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NUCLEAR SAFETY

A BIMONTHLY REVIEW JOURNAL PREPARED BY NSIC

Nuclear Safety covers significant developments in the field of nuclear safety.

The scope is limited to topics relevant to the analysis and control of hazards associated with nuclear reactors, operations involving fissionable materials, and the products of nuclear fission.

Primary emphasis is on safety in reactor design, construction, and operation; however, safety considerations in reactor fuel fabrication, spent-fuel processing, nuclear waste disposal, handling of radioisotopes, and related operations are also treated.

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APRIL 1969

OAK RIDGE NATIONAL LABORATORY
OAK RIDGE, TENNESSEE
OPERATED BY
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FOR THE
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FOREWORD

THE INDEXED BIBLIOGRAPHY OF CURRENT NUCLEAR SAFETY LITERATURE IS PUBLISHED SIX TIMES ANNUALLY UNDER THE AUSPICES OF THE NUCLEAR SAFETY INFORMATION CENTER. THE CENTER WAS ESTABLISHED IN MARCH 1963 AT THE OAK RIDGE NATIONAL LABORATORY UNDER THE SPONSORSHIP OF THE U.S. ATOMIC ENERGY COMMISSION AND SERVES AS A FOCAL POINT FOR THE COLLECTION, STORAGE, EVALUATION, AND DISSEMINATION OF NUCLEAR SAFETY INFORMATION. THE CENTER'S EXTENSIVE REFERENCE FILES ARE STORED ON MAGNETIC TAPE AT THE OAK RIDGE COMPUTING TECHNOLOGY CENTER (CTC) AND ARE READILY AVAILABLE FOR USE BY THE NSIC STAFF IN GIVING GUIDANCE ON PROBLEMS THAT ARISE IN THE FIELD OF NUCLEAR SAFETY. THE PRODUCTION OF THIS BIBLIOGRAPHY WAS MADE POSSIBLE THROUGH IBM-7090 COMPUTER PROGRAMS DEVELOPED BY THE INFORMATION SYSTEMS DEPARTMENT OF CTC.

BIBLIOGRAPHIC ITEMS HAVE BEEN SORTED INTO 19 CATEGORIES OF NUCLEAR SAFETY INFORMATION. ITEMS MAY APPEAR IN AS MANY AS THREE CATEGORIES. A SELECTOR INDEX AND AN AUTHOR INDEX ARE PROVIDED FOR THE CONVENIENCE OF THE USER.

EACH BIBLIOGRAPHIC ITEM CONSISTS OF AUTHOR(S), TITLE, CORPORATE AUTHOR(S), NUMBER OF PAGES, TABLES, FIGURES, REFERENCES, DATE, DOCUMENT NUMBER(S), AVAILABILITY (IF NOT OBVIOUS), AN INFORMATIVE ABSTRACT OF LESS THAN 100 WORDS, AND SEVERAL SELECTOR TERMS. THE SELECTOR TERMS OR KEYWORDS ARE ASSIGNED BY NSIC PERSONNEL TO SERVE AS COORDINATE INDEXING TERMS FOR STORAGE AND FUTURE RETRIEVAL OF INFORMATION. THE MOST SIGNIFICANT SELECTOR TERMS FOR EACH BIBLIOGRAPHIC ENTRY ARE ASTERISKED AS WEIGHTING FACTORS. SELECTOR TERMS ARE INCLUDED WITH THIS BIBLIOGRAPHY SINCE THEY CAN, THROUGH THE SELECTOR INDEX, BE OF AID TO THE READER IN LOCATING ITEMS OF INTEREST. MANY READERS, HOWEVER, WILL PREFER TO SCAN THE CATEGORIES MOST RELATED TO THEIR FIELD OF INTEREST.

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A BASIC APPROACH IS OUTLINED FOR DEVELOPING ANALYTICAL PROCEDURES TO PREDICT VEHICLE-COLLISION BEHAVIOR. THE APPROACH IS TO IDEALIZE THE PHYSICAL SYSTEM BY A NONLINEAR, LUMPED-PARAMETER MATHEMATICAL MODEL, THEN TO SET UP THE EQUATIONS OF MOTION OF THE MODEL AND SOLVE THESE NUMERICALLY BY MEANS OF RUNGE-KUTTA PROPAGATION TECHNIQUES FOR INITIAL-VALUE PROBLEMS. AN ANALYSIS AND DIGITAL COMPUTER PROGRAM ARE PROVIDED FOR NUMERICAL EVALUATION OF SYSTEM RESPONSE FOR THE LONGITUDINAL COLLISION OF A TRACTOR SEMITRAILER CARRYING A CONTAINER FOR IRRADIATED FUEL. THE ANALYSIS GIVEN FOR THIS SPECIFIC CASE PRESUMES FOREKNOWLEDGE OF COLLISION INPUT FORCE AND OF THE FORCE/DISPLACEMENT CHARACTERISTICS OF DEFORMABLE ELEMENTS OF THE SYSTEM. IN ADDITION, ONLY LONGITUDINAL PORTION OF THE SYSTEM WAS CONSIDERED. MODIFICATIONS CAN BE MADE TO THE ANALYSIS IF FUTURE COLLISION-TEST RESULTS REQUIRE THEM.

ABSTRACT
OF ORIGINAL
DOCUMENT

• ACCIDENT ANALYSIS • • ACCIDENT, TRANSPORTATION + • ANALYTICAL MODEL • TRANSPORTATION AND HANDLING

—CORPORATE AUTHOR

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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, EARTHQUAKE CONSIDERATIONS, 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 LEAK 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

1-24694
JACCHIA E
NUCLEAR ENERGY AND SOCIAL ETHICS
EUROPEAN ATOMIC ENERGY COMMUNITY
EUR-2722.E +. 8 PAGES, MARCH 2, 1966, PAPER PRESENTED AT THE CONFERENCE MAN AND NUCLEAR ENERGY TOKYO, SEPTEMBER 11-26, 1965

THE PROBLEM OF RADIATION EFFECTS, AND PARTICULARLY OF GENETIC DAMAGE, IS ONE WHICH IS DIFFICULT TO EXPRESS IN QUANTITATIVE TERMS OR IN MATHEMATICAL FORMULAE, BUT FROM THE STANDPOINT OF SOCIAL ETHICS SUCH A QUESTION CANNOT REMAIN UNANSWERED EVEN IF THE ANSWER CANNOT BE IMMEDIATE OR CATEGORIAL. WE MUST MAKE EVERY EFFORT TO REDUCE AS FAR AS POSSIBLE THE DANGERS BOUND UP WITH RADIATIONS, WHILE CONTINUING TO EXPLOIT THEM AS A SOURCE OF THE IMMENSE BENEFITS WHICH CAN REDOUND TO OUR HEALTH AND MATERIAL WELL-BEING. THE TWO AIMS SEEM TO BE CONTRADICTORY. IN ACTUAL FACT THE TRUE AIM IS ONE AND THE SAME - TO ACHIEVE A JUDICIOUS BALANCE BETWEEN THE RISKS AND ADVANTAGES OF NUCLEAR ENERGY, THE USE OF WHICH MAN WOULD CERTAINLY NOT LIKE TO FOREGO.

*RADIATION EFFECT + *RADIATION IN PERSPECTIVE + EURATOM + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + RADIOBIOLOGY

1-25935 ALSO IN CATEGORIES 17 AND 5
MACPHERSON RE
FAST REACTOR SAFETY CONFERENCE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
8 PAGES, TABLE, REFERENCE, NUCLEAR SAFETY, 9(3), PAGES 202-209 (MAY-JUNE, 1968)

BRIEFLY SUMMARIZES THE SESSIONS COVERING (1) CORE MELTDOWN ACCIDENTS, (2) SODIUM BOILING AND SUPERHEATING, (3) INCIDENTS IN REACTORS, AND (4) SAFETY. MALFUNCTIONS IN THE BRS WERE (1) FUEL-ELEMENT LEAKS CAUSED BY HEATER SHORTING, PLUS AIR IN LEAKAGE CAUSING MASSIVE SODIUM OXIDE PLUGGING, AND (2) REACTIVITY PERTURBATIONS DUE TO ENTRAINMENT OF ARGON BY THE SODIUM STREAM. ***PLUGGING OF SUBASSEMBLIES BY OXIDE HAS BEEN DETECTED PRIMARILY BY THE EFFECT ON PRIMARY FLOW. A PANEL DISCUSSION SHOWED THAT ATTENTION IS SWITCHING FROM THE LARGE, LESS PROBABLE ACCIDENT TO THE SMALLER, MORE FREQUENT ACCIDENTS WHICH AFFECT PLANT USE.

*REACTOR, FAST + *SAFETY PRINCIPLES AND PHILOSOPHY + ACCIDENT ANALYSIS + ACCIDENT, MAXIMUM CREDIBLE (MCA) + COOLANT QUALITY + FLOW BLOCKAGE + INCIDENT, GENERAL + REACTOR, LMCR + REVIEW

1-26005 ALSO IN CATEGORY 17
FUEL CLADDING FAILURE
USAEC, DIVISION OF OPERATIONAL SAFETY
ROE 68-7 +. 2 PAGES, AEC BULLETIN, OPERATING EXPERIENCES, REACTOR SAFETY, MAY 27, 1968

ALUMINUM-CLAD, 168-G U235, FLAT-PLATE, ETR-TYPE ELEMENTS WERE NORMALLY USED TO 200,000 MWD/T. SPENT ELEMENTS WERE NORMALLY STORED IN CADMIUM-LINED HOLSTERS INSIDE THE REACTOR VESSEL. A CHANGE REQUIRED STORAGE IN THE STORAGE POOL, WITH ONLY FILTRATION FOR TREATMENT. A LOW-BURNUP ELEMENT (5 R AT CONTACT), EXAMINED BEFORE REPLACEMENT, HAD A BLISTER COMPLETELY THROUGH THE 0.015-IN. CLAD. ALTHOUGH CORROSION WAS NOTED ON ALL 11 ELEMENTS STORED (SOME FOR AS LONG AS 13 MONTHS) THIS WAS THE ONLY DEFECT.

