTOR, PRESSURIZED WATER +

ACCESSION NUMBER 18-14835 TO 18-14840

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14840 *CONTINUED*
SAFETY ANALYSIS

18-14841 CORE THERMAL/HYDRAULIC STUDY FOR INTERMEDIATE STEADY STATE POWERS AND ROD WITHDRAWAL ACCIDENT
CONNECTICUT YANKEE ATOMIC POWER COMPANY
11 PAGES, 8 FIGURES, PAGES E-1 TO E-11 FROM CONNECTICUT YANKEE ATOMIC POWER CO., AMENDMENT 11 TO LICENSE
APPLICATION, DOCKET NO. 50-213, OCTOBER 6, 1966

SENSITIVITY OF VARIOUS ASSUMPTIONS AND PARAMETERS TESTED. FOR VARIOUS POWER LEVELS, THE
NUMBER OF FUEL RODS STATISTICALLY IN DNB ARE GIVEN FOR NORMAL CONDITIONS (ONE ROD AT 2000
MWTH), VARIATIONS IN POWER DISTRIBUTION (0.3 RODS AT $F \Delta H$ 30' HIGHER), COOLANT FLOW RATE
(0.024 RODS WITH 20' LESS FLOW), CORRELATION ERROR (0.94 RODS WITH 30' ERROR). FOR THE WORST
REACTIVITY WITHDRAWAL ACCIDENT (AT 3 X 10 TO THE MINUS 5TH) $\Delta K/SEC$ BETWEEN ACTIONS OF
TWO DIFFERENT TRIP CIRCUITS), 6 RODS CAN BE IN DNB.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SAFETY ANALYSIS REPORT, GENERAL + *SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS +
ACCIDENT, CONTROL ROD WITHDRAWAL + DNB (DEPARTURE FROM NUCLEATE BOILING) + HEAT TRANSFER CORRELATION +
POWER DISTRIBUTION + REACTOR, PRESSURIZED WATER

18-14852 SMITH RJ
REACTOR SAFETY - A LITERATURE SEARCH
DIVISION OF TECHNICAL INFORMATION
TID-3525 (REV. 5, SUPPL. 2) +. 64 PAGES, 671 REFERENCES, AUGUST 1965

A TOTAL OF 671 REFERENCES TO UNCLASSIFIED REPORTS IS PRESENTED ON REACTOR SYSTEMS, MATERIALS,
AND OPERATION DESIGNED TO PROVIDE MAXIMUM SAFETY FOR THE REACTOR, REACTOR PERSONNEL, AND
ENVIRONS. INFORMATION IS INCLUDED CONCERNING INCIDENTS AND CONDITIONS OF OPERATION
CONSIDERED HAZARDOUS. AUTHOR, REACTOR, AND REPORT-NUMBER-AVAILABILITY INDEXES ARE PROVIDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT ANALYSIS + *ACCIDENT, GENERAL + *BIBLIOGRAPHY + *CONTAINMENT, GENERAL +
*OPERATIONS REPORT, GENERAL + *PERSONNEL PROTECTIVE DEVICE

18-14889 UNION CARBIDE PROPOSES CHANGE TO IRRADIATION EXPERIMENT LIMITS
UNION CARBIDE, TUXEDO, NEW YORK
7 PAGES, DECEMBER 23, 1966, DOCKET NO. 50-54

STERLING FOREST REQUESTS THAT IRRADIATION LIMITS BE INCREASED TO 200 G OF SOURCE AND 50 G OF
SPECIAL NUCLEAR MATERIAL, ON THE GROUNDS THAT THE ORIGINAL LIMITS WERE ARBITRARY AND
SELF-IMPOSED. INCLUDED IN THE DISCUSSION ARE 23 LIMITATIONS ON (E.G., TOTAL WORTH OF
EXPERIMENTS 2' $\Delta K/K$, INDIVIDUAL WORTH 0.5' $\Delta K/K$, DOUBLE ENCAPSULATION OF SODIUM).

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*OPERATING LIMITS/TECHNICAL SPECIFICATIONS + IN PILE LOOP + REACTOR, POOL TYPE + REACTOR, RESEARCH +
SAFETY PRINCIPLES AND PHILOSOPHY

18-14919 ONGMANN HD
NUCLEAR SUPERHEAT PROJECT. FINAL REPORT
GENERAL ELECTRIC COMPANY, SAN JOSE
GEAP-5087 +. 104 PAGES, 15 TABLES, 14 FIGURES, DECEMBER 1965

PRESENTS TASK STATEMENTS AND SUMMARIES OF TOPICAL REPORTS ISSUED. TASKS INCLUDED (A)
ADMINISTRATION, (B) SADE LOOP FUEL IRRADIATION, (C) TESTS OF CLAD RADIATION-DAMAGE, (D)
CRITICAL EXPERIMENTS, (E) COOLANT CHEMISTRY, (F) HEAT TRANSFER, INCLUDING ONCE-THROUGH
BOILING, (G) STEAM SEPARATORS AND DRYERS, (H) ESAD-LOOP FUEL IRRADIATION IN VBWR, (J)
MIXED-SPECTRUM SAFETY STUDIES, AND (K) MIXED-SPECTRUM CRITICAL EXPERIMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

*RESEARCH AND DEVELOPMENT PROGRAM + CLAD + COOLANT CHEMISTRY + CORROSION + CRITICALITY EXPERIMENT +
FAILURE, FUEL ELEMENT + HEAT TRANSFER, BOILING + IRRADIATION TESTING + RADIATION DAMAGE +
REACTOR, SUPERHEAT + SAFETY STUDY

18-14921 SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING AUGUST 31, 1966 - MOLTEN SALT REACTOR PROGRAM
OAK RIDGE NATIONAL LABORATORY
ORNL-4037 +. 242 PAGES, 94 FIGURES, 37 TABLES, 102 REFERENCE, JANUARY 1967

XENON IS ONLY 0.35 THE EXPECTED VALUE, AS HELIUM GAS SCRUBS IT OUT. A 0.3 PERCENT ZERO-POWER
REACTIVITY DISCREPANCY EXISTS. A MAIN RADIATOR BLOWER CATASTROPHICALLY FAILED. MATERIALS
STUDIES AND BREEDER-REACTOR STUDIES DESCRIBED, AS WELL AS MSRE OPERATIONS AND COMPONENT
DEVELOPMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF
STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICRONEGATIVE

ACCESSION NUMBER 18-14840 TO 18-14921

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-14921 *CONTINUED*

*OPERATIONS REPORT, ANALYSIS + *RESEARCH AND DEVELOPMENT PROGRAM + ECONOMICS + MATERIAL +
MSRE (MOLTEN SALT REACTOR EXPERIMENT) + REACTIVITY EFFECT, ANOMALOUS + REACTOR, BREEDER +
REACTOR, CIRCULATING FUEL + REACTOR, MOLTEN SALT + XENON

18-14923 USAEC ENGINEERING MATERIALS LIST - SUPPLEMENT 36
DIVISION OF TECHNICAL INFORMATION EXTENSION, OAK RIDGE, TENNESSEE
TID-4100 (SUPPL. 36) +. 60 PAGES, DECEMBER 1966

OF INTEREST ARE INTERFEROMETERS, NEUTRON SPECTROMETERS, THE ELK RIVER FUEL ELEMENT, AND THE
ORR BOILING DETECTOR EXPERIMENT IN-CORE BOILING HEATER. THIS ISSUE INCLUDES A SUBJECT INDEX
FOR THIS AND ALL PREVIOUS ISSUES.

AVAILABILITY - USAEC DIVISION OF TECHNICAL INFORMATION, OAK RIDGE, TENNESSEE, FREE

*ENGINEERING DRAWING LIST + ELK RIVER + FUEL ELEMENT + NUCLEATE BOILING +
ORR (OAK RIDGE RESEARCH REACTOR) + REACTOR, BOILING WATER

CATEGORY 19
BIBLIOGRAPHIES

19-12333 PARO JN
BIBLIOGRAPHIES IN NUCLEAR SCIENCE AND TECHNOLOGY. SECTION 22 - NUCLEAR SHIP PROPULSION
ZENTRALSTELLE FUER ATOMKERNENERGIE-DOKUMENTATION, GELIN-INSTITUT FUER ANORGANISCHE CHEMIE AND
GRENZGEBIETE, FRANKFURT AM MAIN, WEST GERMANY
AED-C-22-06 +. 48 PAGES, JUNE 1966, DEP. MN

THE GERMAN BUNDESMINISTERIUM FUR WISSENSCHAFTLICHE FORSCHUNG HAS ASSIGNED TO THE DOCUMENTATION AND INFORMATION SERVICES IN THE NUCLEAR ENERGY FIELD THE TASK TO SUPPLY SCIENTISTS AND ENGINEERS WITH ALL RELEVANT INFORMATION AND KNOWLEDGE CONTAINED IN THE INTERNATIONAL LITERATURE. THIS APPLIES PARTICULARLY TO MATERIAL WHICH IS NOT AVAILABLE AT ALL THROUGH FOREIGN DOCUMENTATION SERVICES, OR ONLY WITH CONSIDERABLE DELAYS. TO THIS END, VARIOUS MEANS HAVE BEEN EMPLOYED, ALL DIRECTED TOWARDS PROCURING INFORMATION ON SPECIFIC SUBJECT CATEGORIES OR ON PUBLICATIONS WHICH ARE NOT EASILY ACCESSIBLE. THE MATERIAL PROVIDED BY THESE INSTITUTIONS IS ISSUED AS FAST AS POSSIBLE, BUT AT IRREGULAR INTERVALS.

*DATA PROCESSING + *GERMANY + *INFORMATION RETRIEVAL

19-13390 COUSINS LB
BIBLIOGRAPHY OF REPORTS ON TWO-PHASE HEAT TRANSFER ISSUED BY A.E.R.E., HARWELL
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-B18-150 +. 18 PAGES, MAY 1966

LISTS AND SUMMARISES THE REPORTS AND PUBLICATIONS ISSUED BY THE TWO-PHASE HEAT TRANSFER SECTION OF THE CHEMICAL ENGINEERING DIVISION AT A.E.R.E., HARWELL. REPORTS ARE DIVIDED INTO TWO MAIN SECTIONS - (1) BURNOUT AND HEAT TRANSFER STUDIES ON STEAM-WATER SYSTEMS. (2) HYDRODYNAMIC STUDIES ON AIR-WATER SYSTEMS. A LIST OF OTHER RELEVANT REPORTS ISSUED BY A.E.R.E. HARWELL IS GIVEN IN THE SUPPLEMENT.

AVAILABILITY - BRITISH INFORMATION SERVICE, 845 THIRD AVE, NEW YORK, N.Y. 10022 \$0.60 CY.

*DNB (DEPARTURE FROM NUCLEATE BOILING) + *FLOW, TWO PHASE + BURNOUT HEAT FLUX + HEAT TRANSFER + HEAT TRANSFER, BOILING + PHASE CHANGE + WATER, GENERAL

19-13884 PHYSICS DEPARTMENT PROGRESS REPORT, FEBRUARY - MAY, 1966
LAWRENCE RADIATION LABORATORY
UCRL-50001-66-1 +. 79 PAGES, FIGURES, TABLES, REFERENCES, MAY 1966

OF POSSIBLE SAFETY INTEREST ARE THE COMPILATION OF SHOCK WAVE DATA (PAGE 51), AND THE EXPERIMENTAL DETERMINATION OF THE COMPRESSIBILITY OF ATOMIC SHELLS (PAGE 51). BOTH ITEMS RELATE TO THE EQUATION-OF-STATE AT HIGH PRESSURE WHICH IS USED IN COMPILATIONS OF HYPOTHETICAL VERY LARGE EXPLOSIONS OF FAST REACTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 CY

*EQUATION OF STATE

19-15746 COTTRELL WB
COMPILATION OF UNITED STATES NUCLEAR STANDARDS. 3RD EDITION, 1966
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENN
ORNL-NSIC-30 +. 108 PAGES, DECEMBER 1966

ALL UNITED STATES NUCLEAR STANDARDS ACTIVITIES AND REGULATIONS KNOWN TO THE REACTOR SAFETY STANDARDS USASI COMMITTEE N6 ARE PRESENTED IN SIMPLE TABULAR FORM. THE STANDARDS ACTIVITIES OF ALL ORGANIZATIONS INCLUDING TECHNICAL SOCIETIES, AS WELL AS RELEVANT REGULATIONS ESTABLISHED BY GOVERNMENT AGENCIES, ARE LISTED IN ALPHABETICAL ORDER BY ORGANIZATION, ETC. IN INSTANCES WHERE THAT ORGANIZATION ITSELF UNDERTAKES THE DEVELOPMENT OF NUCLEAR STANDARDS. IN THE UNITED STATES THE MOST CONCENTRATED STANDARDS EFFORT IS CHanneled THROUGH THE USASI, WHICH IS A NATIONAL FEDERATION OF MORE THAN 110 TECHNICAL SOCIETIES AND TRADE ASSOCIATIONS AND, IN ADDITION, HAS 2300 COMPANY MEMBERS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., \$3.00 COPY, \$0.65 MICROFICHE

*CODES AND STANDARDS + *UNITED STATES + BIBLIOGRAPHY

INFORMATION AT NSIC IS DIVIDED INTO 19 CATEGORIES. AN ITEM OF INFORMATION MAY BE KEYED TO AS MANY AS THREE OF THESE. A COLLECTION OF SELECTORS OR KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN AN ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF SELECTORS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT. THE CATEGORY NUMBER IS GIVEN FIRST, FOLLOWED BY THE ACCESSION NUMBER. THE ACCESSION NUMBERS ARE USED TO LOCATE BIBLIOGRAPHIC ITEMS WITHIN A CATEGORY.

AARR (ARGONNE ADVANCED RESEARCH REACTOR)	18-14594	18-14596		
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CHROMIUM				CONTAINMENT INTEGRITY			
14-13765	15-13553	15-13820		8-10413	11-10332	11-10459	18-11852
CIRCULATION, NATURAL (LOOPS AND REACTORS)				CONTAINMENT LEAKAGE CONTROL			
18-12190				11-11308	11-12374	11-13526	12-11308
CIVIL DEFENSE				13-11308	17-11994		
14-11636	14-13227	14-13645	14-14493	CONTAINMENT PAINT			
14-14964	15-11636	15-13227	15-13645	7-13583	7-13584	11-11308	12-11308
15-14473	15-14484	15-14984		13-11308			
CLAD				CONTAINMENT PENETRATION			
5-12147	5-12148	5-13699	5-14600	18-05303			
5-14919	7-13629	7-13735	11-14600	CONTAINMENT PENETRATION, CLOSURE OF			
12-13629	13-13741	17-11626	17-12098	5-14594	5-14596	5-14614	9-14592
17-12148	17-12204	17-14924	18-12144	11-12141	11-12200	11-14591	11-14592
18-12147	18-12148	18-12204	18-14919	11-14594	11-14742	12-14596	17-14591
COATED PARTICLE				17-14742	18-12141	18-12200	18-14591
7-00552	7-13471	7-13540	7-13638	18-14594	18-14596	18-14614	
7-13734	11-13540	18-12187	18-12188	CONTAINMENT REFERENCE MEASURING SYSTEM			
18-13230				11-12198	17-12198	18-12198	
COATING				CONTAINMENT RESEARCH AND DEVELOPMENT			
7-13719				5-06838	7-13583	11-06838	11-10332
COATING, SURFACE				11-12373	11-13482	11-13526	11-13573
7-13583	7-13629	7-13719	12-13629	11-13585			
17-11860				CONTAINMENT SPRAY			
COBALT				5-12177	11-14839	12-14611	12-14839
4-12294	14-11741	14-13219	14-13765	18-11406	18-12177	18-14611	18-14839
15-12305	15-13455	15-13465	15-13557	CONTAINMENT STRUCTURE			
15-13564	15-13820	15-14490	17-12305	11-11846	17-11846	18-05804	
CODES AND STANDARDS				CONTAINMENT-VESSEL LOADING			
1-08774	1-12343	1-12950	1-15746	5-06838	5-12177	11-06838	11-10458
3-12950	3-12957	4-10519	11-10458	11-13528	18-12177		
11-10460	19-15746			CONTAINMENT, CORROSION PROTECTION			
COMPARISON, THEORY AND EXPERIENCE				11-13573			
1-12160	6-14414	8-10339	8-10413	CONTAINMENT, FUEL REPROCESSING			
9-10384	11-10332	13-14369	17-11910	7-13629	11-11308	12-11308	12-13629
17-14367	17-14370	17-14414		13-11308	15-14428		
COMPUTER PROGRAM				CONTAINMENT, GENERAL			
1-12327	5-06838	5-13694	6-10503	2-10326	5-00382	5-14852	11-10326
6-11516	6-11995	6-13381	7-13474	11-10356	11-10460	11-10463	11-13573
7-13480	9-10503	9-12126	9-13381	12-10356	15-12197	17-12197	17-14606
11-06838	11-10460	11-11642	11-12373	17-14852	18-10356	18-12186	16-12197
11-12463	11-13483	11-13813	14-13397	18-14606	18-14835	18-14852	
14-13645	15-12358	15-13261	15-13397	CONTAINMENT, HIGH PRESSURE			
15-13645	15-13873	15-14423	15-14424	11-10332	11-10463	11-12179	11-12198
15-14494	15-14979			11-12199	11-12319	11-14839	12-14839
COMPUTER PROGRAM, METEOROLOGICAL				17-12198	17-12209	17-12319	18-12179
16-14356	16-14361			18-12198	18-12199	18-12209	18-14839
COMPUTER, ANALOG				CONTAINMENT, LOW PRESSURE			
9-12118	9-12130	9-12157		15-12241	17-12241		
COMPUTER, DIGITAL				CONTAINMENT, MULTIPLE			
5-13694	6-11511	6-11520	6-13323	2-10326	7-10524	11-10326	
6-13373	6-13381	6-13407	6-13594	CONTAINMENT, PRESSURE RELIEF			
9-12118	9-12156	9-13373	9-13381	11-10463			
11-13483	15-13415			CONTAINMENT, PRESSURE SUPPRESSION			
CONCENTRATION, ISOPLETH				2-10326	11-10326	11-10463	11-12206
16-14903				12-14612	18-12206	18-14612	
CONCENTRATION, MAXIMUM				CONTAINMENT, PRESSURE VENTING			
15-14981	16-14353			11-11308	11-12141	12-11308	13-11308
CONCRETE				18-12141			
11-10391	11-10463	11-13403	11-13482	CONTAINMENT, PRESSURE VESSEL			
11-13483	13-12309	15-12309	17-12169	11-10317	11-10332	11-10459	11-11642
17-12309				11-11846	11-12374	11-13402	11-13403
CONCRETE, PRESTRESSED				11-13482	11-13487	11-13526	11-13573
11-10317	11-10391	11-11846	11-13403	11-13585	11-13774	11-13815	11-14450
11-13482	17-11846			17-11846	17-11858	17-14450	18-12150
CONDENSATION				18-12164	18-12186	18-13487	
5-13701	8-13701	14-12283	14-13566	CONTAINMENT, SHOCK GENERATION AND PROTECTION			
CONGRESSIONAL ACTIVITY				5-06838	11-06838	11-12463	11-13528
1-12296				CONTAINMENT, SOURCE			
CONSTRUCTION PERMIT PROCESS				3-12880			
1-13787	1-14443	1-14444	18-12107	CONTAINMENT, UNDERGROUND			
18-12108	18-12224	18-13228	18-13664	11-10463			
18-13787	18-13901	18-14443	18-14444	CONTAINMENT, WATER FILLED			
CONTAINMENT AIR COOLING				2-12176			
11-14839	12-14839	18-14839		CONTAMINATION			
CONTAINMENT ANALYSIS				7-13629	12-13629	14-13603	15-11911