USAEC, DIVISION OF OPERATIONAL SAFETY, WASHINGTON, D.C. 20545

*COOLANT QUALITY + *FAILURE, CLADDING + *FUEL STORAGE + ALUMINUM + COOLANT PURIFICATION SYSTEM + FAILURE, ADMINISTRATIVE CONTROL + REACTOR, AEC OWNED + REACTOR, RESEARCH

1-26413 ALSO IN CATEGORIES 7 AND 11
COTTRELL WB
NUCLEAR SAFETY PROGRAM ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1967
OAK RIDGE NATIONAL LABORATORY
ORNL-4228 +. 443 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1960

THE ORNL NUCLEAR SAFETY PROGRAM INVOLVES TASKS IN SEVERAL LABORATORY DIVISIONS AND IS CLOSELY RELATED TO PROGRAMS AT OTHER LABORATORIES. THIS REPORT IS ONE OF A CONTINUING SERIES STARTING WITH ORNL-3319 IN 1962. IT CONTAINS PROGRESS REPORTS ON VARIOUS ASPECTS OF CHARACTERIZATION AND BEHAVIOR OF ACCIDENT-RELEASES, FISSION PRODUCTS, FILTRATION AND ADSORPTION TECHNOLOGY, SPRAY AND ADSORPTION TECHNOLOGY, SAFETY STUDIES FOR HIGH-TEMPERATURE GAS-COOLED REACTORS, SAFETY STUDIES FOR MSBR, PRESSURE VESSEL AND PIPING TECHNOLOGY, GENERAL NUCLEAR SAFETY STUDIES, AND NUCLEAR SAFETY INFORMATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ADSORPTION + *FILTRATION + *FISSION PRODUCT RELEASE, GENERAL + *INFORMATION RETRIEVAL + *NSIC + *PIPING + *PRESSURE VESSEL + *REACTOR, BREEDER + *REACTOR, HTGR + *REACTOR, MOLTEN SALT + *SAFETY PROGRAM + *SPRAY, GENERAL

CATEGORY 1
GENERAL SAFETY CRITERIA

1-26515 ALSO IN CATEGORIES 17 AND 18
QUESTIONNAIRE ON PROPOSED WATER-REACTOR SAFETY SCHOOL
IDAHO OPERATIONS OFFICE, AEC
16 PAGES, LETTER FROM W. L. GINKEL, JULY 1, 1968

PROPOSED SCHOOL (AT NRTS, IDAHO) WOULD PROVIDE 9- TO 12-WEEK SESSIONS (RUNNING SUCCESSIVELY FOR FOUR YEARS) TO DISSEMINATE (WITH REDUCED TIME LAG) THE LATEST REACTOR-SAFETY TECHNOLOGY AND PHILOSOPHY TO INDUSTRY, UNIVERSITIES, AND GOVERNMENT. CURRICULUM COULD BE LIFTED ALMOST DIRECTLY FROM THE WATER-REACTOR ACCIDENT TREE AND WOULD INCLUDE BASIC PHENOMENA AND ANALYTICAL TECHNIQUES. SYLLABUS INCLUDES - BACKGROUND (6 HR), NATURE OF REACTOR SAFEGUARDS (24 HR), HISTORY OF ACCIDENTS (6 HR), REACTOR SAFEGUARDS (24 HR), REGULATORY AND R-AND-D FUNCTIONS (6 HR), ACCIDENT ANALYSIS (48 HR), QUALITY ASSURANCE (12 HR), CLASS PROJECTS (66 HR), AND SUMMATION SESSIONS (28 HR). TUITION - \$2000-\$4000.

AVAILABILITY - R. F. MAKEUS, EDUCATION OFFICER, USAEC, IDAHO OPERATIONS OFFICE, P. O. BOX 2109, IDAHO FALLS, IDAHO 83401

*SAFETY PROGRAM + *STAFFING, TRAINING, QUALIFICATION + NRTS + REACTOR, BWR + REACTOR, PWR + REACTOR, WATER

1-26558 ALSO IN CATEGORIES 7 AND 11
COTTRELL WB
ORNL NUCLEAR SAFETY RESEARCH AND DEVELOPMENT PROGRAM BIMONTHLY REPORT FOR MARCH-APRIL 1968
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2230 +. 164 PAGES, FIGURES, TABLES, MAY 30, 1968

INCLUDED IN THIS PROGRESS REPORT IS 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. ALTHOUGH MOST OF THE WORK HAS BEEN AND CONTINUES TO BE IN GENERAL SUPPORT OF WATER POWER-REACTOR TECHNOLOGY, INCLUDING SOME IN DIRECT SUPPORT OF THE LOFT AND CSE PROGRAMS, SEVERAL PROJECTS WERE STARTED THE FIRST OF THE CALENDAR YEAR IN SUPPORT OF THE HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGR) PROGRAM. THESE PROJECTS INCLUDE BOTH IN-PILE AND OUT-PILE STUDIES OF REACTION RATES AND FISSION PRODUCT RELEASE AND TRANSPORT PHENOMENA RELEVANT TO POTENTIAL HTGR ACCIDENT SITUATIONS. OTHER MAJOR PROJECTS INCLUDE FUEL TRANSPORT SAFETY INVESTIGATIONS, A SERIES OF DISCUSSION PAPERS ON VARIOUS ASPECTS OF SAFETY INVESTIGATIONS, A SERIES OF DISCUSSION PAPERS ON VARIOUS ASPECTS OF WATER REACTOR TECHNOLOGY, AND THE STUDIES ON PRESSURE VESSEL TECHNOLOGY. EXPERIMENTAL WORK RELATIVE TO PRESSURE VESSEL TECHNOLOGY INCLUDES INVESTIGATIONS OF THE ATTACHMENT OF NOZZLES TO SHELLS AND THE VARIABILITY OF IMPACT DATA ON LOW-ALLOY STEELS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*CHEMICAL KINETICS + *CONTAINMENT, GENERAL + *CSE + *FISSION PRODUCT RETENTION +
*FISSION PRODUCT TRANSPORT + *FISSION PRODUCT, AIRBORNE + *IMPACT PROPERTY + *IN PILE EXPERIMENT +
*LOFT (S-RR) + *NOZZLE + *OUT OF PILE LOOPS AND EXPERIMENTS + *STEEL + CONTAINMENT SPRAY +
FISSION PRODUCT RELEASE, GENERAL + PRESSURE VESSEL + REACTOR, HTGR

1-26743 ALSO IN CATEGORIES 17 AND 11
ELK RIVER TECHNICAL SUPPORT CONTRACT, REACTOR VESSEL LEAKS
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-57 +. 22 PAGES, 5 FIGURES, FEBRUARY, 1968, DOCKET NO. 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR SHUT DOWN ENTIRE MONTH BECAUSE RCPA AND AGC CONTRACTURAL NEGOTIATIONS WERE IN PROGRESS REGARDING THE TECHNICAL-SUPPORT SUBCONTRACTOR (TECHNICAL SPECIFICATIONS REQUIRE THERE BE ONE). ***REACTOR CAVITY WATER, WHICH HAD ACCUMULATED AT ABOUT 1 GAL/DAY IN THE LAST THREE MONTHS, ACCUMULATED AT ABOUT 250 ML/DAY, MAINLY DUE TO CONDENSATION. CAVITY DRAIN SAMPLES WERE MAINLY NA-24, BUT CAVITY VENT SAMPLES HAD LESS RB-88 THAN CONTAINMENT AIR.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*FAILURE, PRESSURE VESSEL + *LEAK RATE + *SAFETY REVIEW + ELK RIVER (BWR) + REACTOR, AEC OWNED +
REACTOR, BWR + REPORT, OPERATIONS + SAMPLING + TECHNICAL SPECIFICATIONS

1-27042 ALSO IN CATEGORY 19
NUCLEAR SAFETY INFORMATION
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4228 +. 58 PAGES, 5 FIGURES, 3 TABLES, 10 REFERENCES, PAGES 379-436 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT, DEALING WITH THE FOLLOWING - NUCLEAR SAFETY INFORMATION CENTER - ORGANIZATION AND SCOPE, COMPUTERIZED OPERATIONS, MEETINGS AND CONFERENCES, STATUS OF REVIEWS AND REPORTS, SUMMARY OF INFORMATION ACTIVITIES. COMPUTER HANDLING OF REACTOR DATA - SAFETY (CHORD-S) - INITIAL DEVELOPMENT OF COMPUTERIZED INFORMATION SYSTEM, PREPARATION OF REACTOR SAFETY INFORMATION FOR COMPUTER PROCESSING, COMPUTER OUTPUT OF REACTOR SAFETY DATA TO USERS OF INFORMATION SYSTEM. NUCLEAR SAFETY (A TECHNICAL PROGRESS REVIEW) - PUBLICATION SCHEDULE, FEATURE ARTICLES. BIBLIOGRAPHY. ORGANIZATION CHART.

CATEGORY 1
GENERAL SAFETY CRITERIA

1-27042 *CONTINUED*
*BIBLIOGRAPHY + *COMPUTER PROGRAM + *NSIC + *REVIEW + *SAFETY PRINCIPLES AND PHILOSOPHY + *SAFETY REVIEW +
ACCIDENT ANALYSIS + AEROSPACE SAFETY + FISSION PRODUCT TRANSPORT + INSTRUMENTATION, GENERAL +
METEOROLOGY + REACTOR TRANSIENT + SHIPPING ANALYSIS + SITING, GENERAL

1-27296 ALSO IN CATEGORY 18
BOLSA ISLAND PROJECT CANCELLED
SOUTHERN CALIFORNIA EDISON CO.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 2, (JULY 29, 1968)

AN OFFICIAL AEC STATEMENT SAYS THAT ALTERNATE PLANS FOR A NUCLEAR POWER AND DESALTING PLANT
FOR SOUTHERN CALIFORNIA ARE BEING EXAMINED BECAUSE ALL PARTICIPANTS AGREE THAT THE BOLSA
ISLAND PROJECT IS NOT ECONOMIC AT \$765 MILLION. PARTICIPANTS AGREED THAT CONCEPT SHOULD BE
CONTINUED AND WILL EXPLORE MEANS TO RECONSTITUTE IT ON A MORE ECONOMIC BASIS.

*ECONOMICS + BOLSA ISLAND + REACTOR, DESALINATION

1-27435 ALSO IN CATEGORY 17
SAFETY GUIDELINES FOR HIGH ENERGY ACCELERATOR FACILITIES
UNITED STATES ATOMIC ENERGY COMMISSION
TID-23992 +. 33 PAGES, 1967

FOR ORGANIZATION AND REVIEW OF SAFETY PROGRAMS IN ACCELERATOR LABORATORIES. TO BE CONSIDERED
BY MANAGEMENT IN DEVELOPING POLICIES AND STANDARDS. SECTIONS INCLUDE (I) MANAGEMENT SAFETY
GUIDELINES, 2 PG. (II) BUILDING AND FACILITY GUIDELINES, 4 PG. (III) EXPERIMENTAL
EQUIPMENT, 9 PG. (IV) OPERATING PROCEDURES, 17 PG. ***IN MOST CASES, ADVICE IS RENDERED IN
SHORT, SEPARATE ITEMS. (E.G., DESIGN AND TEST PRESSURES FOR ... SHOULD BE SPECIFIED.
PRESSURE GAGES ... IN PLACES WHERE SYSTEMS MAY BE ISOLATED BY VALVES).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ACCELERATOR + *SAFETY REVIEW + ADMINISTRATIVE CONTROL + DESIGN CRITERIA + OPERATING EXPERIENCE SUMMARY +
RADIATION SAFETY AND CONTROL + SAFETY PRINCIPLES AND PHILOSOPHY

1-27827 ALSO IN CATEGORIES 17 AND 11
MANUAL OF LECTURE NOTES - REACTOR SAFETY COURSE NO. 7
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY, WARRINGTON, LANCASHIRE
200 PAGES, FIGURES, TABLES, REFERENCES, SEPTEMBER 23, 1968

NINE SECTIONS. (I) INTRODUCTION, 5 LECTURES. (II) FISSION PRODUCT RELEASE, 5 LECTURES, (III)
CONTAINMENT ENGINEERING, 7 LECTURES. (IV) CONTROL AND INSTRUMENTATION, 7 LECTURES. (V) GAS
COOLED REACTORS, 11 LECTURES. (VI) WATER REACTORS, 12 LECTURES. (VII) GENERAL, 5 LECTURES.
(VIII) FAST REACTORS, 7 LECTURES. (IX) SITING AND EMERGENCY PROCEDURES, 4 LECTURES. NEW
LECTURES APPEAR TO BE (7) ASSESSMENT OF ENVIRONMENTAL HAZARDS FROM FISSION PRODUCT RELEASES.
(8A) FISSION PRODUCT BEHAVIOR IN LIQUID COOLED REACTORS. (10A) CONTAINMENT OF FISSION
PRODUCTS WITHIN FUEL ELEMENTS. (24A) METHODS AND PROBLEMS IN REACTOR ASSESSMENTS. (40)
PROBABILITY TECHNIQUES APPLIED TO WATER REACTORS.

AVAILABILITY - AUTHORITY HEALTH AND SAFETY BRANCH, U.K.A.E.A., 11 CHARLES II STREET, LONDON, S. W.1.

*SAFETY ANALYSIS + *SAFETY REVIEW + FISSION PRODUCT RETENTION + FUEL ELEMENT + PARTITION COEFFICIENT +
PROBABILITY + REACTOR, GCR + REACTOR, HTGR + REACTOR, LMFBR + REACTOR, WATER +
SAFETY PRINCIPLES AND PHILOSOPHY + UNITED KINGDOM

1-27836 ALSO IN CATEGORIES 18 AND 2
DEPT. OF INTERIOR SPEAKS ON THERMAL POLLUTION
DEPT. OF INTERIOR, WASHINGTON, D. C.
6 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(34), PAGE 1-6, (AUGUST 19, 1968)

J. I. BREGMAN (DEPUTY ASST. SEC. OF INTERIOR FOR WATER POLLUTION CONTROL) IN A KEYNOTE ADDRESS
AT A NATIONAL SYMPOSIUM ON THERMAL POLLUTION AT VANDERBILT U NOTED THE ELECTRIC POWER
INDUSTRY IS THE PRIMARY SOURCE OF THERMAL POLLUTION. CITED 4 SOLUTIONS (INCREASED EFFICIENCY
IN GENERATION AND DISSIPATION, DISPOSAL TO AIR, AND PRODUCTIVE USE) URGED USE OF WASTE HEAT
PRODUCTIVELY. URGED DEPT. OF INTERIOR CERTIFICATION OF A PLANT DISPOSAL MEANS AND LIMITS.

*THERMAL POLLUTION + REGULATION, GENERAL

1-27840 ALSO IN CATEGORIES 17 AND 18
EVEER TECHNICAL SPECIFICATION - SECTION IX - G OPERATIONAL PRINCIPLES AND REQUIREMENTS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
PAGE 37 OF AMENDMENT 11 (TECHNICAL SPECIFICATION) TO THE EVEER LICENSE APPLICATION JUNE 7, 1963, DOCKET
50-183

IF IT IS DISCOVERED THAT A SYSTEM IS INOPERABLE OR DOES NOT MEET ITS SPECIFIED CONDITIONS OF

CATEGORY 1
GENERAL SAFETY CRITERIA

1-27840 *CONTINUED*

OPERATION WHILE IN AN OPERATING MODE WHERE THE SYSTEM IS REQUIRED BY THESE TECHNICAL SPECIFICATIONS TO BE OPERABLE OR TO MEET PARTICULAR CONDITIONS OF OPERATION. IMMEDIATE STEPS WILL BE TAKEN TO CORRECT THE CONDITION PROMPTLY OR TO PLACE THE REACTOR IN A MODE FOR WHICH OPERABILITY OF THE PARTICULAR SYSTEM IS NOT REQUIRED. SUCH PERIODS OF OPERATION AS FALL UNDER THE REQUIREMENTS OF THIS PARAGRAPH WILL NOT BE CONSIDERED A VIOLATION OF THESE TECHNICAL SPECIFICATIONS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *TECHNICAL SPECIFICATIONS + EMERGENCY PROCEDURE + INCIDENT, EQUIPMENT + REACTOR, INTERNAL SUPERHEAT + REACTOR, POWER + REACTOR, RESEARCH + SAFETY PRINCIPLES AND PHILOSOPHY + VESR (ISR)

1-27841

ALSO IN CATEGORIES 18 AND 2

EASTON BWR PROJECT CANCELLED DUE TO THERMAL EFFECTS CRITERIA
NIAGARA MOHAWK POWER CORPORATION

1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(33), (AUGUST 12, 1968), DOCKET 50-300, TYPE--BWR, MFG--G.E.,
AE--STONE + WEBSTER

DIFFICULTIES AND DELAYS IN SECURING REGULATORY APPROVAL FOR THE EASTON SITE HAVE LEAD TO ITS CANCELLATION. DECISIVE FACTOR WAS CONTINUOUS SITUATION WHEREBY STATE HEALTH AGENCIES COULD NOT MAKE UP THEIR MIND AS TO THERMAL EFFECTS CRITERIA. NIAGARA MOHAWK WILL PARTICIPATE IN AN OIL FIRED PLANT READY IN LATE 1971. NY STATE POWER AUTHORITY WILL ASSUME THE CONTRACT, AND BUILD THE PLANT NEXT TO THE NINE MILE POINT PLANT, WITH NIAGARA MOHAWK TO OPERATE THE PLANT BEGINNING IN 1973.

*CONSTRUCTION PERMIT PROCESS + *REGULATION, STATE + *THERMAL POLLUTION + EASTON (BWR) + REACTOR, BWR + SITING, REACTOR + STATE PROGRAM

1-27856

ALSO IN CATEGORIES 17 AND 15

TRAINING MANUAL - MANAGEMENT OF RADIATION ACCIDENTS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

150 PAGES, FIGURES, TABLES, 39 REFERENCES, SEPTEMBER 12, 1966

A SET OF COURSE NOTES FOR 29 LECTURES IN THE GENERAL SUBJECT AREAS OF - I, RADIATION ACCIDENT CONTROL PLANNING AND RESPONSE (4). II, TYPES OF ACCIDENTS (5). III, RADIATION CONTAMINATION MONITORING (3). IV, EVALUATION AND CONTROL OF ACCIDENTAL EXPOSURE (7). V, NUCLEAR REACTOR HAZARDS (6). MEDICAL ASPECTS OF RADIATION ACCIDENTS (4). ***FOR USE IN A ONE WEEK COURSE PRESENTED BY NCRH.

AVAILABILITY - DIVISION OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND 20852

*STAFFING, TRAINING, QUALIFICATION + HEALTH PHYSICS TRAINING + RADIATION INJURY, TREATMENT OF + RADIATION SAFETY AND CONTROL + RADIOLOGICAL ASSISTANCE + SURVEY, RADIATION, EMERGENCY

1-27902

ALSO IN CATEGORIES 18 AND 17

RAMEY JT

THE PDQS OF NUCLEAR POWER PLANT LICENSING

ATOMIC ENERGY COMMISSION

37 PAGES, 14 REFERENCES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

REVIEWS HISTORY OF REGULATORY PROCESS, THEN CONCENTRATES ON (1) DEVELOPMENT OF MANAGEMENT KNOW-HOW, BY UPGRADING UTILITY PERSONNEL AND HIRING NEW GRADUATES. (2) THE AEC LICENSING PROCESS, TOO LITTLE PREPARATION BY UTILITIES IN A RACE TO GET THEIR PAPERWORK IN FIRST. (3) PUBLIC UNDERSTANDING OF NUCLEAR POWER, DISQUIETING RESULTS OF A FEW UTILITIES WHO DID NOT DO THEIR HOMEWORK WELL, SHOULD EXPECT OUTAGES DURING INITIAL OPERATION. (4) ENGINEERING STANDARDS AND QUALITY ASSURANCE. AMONG PROBLEMS MENTIONED WERE OPTIMUM CONSTRUCTION SCHEDULING, BACK FIT. APPENDIX A IS AEC PROGRAM FOR TRAINING UTILITY STAFF AND MANAGEMENT.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE, NEW YORK, N.Y. 10022

*CONSTRUCTION PERMIT PROCESS + *REACTOR, POWER + *STAFFING, TRAINING, QUALIFICATION + QUALITY CONTROL + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REGULATION, AEC

1-27904

ALSO IN CATEGORIES 18 AND 17

JOSLIN M

SOME OBSERVATIONS ON THE REGULATORY PROCESS

ATOMIC ENERGY COMMISSION

7 PAGES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

NEWS OF FAILURES ALERTS THE OTHER FELLOW TO PROFIT BY THE EXPERIENCE OF OTHERS. DISCUSSES EVOLUTION OF UTILITY-REGULATORY RELATIONS. AVOID DEPENDENCE ON SUPPLIER, UTILITY IS ALONE RESPONSIBLE TO AEC. DRESDEN 3 WAS GIVEN EXTENSIVE CORE COOLING SYSTEMS, WHICH COULD HAVE BEEN DONE AT LOWER COST IF THOUGHT OUT IN ADVANCE. URGES UTILITIES TO EDUCATE AEC ON SPECIAL FEATURES OF UTILITY ECONOMICS. NOTES NEED FOR UTILITIES OWN EXPERTS AND TOP MANAGEMENT INVOLVEMENT. CONSIDERS MOST SIGNIFICANT FOR UNBIASED COOPERATION.