15-12360	15-13603	17-11911	17-13785	COUPLED CORES			
CONTROL ROD				6-11512	6-11935	6-13375	6-13383
3-09287	5-12097	9-09287	9-10445	6-14417	9-14417	13-11935	18-12009
9-10511	9-10512	9-12049	9-12051	CREEP			
9-12052	9-12058	9-12068	9-12156	2-14089	2-14104	2-14402	
9-12256	9-12299	9-12350	9-13786	CREEP BEHAVIOR			
11-12198	17-09287	17-11854	17-12198	11-10391	11-10460	11-13815	14-12286
17-13786	18-05303	18-11853	18-12097	CREEP PROPERTY			
18-12162	18-12198	18-13786		11-13482	11-13815		
CONTROL ROD BURNUP				CRITICAL ASSEMBLY FACILITY			
9-12247	9-13786	17-12247	17-13786	6-12124	17-12124	17-13530	17-14367
18-13786				18-12142	18-12210	18-13243	18-13530
CONTROL ROD CALIBRATION				10-14413			
9-12130				CRITICAL NUCLIDE			
CONTROL ROD DRIVE				15-14434			
5-13532	9-10481	9-10501	9-10512	CRITICALITY EXPERIMENT			
9-12051	9-12055	9-12067	9-12132	1-10358	3-12215	5-14919	6-11935
9-12156	9-12202	9-12225	9-12244	9-12249	13-11935	13-12215	17-12100
9-12247	9-12253	9-12256	9-12299	17-12342	18-12190	18-12215	18-12249
9-12383	9-14605	9-14925	17-12244	18-14919			
17-12247	17-12248	17-12253	17-12383	CRITICALITY SAFETY			
17-13524	17-14925	18-12144	18-12202	3-10522	3-12759	6-13383	13-12349
18-12225	18-13532	18-14605		13-12390	13-13213	13-14441	
CONTROL ROD FABRICATION				CROSS SECTION			
9-12068	17-12304	18-12232	18-12304	1-08774	17-12342		
CONTROL ROD PROGRAM				CRUID			
5-14826	17-13359	17-14826	18-14826	15-14748	17-11626	17-12102	17-12229
CONTROL ROD SCRAM MECHANISM				17-12243	17-14748	18-12229	
9-10523	9-12050	9-12067	9-12123	CRYOGENICS			
9-12383	17-12218	17-12363		4-13472	4-13570	7-10524	8-13472
CONTROL ROD WORTH				CSE (CONTAINMENT SYSTEMS EXPERIMENT)			
6-14414	9-10523	17-12100	17-12139	11-12463			
17-14367	17-14414	17-14416	18-12139	CURIUM			
18-12143	18-12190	18-12212		13-13898	14-13658	15-13658	15-13789
CONTROL ROD, SHIM SAFETY				17-13898			
9-12383	17-12383			CVTR (CAROLINAS VIRGINIA TUBE REACTOR)			
CONTROL SYSTEM				1-10482	16-11075	17-10482	18-13240
3-09287	6-12352	9-09287	9-10384	CYLINDER			
9-10467	9-10481	9-10507	9-12069	11-10332	11-11642	11-13483	11-13815
9-12118	9-12125	9-12126	9-12132	CZECHOSLOVAKIA			
9-12156	9-12157	9-12253	9-12256	11-10317			
9-12352	17-09287	17-12253		DAMAGE			
CONTROL, COMPUTER				5-12148	11-14742	17-12148	17-12169
9-10514				17-14742	18-12148	18-13237	
CONTROL, GENERAL				DANGER COEFFICIENT			
1-10355	1-10483	1-12252	8-12252	6-13323			
17-10483	18-10355			DATA PROCESSING			
CONTROLLER				1-12327	1-12333	15-13415	19-12333
9-14747	17-14747			DECAY HEAT			
CONVECTIVE BOILING				5-12181	12-12181		
5-11914	5-13391			DECONTAMINATION			
COOLANT CHEMISTRY				7-13542	7-13629	12-08814	12-12173
1-10355	5-14919	15-14748	17-11664	12-13629	12-14462	13-12309	13-12388
17-12208	17-12217	17-12226	17-12227	13-12390	13-14462	14-12220	14-12223
17-12239	17-12242	17-13359	17-14748	14-12289	14-12292	14-12368	14-12399
18-10355	18-12208	18-12226	18-12227	14-12400	14-13206	14-13227	14-13566
18-14919				14-13045	14-14493	14-14982	14-14987
COOLANT PURIFICATION SYSTEM				15-12309	15-13206	15-13227	15-13645
17-14606	17-14607	18-14606	18-14607	15-13770	15-14484	15-14920	15-14987
18-14608				17-12173	17-12309	17-14920	18-12210
COOLING, SHUTDOWN				DECONTAMINATION SPRAY			
5-12096	18-12096			7-13732			
COPPER				DEFORMATION			
6-12258	7-13736	9-12258		11-10391	11-11642	11-13482	11-13814
CORE COMPONENTS, MISCELLANEOUS				11-13815			
5-12096	17-12248	18-12096	18-12144	DELAYED NEUTRON			
18-13238	18-13239			6-09541	6-13404	6-13407	6-13594
CORE REFLOODING SYSTEM				6-14604			
5-12177	5-14609	5-14837	18-12177	DENMARK			
18-14609	18-14837			15-13418			
CURE SPRAY				DEPUSSION			
5-12096	5-12097	5-12177	5-12381	5-00382	7-13310	7-13311	7-13583
18-11406	18-12096	18-12097	18-12177	7-13584	7-13607	7-13720	14-11637
CORE, PLATE TYPE				14-11775	14-11776	14-11918	14-12320
5-12181	12-12181			14-13207	14-13370	14-14474	15-09406
CORROSION				15-11637	15-11775	15-11776	15-11918
5-11228	5-11931	5-14919	6-12258	15-12320	15-12372	15-13207	15-13226
8-10242	8-13742	9-12258	11-11394	15-13254	15-13256	15-13259	15-13262
11-13573	12-12173	13-13215	17-10242	15-13286	15-13290	15-13293	15-13299
17-11860	17-11916	17-12173	18-14919	15-13366	15-13370	15-13452	15-13564
COSMIC RADIATION				15-13577	15-14474	16-14908	
15-14430				DESIGN CRITERIA			
COUNTER				4-10519	5-14614	6-14616	7-10524
9-12125	14-11635	14-13208	15-11635	7-14615	11-10317	11-10356	11-10458
15-12393	15-12394	15-13208	15-13423	11-10460	11-12200	12-10356	12-14611
15-13564	15-13772	15-13789	15-13794	13-14371	18-10356	18-12200	18-14611
15-13795	15-13806	15-13824	15-13876	18-14614	18-14615	18-14616	
COUNTER, WHOLE BODY				DESIGN STUDY			
14-13217	15-12397	15-13209	15-13339	1-10355	1-10510	1-12030	1-12161
15-13502	15-13616	15-13617	15-13759	1-12185	9-10384	9-10404	9-12383
15-13769	15-13773			11-11846	11-11933	11-13483	17-11846

17-12383	18-10318	18-10355	18-11406	17-11927			
18-11933	18-12007	18-12008	18-12009	DOSIMETRY, GENERAL			
18-12010	18-12011	18-12012	18-12013	11-13402	14-13300	14-13596	14-13649
18-12014	18-12015	18-12030	18-12105	14-13650	14-13657	14-13658	15-09406
18-12161	18-12185	18-12331	18-12332	15-11926	15-12364	15-13210	15-13300
18-14409				15-13302	15-13339	15-13369	15-13428
DESORPTION				15-13459	15-13466	15-13596	15-13598
14-13765	14-14982	15-13442		15-13657	15-13658	15-13767	15-13818
DESTRUCTIVE TRANSIENT				15-13824	15-13825	15-13876	15-14476
6-11511				15-14478	15-14488	15-14495	
DEUTERIUM				DOSIMETRY, PHOTOGRAPHIC			
7-13481	15-13283	15-13799		15-13399	15-13414	15-13431	15-13459
DIETARY HABIT				15-13561	15-14489	15-14490	
15-12338	15-12409	15-13288	15-13295	DOSIMETRY, THERMOLUMINESCENCE			
15-13298	15-13491	15-13523	15-13565	15-12337	15-13507	15-13559	15-14920
15-13606	15-13620	15-13624	15-13819	17-14920			
DIFFUSION				DOUNREAY (UK)			
7-00552	7-13568	7-13586	7-13587	1-10510	6-11995		
7-13588	7-13591	7-13593	7-13638	DRAGON (UK)			
7-13680	7-13723	7-13736	14-13244	9-10507	9-12299	17-13518	
16-13330				DRESDEN 1			
DIFFUSION CHANNEL				9-12225	18-12225		
7-13607				DRESDEN 2			
DIFFUSION COEFFICIENT				9-12225	18-12225		
7-13717	7-13736	16-14353		EARTH MATERIAL, DYNAMIC PROPERTY			
DILUTION				2-14101			
14-12280	14-13370	14-13499	14-13605	EARTHQUAKE			
14-13867	15-13370	15-13514	15-13801	11-13483	18-12186		
15-13802				EARTHQUAKE EPICENTER			
DIRECT ENERGY CONVERSION DEVICES				2-14095	2-14106	2-14391	
4-14363	17-14363	18-11513	18-12194	EARTHQUAKE PREDICTION			
18-13533				2-14095	2-14097	2-14104	2-14106
DISPERSION				2-14390	2-14391	2-14398	2-14399
7-13311	14-12168	14-12280	14-13370	2-14400	2-14401	2-14405	2-14406
14-13499	14-13605	14-13867	15-13293	EARTHQUAKE RECORDS			
15-13370	15-13423	15-13494	15-13498	2-14087	2-14095	2-14102	2-14105
15-13514	15-13553	15-13554	15-13639	2-14107	2-14126	2-14391	
15-13766	15-13801	15-13802	15-13804	EARTHQUAKE, ENGINEERING			
16-12168	16-13498	16-14356	17-12168	2-14391			
DISPLACEMENT, GENERAL				EARTHQUAKE, GENERAL			
2-14126	2-14394	2-14405		2-14087	2-14088	2-14089	2-14095
DNB (DEPARTURE FROM NUCLEATE BOILING)				2-14096	2-14097	2-14098	2-14099
5-11914	5-13233	5-13390	5-14841	2-14100	2-14101	2-14102	2-14103
6-14841	17-07725	18-07725	18-11912	2-14104	2-14105	2-14106	2-14107
18-13233	18-14841	19-13390		2-14126	2-14212	2-14390	2-14391
DOPPLER COEFFICIENT				2-14394	2-14395	2-14396	2-14397
6-11518	6-11519	6-11520	6-11995	2-14398	2-14399	2-14400	2-14401
6-13323	6-13404	6-14604		2-14402	2-14403	2-14404	2-14405
DOPPLER EFFECT				2-14406			
6-11511	6-14757	18-12009		EBOR (EXPERIMENTAL BERYLLIUM OXIDE REACTOR)			
DOSE				17-13785			
4-11515	11-14836	14-12286	14-12362	EBR 1 AND 2 (EXPERIMENTAL BREEDER REACTORS)			
14-12363	14-13602	14-13603	14-13645	6-11372	6-11373	9-12236	13-14368
14-14984	15-12358	15-12362	15-12363	13-14369	13-14371		
15-12364	15-12365	15-12366	15-12392	EBWR (EXPERIMENTAL BOILING WATER REACTOR)			
15-13399	15-13602	15-13603	15-13645	17-12180			
15-13873	15-13876	15-13880	15-14436	ECOLOGICAL CONSIDERATION			
15-14476	15-14488	15-14491	15-14981	2-13821	14-11833	14-12320	14-12321
15-14984	16-14836	18-05303	18-14835	14-12322	14-12323	14-12361	14-13219
18-14836				14-13220	14-13221	14-13224	14-13398
DOSE CALCULATION, EXTERNAL				14-13601	14-13657	14-13658	14-13874
4-11515	4-12293	9-11747	11-14591	14-13875	14-13877	14-13879	14-14492
14-11637	14-12363	14-13245	14-13300	14-14984	14-14987	14-14990	15-11833
14-13370	14-13645	15-11637	15-11925	15-11920	15-12320	15-12321	15-12322
15-11926	15-12325	15-12335	15-12363	15-12323	15-12397	15-12409	15-13254
15-12409	15-13256	15-13261	15-13300	15-13284	15-13289	15-13292	15-13293
15-13321	15-13370	15-13498	15-13557	15-13294	15-13369	15-13424	15-13448
15-13645	15-13754	15-13757	15-13809	15-13455	15-13465	15-13491	15-13494
15-13873	15-14430	16-13498	17-14591	15-13501	15-13511	15-13521	15-13522
18-14591				15-13523	15-13554	15-13558	15-13601
DOSE CALCULATION, INTERNAL				15-13619	15-13621	15-13623	15-13624
4-11515	4-12293	14-11637	14-11833	15-13657	15-13658	15-13709	15-13761
14-12322	14-12363	14-13300	14-13603	15-13766	15-13769	15-13818	15-13821
14-13657	14-13658	15-11637	15-11833	15-13864	15-13874	15-13875	15-13879
15-11925	15-12322	15-12363	15-12409	15-13880	15-14436	15-14984	15-14987
15-13287	15-13299	15-13300	15-13367	15-14990			
15-13422	15-13603	15-13657	15-13658	ECONOMIC STUDY			
15-13754	15-13759	15-13873	15-14483	1-10355	1-12160	1-12161	1-12273
15-14595	16-14595			3-08717	3-12709	3-12710	3-12769
DOSE MEASUREMENT, EXTERNAL				11-11933	14-12220	14-12223	18-10355
9-12121	14-11635	14-13596	14-13597	18-11933	18-12161	18-12331	
14-13657	14-13658	15-11635	15-11919	ECONOMICS			
15-11923	15-11926	15-11928	15-12121	1-14442	4-10519	14-14479	14-14493
15-12325	15-12335	15-13321	15-13369	17-12098	17-13353	17-13519	17-14916
15-13431	15-13432	15-13456	15-13459	17-14921	18-12010	18-12012	18-14921
15-13596	15-13597	15-13628	15-13657	EFFLUENT			
15-13658	15-13769	15-13809	15-13825	14-11637	14-11918	14-13628	14-13865
15-14435	15-14488	17-11910	17-11923	15-11637	15-11918	17-12238	18-12201
17-11928				EGCR (EXPERIMENTAL GAS COOLED REACTOR)			
DOSE MEASUREMENT, INTERNAL				9-12123			
14-13602	15-11927	15-13602	15-13825	ELASTICITY			

11-10391	11-12373	11-13403	11-13483	14-13567			
11-13528	11-13774	11-13813	11-13814	EXPLOSION			
ELECTRIC POWER, GENERAL				8-10413	11-13528	15-11927	17-11927
9-11643	17-13353			17-12171	17-13447	18-05804	
ELECTRON MICROSCOPY				FABRICATION			
7-13587	7-13588	7-13591	7-13680	3-12710	6-12258	9-12258	11-13487
8-13733				18-13487			
ELECTROSTATIC CHARGE				FAILURE, ADMINISTRATIVE CONTROL			
5-14455	7-13473	15-13258		9-14750	13-12309	13-12311	15-12306
ELECTROSTATIC PRECIPITATION				15-12309	15-12310	15-12311	15-13446
7-13542				17-12306	17-12309	17-12310	17-12311
ELEMENTS AND ISOTOPES				17-13446	17-14365	17-14750	
1-10358				FAILURE, CLADDING			
ELK RIVER				5-11906	5-13699	5-14412	5-14599
9-13615	11-12179	11-12198	11-12199	6-11372	7-13735	8-14599	17-11906
11-12200	15-12196	15-12197	17-12178	17-14412			
17-12197	17-12198	17-12216	17-12217	FAILURE, COATED PARTICLE			
17-13359	17-13614	17-13615	17-14370	7-13638			
17-14923	18-12178	18-12179	18-12196	FAILURE, COMPONENT			
18-12197	18-12198	18-12199	18-12200	9-14925	11-11394	17-12102	17-12228
18-12216	18-14923			17-12236	17-12743	17-13785	17-14925
EMBRITTEMENT				18-12228	18-12236		
5-14412	11-12376	11-13402	11-13547	FAILURE, DESIGN ERROR			
11-13774	17-11858	17-14412		3-12347	9-12203	9-13615	9-14747
EMERGENCY COOLING CONSIDERATIONS				10-12203	12-12347	13-14371	17-12218
5-13484	11-10463	15-13503	17-12029	17-12239	17-12347	17-13615	17-14747
17-13524	18-10476	18-11406	18-13484	18-11852	18-12203		
18-14835				FAILURE, EQUIPMENT			
EMERGENCY POWER, ELECTRIC				4-13472	8-13472	9-13786	13-14368
5-12097	5-13485	9-12203	9-12244	17-12029	17-12101	17-12102	17-13524
10-12203	10-13485	15-13503	17-12244	17-13786	17-14741	18-11852	18-13786
17-13485	18-12097	16-12203		FAILURE, FATIGUE			
EMERGENCY PROCEDURE				4-13472	4-13570	8-13472	11-10459
15-11923	15-11924	15-11926	15-11928	11-10460	11-12373	11-13526	
15-13421	15-13503	15-14981	17-11923	FAILURE, FUEL ELEMENT			
17-11928				5-11906	5-14412	5-14919	7-13592
EMERGENCY SYSTEM				12-12173	17-11664	17-11906	17-12173
15-13503				17-12235	17-12248	17-13236	17-13614
ENERGY LEVEL				17-14365	17-14412	17-14924	18-12235
2-14088	2-14099	2-14103	2-14104	18-14919			
2-14390	2-14400	2-14401	2-14404	FAILURE, GENERAL			
2-14405	2-14406			1-12170	6-11331	17-11331	17-12170
ENERGY SOURCE				FAILURE, INSTALLATION ERROR			
1-12185	1-13317	8-13317	11-14467	9-12202	12-12174	17-11857	17-12174
12-14467	13-14467	14-12361	18-12185	17-12218	18-12202		
ENGINEERED SAFEGUARD				FAILURE, INSTRUMENT			
1-12343	1-14444	2-10326	2-13640	9-12203	9-12240	10-12203	13-14360
7-13540	7-13542	11-10326	11-13540	17-12240	18-12203		
12-13640	12-14611	12-14612	18-14444	FAILURE, MAINTENANCE ERROR			
18-14611	18-14612			5-13485	10-13485	17-12239	17-13485
ENGINEERING DRAWING LIST				18-11852			
17-14923	18-12221	18-14923		FAILURE, OPERATOR ERROR			
ENVIRONMENTAL CONDITION				9-13615	9-14751	13-12309	15-12305
2-13821	15-13558	15-13807	15-13821	15-12309	17-11854	17-12246	17-12305
EQUATION OF STATE				17-12309	17-13615	17-14751	18-11852
5-13384	5-13884	6-13884	6-14855	FAILURE, PIPE			
17-14855	19-13884			5-06830	11-06030	11-10460	11-12373
EQUATION, GENERAL				12-12174	17-11856	17-12151	17-12174
14-12363	15-12363	16-13330	16-13332	17-12217	17-14365	18-12151	
EQUIPMENT DESIGN				FAILURE, PRESSURE VESSEL			
3-12709	3-12710	3-12854	3-12949	6-11371	11-10332	11-10459	11-12374
3-12957	3-14470	3-14471	9-10464	11-12376	11-13526	11-13585	11-13774
9-10468	9-10498	9-10502	9-10507	17-13488	18-13488		
9-12132	12-14462	13-13213	13-14462	FAILURE, SCRAM MECHANISM			
15-10468	15-10502			9-12123	9-12202	9-12244	9-12383
ERROR ANALYSIS				9-14925	17-11994	17-12151	17-12218
7-13309	7-13310	7-13311	10-10477	17-12242	17-12244	17-12304	17-12383
ETR (ENGINEERING TEST REACTOR)				17-14925	18-11852	18-11853	18-12151
5-14412	17-11860	17-14412		18-12202	18-12304		
EURATOM				FALLOUT			
1-12295	5-12295	6-11511	14-13400	4-11515	4-13549	4-14460	7-13549
14-13601	14-13602	14-13603	15-13400	14-11636	14-11775	14-11776	14-11917
15-13601	15-13602	15-13603		14-11918	14-11922	14-12220	14-12223
EUROCHEMIC				14-12278	14-12320	14-12321	14-12322
6-12314	13-12314	13-12334	13-13214	14-12363	14-13201	14-13203	14-13204
14-12334				14-13207	14-13212	14-13218	14-13221
EUROPIUM				14-13244	14-13245	14-13246	14-13247
9-12058	15-13759			14-13248	14-13249	14-13250	14-13306
EVAPORATION				14-13307	14-13322	14-13370	14-13398
14-12289	14-13425	14-13426	14-13462	14-13400	14-13549	14-13597	14-13601
14-13520	14-13810	15-13508		14-13603	14-13645	14-13675	14-13877
EXAMINATION				14-13878	14-14472	14-14474	14-14477
9-12225	9-14925	11-14366	17-14366	14-14487	14-14493	14-14984	15-09406
17-14925	18-12225			15-11636	15-11775	15-11776	15-11917
EXCAVATION, NUCLEAR				15-11918	15-11922	15-12320	15-12321
14-13656	15-13656	15-14434		15-12322	15-12356	15-12363	15-12372
EXCURSION, LARGE				15-12409	15-13201	15-13203	15-13204
6-13393	11-13528			15-13207	15-13209	15-13211	15-13212
EXPANSION REACTIVITY EFFECT				15-13218	15-13252	15-13253	15-13254
6-11511	6-11519	18-12009		15-13256	15-13258	15-13261	15-13262
EXPERIMENT, GENERAL				15-13263	15-13270	15-13271	15-13275

15-13278	15-13282	15-13283	15-13286	7-13474	15-12366		
15-13289	15-13291	15-13293	15-13294	FISSION PRODUCT RELEASE, GENERAL			
15-13295	15-13296	15-13297	15-13322	1-10483	1-10484	1-12329	3-14870
15-13366	15-13370	15-13400	15-13427	5-13695	5-14389	7-11834	7-13583
15-13428	15-13438	15-13448	15-13451	7-13695	7-13907	7-14389	7-14870
15-13453	15-13455	15-13467	15-13470	8-13695	14-11834	14-11921	14-13370
15-13491	15-13501	15-13522	15-13523	14-13458	14-14429	15-11834	15-13226
15-13551	15-13552	15-13560	15-13577	15-13251	15-13268	15-13294	15-13370
15-13597	15-13598	15-13601	15-13603	15-13458	15-13766	15-13864	15-13866
15-13618	15-13619	15-13625	15-13627	15-14429	17-16483	17-14389	
15-13645	15-13726	15-13761	15-13798	FISSION PRODUCT RETENTION			
15-13803	15-13875	15-13878	15-14436	5-14389	7-12113	7-13719	7-14389
15-14472	15-14474	15-14477	15-14484	12-14611	17-14389	17-14607	18-12201
15-14494	15-14495	15-14979	15-14984	18-14607	18-14611		
16-14356	16-14361	16-14905	16-14907	FISSION PRODUCT TRANSPORT			
16-14908				5-13695	7-13365	7-13475	7-13476
FARET (FAST ARGONNE REACTOR EXPERIMENT TEST)				7-13540	7-13583	7-13586	7-13587
9-12256	18-12016	18-12138		7-13588	7-13539	7-13590	7-13591
FAST NEUTRON				7-13592	7-13593	7-13607	7-13638
9-11742	9-11747	15-12364		7-13595	7-13720	7-13736	7-13907
FAULT				8-13695	11-13540	15-13226	
2-14087	2-14088	2-14089	2-14096	FISSION PRODUCT, AIRBORNE			
2-14098	2-14099	2-14101	2-14104	7-13365	15-13226	15-13268	
2-14105	2-14126	2-14212	2-14391	FISSION PRODUCT, IODINE			
2-14394				5-14389	7-11834	7-12113	7-13312
FERMI				7-13443	7-13583	7-13584	7-13717
6-11996	9-10523	9-12256	9-12383	7-13720	7-13732	7-13907	7-14389
11-12319	17-10622	17-10624	17-12319	11-14836	14-11833	14-11834	14-11921
17-12383	17-13535	18-13238	18-13239	14-13443	15-11833	15-11834	15-13226
18-13535				16-14836	17-12178	17-14389	18-12178
FILM, GENERAL				18-14836			
5-14497				FISSION PRODUCT, SEPARATION FROM WASTE			
FILM, LIQUID				13-13396	14-13711	18-13396	
5-14449				FISSION PRODUCT, VOLATILE			
FILTER				7-13476	7-13607		
5-13613	7-10348	7-13309	7-13443	FISSION RECOIL			
7-13478	7-13479	7-13648	7-13677	7-00552	7-13540	7-13589	7-13590
7-13680	7-14615	9-12350	11-13613	11-13540			
12-14466	13-14466	14-13443	15-14489	FLAW			
16-14907	17-13445	17-13479	18-13613	11-10332	11-12374	11-13526	11-13585
18-14615				11-13774			
FILTER CHARACTERISTICS				FLOODING, SUPERHEATER			
7-11834	14-11834	15-11834	15-14489	6-13323			
FILTER EFFICIENCY				FLOW BLOCKAGE			
7-12113	7-13677	15-13872		5-12205	17-11626	17-12205	18-12205
FILTER IMPACTION				FLOW DISTRIBUTION			
7-13309	7-13680			7-13309			
FILTER MAINTENANCE				FLOW ORIFICE OR RESTRICTION			
12-14462	13-14462			9-13232	17-13232		
FILTER PACK				FLOW STABILITY			
14-13250				5-10429	5-12377	5-13697	5-13702
FILTER SYSTEM				5-14453	8-13702	17-12217	
7-13542	7-13607			FLOW THEORY AND EXPERIMENTS			
FILTER, ABSOLUTE				5-10451	5-11228	5-11754	5-11914
12-14466	13-14466			5-12377	5-12378	5-13384	5-13385
FILTER, BED				5-13386	5-13387	5-13388	5-13389
7-13648				5-13391	5-13643	5-13644	5-13695
FILTER, DAMAGED				5-13700	5-13702	5-13703	5-13704
7-10348	14-14749	17-14749		5-13706	5-14448	5-14453	5-14455
FILTER, EFFICIENCY OF				7-13695	8-13695	8-13702	18-11912
7-11834	14-11834	15-11834		FLOW, AXIAL			
FILTER, GLASS				5-12381	5-13708		
7-12113	7-13651	7-13652	7-13653	FLOW, CROSS			
15-13823				5-13703			
FILTER, HIGH EFFICIENCY				FLOW, HIGH SPEED			
7-13677	14-14749	17-14749		5-11751	5-13643	5-13701	7-13309
FILTER, LIQUID				7-13310	8-13701		
7-13651	7-13652	7-13653		FLOW, LAMINAR			
FILTER, MAY PACK				5-11751	5-13698	5-13701	5-14449
7-13732				8-13701			
FILTER, TRAP				FLOW, RECIRCULATION			
7-13648				5-14746	17-14746		
FIN				FLOW, TUBE			
5-11753				5-10451	5-10453	5-12377	5-13387
FINLAND				5-13389	5-13697	5-14451	5-14497
15-12340	15-13565	15-13619	15-13620	7-13309	7-13310	7-13311	7-13607
FIRE				18-14613			
1-12252	1-12950	3-12778	3-12950	FLOW, TURBULENT			
3-14407	3-14470	3-14471	3-14897	5-13701	8-13701		
7-13648	7-14615	8-12252	11-12175	FLOW, TWO PHASE			
12-12174	14-14984	15-14984	17-12174	5-10429	5-10451	5-10453	5-11754
17-12175	18-05303	18-14615		5-12378	5-13386	5-13390	5-13644
FISSION GAS RELEASE				5-13697	5-13706	5-14449	5-14453
5-14389	7-00552	7-08820	7-11834	19-13390			
7-13365	7-13475	7-13476	7-13586	FLOW, VORTEX			
7-13587	7-13588	7-13589	7-13590	5-12377			
7-13591	7-13592	7-13593	7-13638	FLUCTUATION			
7-13717	7-13723	7-13738	7-14389	5-13388	5-14448	5-14453	18-12172
12-14466	13-14466	14-11834	14-13865	FLUIDIZED BED			
15-11834	15-13760	17-14389		5-11931	5-14455	13-13215	
FISSION PRODUCT ACTIVITY, GROSS				FLUORIDE VOLATILITY PROCESSES			

13-12389	13-13215			14-11784	14-12276	14-12280	14-12286
FLUX DISTRIBUTION				14-13352	14-13433	14-13567	15-11784
6-12352	6-13900	9-12352	17-11860	15-13352	15-13822	15-14989	
17-12100	17-14367			GEOLOGICAL CONSIDERATION, SALT STRUCTURE			
FLUX TILT				14-10243	14-12279	14-12286	14-13433
6-14417	9-14417			GEOLOGICAL CONSIDERATION, STRATIGRAPHY			
FOAM				14-12280	14-13352	14-13505	14-13567
11-11308	12-11308	13-11308	14-11741	14-13656	15-13352	15-13505	15-13515
14-13711				15-13656	15-13790	15-13791	15-13792
FOG				15-13822	15-14435		
5-12391				GERMANY			
FPCE PLANT				1-12270	1-12272	1-12333	2-13821
13-14464				9-10514	14-12279	14-13208	14-13223
FRANCE				14-13505	14-14477	15-13208	15-13505
1-11850	9-12084	14-11917	14-12371	15-13795	15-13821	15-14477	15-14480
14-13655	14-13828	15-11917	15-13457	15-14980	18-10318	18-11406	18-12011
15-14428	18-14651			18-12145	18-12186	18-12187	18-12188
FRCTF (FAST REACTOR CORE TEST FACILITY)				18-12344	18-12345	18-12346	18-14411
18-12007				19-12333			
FUEL BURNUP				GETR (GENERAL ELECTRIC TEST REACTOR)			
5-11906	5-11931	6-14604	7-13471	17-11854	18-11852	18-11853	18-11855
7-13475	7-13476	7-13540	7-13592	GLASS			
7-13638	7-13734	9-12157	11-13540	14-13320	14-13434	14-13661	14-13711
17-11664	17-11906	17-12243	17-14370	14-13810			
17-14916	17-14924	18-12008	18-12015	GLOVE BOX			
18-12105				12-08814	13-12349	13-13898	15-11927
FUEL ELEMENT				15-14920	17-11927	17-13447	17-13898
3-12277	5-10429	5-10452	5-11931	17-14920			
5-12148	5-13696	5-13699	5-13703	GRAPHITE			
5-13708	5-14454	5-14600	6-12258	8-13733	8-13742		
7-13471	7-13475	7-13586	7-13587	GREECE			
7-13592	7-13629	7-13638	7-13734	15-13417			
7-13735	9-12068	9-12254	9-12258	GROSS ALPHA			
9-12302	9-13338	11-14600	12-13629	14-13205	14-13212	14-13881	15-13205
13-13741	14-12277	14-12279	17-11626	15-13212	15-13343	15-13420	15-13450
17-11860	17-11908	17-12060	17-12098	15-13464			
17-12148	17-12180	17-13518	17-14923	GROSS BETA			
18-12016	18-12144	18-12148	18-12150	14-12288	14-13201	14-13204	14-13205
18-12172	18-12187	18-12188	18-12302	14-13207	14-13212	14-13221	14-13248
18-14923				14-13250	14-14492	15-12372	15-13201
FUEL ELEMENT ROWING				15-13204	15-13205	15-13207	15-13211
11-13814				15-13212	15-13252	15-13272	15-13276
FUEL EXPANSION COEFFICIENT				15-13343	15-13416	15-13419	15-13420
6-11518	7-13475			15-13450	15-13451	15-13453	15-13464
FUEL HANDLING				15-13552	15-13726	15-13823	15-14488
3-08717	3-09287	9-09287	12-08814	15-14489			
17-09287	17-12246	17-14415	18-05303	GROSS GAMMA			
18-12187	18-13531			14-13207	14-13247	14-13877	14-14482
FUEL HANDLING MACHINE				15-09406	15-12364	15-12372	15-13207
17-12151	18-12151			15-13252	15-13343	15-13420	15-13450
FUEL INTEGRITY				15-13451	15-13464	15-13551	15-14478
3-14870	7-13540	7-13586	7-13591	15-14482	15-14489		
7-13592	7-13638	7-13719	7-13734	GROUND MOTION			
7-13739	7-14870	11-13540	11-13814	2-14100	2-14212	2-14390	
FUEL MELTDOWN				GROUND WATER, GENERAL			
5-11989	5-14840	5-14917	6-14840	3-14870	7-14870	14-13604	15-13822
6-14855	6-14917	7-13629	12-13629	GROUND WATER, NUCLIDE OCCURRENCE			
17-07725	17-11989	17-14855	17-14917	14-10243	14-12287	15-13606	
18-07725	18-14840			GROUND WATER, PROPERTY			
FUEL REPROCESSING				14-13604			
13-14368	13-14369	13-14371	14-13661	GROUND WATER, TRACER			
FUEL STORAGE				14-11784	15-11784		
3-09287	3-10522	3-12215	3-12347	HADDAM NECK			
5-12181	9-09287	12-12181	12-12347	2-10326	5-14637	11-10326	18-14837
13-12215	13-14441	17-09287	17-12204	HALLAM			
17-12347	18-12193	18-12204	18-12215	3-14870	7-14870	11-11394	17-12102
GAMMA				HANFORD SITE			
7-13474	9-10468	14-13596	14-13597	1-12159	3-14468	9-11907	13-12349
15-10468	15-12365	15-12366	15-13511	13-12384	13-12385	13-12386	13-14464
15-13559	15-13596	15-13597	15-13618	15-11928	15-13339	15-13498	15-13501
15-13812	15-13818	15-13825	15-14491	16-13498	17-11907	17-11928	17-12159
15-14979				HAZARD, RELATIVE			
GAMMA EMITTER				2-13821	14-11922	15-11922	15-12324
7-13718	15-12366	15-13628		15-13755	15-13821	15-14434	
GE-NTR (GE NUCLEAR TEST REACTOR)				HAZARDS ANALYSIS			
18-05303				2-13821	3-10522	13-13396	14-13207
GENERATOR, DIESEL				14-13300	14-13342	14-13370	14-13657
9-12203	10-12203	18-12203		14-13658	14-13867	15-12409	15-13202
GEOLOGICAL CONSIDERATION, GENERAL				15-13207	15-13226	15-13300	15-13370
2-13821	2-14089	2-14126	2-14397	15-13657	15-13658	15-13766	15-13821
14-10243	14-13352	14-13505	14-13605	18-13396			
14-13764	14-14475	14-14492	15-13344	HBWR (HALDEN BOILING WATER REACTOR)			
15-13352	15-13505	15-13515	15-13790	6-11648	9-11644	9-11645	9-11646
15-13791	15-13792	15-13821	15-13822	9-11647	9-11649	9-11650	9-11651
15-14475				9-11652			
GEOLOGICAL CONSIDERATION, GEOCHEMICAL				HEALTH PHYSICS TRAINING			
14-13352	14-14492	14-14985	15-13352	14-13657	14-13658	15-13657	15-13658
15-13822				15-13755	18-12071		
GEOLOGICAL CONSIDERATION, GEOPHYSICAL				HEAT CONDUCTANCE, FUEL TO CLAD			
2-14087	2-14096	2-14098	2-14099	5-14412	17-14412		
2-14103	2-14105	2-14395	2-14397	HEAT CONDUCTION			