CATEGORY 1
GENERAL SAFETY CRITERIA

1-27904 *CONTINUED*

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE., NEW YORK, N.Y. 10022

*OPERATING EXPERIENCE SUMMARY + *REGULATION, AEC + CODES AND STANDARDS + CORE SPRAY + DRESDEN 3 (BWR) + ECONOMICS + INFORMATION RETRIEVAL + STAFFING, TRAINING, QUALIFICATION

1-27987 ALSO IN CATEGORY 17

WORK EXPERIENCE PROGRAM

UNITED STATES ATOMIC ENERGY COMMISSION

6 PAGES, CHAPTER 7604 FROM THE AEC MANUAL, FEBRUARY 20, 1964

PROVIDES FOR SPECIALIZED WORK EXPERIENCE AT AEC OWNED FACILITIES BY NON-AEC PERSONNEL ENGAGED IN CIVILIAN APPLICATIONS OF ATOMIC ENERGY. OUTLINES AEC RESPONSIBILITIES (DIV. INDUSTRIAL PARTICIPATION, DIV. LABOR RELATIONS, FIELD OFFICES). ASSIGNMENTS INTENDED FOR THOSE ALREADY GENERALLY EDUCATED/TRAINED, NOT FOR BASIC INSTRUCTION OR EXPERIENCE, OR FOR THESIS WORK, OR FOR FACULTY OR FOREIGN NATIONALS, OR FOR TEMPORARY STAFF INCREASE OF CONTRACTORS. NO CHARGES. ***ANNEX A (AGREEMENT BETWEEN CONTRACTORS AND PARTICIPANTS). ALL EXPENSES PAID BY TRAINEES COMPANY, INCLUDING INDEMNIFICATION OF TRAINEES LIABILITY.

*STAFFING, TRAINING, QUALIFICATION + USAEC

1-27989 ALSO IN CATEGORIES 17 AND 18

NUCLEAR TRAINING PROGRAMS

BABCOCK AND WILCOX

TRG-68-68 +. 65 PAGES, 3 FIGURES, AUGUST 1968

DESCRIBES B AND W SERVICES AND FACILITIES AT THEIR LYNCHBURG, VA., TRAINING CENTER (CLASSROOMS, PWR SIMULATORS, POOL REACTOR). PROGRAMS AVAILABLE TO ALL UTILITY PERSONNEL INCLUDE, AT MANAGEMENT (2 DAY SEMINAR) AND STAFF LEVEL (48 LECTURE HOURS), PLANT OPERATION LEVEL 15 PHASES - THEORY 3 MO., PWR OBSERVATION 3 MO., PWR TECHNOLOGY 2 MO., PWR OPERATION AT POOL REACTOR AND SIMULATOR 3 MO., AND ON JOB TRAINING AT TECHNICAL STAFF PROGRAMS (I AND C FAMILIARIZATION, BAILEY 855 COMPUTER FAMILIARIZATION, WATER AND RADIOCHEMISTRY, MAINTENANCE, SIMULATOR SIMULATES 83 FAULTS. SUGGESTED PERSONNEL QUALIFICATIONS LISTED.

AVAILABILITY - BABCOCK AND WILCOX, NUCLEAR TRAINING CENTER, P.O. BOX 1260, LYNCHBURG, VA. 24505

*STAFFING, TRAINING, QUALIFICATION + REACTOR, PWR + SIMULATION

1-27991 ALSO IN CATEGORY 17

AEC SPECIAL FELLOWSHIPS IN NUCLEAR SCIENCE AND ENGINEERING

OAK RIDGE ASSOCIATED UNIVERSITIES

36 PAGES, SEPTEMBER 1966

DESCRIBES WHO MAY APPLY AND TYPE OF PROGRAMS, TENURE, CONDITION, FEES AND STIPENDS (6 PAGES). OTHER PAGES LIST 66 PARTICIPATING SCHOOLS, GIVING FELLOWSHIP ADVISOR, DEGREES OFFERED, AND AREAS OF EMPHASIS.

AVAILABILITY - OAK RIDGE ASSOCIATED UNIVERSITIES, OAK RIDGE, TENNESSEE

*STAFFING, TRAINING, QUALIFICATION + USAEC

1-27992 ALSO IN CATEGORY 17

ENGINEERING MANPOWER NEEDS OF THE INVESTOR OWNED ELECTRIC UTILITY INDUSTRY

EDISON ELECTRIC INSTITUTE

EEL-PUB-68-27 +. 52 PAGES, FIGURES, TABLES, FEBRUARY 1968

REPORT OF COMMITTEE FORMED IN 1966. RECOMMENDS (1) UTILITIES REINSPECT NEEDS, AS INDUSTRY UNDERESTIMATES NEEDS. IN 5 YEARS 15-20 PERCENT OF ENGINEERS HIRED WILL BE MS. (2) UTILITIES SHOULD REPORT 10-20 SCHOOLS OF EXCELLENCE. (3,4) BETTER COMMUNICATION AND SUPPORT OF SCHOOLS. (5,6) UTILIZE TECHNICIAN EMPLOYEES BETTER, AND RECRUIT HIGH SCHOOL GRADUATES. ***APPENDICES PROVIDE MANPOWER SURVEY, UNIVERSITY DEGREE PRODUCTION, AND AN ANALYSIS OF ONE UTILITIES NEEDS. ***UTILITY ESTIMATES ARE FOR 1100 ENGINEERS/YEAR AND 75 MS/YEAR (10 NUCLEAR POWER). COMMITTEE ESTIMATES ARE 2500-5000/YEAR (7-14 PERCENT OF CURRENT GRADUATE ENGINEER RATE), AND 40/YEAR MS NUCLEAR ENGINEERING.

AVAILABILITY - EDISON ELECTRIC INSTITUTE, 750 THIRD AVE., NEW YORK, N.Y. 10017

*STAFFING, TRAINING, QUALIFICATION + REACTOR, POWER

1-27996 ALSO IN CATEGORIES 17 AND 18

SCHUMAN SD

DESCRIPTION WESTINGHOUSE REACTOR OPERATOR TRAINING PROGRAM

WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.

WCAP-7170 +. 45 PAGES, FEBRUARY 1968

CATEGORY 1
GENERAL SAFETY CRITERIA

1-27996 *CONTINUED*

INTENDED FOR CONTRACTED PWR STAFF TRAINING. INCLUDES SELECTION HELP (APTITUDE TEST FOR 24 PERSONNEL, ADMINISTERED 6 MONTHS BEFORE START OF TRAINING RESULTING IN SELECTION OF 5 SUPERVISORS, 6 SHIFT SUPERVISORS, AND 10 OPERATORS). PHASE I (11 WEEKS BASIC LECTURE WITH POOL REACTOR OPERATION AT WREC), PHASE II (24 WEEKS SAXTON PWR OPERATING EXPERIENCE AND LICENSE EXAM), PHASE III (6 WEEKS LECTURE SERIES AT WAPD), PHASE IV (ONE YEAR ON-SITE TRAINING FOR OPERATOR LEVEL MATERIAL). LESSON OUTLINES GIVEN FOR EACH LECTURE.

AVAILABILITY - S. D. SCHUMAN, WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER DIVISION, PENN CENTER SITE, P. O. BOX 355, PITTSBURGH, PA. 15230

*STAFFING, TRAINING, QUALIFICATION + REACTOR, POWER + REACTOR, PWR + SAXTON (PWR)

1-27997 ALSO IN CATEGORIES 18 AND 17

COMMENTS FROM BRIEFING CONFERENCE ON NUCLEAR POWER, SEPT. 3-6, 1968
YANKEE ATOMIC ELECTRIC CO.

15 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(37), PAGE 8-11 AND 19-29, (SEPTEMBER 9, 1968)

(ROGER COE) - INNUMERABLE ECONOMIC FORECASTS BUT LITTLE HINDSIGHT INFORMATION. DISCUSSED YANKEE, CONN. YANKEE, AND HUMBOLDT BAY ECONOMICS. (JAMES T. RAMEY) - NOT LIKELY TO SEPARATE REGULATORY FUNCTION FROM AEC FOR AT LEAST 5 YEARS. EVOLUTION EXPECTED. (JOHN B. ANDERSON) - DETAILED DISCUSSION OF LEGISLATIVE BILLS ON SITING, THERMAL EFFECTS, SMALL UTILITY PARTICIPATION, PRACTICAL VALUE. (H. L. PRICE) - SUGGESTED APPROVING A NUCLEAR STEAM SUPPLY SYSTEM OUTSIDE THE CONSTRUCTION PERMIT PROCESS. (P. A. MORRIS) - CONSTRUCTION PERMIT TAKE 12.4 MONTHS BECAUSE OF 12 TECHNICAL AND 4 GENERAL ITEMS NOT SPECIFICALLY TREATED IN PSAR. (R. LOWENSTEM) - LICENSING DELAYS COST APPLICANT ONE MILLION \$/MONTH. HE ADVISES APPLICANT TO PLAN ON 18 MONTHS FOR A CONSTRUCTION PERMIT, ONE YEAR FOR OPERATING LICENSE AFTER FILING FSAR (WHICH TAKES 6 MONTHS TO PREPARE).

AEC QUESTION + CONGRESSIONAL ACTIVITY + CONSTRUCTION PERMIT PROCESS + ECONOMICS + OPERATING LICENSE PROCESS + REACTOR, POWER + REACTOR, WATER + REGULATION, AEC + REPORT, PSAR + REPORT, SAR + RESPONSE TIME

1-28003 ALSO IN CATEGORIES 17 AND 13

AEC PLANS REVISION OF RADIOISOTOPE LICENSING PROCEDURES

U.S. ATOMIC ENERGY COMMISSION

AEC PRESS RELEASE IN-866 +. 3 PAGES, APRIL 29, 1968

REVISIONS PROPOSED TO 10CFR33 WOULD BE ALONG LINES OF PRESENT BROAD LICENSES (TYPE A - INSTITUTIONS ALLOWED TO POSSESS LARGE MULTI-CURVE QUANTITIES. RADIOLOGICAL SAFETY OFFICER AND AN ISOTOPE SAFETY COMMITTEE REQUIRED.). ADDED WOULD BE TYPE B (INSTITUTION MAY POSSESS UP TO 10,000 TIMES THE QUANTITY WHICH 10CFR20 WOULD ALLOW TO BE INHALED BY ONE PERSON IN ONE YEAR, MUST HAVE A QUALIFIED RADIOLOGICAL SAFETY OFFICER AND ADMINISTRATIVE PROCEDURES FOR CONTROLLING USAGE) AND TYPE C (INDIVIDUAL USER MUST HAVE SCIENTIFIC BACKGROUND AND RADIATION PROTECTION TRAINING, MAY POSSESS UP TO 100 TIMES THE QUANTITY WHICH 10 CFR 20 WOULD ALLOW ONE PERSON TO INHALE IN ONE YEAR). ***COMMENT REQUESTED ON FEDERAL REGISTER PUBLICATION OF APRIL 30, 1968.

*RADIOISOTOPE + *REGULATION, AEC + APPLICATION FOR AEC LICENSE

1-28004 ALSO IN CATEGORIES 17 AND 13

HOW TO GET A LICENSE TO USE RADIOISOTOPES

U.S. ATOMIC ENERGY COMMISSION

35 PAGES, JULY 1967

BRIEFLY REVIEWS (FOR AN APPLICANT WITHOUT PRIOR KNOWLEDGE) THE OBJECTIVES AND REQUIREMENTS OF THE REGULATORY PROGRAM, PLUS THE SAFETY RESPONSIBILITIES OF THE USER. A STARTING POINT FOR FURTHER INFORMATION. ***REVIEWS RADIOISOTOPE LICENSING, STATE REGULATION, AEC SAFETY STANDARDS AND REGULATIONS, QUALIFYING FOR A SPECIFIC LICENSE, RESPONSIBILITY OF LICENSEES. APPENDICES INCLUDE RULES AND REGULATIONS, INSTRUCTION SHEETS, AND SAMPLE APPLICATION/LICENSE REFERENCES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

*RADIOISOTOPE + *REGULATION, AEC + APPLICATION FOR AEC LICENSE + GUIDE

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-25164 ALSO IN CATEGORY 5
BOWEN JH
PROGRESS IN THE U.K. ON THE SAFETY ASSESSMENT OF A.G.R., USING THE PROBABILITY METHOD
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY
10 PAGES, 6 REFERENCES, PRESENTED AT THE THIRD CREST MEETING, NOVEMBER 15-17, 1967, PARIS

THE ADVANCE TO URBAN SITING HAS BEEN ACCOMPLISHED BY THE DETERMINATION TO REFINE AND IMPROVE THE SAFETY CHARACTERISTICS OF THE AGR. THE MCA CONCEPT WOULD BE INAPPROPRIATE FOR THIS PURPOSE SO THE PROBABILISTIC METHOD OF SAFETY ASSESSMENT IS DISCUSSED (SEE ALSO NSIC 18210). THE ANALYSIS IS MADE BY ASSIGNING OR CALCULATING A PERCENTAGE RELEASE FOR A GIVEN FISSION-PRODUCT INVENTORY AND THUS DETERMINING THE EXPECTED PROBABILITY AND FREQUENCY OF SUCH A RELEASE.

AVAILABILITY - J. H. BOWEN, SAFEGUARDS DIVISION, UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY

ACCIDENT, PROBABILITY OF + CREST + REACTOR, GCR + SAFETY EVALUATION + SITING, REACTOR + SITING, URBAN + UNITED KINGDOM

2-25883 ALSO IN CATEGORIES 18 AND 16
BELL PSAR SECTION II, STATION SITE AND ENVIRONS
NEW YORK STATE ELECTRIC + GAS CORPORATION
100 PAGES, 17 FIGURES, 12 TABLES. PAGE II-1-1 THRU II-6-2. MARCH 1968. DOCKET 50-319.

INCLUDES PRELIMINARY (JAN. 68) REPORTS ON METEOROLOGY (B.E. DETHIER) AND LIMNOLOGY OF CAYUGA LAKE AND INTERRELATIONS WITH NUCLEAR POWER PLANT (J. F. STORR). ***NOCTURNAL DRAINAGE WIND FLOWS UP RIVER FROM ITHACA (13 MILES AWAY) TOWARD THE SITE. ON-SITE TOWER BEING INSTALLED. ***EXTENSIVE MIXING OF WATER EXPECTED. A SURVEY IS BEING MADE, BASED ON FOSSIL PLANT DISCHARGE. A HATCHERY FOR TROUT AND COHO SOLUTION IS PLANNED TO USE THE THERMAL ENRICHMENT PROVIDED BY CONDENSER DISCHARGE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*LAKE + *THERMAL POLLUTION + BELL (BWR) + DIFFUSION + ON SITE WORK + REACTOR, BWR + REPORT, PSAR + TOPOGRAPHY

2-26564 ALSO IN CATEGORY 17
COMMENTS ON THE PROPOSED NUCLEAR POWER PLANT ON THE HUDSON RIVER OPPOSITE THE SARATOGA NATIONAL HISTORICAL PARK, AS REQUESTED BY AEC LETTER MARCH 20, 1968.
DIVISION OF REACTOR LICENSING, AEC
8 PAGES, LETTER TO G. T. SEABORG, AEC. MAY 27, 1968. DOCKET 50-300. TYPE--BWR, MFG--G.E., AE--STONE + WEBSTER

REPORT CONCLUDES THAT MASS AND SCALE OF STRUCTURES WOULD HAVE A SIGNIFICANT ADVERSE VISUAL IMPACT AND WOULD MATERIALLY DETRACT FROM INTERPRETATION OF THE EVENTS EMBODIED BY THE PARK. REFERRING TO SECT. 106 OF NATIONAL HISTORICAL PRESERVATION ACT OF 1966 (REQUIRING AEC TO TAKE INTO ACCOUNT EFFECT ON NATIONAL-REGISTER PROPERTIES), COUNCIL CONCLUDES AEC SHOULD NOT ISSUE A CONSTRUCTION PERMIT UNLESS THERE IS NO FEASIBLE ALTERNATIVE SITE, AND THEN WITH ALL POSSIBLE PLANNING TO MINIMIZE ADVERSE (VISUAL) EFFECT. CRITERIA INCLUDED.

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

CONSTRUCTION PERMIT PROCESS + EASTON (BWR) + REACTOR, BWR + SITING, REACTOR

2 27299 ALSO IN CATEGORY 18
SEISMICITY OF VERMONT YANKEE
VERMONT YANKEE NUCLEAR POWER CORP.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 29 AND 30, (JULY 29, 1968), DOCKET 50-271, TYPE--BWR, MFG--G.E., AE--EBASCO

(LETTER, JULY 10) YOUR LETTER OF MAR. 8, 1968, HAS NOT CLEARED UP MY CONCERN REGARDING SEISMICITY OF VERMONT YANKEE, 4 MILES AWAY. YOUR EXPLANATION OF COMPATABILITY (BETWEEN NO VERIFIED RECORD OF SEISMIC ACTIVITY WITHIN 45 MILES, AND NO DEMONSTRABLE CONTROLS) IS A PLAY ON WORDS, A DISTINCTION WITHOUT A DIFFERENCE. IT MATTERS NOT WHERE CONTROLS MAY CONCENTRATE EFFECTS IF (AS HAPPENED IN MY HOME 4 MILES AWAY) AN EARTHQUAKE EFFECT IS VIOLENT ENOUGH TO CRACK WALLS AND CEILINGS AND TO CAUSE DOOR TO SPRING OPEN SUDDENLY FOR A LONG TIME THEREAFTER. WHAT PROGRESS HAS BEEN MADE ON PROVIDING AGRS WITH INTERIM GUIDELINES FOR REACTOR DESIGN AGAINST EARTHQUAKES.

*EARTHQUAKE ENGINEERING + AGRS + EARTHQUAKE RECORDS + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REACTOR, BWR + VERMONT YANKEE (BWR)

2-27615 ALSO IN CATEGORIES 18 AND 17
ACRS REPORT ON ZION 1 AND 2

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-27615 *CONTINUED*

U.S. ATOMIC ENERGY COMMISSION
8 PAGES, LETTER TO G.T. SEABORG (AEC PRESS RELEASE L-178), AUGUST 24, 1968, DOCKETS 50-295/304, TYPE--PWR,
MFG--WEST., AE--SGT + LUNDY

ZION IS LARGEST REACTOR TO DATE IN A RELATIVELY HIGH POPULATION DENSITY. REACTOR CAVITY FLOODING FOLLOWING A LONGITUDINAL SPLIT IN THE REACTOR VESSEL MAY BE INSTALLED FOLLOWING STUDY OF VESSEL FAILURE PROBABILITY FROM THERMAL SHOCK FOLLOWING CORE FLOODING ACTION. CONTROL AND SAFETY SIGNALS SHOULD BE INDEPENDENT. CONTAINMENT SPRAY SHOULD HAVE A FULL TEST. *** IN 3 PAGES OF REMARKS BY OKRENT, HE DISCUSSES VESSEL SPLIT PROBLEM. RECOMMENDS (FOR HIGH POPULATION DENSITIES) ADDITIONAL DESIGN CONSERVATISM AND QUALITY ASSURANCE, WELL DEFINED R AND O FOR SAFETY ISSUES NOT RESOLVED AT CONSTRUCTION PERMIT STAGE, EXTRA MARGIN IN ENGINEERED SAFETY FEATURES IN LIEU OF A DEMONSTRATION UNDER ACCIDENT CONDITIONS, AND MORE STUDY TO REDUCE PROBABILITY OF SMALL ACCIDENTAL RELEASES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, PRESSURE VESSEL + ACRS + CONTAINMENT SPRAY + CORE REFLOODING SYSTEM + REACTOR, PWR + REPORT, PSAR + REVIEW + SAFETY MARGIN + TEST, PREOPERATIONAL + TEST, PROOF + THERMAL MECHANICAL EFFECT + ZION 1 AND 2 (PWR)

2-27833 ALSO IN CATEGORIES 18 AND 16
BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2, PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME III
CAROLINA POWER + LIGHT COMPANY
275 PAGES, FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

FOUR APPENDICES - (A) GEOLOGICAL ANALYSIS, FOUNDATION ENGINEERING, SEISMIC DESIGN CRITERIA, SEISMIC DESIGN RESPONSE SPECTRA, PRELIMINARY MARINE BIOLOGY AND OCEANOGRAPHY, STORM TIDES, AND WILMINGTON 1959-63 WINDIF WIND DIFFUSION STUDY. THEN FOLLOWS THE USUAL - (B) JET PUMP DEVELOPMENT, (C) CORE SPRAY TEST PROGRAM, AND (D) COMPARATIVE EVALUATION WITH AEC DESIGN CRITERIA (A LISTING OF APPROPRIATE PSAR SECTIONS FOR EACH CRITERIA).