5-13693	5-13698	5-13699	5-13701	HUMBOLDT BAY			
5-13704	8-13701	14-14426		5-12205	9-12202	9-12203	10-12203
HEAT EXCHANGER				11-12206	17-12204	17-12205	18-12143
5-13644	12-14918	17-12178	17-12217	18-12201	18-12202	18-12203	18-12204
17-12227	17-12228	18-12165	18-12178	18-12205	18-12206		
18-12227	18-12228			HUMIDITY			
HEAT FLUX, DRYOUT				7-12113	7-13308		
5-12381				HYDRAULIC ANALYSIS			
HEAT GENERATION, INTERNAL				5-13386	15-13724		
5-11909	5-13698	5-13707	7-13480	HYDRAULIC EFFECT			
11-14467	12-14467	13-14467	14-12279	6-12124	9-12055	9-12067	15-13724
17-11909	18-03614			17-12124	17-13359		
HEAT SINK				HYDRAULIC EXPERIMENT			
18-14613				6-12124	15-13514	17-12124	
HEAT TRANSFER				HYDRIDE			
3-12778	3-12882	3-12883	3-12895	17-12098	18-12145		
5-10429	5-10452	5-11228	5-11750	HYDRODYNAMIC ANALYSIS			
5-11751	5-11752	5-11753	5-11754	5-10429	5-10451	5-10453	5-11754
5-11913	5-11914	5-12377	5-12379	5-12377	18-12187	18-14835	
5-12380	5-12381	5-13384	5-13385	HYDROGEN			
5-13388	5-13389	5-13390	5-13391	1-12266	4-13472	5-08812	5-12379
5-13643	5-13644	5-13693	5-13694	5-13388	5-14412	5-14599	8-10413
5-13695	5-13696	5-13697	5-13698	8-12266	8-12269	8-13472	8-14599
5-13699	5-13700	5-13701	5-13702	11-08812	12-12174	12-14466	13-14466
5-13703	5-13704	5-13705	5-13706	15-13799	17-11858	17-12174	17-14412
5-13707	5-13708	5-14449	5-14451	18-05804			
5-14453	5-14454	5-14455	5-14497	HYDROLOGICAL CONSIDERATION, GENERAL			
6-11648	7-13695	8-13695	8-13701	2-13821	14-12287	14-13219	14-13221
8-13702	11-13813	14-13425	14-13433	14-13222	14-13352	14-13505	14-13604
14-13659	14-14426	14-14880	18-05303	14-14985	15-13352	15-13505	15-13724
18-11513	18-11912	19-13390		15-13802	15-13803	15-13805	15-13821
HEAT TRANSFER ANALYSIS				15-13822			
5-10429	5-10452	5-11752	5-11914	HYDROLOGICAL CONSIDERATION, QUALITY OF WATER			
5-13693	5-13694	5-13698	5-13699	14-13219	14-13222	14-13352	14-13605
5-13701	5-13704	5-13706	5-13707	15-13352	15-13662		
5-13708	5-14454	5-14824	5-14829	HYDROLOGICAL CONSIDERATION, RATE OF MOVEMENT			
6-11371	8-13701	17-14829	18-12187	14-11784	14-12287	14-12398	14-13222
18-14824	18-14829			14-13605	15-11784	15-13802	15-13804
HEAT TRANSFER AUGMENTATION				IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY)			
5-11753	5-14455			1-13632	1-14869	3-13632	3-14869
HEAT TRANSFER CORRELATION				15-11926	18-10516		
5-11750	5-11753	5-12379	5-12380	ICRP (INT. COMM. ON RADIOLOGICAL PROTECTION)			
5-13644	5-14451	5-14827	5-14841	15-13521			
6-14841	18-14827	18-14841		ICRU (INT. COMM. RAD. UNITS AND MEASUREMENTS)			
HEAT TRANSFER EXPERIMENT				15-12324	15-12339	15-12409	15-13305
3-14407	5-10429	5-11750	5-11751	IDAH0 FALLS			
5-12379	5-12380	5-12381	5-13389	13-12391	14-13437	15-13293	
5-13391	5-13643	5-13644	5-13693	IGNITION			
5-13696	5-13701	5-13702	5-14455	1-12266	7-13648	8-12266	
5-14497	6-11371	8-13701	8-13702	IMPACT PROPERTY			
9-11647				11-13539	11-13547		
HEAT TRANSFER, BOILING				IMPACT SHOCK			
5-09520	5-10429	5-11752	5-11754	3-14064	11-13483	11-13528	11-13774
5-11913	5-11914	5-12378	5-12381	IN CORE MEASUREMENT			
5-13386	5-13390	5-13391	5-13697	5-11909	6-12261	9-11644	9-11645
5-13701	5-14453	5-14497	5-14919	9-11646	9-11649	9-11650	9-11651
8-13701	17-07725	17-13535	18-07725	9-11652	9-12133	9-12261	17-11909
18-13535	18-14919	19-13390		IN PILE EXPERIMENT			
HEAT TRANSFER, CONVECTION				7-13540	7-13590	7-13638	9-12134
5-13693	5-13694	5-13698	5-13701	9-12302	11-13540	17-07725	18-03614
5-13707	8-13701			18-07725	18-12146	18-12302	18-13316
HEAT TRANSFER, NATURAL CONVECTION				IN PILE LOOP			
5-12181	5-12380	5-13707	12-12181	4-13570	5-11989	5-14412	7-00552
18-12212				7-13740	17-11989	17-14412	17-14889
HEAT TRANSFER, RADIANT				18-13230	18-13316	18-14889	
5-13701	8-13701			INCIDENT COMPILATION			
HEAVY WATER				6-11331	17-11331		
7-13481				INCIDENT, ACTUAL, EQUIPMENT			
HEIGHT OF RISE				17-12029	17-12171		
11-14591	15-14595	16-08815	16-10778	INCIDENT, ACTUAL, GENERAL			
16-14595	17-14591	18-14591		1-10190	2-10190	5-11989	5-12205
HELIUM				5-13699	12-12174	15-11927	15-11926
14-12280				15-12306	17-11927	17-11928	17-11989
HFIR (HIGH FLUX ISOTOPE REACTOR)				17-12174	17-12205	17-12306	18-12205
6-11935	9-12125	13-11935	17-11916	INCIDENT, ACTUAL, HUMAN ERROR			
HIGH TEMPERATURE				5-13485	9-14751	10-13485	13-12309
7-13717	7-13734	8-12269	9-12055	15-12305	15-12309	17-11854	17-12246
9-12058	9-13382	11-10391	11-10460	17-12305	17-12309	17-13485	17-14751
11-13482	11-13813	12-14918	17-12060	INCIDENT, ACTUAL, NONREACTOR			
17-13518	18-14613			15-11911	17-11911		
HOT CELL				INCIDENT, ACTUAL, RECOVERY FROM			
11-10356	11-12175	11-14366	11-14467	17-11908	17-14597		
12-10356	12-14372	12-14467	13-12387	INCIDENT, EXPOSURE			
13-12388	13-14368	13-14369	13-14371	15-11924	15-11926	15-12395	15-13556
13-14467	17-12175	17-14366	18-10356	15-13557	15-13756	15-13866	
HOT CHANNEL				INCIDENT, FATALITY			
5-14825	18-14825			14-13650	15-13866		
HOT SPOT				INCINERATION			
5-13694	5-13705			14-12284	14-12371	14-13441	14-13725
HPRR (HEALTH PHYSICS RESEARCH REACTOR)				14-13881			
6-11934	17-11934			INCINEL			

6-13323				14-14482	15-09406	15-10468	15-10502
INDEPENDENCE				15-12318	15-12367	15-12393	15-12394
9-14593	9-14605	11-14593	18-14605	15-13208	15-13321	15-13432	15-14476
INDIA				15-14478	15-14481	15-14482	15-14495
6-14757	7-13677	14-12278	14-13878	15-14979	17-12318		
14-13881	15-13470	15-13494	15-13878	INSTRUMENTATION, RATE OF CHANGE			
INDIAN POINT 1				9-11907	17-11907		
1-12313	5-13233	6-13235	9-13232	INSTRUMENTATION, RELAY			
17-12139	17-12313	17-13232	18-12139	9-11643			
18-13233	18-13235			INSTRUMENTATION, STARTUP			
INDIAN POINT 2				17-11994	17-12216	18-12216	
1-12313	1-13787	1-13788	5-13484	INSTRUMENTATION, STARTUP RANGE			
17-12313	18-12107	18-12108	18-13484	9-12203	10-12203	11-12319	17-12319
18-13767	18-13788			18-12203			
INFORMATION RETRIEVAL				INSTRUMENTATION, TEMPERATURE			
1-12333	1-14442	15-13294	19-12333	9-12134	9-12156	9-12254	9-12300
INGESTION				9-13232	9-13382	17-12242	17-13232
14-12320	14-13322	14-13602	15-11925	18-11912			
15-11926	15-12320	15-12409	15-13288	INSTRUMENTATION, TESTING			
15-13290	15-13295	15-13298	15-13299	9-10514	9-12123	9-12126	9-12130
15-13304	15-13322	15-13422	15-13455	INSURANCE			
15-13501	15-13511	15-13602	15-13617	1-12272	1-12296	1-13632	3-08717
15-13754	15-13819			3-13632			
INHALATION				INTERACTION, SOIL AND STRUCTURE			
13-12311	14-11922	14-12320	15-09406	11-13483			
15-11922	15-11925	15-11926	15-12311	IODINE			
15-12320	15-12360	15-13226	15-13241	6-13381	7-12113	7-13312	7-13583
15-13242	15-13367	15-13422	15-13501	7-13584	7-13717	7-13720	7-13907
15-13512	15-13513	15-13759	15-13863	9-13381	14-11637	14-11921	14-12322
17-12311	17-13242	18-05303	18-13241	14-13566	14-14429	14-14876	14-14877
18-13242				14-14879	15-11637	15-11920	15-11936
INSPECTION AND COMPLIANCE				15-12322	15-13226	15-13254	15-13289
9-14750	15-12307	17-12307	17-14750	15-13292	15-13293	15-13299	15-13319
INSTABILITY				15-13339	15-13367	15-13416	15-13419
9-10445	11-10332			15-13452	15-13511	15-13512	15-13552
INSTRUMENTATION CALIBRATION				15-13577	15-13621	15-13623	15-13624
9-11478	9-11649	9-11651	9-12126	15-13627	15-13758	15-13760	15-13771
15-09406	15-13809	15-13812		15-13866	15-14429	15-14979	16-14902
INSTRUMENTATION, ABNORMAL INDICATION				ION EXCHANGE			
9-14744	17-12101	17-12102	17-13359	3-14468	7-13473	7-13651	7-13652
17-13535	17-14416	17-14744	18-13535	7-13653	7-13737	13-13721	14-11741
INSURUMENTATION, AIR SAMPLING				14-13492	14-13520	14-13765	14-14438
7-13677	7-13680	15-14481	15-14495	14-14982	14-14987	15-12326	15-13413
INSTRUMENTATION, COINCIDENT				15-13626	15-13770	15-13771	15-14987
9-12250	17-13445	18-12250		IONOSPHERE			
INSTRUMENTATION, COMPONENT				4-13572	7-13572		
9-12133	15-09406			IRON			
INSTRUMENTATION, CONTROL				11-13547	14-13219	14-13765	15-09406
9-10507	9-10514	9-12050	9-12069	15-12338	15-13303	15-13455	15-13820
9-12123	9-12123	9-12126	9-12156	IRRADIATION TESTING			
9-12253	17-12253			4-13570	5-14919	7-00552	7-13471
INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT				7-13540	7-13586	7-13587	7-13588
9-10481	9-13229	17-13614	18-13229	7-13589	7-13590	7-13591	7-13592
INSTRUMENTATION, FLOW				7-13638	7-13717	7-13722	9-12133
5-12378	5-13387	9-11651	9-12240	11-12376	11-13540	11-13547	17-12208
9-13232	10-10477	17-11856	17-12240	18-03614	18-12016	18-12208	18-12213
17-13232	17-13535	18-13535		18-14919			
INSTRUMENTATION, GENERAL				ISOCEM, INC.			
1-10355	1-14463	5-11228	5-13385	13-12384	13-12385	13-12386	13-13396
7-13677	9-10467	9-10481	9-10514	13-14464	18-13396		
9-12118	9-12125	9-12126	9-12254	ISOTOPIIC GENERATOR			
9-12351	17-14364	18-10355	18-11912	1-12185	18-12185		
INSTRUMENTATION, IN CORE				ISRAEL			
5-11909	9-10481	9-10511	9-11644	14-13875	15-13419	15-13875	
9-11645	9-11647	9-11650	9-11652	ITALY			
17-11909	17-12236	18-12236	18-13237	6-11517	9-10481	9-12315	15-13606
INSTRUMENTATION, INTERMEDIATE RANGE				JAPAN			
9-12203	10-12203	18-12203	18-12231	3-12894	3-12895	14-13425	14-13426
INSTRUMENTATION, LIQUID LEVEL DETECTION				15-13427	15-13449	15-13450	15-13552
9-12240	17-12240	17-13359		15-13625	15-13750		
INSTRUMENTATION, METEOROLOGICAL				KRYPTON			
9-12118	16-11075	16-14910		7-10524	7-13365	7-13568	7-13736
INSTRUMENTATION, NUCLEAR				14-13657	14-13658	14-14429	15-13657
3-09287	9-09287	9-10464	9-11478	15-13658	15-14429		
9-11650	9-11907	9-12118	9-12128	LACROSSE			
9-12156	9-12263	9-12301	10-10477	5-12096	5-12097	10-10477	18-10476
15-12263	15-13343	15-13493	17-09287	18-10478	18-12096	18-12097	18-12144
17-11907	18-05303			LAMPRE 1 (LASL MOLTON PU REACTOR EXPERIMENT)			
INSTRUMENTATION, POWER RANGE				9-12256			
6-14601	9-14601	9-14744	17-14744	LANTHANUM			
18-14601				15-14979			
INSTRUMENTATION, PROCESS				LAPSE RATE, STABLE			
7-13740	9-12118	9-12125	9-12126	14-12168	15-14920	16-12168	17-12168
9-12254	9-14592	9-14593	11-14591	17-14920			
11-14592	11-14593	17-14591	18-14591	LASER HEATING			
INSTRUMENTATION, PROTECTIVE				1-13317	8-13317		
9-10514	9-11643	9-12318	15-12318	LASL (LOS ALAMOS SCIENTIFIC LABORATORY)			
17-12318				14-13460			
INSTRUMENTATION, RADIATION MONITORING				LAW			
9-10468	9-10502	9-11747	9-12069	1-12270	1-13632	1-13788	3-13632
9-12125	9-12126	9-12318	14-13208	18-12107	18-12108	18-13788	

LEAD	3-12949	15-12326	15-12372	15-13761	7-13736	11-12373	11-14366	12-14372
	15-13827				17-14366			
LIABILITY	1-11850	1-12272	1-12296	1-13632	METAL WATER REACTION			
	3-08717	3-13632			1-13317	5-14599	6-11370	6-14855
LICENSING STATUS OF NUCLEAR PROJECTS					8-10338	8-10339	8-12269	8-13317
	1-12251	1-12268	1-12270	3-09287	8-14599	11-14839	12-14839	17-14855
	9-09287	17-09287			18-11855	18-14639		
LIQUID FUEL	3-12347	12-12347	17-12347		METAL, ALKALI			
					1-12252	8-12252		
LIQUID SCRUBBER	7-13542				METAL, LIQUID			
					5-09520	5-11228	5-11752	5-13385
LITHIUM	15-12337				5-13708	8-10242	8-12330	9-12254
					17-10242	18-11855		
LOFT (LOSS OF FLUID TEST)	5-10452	7-13629	12-13629		METAL, REFRACTORY			
					1-13317	8-13317		
LRL (LAWRENCE RADIATION LABORATORY)	15-13294	15-14920	17-14920		METEOROLOGICAL SUPPORT			
					16-14914			
MAGNESIUM	15-13820				METEOROLOGY			
MAIN COOLING SYSTEM	9-12051	9-12253	12-12173	17-12173	2-13821	14-11918	14-12278	14-13306
	17-12173	17-12253	18-12163	18-12178	14-13307	14-13352	14-13875	14-13878
	18-12201				15-11918	15-13263	15-13264	15-13265
MAINTENANCE AND REPAIR	1-10355	9-12202	11-10356	12-10356	15-13267	15-13274	15-13278	15-13302
	12-14462	12-14918	13-12384	13-12385	15-13352	15-13438	15-13449	15-13498
	13-12386	13-12387	13-12388	13-12389	15-13621	15-13800	15-13821	15-13875
	13-12390	13-12391	13-14462	17-10622	15-13878	15-14494	16-13498	16-14362
	17-10624	17-11856	17-12208	17-12226	16-14905	16-14914		
	17-12238	17-14440	17-14924	18-10355	MICROMETEOROLOGY			
	18-10356	18-12201	18-12202	18-12208	15-14595	16-14595	16-14901	
	18-12226				MINERAL EXCHANGE			
MAINTENANCE, REMOTE	12-14462	13-14462			14-11741	14-11835	14-13605	14-13657
MALIBU	2-10326	11-10326	18-13664		14-13658	14-14438	15-11835	15-13413
MANGANESE	14-13219	14-13260	15-09406	15-13252	15-13442	15-13511	15-13553	15-13562
	15-13260	15-13268	15-13279	15-13455	15-13626	15-13657	15-13658	15-13710
	15-13553	15-13606	15-13754	15-13758	15-13805	15-13807		
	15-13820	15-14979			MISSILE GENERATION AND PROTECTION			
MASS TRANSFER	5-12380	5-13700	5-14449		5-06838	11-06838		
MATERIAL	5-06838	5-11228	5-13385	11-06838	MUCKUP			
	11-12198	13-13350	17-12198	17-13350	2-12176	11-13403	11-13483	11-13814
	17-14921	18-12198	18-14921		MODERATOR			
MATHEMATICAL STUDY	1-12327	2-14097	2-14098	2-14101	7-13540	7-13719	11-13540	17-13785
	2-14107	2-14394	2-14395	2-14396	MODERATOR COEFFICIENT			
	2-14402	6-10503	6-11648	6-13381	5-14840	6-13404	6-14840	18-13612
	7-13473	7-13593	7-13607	8-12269	18-14840			
	9-10445	9-10503	9-12084	9-12157	MODIFICATION, SYSTEM OR EQUIPMENT			
	9-13381	11-10391	11-11642	11-13813	9-12249	9-12385	9-14925	11-12200
	11-13814	14-11776	14-12282	14-12355	17-10622	17-10624	17-12383	17-14924
	14-12363	14-14426	15-11776	15-12363	17-14925	18-11853	18-12099	18-12200
	15-13286	15-13289	15-13299	15-13763	18-12249			
	16-14353	16-14903	16-14904		MOLECULAR SIEVE			
MAXIMUM PERMISSIBLE BODY BURDEN	14-11922	15-11836	15-11922	15-12324	7-13910			
	15-13564	15-13766			MOLTEN FUEL			
MAXIMUM PERMISSIBLE CONCENTRATION (MPC)	1-10484	14-11635	14-12362	15-11635	18-12015			
	15-12182	15-12324	15-12339	15-12362	MOLYBDENUM			
	15-13305	15-13408	15-13628	15-13758	7-13720			
	15-13766	17-12182	17-12182		MONITOR, RADIATION, AIR			
MAXIMUM PERMISSIBLE DOSE (MPD)	14-11635	15-11635	15-12409	15-13431	9-12121	9-12318	14-08813	14-13400
MEASUREMENT, GENERAL	16-14906	16-14914			14-14472	15-08813	15-09406	15-12121
MEASUREMENT, NOISE	9-12350	17-13359			15-12196	15-12197	15-12318	15-12360
MEASUREMENT, REACTIVITY	6-12352	9-10523	9-11478	9-11742	15-13400	15-13416	15-13454	15-13760
	9-12128	9-12157	9-12352	17-12100	15-13808	15-13823	15-14472	15-14748
	17-14367	17-14416			17-12197	17-12318	17-14748	18-12196
MEASUREMENT, STRAIN GAGE	11-11642	11-13482	11-13483	11-13526	18-12197			
	11-13585	11-13814			MONITOR, RADIATION, BACKGROUND			
MEASUREMENT, SUBCRITICALITY	3-12215	6-12352	9-12352	13-12215	9-10468	9-12121	14-13596	14-13597
	13-14441	17-14415	18-12215		15-10468	15-12121	15-13493	15-13521
MEASUREMENT, TEMPERATURE	9-12300	9-13382			15-13596	15-13597	15-13767	
MERCURY	15-13876				MONITOR, RADIATION, EMERGENCY			
MESOSPHERE	4-13572	7-13572			15-13521			
METAL					MONITOR, RADIATION, ENVIRONMENTAL			
					9-10468	9-12121	14-12398	14-13322
					14-13605	14-13878	15-10468	15-12121
					15-13322	15-13427	15-13450	15-13467
					15-13501	15-13521	15-13598	15-13793
					15-13878	16-14902		
					MONITOR, RADIATION, GAS			
					14-13093	15-12367	15-13093	
					MONITOR, RADIATION, GENERAL			
					15-12394	15-13432	15-13449	15-13450
					15-13812	15-14986		
					MONITOR, RADIATION, GENERAL PRACTICE			
					9-11478	18-05303		
					MONITOR, RADIATION, LIQUID			
					7-13740	9-12263	15-12263	
					MONITOR, RADIATION, PERSONNEL			
					9-11747	15-13343	15-13414	15-13428
					15-13431	15-13449	15-13456	15-13459
					15-13507	15-13561		
					MONITOR, RADIATION, SAMPLING			
					15-13319	15-13509	15-13760	15-13808
					15-13823			
					MONITOR, RADIATION, STACK			

14-13093	15-13093			15-13656	15-14429	16-14903	16-14904
MONITOR, RADIATION, SURFACE				16-14905			
9-10502	15-10502	15-13321		NUCLEAR ROCKET			
MONITOR, RADIATION, TELEMETRY				14-11918	15-11918	15-13514	
15-13450				NUCLEATE BOILING			
MONTICELLO				17-14923	18-12165	18-14923	
5-13484	11-13487	18-13484	18-13487	OCEAN AND SEA			
MOUND LABORATORY				7-13473	7-13651	7-13652	7-13653
15-13345				9-12263	14-10243	14-11775	14-12361
MPBE (MOLTEN PLUTONIUM BURNUP EXPERIMENT)				14-13217	14-13219	14-13220	14-13222
18-12105				14-13765	14-13875	14-14482	14-14492
MSRE (MOLTEN SALT REACTOR EXPERIMENT)				14-14985	14-14988	14-14990	15-11775
6-13594	9-12125	9-12156	17-14921	15-12263	15-13423	15-13465	15-13514
18-13595	18-14921			15-13553	15-13554	15-13560	15-13639
MSSR (MIXED SPECTRUM SUPERHEAT REACTOR)				15-13766	15-13801	15-13807	15-13875
6-13323				15-14482	15-14990	16-14905	16-14908
N S SAVANNAH				OLDBURY (UK)			
1-12295	5-12295	5-13532	17-11856	11-11846	17-11846		
17-11857	17-12029	17-13445	17-13524	OPERATING EXPERIENCE			
17-14440	18-12152	18-12211	18-13532	1-10483	1-12170	4-14363	5-12147
NAK (SODIUM POTASSIUM ALLOY)				5-12148	6-11934	7-13478	7-13479
1-10510	1-12252	8-10242	8-12252	9-12240	9-12244	9-12383	9-13232
11-12175	17-10242	17-12175	18-11855	11-14366	12-12174	13-13350	13-13090
NCRP (NATIONAL COMMITTEE RADIATION PROTECTION)				13-14368	13-14369	13-14371	14-14749
15-12339	15-12409			15-12197	17-07725	17-10463	17-10622
NDT DATA (NIL DUCTILITY TRANSITION)				17-10624	17-11664	17-11858	17-11934
11-10332	11-13402	11-13547	11-14450	17-12098	17-12101	17-12102	17-12148
17-12180	17-14450			17-12151	17-12169	17-12170	17-12174
NEUTRON				17-12178	17-12180	17-12197	17-12228
9-10464	9-10468	9-11478	15-10468	17-12229	17-12233	17-12238	17-12240
15-12337	15-12358	15-12366	15-13202	17-12242	17-12244	17-12363	17-13232
15-13210	15-13511	15-13559	15-13789	17-13350	17-13479	17-13488	17-13518
15-13818	15-13824	15-14430	17-14367	17-13524	17-13838	17-13902	17-14363
NEUTRON INTERACTION				17-14364	17-14365	17-14366	17-14440
3-10522				17-14606	17-14749	18-07725	18-11852
NEVADA TEST SITE				18-11853	18-11855	18-12147	18-12148
14-13352	15-13352			18-12151	18-12166	18-12178	18-12197
NEW ZEALAND				18-12228	18-12229	18-12233	18-13488
14-13207	14-13400	15-12372	15-13207	18-13612	18-14606		
15-13400	15-13551	16-14907		OPERATING LICENSE PROCESS			
NFS (NUCLEAR FUEL SERVICES)				5-12097	18-12097		
13-12309	13-14465	15-12309	17-12309	OPERATING LIMITS/TECHNICAL SPECIFICATIONS			
NICKEL				3-09287	5-12147	5-13233	5-13532
4-12294	13-13215			6-13235	6-14601	9-09287	9-12225
NINE MILE POINT				9-12249	9-12250	9-13279	9-14601
2-10326	11-10326			10-10477	11-12141	11-12179	11-12199
NIOBIUM				15-12196	15-13241	17-09287	17-12230
11-13547	14-13220	15-13455	15-13770	17-12233	17-12235	17-12236	17-12304
15-14979				17-13236	17-13445	17-14889	18-12141
NITRIDE				18-12142	18-12143	18-12146	18-12147
5-11931	7-13734	11-13573		18-12150	18-12152	18-12179	18-12190
NITROGEN				18-12194	18-12196	18-12199	18-12211
1-10358				18-12212	18-12213	18-12225	18-12230
NOBLE GAS				18-12231	18-12232	18-12233	18-12234
5-14389	7-10524	7-13365	7-13568	18-12235	18-12236	18-12249	18-12250
7-13586	7-13588	7-13589	7-13591	18-12304	18-13229	18-13230	18-13233
7-13593	7-13723	7-13736	7-13910	18-13235	18-13237	18-13238	18-13239
7-14380	15-12197	17-12197	17-14389	18-13240	18-13241	18-13243	18-13486
18-12197				18-13531	18-13532	18-13533	18-13595
NOISE				18-13612	18-14601	18-14889	
9-12350				OPERATION			
NOISE ANALYSIS				8-10242	17-10242		
6-11517	6-13406	9-14744	17-14744	OPERATIONS REPORT, ANALYSIS			
NORWAY				4-14363	6-14414	6-14417	6-14418
6-13374	9-12301	15-13296	15-13297	9-14417	17-13359	17-14363	17-14414
15-13448	15-14439			17-14415	17-14416	17-14418	17-14921
NOZZLE				18-14921			
7-13310	11-10459	11-13526	11-13585	OPERATIONS REPORT, GENERAL			
NPR (HANFORD NEW PRODUCTION REACTOR)				5-14852	9-14925	15-14920	17-12216
9-12253	17-11910	17-12253		17-12217	17-12226	17-12227	17-12228
NRTS (NATIONAL REACTOR TEST STATION)				17-12229	17-13614	17-14852	17-14920
13-12390	13-12391	14-12280	14-12287	17-14924	17-14925	18-12216	18-12226
15-13822				18-12227	18-12228	18-12229	18-14411
NRX (CANADIAN NATURAL U-HEAVY WATER REACTOR)				18-14852			
15-12365				OPERATIONS SUMMARY FOR AEC			
NUCLEAR DETONATION				5-14743	5-14746	6-14745	9-12202
7-13474	7-13718	14-11636	14-11776	9-12203	9-12240	9-12244	9-12247
14-11784	14-11833	14-11922	14-12363	9-14744	9-14747	9-14750	9-14751
14-13244	14-13245	14-13246	14-13247	10-12203	11-12206	11-12319	11-14742
14-13248	14-13249	14-13260	14-13266	14-14749	15-12241	15-14748	17-10622
14-13352	14-14474	14-14475	14-14984	17-10624	17-12139	17-12178	17-12204
15-11636	15-11776	15-11784	15-11833	17-12208	17-12209	17-12238	17-12239
15-11922	15-12363	15-13253	15-13260	17-12240	17-12241	17-12242	17-12243
15-13261	15-13268	15-13281	15-13344	17-12244	17-12246	17-12247	17-12248
15-13352	15-13558	15-13577	15-14434	17-12319	17-13535	17-14741	17-14742
15-14473	15-14474	15-14475	15-14484	17-14743	17-14744	17-14745	17-14746
15-14486	15-14984	15-14989		17-14747	17-14748	17-14749	17-14750
NUCLEAR EXPLOSION DEBRIS				17-14751	18-12139	18-12178	18-12201
14-11776	14-13306	14-13307	14-13597	18-12202	18-12203	18-12204	18-12206
14-13656	14-14429	15-11776	15-12358	18-12208	18-12209	18-13535	
15-13491	15-13552	15-13597	15-13619	ORGANIC COOLANT			

5-11750	5-14454			PHASE CHANGE			
ORGANIC IODIDE				5-12379	5-13390	5-13693	19-13390
7-12113	7-13583	7-13732		PHOSPHATE			
ORNL (OAK RIDGE NATIONAL LABORATORY)				14-13320			
1-12329	8-12330	9-12125	9-12126	PHOSPHORUS			
11-11933	12-14462	13-12334	13-12387	7-13734	14-13650	15-12326	15-13339
13-12389	13-13213	13-14462	14-10243	15-13408	15-13522		
14-12276	14-12334	14-12355	14-12356	PIPING			
14-12357	14-13093	14-13810	15-13093	11-10460	11-12373		
18-11933	18-12331			PLANT PROTECTIVE SYSTEM			
ORR (OAK RIDGE RESEARCH REACTOR)				1-12159	17-12159		
9-12318	15-12318	17-12318	17-14923	PLASTICITY			
18-14923				11-10332	11-10460	11-11642	11-12376
OSCILLATOR, REACTIVITY				11-13482	11-13483	11-13526	11-13774
6-12261	9-12261	9-14744	17-14744	11-13815			
OUT OF PILE LOOPS AND EXPERIMENTS				PLOWSHARE PROGRAM			
5-09520	18-12187			14-14474	14-14475	15-14474	15-14475
OXIDATION				15-14989			
1-13317	4-12294	4-14458	7-13648	PLUM BROOK			
8-10338	8-13317	8-13742		5-13485	10-13485	17-13485	
OXIDE				PLUME BEHAVIOR, GENERAL			
7-12219	7-13734	9-12058		1-12266	8-12266	16-10778	16-14353
OXYGEN				PLUTONIUM			
1-10358	4-13472	7-13910	8-13472	1-10358	1-12030	3-12759	5-11931
15-13283				6-13404	6-14604	6-14757	6-14855
OYSTER CREEK				7-13734	13-12311	13-12349	13-12386
2-10326	11-10326			14-08813	14-11922	14-13208	14-13657
PAKISTAN				14-13658	15-08813	15-09466	15-11836
15-13431				15-11922	15-11927	15-12311	15-12335
PARTICLE SIZE				15-12336	15-12366	15-13208	15-13254
4-14460	5-13700	7-13308	7-13309	15-13339	15-13345	15-13410	15-13657
7-13310	7-13311	7-13591	7-13648	15-13658	15-13766	15-13876	17-11626
7-13680	14-11637	14-11835	14-13249	17-11927	17-12098	17-12180	17-12311
14-13250	15-09406	15-11637	15-11835	17-12342	17-13447	17-14855	18-12010
15-13509	15-13872	15-13876		18-12015	18-12030	18-12105	18-13316
PARTICLE SIZE DISTRIBUTION				18-14651			
4-13572	5-13700	7-13308	7-13309	PLUTONIUM OXIDE			
7-13310	7-13572	7-13680	14-11835	7-13722			
14-13248	15-11835	15-13252	15-13255	PM 2A (PORTABLE MEDIUM NUCLEAR POWER PLANT)			
15-13257	15-13261			11-14450	17-14450		
PARTICLE, RADIOACTIVE				POISON, BURNABLE			
7-13312	7-13607	16-14356		6-12124	6-12258	9-12050	9-12084
PARTICULATE				9-12258	9-13338	17-12060	17-12124
4-13572	4-14460	5-13700	5-14455	17-14367			
7-13572	14-08813	14-11918	14-13093	POISON, SOLUBLE			
14-13218	14-13566	15-08813	15-11918	9-10511	18-11406		
15-13093	15-13218	15-13258	15-13259	PULAND			
15-13273	15-13276	15-13277	15-13625	14-13206	14-13596	14-13597	15-13206
15-13823	15-14481	15-14494		15-13596	15-13597	15-14432	15-14490
PATENT				POLONIUM			
3-12880	3-12882	3-12883	3-12892	15-12372	15-13345	15-13506	15-13512
3-12894	3-12895			15-13761	15-13827	15-13863	
PATHFINDER				PONTRYAGINS PRINCIPLE			
5-14743	5-14746	6-14414	6-14417	9-12084			
6-14418	6-14745	9-14417	9-14744	POPULATION DISTRIBUTION			
9-14747	9-14750	9-14751	11-14742	2-13821	5-13613	11-13613	15-13821
14-14749	15-13241	15-14748	17-14414	18-13613			
17-14415	17-14416	17-14418	17-14741	POPULATION EXPOSURE			
17-14742	17-14743	17-14744	17-14745	4-11515	14-08813	14-11636	14-13300
17-14746	17-14747	17-14748	17-14749	14-13499	14-13538	14-13657	14-13658
17-14750	17-14751	18-13241		15-08813	15-11636	15-12409	15-13287
PBF (POWER BURST FACILITY)				15-13300	15-13453	15-13516	15-13521
9-12302	18-12302			15-13538	15-13558	15-13577	15-13608
PEACH BOTTOM 1				15-13619	15-13621	15-13627	15-13657
17-12151	18-12151			15-13658	15-13757	15-13758	15-13767
PERFORMANCE LIMIT				15-13769	15-13863	15-14424	15-14981
5-14603	6-14601	6-14603	9-14601	POROUS DIFFUSION			
18-14601	18-14603			7-13651	7-13652	7-13653	7-13738
PERIOD METER				POROUS MEDIA			
6-12352	9-12352			7-13651	7-13652	7-13653	
PERSONNEL EXPOSURE, RADIATION				PORTSMOUTH PLANT			
13-12391	14-13300	14-13538	15-11836	15-13420	15-13464	15-13628	
15-11919	15-11923	15-11924	15-11928	POTASSIUM			
15-12305	15-12306	15-12307	15-12310	1-12252	5-09520	5-11752	8-12252
15-12392	15-12395	15-13210	15-13300	14-13224	14-13322	14-13596	15-12340
15-13339	15-13399	15-13410	15-13431	15-13296	15-13322	15-13423	15-13502
15-13444	15-13446	15-13449	15-13456	15-13596	15-13616	15-13710	15-13758
15-13467	15-13538	15-13555	15-13556	15-13771			
15-13557	15-13577	15-13598	15-13608	POWER COEFFICIENT			
15-13756	15-13757	15-13759	15-13880	6-14618	18-14618		
15-14428	15-14430	15-14480	15-14981	POWER DISTRIBUTION			
17-11923	17-11928	17-12246	17-12305	5-13532	5-14743	5-14824	5-14826
17-12306	17-12307	17-12310	17-13444	5-14828	5-14841	6-14618	6-14841
17-13446	17-13447	17-13524		9-12244	17-12216	17-12233	17-12244
PERSONNEL PROTECTIVE DEVICE				17-12248	17-14367	17-14743	17-14826
5-14852	9-11643	9-12121	12-14918	18-12216	18-12233	18-13532	18-14618
15-12121	15-13241	15-13242	15-14431	18-14824	18-14826	18-14828	18-14841
17-12246	17-13242	17-14852	18-13241	POWER UPGRATING			
18-13242	18-14852			18-11855	18-12099	18-12146	18-12191
PFR (PROTOTYPE FAST REACTOR, UK)				18-12193			
1-10510				PRECIPITATION			