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

*AEC DESIGN CRITERIA + *EARTHQUAKE ENGINEERING + BRUNSWICK (BWR) + REACTOR, BWR + REPORT, PSAR

2-27836 ALSO IN CATEGORIES 18 AND 1
DEPT. OF INTERIOR SPEAKS ON THERMAL POLLUTION
DEPT. OF INTERIOR, WASHINGTON, D. C.
6 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(34), PAGE 1-6, (AUGUST 19, 1968)

J. I. BREGMAN (DEPUTY ASST. SEC. OF INTERIOR FOR WATER POLLUTION CONTROL) IN A KEYNOTE ADDRESS AT A NATIONAL SYMPOSIUM ON THERMAL POLLUTION AT VANDERBILT U NOTED THE ELECTRIC POWER INDUSTRY IS THE PRIMARY SOURCE OF THERMAL POLLUTION. CITED 4 SOLUTIONS (INCREASED EFFICIENCY IN GENERATION AND DISSIPATION, DISPOSAL TO AIR, AND PRODUCTIVE USE) URGED USE OF WASTE HEAT PRODUCTIVELY. URGED DEPT. OF INTERIOR CERTIFICATION OF A PLANT DISPOSAL MEANS AND LIMITS.

*THERMAL POLLUTION + REGULATION, GENERAL

2-27841 ALSO IN CATEGORIES 18 AND 1
EASTON BWR PROJECT CANCELLED DUE TO THERMAL EFFECTS CRITERIA
NIAGARA MOHAWK POWER CORPORATION
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(33), (AUGUST 12, 1968), DOCKET 50-300, TYPE--BWR, MFG--G.E.,
AE--STONE + WEBSTER

DIFFICULTIES AND DELAYS IN SECURING REGULATORY APPROVAL FOR THE EASTON SITE HAVE LEAD TO ITS CANCELLATION. DECISIVE FACTOR WAS CONTINUOUS SITUATION WHEREBY STATE HEALTH AGENCIES COULD NOT MAKE UP THEIR MIND AS TO THERMAL EFFECTS CRITERIA. NIAGARA MOHAWK WILL PARTICIPATE IN AN OIL FIRED PLANT READY IN LATE 1971. NY STATE POWER AUTHORITY WILL ASSUME THE CONTRACT, AND BUILD THE PLANT NEXT TO THE NINE MILE POINT PLANT, WITH NIAGARA MOHAWK TO OPERATE THE PLANT BEGINNING IN 1973.

*CONSTRUCTION PERMIT PROCESS + *REGULATION, STATE + *THERMAL POLLUTION + EASTON (BWR) + REACTOR, BWR + SITING, REACTOR + STATE PROGRAM

2-27975 ALSO IN CATEGORY 11
CURRENT STATUS AND FUTURE TECHNICAL AND ECONOMIC POTENTIAL OF LIGHT WATER REACTORS
JACKSON AND MORELAND, S. M. STROLLER ASSOCIATES
WASH-1082 +. 125 PAGES, FIGURE, TABLES, REFERENCES, MARCH 1968

THIS TASK-FORCE STUDY OF LIGHT-WATER REACTORS DISCUSSES (1) THE CURRENT AND FUTURE ECONOMIC POSITION OF BOILING AND PRESSURIZED WATER REACTORS (2) FUELS, FUEL MANAGEMENT, FUEL ECONOMICS, AND (3) REACTOR SITING. OF GREATEST SAFETY INTEREST IS THE SECTION ON NEUTRON PLANT SITING (SECTION 4). THIS SECTION DISCUSSES THE PROBLEM, THE NEED FOR GREATER FLEXIBILITY, ANTICIPATED DEVELOPMENTS, AND TRENDS IN SITING PRACTICES. THE ASPECTS OF FUTURE SITING TRENDS ARE DISCUSSED (GENERALLY) WITH REGARD TO THE USE OF ENGINEERED SAFETY FEATURES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-27975 *CONTINUED*
*CONTAINMENT, GENERAL + *ECONOMICS + *SITING, REACTOR + ENGINEERED SAFETY FEATURE + REACTOR, BWR +
REACTOR, POWER + REACTOR, PWR + REACTOR, WATER + REGULATION, AEC + SAFETY PRINCIPLES AND PHILOSOPHY

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-25973

KARANAGH MT + GUALTIERI G
TRANSPORTATION OF IRRADIATED FUEL FROM THE LATINA ELECTRONUCLEAR POWER PLANT
8 PAGES, 4 FIGURES, RIVISTA DI INGEGNERIA NUCLEARE, 3, PAGES 851-859 (SEPT.-DEC., 1965) IN ITALIAN

TRANSPORTATION OF THE FIRST IRRADIATED FUEL FROM THE LATINA ELECTRONUCLEAR POWER PLANT TO THE WINDSCALE PROCESSING PLANT IS DESCRIBED. THE DESIGN AND TESTING OF THE CONTAINER FOR IRRADIATED FUEL AND THE TECHNICAL CONSIDERATIONS IN THE TRANSPORTATION ARE DISCUSSED. THE TRUCKING, RAIL, AND SHIPPING MODIFICATIONS FOR THE TRANSPORTATION ARE INDICATED. EMERGENCY PRECAUTIONS ARE GIVEN.

FUEL REPROCESSING + ITALY + OPERATING EXPERIENCE + SHIPPING CONTAINER + TRANSPORTATION AND HANDLING

3-25974

FUEL CONTAINER FOR NUCLEAR REACTORS
BROWN, BOVERI AND CIE. - KRUPP ARBEITSGEMEINSCHAFT, GERMANY
BRITISH PATENT 1,082,706 +. 5 PAGES, 8 FIGURES, SEPTEMBER 13, 1967

A FUEL CONTAINER FOR FISSIONABLE NUCLEAR MATERIALS COMPRISES A SPHERICAL BODY OF MODERATOR MATERIAL, PARTICULARLY GRAPHITE, HAVING AN INNER HOLLOW OF ROUNDED SHAPE CONCENTRIC WITH THE OUTER SPHERICAL SURFACE OF THE BODY. A ROTATIONALLY SYMMETRICAL ROD OF MODERATOR MATERIAL IS DISPOSED IN THE HOLLOW TO FORM A RING-SHAPED ROTATIONALLY SYMMETRICAL INTERSPACE WITH THE BODY. THE ROD MAY BE SHAPED IN SUCH A MANNER AS TO COMPLETELY CLOSE OFF THE HOLLOW IN THE CONTAINER.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

PATENT + SHIPPING CONTAINER + UNITED KINGDOM

3-25975

VERTUT J + FRADIN J + RAGGENBASS A
DEVICE FOR LOADING AND UNLOADING FLASKS OF THE TYPE EMPLOYED FOR TRANSPORTING IRRADIATED MATERIALS
COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE
BRITISH PATENT 1,083,796 +. 7 PAGES, FIGURE, SEPTEMBER 20, 1967

A DEVICE USED IN LOADING AND UNLOADING FLASKS AT HOT CELLS IS DESCRIBED. THE FLASKS ARE USED IN TRANSPORTING IRRADIATED MATERIALS. THE FLASKS ARE PLACED ON A ROCKING SUPPORT WHICH MOVES THE FLASK FROM A VERTICAL TO HORIZONTAL OR HORIZONTAL TO VERTICAL POSITION. THE SUPPORT HAS AN EPICYCLIC MOTION PRODUCED BY THE ROLLING MOTION OF A TOOTHED SECTOR. THE SUPPORT RUNS ON A HORIZONTAL RACK CARRIED BY A STATIONARY, HEIGHT-ADJUSTABLE TABLE. A DEVICE FOR REMOVING THE FLASK PLUG AND A MEANS FOR FORMING A LEAK TIGHT SEAL ARE PROVIDED.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

PATENT + SHIPPING CONTAINER + UNITED KINGDOM

3-25976

TRANSPORT OF RADIOACTIVE MATERIALS BY INLAND WATER CRAFT
1 PAGE, PTB-MITTEILUNGEN 77, PAGE 225 (JUNE 1967) IN GERMAN

THE IAEA REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS, 1967 EDITION, CONTAINS IN PART D ADDITIONAL REQUIREMENTS RELATING TO DIFFERENT MODES OF TRANSPORT WITH THE EXCEPTION OF CARRIAGE BY INLAND WATER CRAFT. THE AUTHOR DRAWS ATTENTION TO TWO PROBLEMS RELATING TO CARRIAGE OF RADIOACTIVE MATERIALS BY INLAND WATER CRAFT - (1) RISK OF CONTAMINATION AFTER AN ACCIDENT IN WHICH LOW SPECIFIC ACTIVITY MATERIAL IS INVOLVED, (2) MAXIMUM PERMISSIBLE DOSE RATE ON BOARD INLAND WATER CRAFT.

CONTAMINATION + GERMANY + MAXIMUM PERMISSIBLE DOSE (MPD) + OCEAN AND SEA + REGULATION, IAEA

3-25977

BLECHSCHMIDT MG
THE PRESENT SITUATION OF THE OFFICIAL REGULATIONS FOR TRANSPORTS OF NUCLEAR FUEL
2 PAGES, PTB-MITTEILUNGEN 77, P. 151-152 (APRIL 1967) IN GERMAN

THE TECHNICAL REQUIREMENTS AND OFFICIAL REGULATIONS FOR APPROVALS ARE DISCUSSED. THE GERMAN COMPETENT AUTHORITY CONFORMS TO THE REGULATIONS OF THE IAEA REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIALS, 1967 EDITION. AT THE MOMENT, GERMAN ATOMIC LAW REQUIRES PERMISSION FOR EVERY SINGLE TRANSPORT. THIS MEANS THAT ALL TRANSPORTS MUST BE CARRIED OUT ON THE FISSION CLASS-III PREMISES. EXCEPTIONS ARE POSSIBLE IN LIMITED CIRCUMSTANCES. THE APPROVAL FOR THE SHIPMENTS ARE TO BE GIVEN TO THE CARRIER AND NOT TO THE CONSIGNOR. MOREOVER, THE REGULATIONS FOR SHIPMENTS BY RAIL, ROAD, SEA-GOING VESSELS, AND AIR ARE STATED CHANGES IN THE GERMAN ATOMIC LAW ARE EXPECTED.