14-13204	14-13219	14-13306	15-13204	17-13446	17-13898	17-14748	17-14920
15-13211	15-13508	15-13800	15-13803	17-14925	18-12140	18-12208	18-12226
16-14362	16-14905	16-14907	16-14914	18-12228	18-12229	18-12230	18-13241
PRESSURE DROP				18-13242	18-13533		
5-11750	5-13389			RADIATION, PUBLIC EDUCATION/ACCEPTANCE			
PRESSURE RELIEF				1-10190	1-12109	1-13767	1-13788
9-12068				1-13829	1-14443	2-10190	3-13829
PRESSURE, EXTERNAL				14-12109	18-13787	18-13788	18-13901
9-12315	11-10458			18-14443			
PRESSURE, INTERNAL				RADIOACTIVITY, RELEASE			
5-14448	5-14600	9-14744	9-14747	3-10841	3-14870	7-13312	7-14870
11-10332	11-10458	11-11642	11-12374	14-11921	14-12361	14-13093	15-12182
11-13528	11-14600	11-14839	12-14839	15-13093	16-13332	17-12182	17-12182
17-13902	17-14744	17-14747	18-05804	RADIOCHEMICAL ANALYSIS			
18-14839				7-13722	13-13721	14-13246	14-13247
PRESSURIZER				14-13249	14-13250	14-14429	15-12326
5-14448	17-12230	18-12230		15-13279	15-13319	15-13412	15-13419
PROCEDURES AND MANUALS				15-13451	15-13454	15-13455	15-13470
11-14366	17-14366	17-14597	18-12071	15-13726	15-13770	15-13771	15-13820
PROMETHIUM				15-14429	15-14439		
7-13737	13-13396	14-13500	14-13711	RADIOCHEMICAL PLANT SAFETY			
15-09406	15-13419	15-14979	18-13396	12-14466	13-12349	13-12387	13-12388
PROPERTY, PHYSICAL				13-12390	13-12391	13-13213	13-13214
3-12949	5-11228	7-13586	7-13592	13-13396	13-14466	18-13396	
8-13733	14-12356			RADIOCHEMICAL PROCESSING			
PRTR (PLUTONIUM RECYCLE TEST REACTOR)				5-11931	6-12314	7-13737	11-14467
5-11989	5-13699	12-12173	17-11989	12-14462	12-14466	12-14467	13-12314
17-12173				13-12334	13-12349	13-12384	13-12385
PUERTO RICO				13-12387	13-12389	13-13214	13-13215
17-12171				13-13350	13-13396	13-13721	13-13741
PULSED NEUTRON TECHNIQUE				13-13898	13-14368	13-14369	13-14371
6-13405	17-14364			13-14462	13-14464	13-14465	13-14466
PUMP				13-14467	14-12334	14-13500	15-11928
5-14746	9-14605	17-12029	17-12243	17-11928	17-13350	17-13898	18-12008
17-13785	17-14746	18-12166	18-13238	18-13396			
18-13239	18-14605			RADIOGRAPHY			
PYROLYTIC				7-13722	9-12049	15-12305	17-12305
7-13471	7-13540	7-13734	11-13540	RADIOISOTOPE			
QUAD CITIES 1 AND 2				1-12185	5-13387	7-13480	7-13607
18-13901				7-13717	7-13737	7-13907	13-13721
QUALITY CONTROL				14-13500	15-13755	18-12185	
1-12343	1-12353	1-14444	11-13487	RADIOLOGICAL ASSISTANCE			
18-13487	18-14444			15-13421			
RADIATION DAMAGE				RADIOLYTIC GAS			
5-14919	7-13590	7-13638	8-13733	5-14599	8-14599	9-12244	9-12247
9-12133	11-13402	11-13547	14-14984	12-14466	13-14466	17-12171	17-12244
15-13513	15-13556	15-13756	15-13818	17-12247			
15-13876	15-13880	15-14486	15-14984	RADIUM			
17-11860	17-13902	18-14919		3-10841	9-11747	15-11911	15-13304
RADIATION EFFECT				15-13368	15-13455	15-13461	15-13494
5-11931	7-13588	7-13589	7-13590	15-13662	15-13761	15-13769	15-13827
7-13591	7-13592	7-13638	7-13723	15-14432	17-11911		
7-13738	8-13733	9-12300	11-13547	RADON			
14-13433	14-13645	14-13657	14-13658	15-09406	15-12367	15-13302	15-13512
14-14984	15-11920	15-13302	15-13304	15-14920	17-14920		
15-13369	15-13424	15-13501	15-13511	RAINOUT			
15-13556	15-13608	15-13645	15-13657	14-11784	14-11917	14-12278	14-12287
15-13658	15-13769	15-13818	15-13864	14-12320	14-13204	14-13218	14-13306
15-13880	15-14436	15-14984	17-14364	14-13400	14-14472	15-09406	15-11784
RADIATION INJURY, TREATMENT OF				15-11917	15-12320	15-12372	15-13204
15-11926	15-11927	15-12395	15-13556	15-13211	15-13218	15-13254	15-13259
15-13756	17-11927			15-13270	15-13274	15-13275	15-13276
RADIATION PROTECTION, CHEMICAL				15-13277	15-13278	15-13279	15-13280
15-13818	15-13876			15-13282	15-13286	15-13297	15-13400
RADIATION PROTECTION, ORGANIZATION				15-13427	15-13428	15-13438	15-13453
14-13300	14-13645	15-11923	15-11924	15-13551	15-13552	15-13598	15-13625
15-13300	15-13339	15-13449	15-13467	15-13803	15-14472		
15-13521	15-13621	15-13645	17-11923	RARE EARTH			
RADIATION SAFETY AND CONTROL				7-13737			
1-13829	3-12957	3-13829	9-14925	REACTIVITY EFFECT			
12-14918	13-12311	13-13898	14-12362	5-14743	17-14743		
14-13093	14-13208	14-13574	14-13645	REACTIVITY EFFECT, ANOMALOUS			
14-13657	14-13658	14-13878	14-14472	5-12205	5-14743	17-11860	17-11994
14-14474	14-14475	14-14479	15-11836	17-12101	17-12205	17-12209	17-12216
15-11923	15-11924	15-11926	15-12307	17-12227	17-14743	17-14921	17-14924
15-12310	15-12311	15-12360	15-12362	18-12205	18-12209	18-12216	18-12227
15-12392	15-13093	15-13208	15-13210	18-14921			
15-13241	15-13242	15-13339	15-13415	REACTIVITY EFFECT, SLUMP			
15-13444	15-13446	15-13449	15-13456	18-14413			
15-13459	15-13466	15-13467	15-13521	REACTIVITY, EXCESS			
15-13555	15-13574	15-13598	15-13621	6-14418	9-10512	17-14418	17-14924
15-13645	15-13657	15-13658	15-13755	REACTOR CONTROL			
15-13768	15-13818	15-13876	15-13878	6-13373	9-13373		
15-13880	15-14424	15-14428	15-14472	REACTOR COOLANT			
15-14473	15-14474	15-14475	15-14476	9-10445			
15-14478	15-14480	15-14483	15-14484	REACTOR DECOMMISSIONING EXPERIENCE			
15-14486	15-14488	15-14489	15-14490	15-14986	17-13519	17-13530	17-13785
15-14495	15-14748	15-14920	15-14981	18-12210	18-13530		
15-14986	17-11923	17-12208	17-12226	REACTOR DESCRIPTION			
17-12228	17-12229	17-12230	17-12307	11-11846	17-11846	18-10516	18-11406
17-12310	17-12311	17-13242	17-13444	18-11932	18-12007	18-12008	18-12010

18-12011	18-12012	18-12013	18-12014	18-12147	18-12148	18-12150	18-12161
18-12104	18-12138	18-12145	18-12162	18-12163	18-12164	18-12172	18-12177
18-12163	18-12164	18-12165	18-12167	18-12178	18-12179	18-12196	18-12197
18-12332	18-12344	18-12345	18-12346	18-12198	18-12199	18-12200	18-12201
18-14651				18-12202	18-12203	18-12204	18-12205
REACTOR DYNAMICS				18-12206	18-12216	18-12225	18-12249
6-10503	6-13375	6-13376	6-13381	18-12250	18-13228	18-13241	18-13484
6-13816	6-13868	6-13869	6-13870	18-13487	18-13613	18-13901	18-14411
6-14855	9-10503	9-13381	17-14855	18-14591	18-14594	18-14596	18-14601
REACTOR KINETICS				18-14602	18-14603	18-14605	18-14606
1-10355	8-10339	18-10355		18-14607	18-14608	18-14609	18-14610
REACTOR OFFGAS				18-14611	18-14612	18-14613	18-14614
7-14615	9-13615	14-14749	15-12241	18-14615	18-14616	18-14617	18-14618
17-12178	17-12241	17-13614	17-13615	18-14823	18-14824	18-14825	18-14826
17-14749	18-12178	18-14615		18-14827	18-14828	18-14829	18-14923
REACTOR PHYSICS				REACTOR, BREEDER			
1-08774				1-12030	1-12264	1-12270	9-10501
REACTOR SAFETY SYSTEM				9-10523	9-12256	17-14921	18-10318
1-10482	1-10484	3-09287	4-10519	18-12030	18-12138	18-12331	18-14921
5-14746	6-12352	6-14601	9-09287	REACTOR, CIRCULATING FUEL			
9-10467	9-10481	9-10498	9-12069	17-14921	18-13595	18-14409	18-14921
9-12156	9-12249	9-12250	9-12302	REACTOR, DESALINATION			
9-12352	9-14601	9-14747	9-14750	2-12176	6-14757		
17-09287	17-10482	17-14746	17-14747	REACTOR, FAST			
17-14750	18-12249	18-12250	18-12302	1-10510	1-12270	1-13317	5-09520
18-14601				5-14917	6-11511	6-11518	6-11519
REACTOR STABILITY				6-11520	6-11995	6-11996	6-14757
6-09541	6-10503	6-11512	6-11519	6-14855	6-14917	7-13540	8-13317
6-11996	6-13870	6-14616	6-14617	9-10501	9-10523	9-12069	9-12256
6-14745	9-10503	17-13359	17-14745	9-12256	9-12383	11-10356	11-10460
18-14616	18-14617			11-11933	11-12319	11-13540	12-10356
REACTOR STARTUP EXPERIENCE, INITIAL				17-10622	17-10624	17-11994	17-12319
17-11994	17-12101	17-12139	17-14741	17-12383	17-13353	17-13535	17-14855
18-12139				17-14917	18-10318	18-10356	18-11933
REACTOR STARTUP TESTING				18-12007	18-12008	18-12009	18-12010
5-14829	6-12352	9-12352	17-13359	18-12011	18-12012	18-12013	18-12014
17-14829	18-14829			18-12015	18-12016	18-12138	18-13238
REACTOR TRANSIENT				18-13239	18-13535	18-14413	18-14651
5-13391	6-14601	9-14601	18-14601	REACTOR, FAST BURST			
REACTOR, AEC OWNED				6-11511	6-11934	6-11935	9-14925
1-10203	5-11989	6-11331	12-12173	13-11935	17-11916	17-11934	17-14364
17-11331	17-11989	17-12171	17-12173	17-14925	18-12140		
17-12180	17-12216	18-12138	18-12216	REACTOR, GAS COOLED			
REACTOR, AIRCRAFT				1-12264	5-00382	7-11834	7-13471
6-11935	13-11935	14-11918	15-11918	7-13540	8-13742	9-10481	9-10507
REACTOR, ARMY				9-12123	9-12299	11-11846	11-11933
9-14925	11-13402	11-14450	17-12218	11-13540	12-14918	14-11834	15-11834
17-14367	17-14450	17-14924	17-14925	15-13873	15-13876	17-11846	17-12151
18-12031	18-12106	18-12140	18-12191	17-13518	17-13519	17-13785	18-11933
18-12193				18-12014	18-12151	18-12186	18-12187
REACTOR, BEO MODERATED				18-12188	18-12344	18-12345	18-12346
17-13785				18-14409			
REACTOR, BOILING WATER				REACTOR, GENERAL			
1-12161	2-10326	5-12096	5-12097	1-10483	9-12318	15-12318	17-10483
5-12147	5-12148	5-12177	5-12205	17-12318			
5-13484	5-13613	5-14594	5-14596	REACTOR, GRAPHITE MODERATED			
5-14598	5-14599	5-14600	5-14602	1-13317	3-14870	5-14917	6-11516
5-14603	5-14609	5-14614	5-14743	6-14855	6-14917	7-14870	8-13317
5-14746	5-14823	5-14824	5-14825	9-10498	9-12123	9-12130	9-12253
5-14826	5-14827	5-14828	5-14829	9-12302	11-11394	17-11910	17-12100
6-10503	6-11648	6-14414	6-14417	17-12102	17-12151	17-12253	17-14855
6-14418	6-14601	6-14602	6-14603	17-14917	18-12151	18-12186	18-12187
6-14604	6-14616	6-14617	6-14618	18-12188	18-12302		
6-14745	7-14615	8-14599	9-10481	REACTOR, HEAVY WATER			
9-10503	9-11644	9-11645	9-11646	1-10482	5-11989	6-10503	6-11646
9-11647	9-11649	9-11650	9-11651	6-13900	9-10503	9-11644	9-11645
9-11652	9-12202	9-12203	9-12225	9-11646	9-11647	9-11649	9-11650
9-12240	9-12244	9-12247	9-12249	9-11651	9-11652	12-12173	15-13772
9-12250	9-13615	9-14417	9-14592	16-11075	17-10482	17-11664	17-11989
9-14593	9-14601	9-14605	9-14744	17-12098	17-12101	17-12173	18-11932
9-14747	9-14750	9-14751	10-10477	18-12104	18-13240	18-13611	18-13612
10-12203	11-10326	11-12179	11-12198	18-14410			
11-12199	11-12200	11-12206	11-13487	REACTOR, LARGE			
11-13613	11-14591	11-14592	11-14593	1-12264	1-12273	6-11519	6-11520
11-14594	11-14600	11-14742	12-14596	REACTOR, LIQUID METAL COOLED			
12-14611	12-14612	14-14749	15-12196	1-10510	3-14870	5-09520	5-14917
15-12197	15-12241	15-13241	15-13866	6-11516	6-11996	6-14917	7-13907
15-14595	15-14748	16-14595	17-12148	7-14870	8-10242	9-10498	9-10523
17-12178	17-12180	17-12197	17-12198	9-12130	9-12256	9-12383	11-10356
17-12204	17-12205	17-12216	17-12217	11-11394	11-12319	12-10356	17-10242
17-12238	17-12239	17-12240	17-12241	17-10622	17-10622	17-10624	17-11994
17-12242	17-12243	17-12244	17-12246	17-12102	17-12319	17-12383	17-13535
17-12247	17-12248	17-13359	17-13415	17-14917	18-10318	18-10356	18-12007
17-13615	17-14370	17-14414	17-14415	18-12008	18-12009	18-12010	18-12011
17-14416	17-14418	17-14591	17-14597	18-12012	18-12013	18-12138	18-12145
17-14606	17-14607	17-14741	17-14742	18-12165	18-13238	18-13239	18-13535
17-14743	17-14744	17-14745	17-14746	18-14651			
17-14747	17-14748	17-14749	17-14750	REACTOR, MARITIME			
17-14751	17-14826	17-14829	17-14923	1-12185	1-12272	1-12295	1-13632
18-10476	18-10478	18-11406	18-11932	3-13632	5-12295	9-10384	17-11856
18-12096	18-12097	18-12143	18-12144	17-11857	17-12029	17-13445	17-14440

18-12152	18-12185	18-12211		17-13485	17-14412	17-14855	18-07725
REACTOR, MOLTEN SALT				18-11852	18-11653	18-11855	18-12007
6-13594	9-12125	9-12156	17-14921	18-12016	18-12138	18-12302	
18-12331	18-13595	18-14921		REACTOR, THERMAL			
REACTOR, ORGANIC COOLED				6-13404	9-12157		
1-10355	17-11664	17-12101	18-10355	REACTOR, TRAINING			
REACTOR, PEBBLE BED				9-13786	17-13786	18-13786	18-14045
7-13540	7-13638	11-13540	18-12186	REACTOR, WATER			
18-12187	18-12188	18-12344	18-12345	1-10482	1-12329	17-10482	17-11916
18-12346				RECOVERY FACTOR			
REACTOR, POOL TYPE				7-13480	14-11636	15-11636	
3-12215	6-12261	9-12261	13-12215	RECOVERY PROCESS			
17-12171	17-13902	17-14889	17-14916	7-13480	7-13481	14-11636	15-11636
18-12099	18-12191	18-12193	18-12213	15-13503	15-13556	15-13558	
18-12214	18-12215	18-12231	18-13531	REDUNDANCE			
18-14889				9-12250	18-10476	18-12250	
REACTOR, POWER				REENTRY, ATMOSPHERIC			
1-08665	1-12160	1-12170	1-12264	4-14458	4-14459	4-14461	5-11751
1-12267	1-12273	1-12353	1-13632	5-13643			
2-12176	3-13632	6-09541	9-11907	REFUELING			
17-11907	17-12169	17-12170	18-08665	5-12147	17-12139	17-12216	17-12233
18-12008	18-12009	18-12010	18-12011	17-12235	17-12304	17-13236	18-12139
18-12012	18-12014	18-12166	18-12167	18-12143	18-12147	18-12150	18-12216
REACTOR, PRESSURE TUBE				18-12233	18-12234	18-12235	18-12304
1-10482	5-11989	9-12253	12-12173	18-13238	18-13239		
16-11075	17-10482	17-11989	17-12173	REGULATION, AEC			
17-12253	18-11932	18-12104	18-13240	1-08665	1-10203	1-10462	1-12251
REACTOR, PRESSURIZED WATER				1-12268	1-12296	1-12343	1-12959
1-12161	1-12313	1-13787	1-13788	1-13829	1-14444	1-14463	3-12959
2-10326	5-10452	5-11906	5-13233	3-13634	3-13829	13-14441	13-14464
5-13484	5-13532	5-14837	5-14840	14-13865	15-13242	17-10482	17-13242
5-14841	6-12258	6-13235	6-14840	18-08665	18-12031	18-13242	18-13486
6-14841	9-10511	9-12258	9-13232	18-14444			
11-10326	11-12463	11-14450	11-14450	REGULATION, GENERAL			
11-14836	11-14839	12-14839	16-14836	1-10484	1-11850	1-12955	3-12937
17-11626	17-11856	17-11857	17-11858	3-12955	14-13865	14-13867	15-13755
17-11906	17-12029	17-12098	17-12139	REGULATION, IAEA			
17-12208	17-12209	17-12226	17-12227	1-12955	1-14869	3-12955	3-14869
17-12228	17-12229	17-12230	17-12233	REGULATION, ICC			
17-12235	17-12236	17-12304	17-12313	1-12955	1-12962	3-12955	3-12962
17-13232	17-13236	17-13445	17-13524	3-12970			
17-14367	17-14440	17-14450	17-14450	REGULATION, STATE			
18-12104	18-12106	18-12107	18-12108	1-12268	14-13865		
18-12139	18-12152	18-12161	18-12162	RELEASE RATE			
18-12164	18-12165	18-12208	18-12209	7-08820			
18-12211	18-12226	18-12227	18-12228	RELIABILITY ANALYSIS			
18-12229	18-12230	18-12232	18-12233	9-10499	9-12351	11-12373	
18-12234	18-12235	18-12236	18-12304	RELIABILITY, COMPONENT			
18-13233	18-13235	18-13237	18-13484	9-10499	9-12133	9-12134	9-12351
18-13532	18-13664	18-13787	18-13788	RELIABILITY, SYSTEM			
18-14835	18-14836	18-14837	18-14839	1-12170	9-12351	17-12170	
18-14840	18-14841			REMOTE MANIPULATING AND VIEWING			
REACTOR, PULSED				13-14368			
6-11511	15-12364	17-14924	18-12099	RESEARCH AND DEVELOPMENT PROGRAM			
18-12190	18-12194	18-12212		5-14919	9-12318	15-12318	17-12318
REACTOR, RESEARCH				17-14921	18-14919	18-14921	
1-12265	1-14443	3-09287	9-09287	RESEARCH CONTRACT			
9-12125	9-13229	11-12141	12-12173	1-12329	1-12353	5-11931	6-13900
13-13350	17-09287	17-11916	17-12171	17-12342			
17-12173	17-12218	17-13350	17-13902	RESIN			
17-14899	17-14924	18-05303	18-10516	7-13473	17-14607	18-14607	
18-12071	18-12141	18-12146	18-12191	RESONANCE OVERLAP			
18-12193	18-12212	18-12214	18-12224	17-12342			
18-12231	18-13229	18-13230	18-13316	RESPONSE SPECTRUM			
18-13611	18-13612	18-14410	18-14443	2-14100	2-14107		
18-14889				REVIEW			
REACTOR, SPACE				1-12264	1-12265	1-12267	9-10467
5-14389	6-12124	7-14389	9-12132	9-10511	9-10514	13-12334	14-12334
9-12133	9-12254	17-12124	17-14389	14-12369	14-12370	15-12369	15-12370
18-11513				17-11854	17-12098	18-11852	18-11853
REACTOR, SUPERHEAT				18-11855			
5-14743	5-14746	5-14919	6-14414	RIVER, CLINCH			
6-14417	6-14418	6-14745	9-12240	14-10243	14-13397	14-13657	14-13656
9-12244	9-12247	9-12249	9-12250	14-13867	15-12409	15-13397	15-13657
9-14417	9-14744	9-14747	9-14750	15-13658			
9-14751	11-14742	14-14749	15-12241	RIVER, COLUMBIA			
15-13241	15-14748	17-12238	17-12239	14-10243	14-12396	14-13217	14-13220
17-12240	17-12241	17-12242	17-12243	14-13222	14-14438	15-13553	
17-12244	17-12246	17-12247	17-12248	RIVER, GENERAL			
17-14365	17-14365	17-14414	17-14415	14-13867	14-13875	15-13875	
17-14416	17-14418	17-14741	17-14742	RIVER, GUADALUPE			
17-14743	17-14744	17-14745	17-14746	15-13442			
17-14747	17-14748	17-14749	17-14750	RIVER, OTTAWA			
17-14751	18-11932	18-12172	18-12249	14-10243			
18-12250	18-13241	18-14919		RIVER, RHONE			
REACTOR, TEST				14-10243			
1-13317	5-11989	5-12181	5-13485	RIVER, SAVANNAH			
5-14412	6-13816	6-14855	8-13317	14-10243	14-13492	15-13618	
9-12125	9-12302	9-12318	10-13485	RIVER, THAMES			
12-12181	15-12318	17-07725	17-11854	14-10243			
17-11860	17-11916	17-11989	17-12318	ROCK MECHANICS			

2-14087	2-14088	2-14096	2-14097	1-08665	1-10482	1-12159	1-12295
2-14098	2-14099	2-14101	2-14404	5-12295	7-12219	17-10482	17-12159
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13-12349				SAFETY STUDY			
ROSSI ALPHA				1-12159	1-12160	1-14442	4-12293
6-11517	6-13374	6-13817		5-14919	7-13540	11-13540	11-14450
ROVER PROGRAM				14-13397	15-13397	17-12159	17-14450
14-11637	15-11637	15-13345		18-14919			
RUBIDIUM				SALT			
1-12252	7-13568	8-12252	15-13758	7-13651	7-13652	7-13653	
RUTHENIUM				SAMARIUM			
7-11834	14-11834	14-12278	14-13219	9-12058			
14-13657	14-13658	14-13810	14-13828	SAMPLING			
14-14485	15-11834	15-13268	15-13303	7-13309	7-13310	7-13629	7-13680
15-13455	15-13606	15-13657	15-13658	12-13629	14-10243	14-11635	14-11637
15-13726	15-13754	15-13770	15-13807	14-11833	14-11918	14-12280	14-12322
SAFE FAILURE CRITERION				14-13093	14-13201	14-13207	14-13247
17-11994				14-13250	14-13266	14-13398	14-13400
SAFETY ANALYSIS				14-13566	14-13878	14-14472	14-14985
4-14457	4-14459	5-14840	6-14840	15-09406	15-11635	15-11637	15-11833
9-14747	17-14747	18-14840		15-11836	15-11918	15-12322	15-12340
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1-08665	5-14837	5-14840	5-14841	15-13207	15-13252	15-13255	15-13262
6-14840	6-14841	11-14836	11-14839	15-13273	15-13274	15-13275	15-13285
12-14839	13-13396	16-14836	17-11854	15-13319	15-13345	15-13400	15-13453
18-05303	18-08665	18-11406	18-11852	15-13454	15-13470	15-13509	15-13560
18-11853	18-11855	18-12071	18-12099	15-13598	15-13628	15-13768	15-13797
18-12106	18-13316	18-13396	18-14045	15-13808	15-13823	15-13866	15-13872
18-14410	18-14413	18-14835	18-14836	15-13878	15-14472	15-14481	17-12230
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5-14598	5-14599	5-14600	5-14602	2-10326	11-10326		
5-14603	5-14609	5-14614	5-14823	SAVANNAH RIVER PLANT			
5-14824	5-14825	5-14826	5-14827	7-13479	13-12388	14-10243	15-13618
5-14828	5-14829	6-14601	6-14602	17-13479			
6-14603	6-14604	6-14616	6-14617	SAXTON			
6-14618	7-14615	8-14599	9-14592	9-10511	17-12208	17-12209	18-12208
9-14593	9-14601	9-14605	11-13487	18-12209			
11-13613	11-14591	11-14592	11-14593	SCRAM, REAL			
11-14594	11-14600	12-14596	12-14611	17-14741			
12-14612	15-14595	16-14595	17-14591	SCRAM, SPURIOUS			
17-14597	17-14606	17-14607	17-14826	9-12247	17-12239	17-12242	17-12247
17-14829	18-12177	18-13487	18-13613	17-13535	18-13535		
18-14591	18-14594	18-14596	18-14601	SCRUBBER			
18-14602	18-14603	18-14605	18-14606	7-13542	9-13232	12-14466	13-14466
18-14607	18-14608	18-14609	18-14610	17-13232			
18-14611	18-14612	18-14613	18-14614	SEAL			
18-14615	18-14616	18-14617	18-14618	17-12101			
18-14823	18-14824	18-14825	18-14826	SEDIMENT			
18-14827	18-14828	18-14829		15-13442	15-13553	15-13807	
SAFETY ANALYSIS RPT, RESPONSE TO AEC QUESTIONS				SEFOR (SOUTHWEST EXP. FAST OXIDE REACTOR)			
5-14594	5-14596	5-14598	5-14599	1-12270	6-13817	9-12069	9-12256
5-14600	5-14602	5-14603	5-14609	SEICHE			
5-14614	5-14823	5-14824	5-14825	2-14102	2-14396		
5-14826	5-14827	5-14828	5-14829	SEISMIC ZONE			
5-14837	5-14840	5-14841	6-14601	2-14095	2-14102	2-14104	2-14106
6-14602	6-14603	6-14604	6-14616	2-14390	2-14391	2-14397	2-14400
6-14617	6-14618	6-14840	6-14841	2-14401	2-14402	2-14405	2-14406
7-14615	8-14599	9-14592	9-14593	SEISMOLOGY			
9-14601	9-14605	10-10477	11-14591	14-13352	15-13344	15-13352	18-05303
11-14592	11-14593	11-14594	11-14600	SEPARATOR			
11-14836	11-14839	12-14596	12-14611	7-10524			
12-14612	12-14839	15-14595	16-14595	SERVOMECHANISM			
16-14836	17-14591	17-14597	17-14606	9-12156			
17-14607	17-14826	17-14829	18-10476	SHARED COMPONENTS			
18-10478	18-12144	18-13611	18-14591	9-14605	18-14605		
18-14594	18-14596	18-14601	18-14602	SHELL			
18-14603	18-14605	18-14606	18-14607	11-10332	11-11642	11-13528	
18-14608	18-14609	18-14610	18-14611	SHIELDING			
18-14612	18-14613	18-14614	18-14615	3-12778	3-12949	6-12314	12-14462
18-14616	18-14617	18-14618	18-14823	13-12314	13-14462	15-13466	15-13503
18-14824	18-14825	18-14826	18-14827	15-13555	15-14423	15-14424	17-11910
18-14828	18-14829	18-14835	18-14836	17-12171	17-13902	18-12186	18-12191
18-14837	18-14839	18-14840	18-14841	SHIPPING CONTAINER			
SAFETY EVALUATION				1-12955	3-12215	3-12347	3-12709
9-12250	9-13229	15-13241	17-13236	3-12710	3-12759	3-12773	3-12882
17-13530	18-12143	18-12146	18-12150	3-12883	3-12892	3-12894	3-12895
18-12193	18-12194	18-12212	18-12231	3-12955	3-13634	3-14407	3-14470
18-12232	18-12234	18-12250	18-13229	3-14471	3-14897	12-12347	13-12215
18-13230	18-13237	18-13239	18-13240	17-12347	18-12215		
18-13241	18-13530	18-13533	18-13612	SHOCK WAVE			
SAFETY PRINCIPLES AND PHILOSOPHY				11-13528			
1-10482	1-10483	1-10484	1-12343	SHUTDOWN MARGIN			
2-13640	4-10519	5-14602	6-14602	5-13532	6-14414	6-14418	9-12084
7-12219	9-10467	12-13640	17-10482	17-14367	17-14414	17-14416	17-14418
17-10483	17-14889	18-12014	18-14602	18-13532			
18-14889				SHUTDOWN SYSTEM, SECONDARY			
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SINGLE-FAILURE CRITERION	9-14592	11-14592			SOUTH AFRICA	14-14983	15-13806		
SINTERING	7-13723				SPACE DEPENDENT DYNAMICS	6-11519	6-13393	6-13405	6-13407
SITE CLIMATOLOGY	16-11075	16-14901	16-14914		SPACECRAFT	4-14363	17-14363		
SITING, GENERAL	1-10190	2-10190	15-13503		SPECTROMETRY, ALPHA	15-13876			
SITING, OFF SHORE	2-12176				SPECTROMETRY, GAMMA	7-13474	14-13249	15-12340	15-12393
SITING, REACTOR	2-10326	2-12176	2-13640	2-13821		15-12394	15-13253	15-13254	15-13256
	3-09287	9-09287	11-10326	12-13640		15-13302	15-13411	15-13423	15-13455
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SL 1 (STATIONARY LOW POWER PLANT)	15-13866				SPECTROMETRY, NEUTRON	9-11742			
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SNAP 10A (SYSTEMS FOR NUCLEAR AUXILIARY POWER)	4-11514	4-14363	4-14461	5-14389	SPHERE	11-13528			
	6-12124	7-14389	9-12133	17-12124	SPRAY, GENERAL	5-13644	7-13732		
	17-14363	17-14389			SRE (SODIUM REACTOR EXPERIMENT)	7-10428	9-12130		
SNAP 50 (SYSTEMS FOR NUCLEAR AUXILIARY POWER)	9-12254				STACK	7-13607	15-12182	16-08815	16-10778
SNAP 8 (SYSTEMS FOR NUCLEAR AUXILIARY POWER)	6-12124	9-12132	17-12124			16-14353	16-14354	16-14902	17-12169
SNAP, GENFRAL (SYSTEMS FOR NUCLEAR AUX. POWER)	4-11515					17-12182	17-12182		
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	7-13677	7-13907	8-10242	8-12252		18-12201	18-13488		
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	15-13502	15-13758	15-13820	17-10242		9-10384	9-12240	9-13232	17-12230
SODIUM COEFFICIENT	6-11519	6-11520	6-11995	6-14757		17-12240	17-13232	18-12230	
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SOIL MECHANICS	2-14100					11-10332	11-10463	11-13483	11-13526
SOIL, NUCLIDE OCCURRENCE	14-11835	14-12320	14-12363	14-12398		11-13547	11-13585	11-13774	
	14-13218	14-13224	14-13397	14-13400	STEEL LINER	11-10463	11-13403		
	14-13596	14-13656	14-13877	14-14472	STEEL, STAINLESS	1-13317	4-12294	5-11931	6-13323
	14-14477	14-14984	14-14987	15-11835		7-13475	7-13583	8-13317	11-13573
	15-12320	15-12363	15-12372	15-13218		17-11916			
	15-13262	15-13285	15-13290	15-13397	STEP (SAFETY TEST ENGINEERING PROGRAM)	7-13720			
	15-13400	15-13427	15-13451	15-13453	STORAGE CONTAINER	3-12348	12-14612	17-12348	18-14612
	15-13494	15-13506	15-13511	15-13562	STRATOSPHERE	4-13549	4-13572	7-13549	7-13572
	15-13596	15-13598	15-13656	15-13726		14-11175	14-11776	14-13260	14-13266
	15-13769	15-13793	15-14435	15-14472		14-13549	15-11775	15-11776	15-13260
	15-14477	15-14491	15-14980	15-14984		15-13264	15-13265	15-13268	15-13279
SOIL, PROPERTY	14-11835	14-13206	14-13221	14-13224		15-13282	15-13757	16-14362	16-14907
	14-13244	14-13874	14-13879	14-14426	STRESS	5-12147	5-12148	11-10332	11-10391
	14-14984	14-14987	15-11835	15-13206		11-11394	11-12373	11-13403	11-13462
	15-13506	15-13562	15-13626	15-13710		11-13526	11-13528	11-13539	11-13573
	15-13874	15-13879	15-14491	15-14984		11-13585	11-13613	11-13614	11-13815
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SOLID STATE DEVICE	9-10502	15-10502			STRESS RUPTURE	11-13539	11-13615		
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	14-14982	15-13206	15-13874		STRONTIUM	3-14468	7-11834	7-13907	11-14467
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	2-14098	2-14099	2-14101	2-14103		14-11741	14-11775	14-11776	14-11834
	2-14105	2-14106	2-14212	2-14394		14-11917	14-12288	14-12321	14-13222
	2-14398	2-14399	2-14403	2-14404		14-12323	14-12361	14-13203	14-13204
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	16-12168	16-14355	17-12168	17-12178		14-13307	14-13342	14-13397	14-13400
	17-12182	17-12182	17-14365	18-12178		14-13436	14-13500	14-13603	14-13657
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	16-14353					14-14877	14-14879	14-14987	15-09406
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15-13400	15-13412	15-13413	15-13417	7-10524	9-10507		
15-13418	15-13424	15-13427	15-13438	SYSTEM OPERABILITY IN ACCIDENT CONDITIONS			
15-13442	15-13451	15-13453	15-13465	5-14596	11-14591	12-14596	17-14591
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15-13577	15-13603	15-13606	15-13616	4-14458			
15-13617	15-13618	15-13623	15-13625	TECHNETIUM			
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15-13798	15-13819	15-13874	15-13876	2-14395	2-14397	2-14398	2-14399
15-13879	15-14477	15-14987	16-14362	2-14402	2-14403	2-14404	
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14-10243	14-12282	14-12287	14-12361	4-14457			
14-13205	14-13212	14-13218	14-13219	TEST, FILTER			
14-13400	14-13867	14-13875	14-14472	7-10348	7-13648	7-13677	17-13524
14-14482	14-14492	14-14985	15-12409	TEST, FILTER SYSTEM			
15-13205	15-13212	15-13218	15-13345	7-13478	7-13479	7-13677	15-12241
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15-13554	15-13560	15-13618	15-13795	TEST, LEAK LOCATION			
15-13801	15-13805	15-13807	15-13875	11-12199	17-12204	18-12199	18-12204
15-13876	15-14472	15-14482	15-14491	TEST, LEAK RATE			
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14-13400	14-13460	14-13596	14-13597	9-11649	9-12123	9-13232	12-14466
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15-13453	15-13464	15-13494	15-13515	14-13245	14-14429	15-14429	16-14904
15-13551	15-13552	15-13560	15-13577	TESTING			
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CSANADY GT			18-12214	
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CULLEN TL			15-11836	
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15-13553			DOYLE EF	
DAHL AH			5-11914	
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DAITCH PB			15-12326	15-13252
6-13405			DRISCOLL MJ	
DALBY WD			6-13900	
4-14457			DRIVER GE	
DALEAS RS			9-12118	
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DALTON CP			15-13557	
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DANCEY ME			7-13677	
15-13209			DUBRIDGE RA	
DANIELSEN EF			9-10464	
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DANIEL RC			15-14435	
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DAVIES DK			15-11836	
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7-13571			DWYER OE	
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DAVIS RE			15-13452	
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DELLA ROSA RJ			16-14906	
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FAIRHALL AW				9-10507			
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2-14087				FREDERICK L			
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FARMER WS				15-13452			
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KUZNETSOVA NN				LEWELLEN JW			
15-13424				6-14414	6-14417	6-14418	9-14417
LACY PS				17-14414	17-14415	17-14416	17-14418
6-14414	6-14417	6-14418	9-14417	LEWIS H			
17-14414	17-14415	17-14416	17-14418	18-12108			
LAGERQUIST CR				LEWIS L			

1-10482	17-10482			MARCINKOWSKY AE			
LEWIS WB				7-13653			
7-13592				MARCUS AA			
LICHLITER JS				9-12132			
3-12709				MARCUS F			
LIEBERMAN P				13-13214			
5-06838	11-06838			MARGOLIS SG			
LINCOLN TA				5-10452	5-14448		
15-12395				MARKEE EH			
LINDEMANN J				15-13293			
15-13418				MARNET C			
LINDENMAYR G				18-12188			
15-13799				MARSHALL BW			
LINDSKOG A				4-14458			
14-12368				MARTIN JH			
LINK LE				15-13876			
18-12008				MARTIN PE			
LINTZ DO				1-12266	8-12266		
14-14472	15-14472			MARTIN TG			
LIST RJ				15-14483			
15-13262				MARTIN WE			
LITTLE WW				15-13289			
18-12007				MAS R			
LIU BY				15-13457			
15-13258				MASHBURN JC			
LOCKHART LB				15-14481			
14-13250	15-13272			MASON EA			
LOEWENSTEIN WB				5-11750			
18-12009	18-14413			MATHEWS ER			
LOMENICK TF				14-13520			
14-13433				MATZKE H			
LOMNITZ C				7-13588			
2-14095				MAWSON CA			
LONDEN SO				14-13300	15-13300		
17-12100				MAYBERRY BD			
LONG EL				14-13874	15-13874		
7-13638				MCCAMMON CP			
LONGHURST WM				15-12409			
14-12323	15-12323			MCCARTER R			
LOPEZ-MENCHERO E				12-14462	13-12387	13-14462	
13-13214	14-11741			MCCAULEY JE			
LOWDER WM				5-11906	14-14438	17-11906	
15-13256				MCCCLAIN WC			
LUKS H				3-12277	14-12277	14-12286	14-13433
2-13821	15-13821			MCCLELLAND RO			
LUMB RF				15-13491			
17-14916				MCCORMICK JF			
LYDAY RO				15-13369			
15-14423	15-14424			MCFADDEN PW			
LYNAM L				5-12380			
5-11906	17-11906			MCFERON DE			
MACEWAN JR				5-13699			
7-13586				MCGARR A			
MACEWANN JR				2-14396			
7-13591				MCGHAN VL			
MACHTA L				14-12398			
15-13262	15-13263			MCGOVERN JJ			
MACK RJ				17-13902			
15-13873				MCINTOSH AE			
MACKAY SD				7-11834	14-11834	15-11834	
17-13359				MCINTOSH JD			
MACPHEE J				13-12385			
17-14916				MCIVOR IK			
MADSHUS K				2-14107			
15-13297	15-13448	15-14439		MCKEON JT			
MAECK WJ				11-10460			
7-13720				MCNEES RA			
MAGNO PJ				9-12058			
15-13371				MCQUILKIN FR			
MAHAGIN DE				7-13638			
13-14371				MECHAM WJ			
MAHLMAN JD				3-12769	18-12008		
15-13270	15-13271			MEENAN P			
MALLET P				6-13869			
15-14428				MEHANN RO			
MALLETT AJ				17-13445	18-12211		
3-14470				MEIER RW			
MALSKAYA RV				1-08774			
15-13662				MEIERAN HB			
MALYSHEVA MS				5-11906	17-11906		
15-13557				MEINERT W			
MANN JR				18-12172			
15-11927	17-11927			MENEGHETTI D			
MANNESCHMIDT JF				18-12009			
14-13093	15-13093			MENON KK			
MANNHEIMER WA				15-13279			
11-13573				MERCER BW			
MANSINHA L				3-14468	14-12283		
2-14101				MERRETT DJ			
MARCHNKOWSKY AE				18-05804			
7-13652				MERRILL ET			