GERMANY + LAW + REGULATION, IAEA + TRANSPORTATION AND HANDLING

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-26368 ALSO IN CATEGORIES 17 AND 15
FIRE CONSUMES TRUCK TRANSPORTING RADIOGRAPHY SOURCE
LANE-WELLS, HOUSTON, TEXAS
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM J.C. WILSON, AUGUST 29, 1966

A FIRE CONSUMED A TRUCK TRANSPORTING A 1-CURIE CESIUM SOURCE. WHEN THE FIRE WAS EXTINGUISHED, THE SOURCE WAS FOUND FLOATING ON THE MOLTEN LEAD FROM THE SHIELD. THE SOURCE WAS RETRIEVED, UNDamaged, AND PLACED ON A LID OF A TOOL BOX. WHILE WAITING FOR A RADIOLOGICAL ASSISTANCE TEAM CALLED BY A HIGHWAY PATROLMAN ON THE SCENE, THE PATROLMAN PICKED UP THE SOURCE AND HELD IT FOR 1 MIN. HE RECEIVED A DOSE OF 100 MILLIREMS WHOLE BODY AND 10 REMS TO HANDS. OTHER EXPOSURES WERE MINIMAL.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FIRE + *RADIOGRAPHY + *TRANSPORTATION AND HANDLING + INCIDENT, NONREACTOR +
PERSONNEL EXPOSURE, RADIATION + SOURCE, RADIATION

3-26742 ALSO IN CATEGORIES 17 AND 11
ERR COLD HYDROTEST AT 240 PSIG.
RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINNESOTA
COD-651-60 +. 25 PAGES, 3 FIGURES, 4 TABLES, RURAL COOPERATIVE POWER ASSOCIATION'S ELK RIVER REACTOR SIXTY-SEVENTH MONTHLY OPERATING REPORT, MAY, 1968 DOCKET NO. 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR HAS NOT OPERATED SINCE JANUARY. A 240-PSIG COLD HYDROTEST WITH SR-85 DISPERSED IN THE PRIMARY SYSTEM WAS TERMINATED AFTER 7 DAYS, WITH NO SR-85 FOUND IN CAVITY WATER. RUPTURE DISK RUPTURE ON FUEL SHIPPING CASK WAS TRACED TO ALCONOX SOLUTION USED IN DECONTAMINATION AT SRL. APPENDIX A -DESCRIBES 240-PSIG HYDROTEST AND RESULTS. APPENDIX B -PROCEDURE FOR 1000-PSIG HYDROTEST AT 300 F, USING SR-85 AND RB-86.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C. (\$0.25 CENTS/PAGE)

*MAIN COOLING SYSTEM + *TEST, PROOF + CORROSION + DECONTAMINATION + ELK RIVER (BWR) + FAILURE, EQUIPMENT + FAILURE, PRESSURE VESSEL + PRESSURE RELIEF + PRESSURE VESSEL + PRESSURE, INTERNAL + PROCEDURES AND MANUALS + REACTOR, AEC OWNED + REACTOR, BWR + REPORT, OPERATIONS + RUBIDIUM + SHIPPING CONTAINER + STRONTIUM + TRACER, RADIOACTIVE

3-27041
GENERAL NUCLEAR SAFETY STUDIES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4228 +. 33 PAGES, 5 FIGURES, 7 REFERENCES, PAGES 347-379 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT, DEALING WITH - FUEL TRANSPORT SAFETY STUDIES - STRUCTURAL DESIGN AND PHILOSOPHY, HEAT TRANSFER, CRITICALITY, SHIELDING, AEC CONSULTING WORK. HTGP SAFETY PROGRAM OFFICE - HIGH-TEMPERATURE PHYSICS, FISSION-PRODUCT TRANSPORT AND COOLANT CHEMISTRY. FUTURE TOPICAL EVALUATIONS. SUPPLEMENTARY ACTIVITIES. DISCUSSION PAPERS ON VARIOUS ASPECTS OF WATER-COOLED REACTOR SAFETY. ROT REACTOR STANDARDS - PROGRAM ORGANIZATION, STANDARDS PREPARATION, SPECIAL STUDIES, LIST OF STANDARDS ISSUED. ANTISEISMIC DESIGN OF NUCLEAR FACILITIES - CONCEPTUAL ANTISEISMIC DESIGN STUDIES, MODEL STUDIES, GENERAL STUDIES.

*CRITICALITY SAFETY + *DESIGN CRITERIA + *EARTHQUAKE, GENERAL + *FUEL HANDLING + *REACTOR, WATER + *SAFETY PRINCIPLES AND PHILOSOPHY + *SAFETY REVIEW + *SHIELDING + *SHIPPING ANALYSIS + *SHIPPING CONTAINER + ANALYTICAL MODEL + COOLANT CHEMISTRY + DECAY HEAT + FISSION PRODUCT TRANSPORT + FUEL STORAGE + HIGH TEMPERATURE + THERMAL PROPERTY

3-27424
BACKS H + GODIN D + MAULARD J + RIVET C
GRABS FOR HANDLING NUCLEAR FUEL ELEMENTS
COMMISSARIAT A L'ENERGIE ATOMIQUE, FRANCE
BRITISH PATENT 1,088,969 +. 4 PAGES, 4 FIGURES, OCTOBER 25, 1967

THE DESIGN FOR A GRAB FOR HANDLING REACTOR FUEL ELEMENTS IS PRESENTED. THE GRAB IS COMPRISED OF A CYLINDRICAL BODY WITH AN ELECTRICAL MOTOR AND SCREW-NUT SYSTEM FOR TRANSLATIONAL MOVEMENT. THE GRAB MECHANISM IS LOCATED ON A STATIONARY GRID ABOVE THE REACTOR CORE.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

FUEL HANDLING MACHINE + PATENT + REFUELING + UNITED KINGDOM

3-27425
DELISLE JP
APPARATUS FOR HANDLING THE FUEL ELEMENTS IN A NUCLEAR REACTOR
COMMISSARIAT A L'ENERGIE ATOMIQUE, FRANCE
BRITISH PATENT 1,089,559 +. 4 PAGES, 1 FIGURE, NOVEMBER 1, 1967

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-27425 *CONTINUED*

THE DESIGN OF A FUEL HANDLING APPARATUS FOR SODIUM-COOLED REACTORS IS PRESENTED. THE FUEL HANDLING APPARATUS HAS AN ARM CONNECTED BY A HORIZONTAL PIVOT PIN TO A VERTICAL SUPPORT COLUMN WHICH ROTATES ABOUT ITS AXIS IN A PLUG MOUNTED IN THE REACTOR COVER. A SECOND ARM PIVOTED TO THE FREE END OF THE FIRST ARM HAS A FUEL-ELEMENT GRAB PIVOTED TO THE SECOND ARM FREE END.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

FUEL HANDLING MACHINE + PATENT + REACTOR, FAST + SODIUM + UNITED KINGDOM

3-27426

KARTTUNEN JO

A TECHNIQUE FOR HANDLING HIGHLY RADIOACTIVE OR TOXIC MATERIALS FOR X-RAY FLUORESCENCE ANALYSIS ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
2 PAGES, 1 TABLE, 4 REFERENCES, CHEMIST-ANALYST, 56, PAGES 33-34 (JANUARY 1967)

A TECHNIQUE FOR HANDLING THE PLACEMENT OF THE DISSOLVED RADIOACTIVE MATERIAL WITHIN A GLASS CELL AND THEN WITHIN A NYLON-FILM POUCH IS DISCUSSED. THIS NYLON ENVELOPE DOES NOT INTERFERE IN THE ALIGNMENT OF THE CELL, AND IN EVENT OF RUPTURE THE SAMPLE IS STILL RETAINED. THIS METHOD IS CONTRASTED TO OTHER HANDLING METHODS COMMONLY EMPLOYED, AND ADVANTAGES ARE GIVEN.

PLUTONIUM + TRACER, FLUORESCENT + X-RAY

3-27427

NELMS HA

STRUCTURAL ANALYSIS OF SHIPPING CASKS VOL. 3. EFFECTS OF JACKET PHYSICAL PROPERTIES AND CURVATURE ON PUNCTURE RESISTANCE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1312 +. 84 PAGES, 23 FIGURES, 7 TABLES, 13 REFERENCES, VOL. 3, JUNE 1968

AN EXPERIMENTAL INVESTIGATION WAS MADE OF THE PUNCTURE RESISTANCE OF LEAD-SHIELDED STEEL-JACKETED SHIPPING CASKS, AND THE RESULTS ARE REPORTED. THIS INVESTIGATION WAS CONCENTRATED UPON DETERMINING THE EFFECTS OF THE MATERIAL PROPERTIES AND THE CURVATURE OF THE CASK JACKET UPON PUNCTURE RESISTANCE. AN EMPIRICAL EQUATION FOR PRISMATIC CASKS WAS DEVELOPED TO RELATE THE THICKNESS OF THE JACKET MATERIAL NECESSARY TO RESIST PUNCTURE TO THE ULTIMATE TENSILE STRENGTH OF THE JACKET MATERIAL AND THE WEIGHT OF THE CASK. THE EQUATION DEVELOPED WAS THEN COMPARED WITH DATA PREVIOUSLY OBTAINED FROM TESTS WITH A PROTOTYPE CASK. A PROCEDURE FOR SELECTING THE JACKET THICKNESSES OF CYLINDRICAL CASKS WAS ALSO OUTLINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*IMPACT SHOCK + *SHIPPING CONTAINER + *TEST, DROP + IMPACT PROPERTY + STRUCTURAL INTEGRITY

3-27877

ALSO IN CATEGORIES 13 AND 12

FINNEY BC + LOWRIE RS + WATSON CD

A CONCEPTUAL DESIGN AND A COST ESTIMATE OF AN ON-SITE FACILITY FOR CLEANING, DISASSEMBLING, AND CANNING SHORT-COOLED LMFBR FUEL IN PREPARATION FOR SHIPMENT TO A CENTRAL REPROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2050 +. 29 PAGES, 3 FIGURES, 4 TABLES, 9 REFERENCES, MAY 1968

THIS REPORT PRESENTS A CONCEPTUAL DESIGN AND A PRELIMINARY COST ESTIMATE FOR A FUEL PRESHIPMENT PREPARATION FACILITY THAT WOULD BE LOCATED AT A 1000-MW (ELECTRICAL) SODIUM-COOLED FAST-BREEDER-REACTOR STATION. THIS FACILITY WOULD PROVIDE MEANS FOR CLEANING, DISASSEMBLING, SORTING (SEPARATING BEEB RODS FROM FUEL RODS), CANNING, AND LOADING SPEND FUEL RODS (INTO CASKS) PRIOR TO SHIPMENT TO A CENTRAL REPROCESSING PLANT. THE FUEL WOULD BE ALLOWED TO COOL 10 TO 25 DAYS BEFORE THE START OF THESE OPERATIONS. THE FACILITY WOULD CONSIST OF A SODIUM REMOVAL AREA, A SPENT-FUEL STORAGE POOL, A MECHANICAL CELL CONTAINING EQUIPMENT FOR DISASSEMBLING FUEL ELEMENTS, AND A POOL IN WHICH FUEL CANS COULD BE STORED AND CASKS WOULD BE LOADED. A PRELIMINARY ESTIMATE GIVES \$5 MILLION IN CAPITAL COST AN ANNUAL OPERATING COST OF \$1 MILLION. CONCLUSION - SUCH A FACILITY WOULD BE PROHIBITIVE FOR A SINGLE REACTOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DESIGN STUDY + *FUEL HANDLING + *FUEL STORAGE + *REACTOR, GENERAL + REACTOR, BREEDER + REACTOR, FAST