7-13480				14-14990	15-14990
MESTRE E				MORTON RJ	
14-13655				15-12409	
MEYER K				MOULOKHIA K	
6-09541				15-13623	
MEYER MW				MOYER CB	
15-13262				5-13696	
MICHALSKI Z				MUDRA PJ	
15-14490				14-12280	
MICHEL JW				MUHLBAIER DR	
9-12055				7-13478	
MIETTINEN JK				MULLER HW	
15-13619				18-12345	
MIHALCZO JT				MUMME IA	
6-11935	13-11935			15-14435	
MILLER A				MUNIAK SE	
14-13306				15-13273	15-13290
MILLER AJ				MUNNICH KO	
15-13264				15-13802	
MILLER CF				MURDTA K	
14-13245				3-12895	
MILLER D				MURPHY CH	
5-14453				16-14910	
MILLER DR				MURPHY PM	
9-10445				1-12030	18-12030
MILLER EC				MURPHY WP	
11-10459				18-12140	
MILLERS A				MURRAY CL	
15-13278				13-12391	
MILLIOT B				MURRAY HS	
5-09520				6-11512	
MIMIKOS N				MUSGRAVE B	
15-13417				15-13251	
MIN K				MUSIALOWICZ T	
5-14455				15-14490	
MINKLER JL				MYTTENAERE C	
15-13294				15-13606	
MINUSHKIN B				NAGAMOTO TT	
8-10242	17-10242			5-12379	
MINX RP				NAGASAKI R	
14-13725				7-13736	
MIRONOV UG				NARDI AJ	
15-13726				18-14409	
MISHIMA J				NARITOMI M	
7-13732				15-13760	
MISKEL JA				NASH WA	
14-13656	14-14474	15-13656	15-14474	11-13528	
MISSONI G				NAY U	
9-12315				14-13649	
MITCHELL DL				NEBGEN K	
13-14369				18-12186	
MITCHELL RI				NELSON CT	
7-10348				7-13907	
MIYANAGA I				NELSON RW	
15-13459				14-13604	
MIYAUCHI T				NELSON RY	
14-13425	14-13426			15-13275	
MOECK EU				NEWCOMBE CL	
5-12381				15-13766	15-14436
MOHINDRA VK				NEWELL RE	
14-13204	14-13205	14-13212	15-13204	15-13264	
15-13205	15-13211	15-13212		NEWTON CE	
MOLLER P				15-11928	17-11928
7-13723				NIAZI M	
MONTGOMERY DW				2-14099	2-14104
3-12882				NICHOLS RW	
MOODY FJ				11-10332	
5-10453				NICHOLSON RB	
MOORE EA				6-11519	6-11996
9-12130				NICKEL HC	
MOORE RL				10-10477	18-10476 18-10478
7-13542	7-13737	14-12292		NICUL RG	
MOREL PA				13-12389	
7-13591				NIELSEN A	
MORGAN JM				15-13418	
14-14479				NIELSEN JM	
MORISHIMA H				15-12394	15-13254
14-13765				NIETO JM	
MORISON WG				6-13406	
18-12104				NIJSING R	
MORRELL RP				5-14454	
6-13817				NIKULA JV	
MORRIS DA				15-13265	
15-13822				NIMS JB	
MORRIS PA				6-11519	6-11996
11-12179	18-12143	18-12150	18-12179	NISHI T	
18-12193	18-13240			15-13459	
MORRISON DL				NISHIWAKI Y	
5-13695	7-13583	7-13584	7-13695	14-13765	
8-13695				NORDMAN DA	
MORRISON GE				17-13353	

NORMENT HG					PARKER WJ				
15-14494					15-14473				
NOTLEY MJ					PARO JN				
7-13586					1-12333	19-12333			
NOVAK PE					PARSONS DE				
7-13571					15-14435				
NOWAK K					PASCERI RE				
9-11643					7-13680	15-13255			
O BOYLE MJ					PASHOS TJ				
17-11626					7-13475				
O NEIL GL					PASSY N				
18-12012					15-13419				
OAKES LC					PATTERSON RL				
9-12157					14-13250	15-13272			
OBATUROV GM					PAWLIW J				
15-11925					17-12098				
OBERHOFER M					PAXTON HW				
15-13561					11-13573				
OBERKLUS J					PAYNE BR				
18-12346					15-13282	15-13794	15-13803		
OBRIEN MJ					PEARCE DG				
15-13466					8-10413	18-05804			
ODQVIST FK					PEARCE DW				
11-13815					14-10243				
OKRENT D					PEARCY WG				
17-12151	18-12151				14-13220				
OKUBO A					PECCI J				
15-13514					15-12326	15-13252			
OLSON J					PECKINPAUGH CL				
15-13864					9-12130				
OLSON JS					PEISHEL FL				
15-13522					12-14462	13-12387	13-14462		
OLSON WR					PELLETIER CA				
17-11994					15-13286				
OLSZEWSKA I					PELZER N				
15-13508					1-12272				
ONGMANN HD					PENSKO J				
5-14919	18-14919				14-13596	14-13597	15-13596	15-13597	
OPHEL IL					PEPPER EW				
14-12362	15-11920	15-12362			15-13771				
ORBECK I					PEREZ RB				
9-11652					7-13593				
OREN OH					PERKINS EJ				
14-13875	15-13554	15-13875			15-13807				
OSBORN RK					PERKINS RW				
6-13406					15-12393	15-12394	15-13254	15-13455	
OSBORNE RV					PERRIGO LD				
15-13409	15-13772				12-12173	17-12173			
OSBURN WS					PERSIANI PJ				
14-13221					18-12016				
OSLOOND JH					PETER G				
14-13437					2-14397				
OSTERBERG C					PETERSEN DF				
15-13553					14-13650				
OSTERBERG CL					PETERSEN NJ				
14-13220					15-13368				
OSTLUND HG					PETRICK				
15-13800					5-14453				
OTT K					PETRICONE R				
6-13407					11-11642				
OVERSTREET R					PFLUKE JH				
14-14987	15-14987				2-14212				
OWEN FE					PHILIPP LD				
15-12392					9-11907	17-11907			
OZISIK MN					PHILLIPS HO				
7-13607					7-13652				
PAAKKOLA O					PHILLIPS KE				
15-13565				</					

15-13410					RICHARDS RB				
POLLOCK JS					18-12163				
15-12360					RICHEY EO				
POLSTER G					15-14486				
15-14980					RICHMOND CR				
POPENOE P					15-13758				
15-13515					RICKARD WH				
POPOV VV					14-13398				
2-14403					RILEY PJ				
POPTAL A					5-12378				
12-14372					RINEHART V				
PORTER CR					2-14103				
15-13771					RIPLING EJ				
POSTMA AK					11-13774				
7-13365					RITCHIE JB				
POSTON JW					15-14431				
6-11934	17-11934				RITZMAN RL				
POTTER RA					5-13695	7-13695	8-13695		
9-12058					RIVERA J				
PRADOS JW					14-13400	15-13287	15-13288	15-13400	
7-00552	7-13638				16-14907				
PRESCOTT NF					RIZNICHENKO YV				
18-12167					2-14390	2-14400	2-14401	2-14402	
PRESTON RG					2-14405	2-14406			
15-14289					ROBBINS DE				
PRICKETT WZ					4-12293				
18-14409					ROBERTS JT				
PRINCE RF					14-12275				
6-13594					ROBERTSON RC				
PROSPERO JM					18-12331				
15-13423					ROBERTSON RF				
PSHENNIKOV KB					17-11664				
2-14404					ROBINSON LE				
PUECHL KH					5-14917	6-14917	17-14917		
17-13447					ROBINSON MN				
PURPURA JA					9-12133				
14-14988					ROCCO GG				
PUTZIER EA					15-13639				
13-13898	15-11927	17-11927	17-13898		RODEAN HC				
RAAB GJ					14-14475	15-14475			
13-12385					RODGERS SJ				
RAB MOLLA MA					1-12252	8-12252			
15-13431					ROETHER W				
RABINOVICH YS					15-13802				
16-13330					ROGERS TG				
RADCLIFFE TJ					11-10391				
3-12800					ROHRMANN CA				
PAFFETY SJ					7-13480	14-13500			
6-11935	13-11935				ROM AM				
RAHE EP					13-13213				
17-14367					ROSENBERG GS				
RAICHLEN F					18-14413				
2-12176					ROSENBERG HS				
RAINES GE					7-13584	15-13319			
5-13704					ROSER FX				
RAJEWSKY B					15-13291				
14-13649	15-13863				ROTHER W				
RAMA					15-14489				
15-13798					ROUX DP				
RAMEY JT					9-12128				
1-12343					ROVINSKII FY				
RAMM EJ					14-12282				
7-13719					ROWE OS				
RAMOS E					5-13699				
15-13295					ROWE PC				
RANDALL MJ					15-11919				
2-14088	2-14096				ROWLANDS JL				
RANDLES J					6-11520	6-11995			
6-11511					ROWLANDS RP				
RASTOGI RC					12-14918				
14-14485					RUBIN B				
RATCLIFFE CA					5-11906	17-11906			
15-13343					RUBIN DF				
RAUSCH W					5-14412	17-14412			
18-12187					RUBIN HH				
RAYMOND JR					6-13870				
14-12398					RUDDER E				
REDFIELD JA					18-12213				
5-10452	5-14448				RUSSELL JA				
REEDY RK					9-12318	15-12318	17-12318		
6-11935	13-11935				RUSSELL JL				
KEEVE KD					17-14364				
7-13719					RUSSELL JT				
REIMER A					9-12118				
16-14901					RYAN JT				
REIN JE					14-12223	14-14493			
7-13720					RYDKII SG				
REISCH F					15-13424				
6-13373	9-13373				SADASIVAN S				
REITER ER					14-12278				
15-13270					SALMON RJ				

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SALT KJ				SHAMMON, A			
18-11912				15-13809			
SALTER LP				SHAMOV VP			
14-13266				15-13305			
SAMUELS ER				SHANNON RO			
14-13203	14-13204	14-13205	14-13212	15-13491			
15-13203	15-13204	15-13205	15-13211	SHANSTROM R			
15-13212				18-12014			
SAMUELS LD				SHAPIRO J			
15-13368				15-13767			
SANDERS JP				SHAPPERT LB			
5-13694				3-08717			
SARTOR JD				SHAW M			
14-13245				1-12353			
SASAKI S				SHEEN EM			
15-13450				15-13343			
SAUCIER WJ				SHERCIK JJ			
15-13275				14-12289			
SAUNDERS AW				SHELTON FH			
14-13250	15-13272			7-13718			
SAUVAGE M				SHERWOOD RJ			
11-10356	12-10356	18-10356		14-08813	15-08813		
SAVAGE HW				SHILLING AW			
8-12330				7-08820			
SAYEG JA				SHINOHARA Y			
15-12364				9-12084			
SCHAFFER WF				SHIPMAN TL			
3-12277	14-12277	14-12286		14-11922	15-11922		
SCHALLOPP B				SHIRES GL			
9-10467	9-10514			5-12378			
SCHEEL H				SHMIDT, OY			
14-14477	15-14477			2-14400	2-14401	2-14402	
SCHELL WR				SHOR AJ			
15-13268				7-13652	7-13653		
SCHENK K				SHORE ML			
9-11651				15-13763			
SCHLAPP FW				SHOTKIN LM			
3-14870	7-14870			5-13697			
SCHMALZ BL				SHTUKKENBERG YM			
14-12280	14-12287			15-13557			
SCHMIDT WC				SIEGEL O			
3-14468				15-13802			
SCHMITT RC				SIEKMANN J			
17-07725	18-07725			11-13528			
SCHREIBER B				SIEMASZKO A			
14-14492				14-14982			
SCHREIBER RE				SIKES PG			
18-03614				17-12169			
SCHROCK VE				SIMPSON CL			
5-11913	5-13391			15-13498	16-13498		
SCHUBACH K				SINGER RM			
15-13802				5-13702	8-13702		
SCHULTEN R				SINGER T			
18-12344				5-06836	11-06838		
SCHULTZ OG				SINGH RS			
6-11512				6-14757			
SCHULTZ NB				SISMAN O			
14-12288				7-13590			
SCHWEIGER F				SMIDT O			
18-12345				18-10318	18-12011		
SCHWENDIMAN LC				SMITH DC			
7-13312				6-11520	6-11995		
SCHWENKE TW				SMITH DR			
15-14494				3-10522			
SCIUTO F				SMITH EE			
9-10507				17-13353			
SCOTT JL				SMITH ER			
7-00552	7-13734			15-12197	17-12197	18-12197	
SCOTT LM				SMITH GH			
15-13411				14-13865			
SCOTT RF				SMITH HA			
2-14089				15-13796			
SCOTTEN WC				SMITH JA			
7-13481				6-14414	6-14417	6-14418	9-14417
SEDGLEY DB				15-12307	17-12307	17-14414	17-14415
15-13873				17-14416	17-14418		
SEGALL A				SMITH ME			
15-13767				16-14902			
SEHGAL JD				SMITH PD			
14-14485				7-13719			
SEHMEL GA				SMITH RD			
7-13308	7-13309	7-13310	7-13311	9-11644			
15-13872				SMITH RJ			
SEKORSKI JA				5-14852	17-14852	18-14852	
16-14356				SMITH RR			
SELLSCHOP JP				6-11519	6-11996		
15-13806				SMITH W			
SENOSKI WE				5-13707			
14-13725				SNOEBERGER D			
SERVANT JY				12-14466	13-14466		

SNYDER WS				5-11914		
15-12409	15-13757			SVOBODA CJ		
SOSKE PL				14-12283		
4-11514				SWAN AH		
SODAIN G				5-11750		
14-11635	15-11635			SWANSON CA		
SOULHIER R				15-13268		
7-13589				SWANSON NJ		
SOWER GW				1-10355	18-10355	
3-12880				SYTINSKIY AD		
SPAHR HR				2-14398		
4-14459				TADMOR J		
SPALLER AE				14-13370	15-13370	
3-14064				TAKAHASHI SK		
SPEAR WG				11-13483		
9-12118				TALBOY JH		
SPINRAD BI				5-11909	17-11909	
1-08774				TALLMAN CR		
SPLICHAL WF				9-12300		
15-13493				TAMPLIN AR		
SQUIER LA				14-11833	15-11833	15-13294
15-13259				TAMRAZIAN GP		
STAHFL EP				2-14399		
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STAHLMHOFEN W				15-13710		
14-13649	15-13863			TANOOKA H		
STANDING J				15-13459		
8-13742				TAURIT R		
STANLEY L				18-11406		
9-10464				TAYLOR R		
STAUB FW				7-11834	14-11834	15-11834
5-10429				TAYLOR RD		
STAUDER W				15-13507		
2-14105				TAYLOR WC		
STEELE H				18-12172		
18-12152				TEASDALE WE		
STEIN JM				15-13822		
18-12014				TERESI JO		
STEMPSON LJ				15-13766	15-14436	
16-14914				TERMAN AV		
STERN F				3-12957		
5-12381				TEVEBAUGH AD		
STEVENS DC				1-13317	8-13317	
15-14431				THAL MF		
STEVENSON CE				14-11921		
13-12390	13-14368	14-12284		THATCHER LL		
STEWART GL				15-13282	15-13803	
15-13805				THIE J		
STEWART HF				17-13359		
15-13284				THIE JA		
STEWART JC				6-11519	6-11996	
1-12264				THOMAS CW		
STEWART R				15-13254		
5-14917	6-14917	17-14917		THOMAS JT		
STIGALL GE				6-11935	13-11935	
15-13299				THOMAS KT		
STINCHCOMBE RA				14-13881	14-14485	
14-13566				THOMASIAN A		
STOHR KW				15-13265		
18-12145				THOMPSON IC		
STONE LR				9-12067		
3-12880				THOMPSON JC		
STRAUB CP				15-13298		
15-12409				THOMPSON JT		
STRAUSS SD				14-14479		
17-12102				THOMPSON R		
STRAWSON DG				15-13501		
18-12010				THOMPSON RC		
STRICKLAND G				15-13762		
14-12290	14-13434			THOMPSON TJ		
STPOFMMF A				6-13900		
15-13448				THORNTON EB		
STROMME A				14-14988		
15-13296	15-13297	15-14439		THURSTON RS		
STRUXNESS EG				5-13388		
14-13764	15-12409	15-13521		TIREN LI		
STUMKE H				17-12100		
16-14353				TOOLE CR		
STURMER W				17-07725	18-07725	
18-12345				TOUHILL CJ		
SUDDATH JC				14-12283		
14-12355	14-13810			TOUZET R		
SUMMACH AJ				15-13295		
17-12101				TRICE WG		
SUNDELL RE				18-12008		
5-13643				TRIPP LF		
SUNDERMAN DN				11-14467	12-14467	13-14467
15-13319				TSUNOKAWA M		
SUNTHAKALINGAM N				15-13450		
15-13414				TUGGLE KH		
SUD M				3-12970		

TUREKIAN KK				15-13455			
14-14985				WATT DE			
TURNBULL AH				15-14430			
12-08814				WEAVER LE			
TURNER FB				6-11512			
15-13292				WEBSTER JW			
TURNER JM				6-11935	13-11935		
5-10451				WEDLICK HI			
TURNER T				15-13286			
15-12366				WEED RD			
TUTHILL EJ				12-12173	17-12173		
14-12290	14-13434			WEEREN HO			
UNNEWEHR F				14-12276			
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UPSON UL				18-12008			
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VAN LINT JM				14-12291			
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VAN NESS HC				14-12290	14-13434		
5-13384				WHAPHAM AD			
VAN SANT JH				7-13587			
5-13389				WHICKER FW			
VANDE POEL M				14-12320	14-12322	15-12320	15-12322
14-12400				15-13754			
VANONI VA				WHIPPLE GH			
2-12176				15-13286			
VAPAAVUORI O				WHITBY KT			
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11-11846	17-11846			15-14481			
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VON DER DECKEN CB				WILLIS CA			
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WACHTELL GP				WILSON RE			
3-14407				8-10338			
WAGENER K				WINSCHER WE			
7-13723				7-13550	14-13550		
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15-11923	17-11923			18-11912			
WALKER DM				WIRTZ K			
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7-12219				18-12172		
ZARNOWIECKI K						

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