CATEGORY 4
AEROSPACE SAFETY

4-27027
WALKER JAJ + FRANCE ED
DETERMINATION OF CARBONATE IN SODIUM
UKAEA, CULHETHCH, ENGLAND
TRG-REPORT 1635 +. 12 PAGES, 4 FIGURES, 4 TABLES, 8 REFERENCES, 1968

A METHOD IS DESCRIBED FOR THE DETERMINATION OF SODIUM CARBONATE IN SODIUM IN THE RANGE 7-150 PPM WITH A STANDARD DEVIATION OF NOT GREATER THAN 1-5 PPM. THE PRINCIPLE OF THE METHOD INVOLVES THE REMOVAL OF SODIUM BY DISTILLATION AND THE CONDUCTOMETRIC DETERMINATION OF THE CARBON DIOXIDE EVOLVED AFTER ACIDIFICATION OF THE DISTILLATION RESIDUE. IT IS SHOWN THAT WHEN A MAXIMUM DISTILLATION TEMPERATURE OF 350 C IS USED, THE DECOMPOSITION OF SODIUM CARBONATE IN NICKEL CRUCIBLES IS NEGLIGIBLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL TECHNIQUE, CALIBRATION + *CARBON + *METAL, LIQUID + *SODIUM + CARBON DIOXIDE +
DECONTAMINATION + REACTOR, LMCR

4-27028 ALSO IN CATEGORY 7
EICHEBERGER RL + MCKISSON RL
SOLUBILITY OF COPPER IN SODIUM
ATOMICS INTERNATIONAL
AI-AEC-12671 +. 22 PAGES, 8 FIGURES, 3 TABLES, 4 REFERENCES, MAY, 1968

THE SOLUBILITY OF COPPER IN SODIUM HAS BEEN STUDIED IN THE TEMPERATURE RANGE OF 250 TO 726 C, USING A VERY HIGH PURITY SODIUM AND OXYGEN FREE HIGH CONDUCTIVITY COPPER. A CAPSULE WAS USED, WITH THE SODIUM EXPOSED ONLY TO HIGH VACUUM. CHEMICAL ANALYSIS WAS PERFORMED USING COLORIMETRY AND ATOMIC ABSORPTION SPECTROMETRY. RESULTS OF THE 21 EXPERIMENTS REPORTED BETWEEN 350 AND 726 C WERE COMBINED WITH THOSE FROM TWO OTHER STUDIES TO GIVE AN EXPRESSION BASED ON 39 DATA POINTS AND COVERING THE TEMPERATURE RANGE OF 245 TO 726 C.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL TECHNIQUE, CALIBRATION + *COPPER + *METAL, LIQUID + *SODIUM + PROPERTY, PHYSICAL +
REACTOR, LMCR

4-27029 ALSO IN CATEGORY 7
MOREWITZ HA + KOONTZ RL + NELSON CT + GREENFIELD MA + HAUSKNECHT OF
SODIUM BURNING, AEROSOL GENERATION, AND CONTROL OF FISSION PRODUCT RELEASE DURING AN ACCIDENT PART II.
AEROSOL GENERATION AND CONTROL OF FISSION PRODUCT RELEASE
ATOMICS INTERNATIONAL +
29 PAGES, 16 FIGURES, TABLE, 4 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR
REACTORS, SEPTEMBER, 1967

RESULTS ARE PRESENTED FOR WORK IN PROGRESS AT ATOMICS INTERNATIONAL TO DEVELOP EXPERIMENTAL INFORMATION AND ANALYTICAL METHODS WHICH CHARACTERIZE THE RELEASE AND TRANSPORT OF EFFLUENTS GENERATED DURING A SODIUM FIRE IN AN LMFBR. DATA ARE PRESENTED FROM EXPERIMENTS WHICH DESCRIBE THE TIME-HISTORY OF PARTICLE SIZE AND MASS DISTRIBUTION OF AEROSOLS GENERATED DURING SODIUM FIRES. EXPERIMENTAL OBSERVATIONS ARE MADE TO STUDY AEROSOL DEPLETION RESULTING FROM AGGLOMERATION, FALLOUT, AND WALL PLATING MECHANISMS. PREDICTION OF SODIUM OXIDE AEROSOL BEHAVIOR USING A THEORETICAL MODEL IS IN AGREEMENT WITH EXPERIMENTAL OBSERVATIONS IN THE LABORATORY. THE INTERACTION OF THE DOMINANT AEROSOL SPECIES, SODIUM OXIDE, WITH FUEL AND FISSION PRODUCT AEROSOLS IS ALSO DESCRIBED.

AVAILABILITY - H.A. MOREWITZ, P.O. BOX 309, CANOGA PARK, CALIFORNIA

*AEROSOL PRODUCTION + *AEROSOL PROPERTIES + *ANALYTICAL MODEL + *FIRE + *METAL, LIQUID + *OXIDE +
*REACTOR, LMCR + *SODIUM + AGGLOMERATE + DEPOSITION + FALLOUT + FISSION PRODUCT TRANSPORT

4-27030 ALSO IN CATEGORY 7
MACPHERSON RE
SODIUM BURNING AND AEROSOL RELEASE - AN EVALUATION OF THE STATE OF THE ART
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1937 +. 33 PAGES, 26 REFERENCES, MAY 6, 1968

IN A SODIUM-COOLED REACTOR, THE POSSIBILITY OF SODIUM FIRES AND THE RESULTANT RELEASE OF AEROSOLS STRONGLY INFLUENCE CONTAINMENT VESSEL DESIGN AND OPERATING SAFETY. QUALITATIVE INVESTIGATIONS OF SODIUM POOL FIRES AND SPRAY FIRES HAVE BEEN CARRIED OUT IN CONJUNCTION WITH EACH MAJOR SODIUM-COOLED REACTOR PROJECT. RECENTLY, MORE QUANTITATIVE STUDIES WERE UNDERTAKEN IN THESE AREAS, AND THE PROBLEM OF EXPLOSIVE INJECTION OF SODIUM SPRAYS INTO CONTAINMENT VOLUMES WAS INVESTIGATED. WORK IS ALSO UNDER WAY TO CHARACTERIZE AEROSOLS RELEASED FROM SODIUM FIRES AND TO DEFINE THEIR PERFORMANCE IN THE CONTAINMENT VOLUME. THIS DOCUMENT BRIEFLY SUMMARIZES THE WORK TO DATE ON SODIUM FIRES AND AEROSOL RELEASE, REVIEWS THE SCOPE OF CURRENT PROGRAMS, AND THEN PROPOSES ADDITIONAL EFFORT TO PROVIDE SAFETY CRITERIA FOR LIQUID-METAL-COOLED FAST-REACTOR DESIGN.

CATEGORY 4
AEROSPACE SAFETY

4-27030 *CONTINUED*
 AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
 \$3.00 COPY, \$0.65 MICROFICHE

*FIRE + *METAL, LIQUID + *REACTOR, LMCR + AEROSOL PRODUCTION + AEROSOL PROPERTIES + OXIDE + SAFETY REVIEW + SODIUM

4-27031 ALSO IN CATEGORY 7
 GORLAND S + BILSKI R
 CONTROL OF CONTAMINANTS IN LIQUID-METAL SYSTEMS
 NASA, LEWIS RESEARCH CENTER
 NASA-TM-X-1432 +. 9 PAGES, 7 FIGURES, TABLE, 10 REFERENCES, DECEMBER, 1967

THE CONTAMINANT CONTROLS AND CLEANING PROCEDURES USED IN THE SNAP-8 SIMULATION LOOP, CONSISTING OF TWO SODIUM-POTASSIUM (NAK) LOOPS AND ONE MERCURY LOOP, MINIMIZED BOTH STARTUP AND OPERATIONAL PROBLEMS. MERCURY WETTING WAS INDUCED IN THE BOILER AND CONDENSER AS DETERMINED BY PROGRESSIVE IMPROVEMENT IN THE HEAT-TRANSFER PERFORMANCE. THE DEGREE OF WETTING IS AN INDICATION OF THE SYSTEM CLEANLINESS. THE BOILER WAS CONDITIONED IN APPROXIMATELY 250 HOURS OF OPERATION WITHOUT WETTING ADDITIVES. AFTER 384 HOURS OF OPERATION, ANALYSIS OF A HG SAMPLE BY A DISTILLATION METHOD INDICATED NO CONTAMINATION. OXIDE PLUGGING IN THE NAK LOOPS WAS MINIMIZED USING THE LOOP-ENTRY PROCEDURES DEVELOPED IN THE INVESTIGATION. NO PLUGS OCCURRED BECAUSE OF CHANGED OR OF REPAIRS THAT REQUIRED SYSTEM ENTRY, AND ONLY MINOR PARTIAL PLUGS OCCURRED IN OVER 1500 HOURS OF OPERATION OF THE NAK LOOPS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
 \$3.00 COPY, \$0.65 MICROFICHE

*MERCURY + *METAL, LIQUID + *OPERATING EXPERIENCE + *OUT OF PILE LOOPS AND EXPERIMENTS + *OXIDE + *SODIUM + DECONTAMINATION + NAK + PIPING + REACTOR, LMCR + REACTOR, SPACE + SNAP 8 (SR)

4-27043 ALSO IN CATEGORY 5
 YAROSH MM
 AN EXPERIMENT EMPLOYING ULTRASONIC ENERGY TO PROMOTE BOILING IN LIQUID METAL
 OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
 30 PAGES, 13 FIGURES, 14 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

THE TENDENCY FOR LIQUID METALS SUCH AS NA AND K TO UNDERGO SUBSTANTIAL LIQUID SUPERHEATING AND SUBSEQUENT EXPLOSIVE BOILING HAS BEEN DEMONSTRATED AT OAK RIDGE NATIONAL LABORATORY AND AT OTHER RESEARCH INSTALLATIONS. AN EXPERIMENT WAS CONDUCTED EMPLOYING ULTRASONIC ENERGY EXCITATION TO INITIATE AND MAINTAIN STABLE BOILING IN K UNDER CONDITIONS THAT NORMALLY PRODUCED LIQUID SUPERHEATING AND UNSTABLE, EXPLOSIVE BOILING. UNSTABLE BOILING IS CHARACTERIZED BY LARGE AND ERRATIC TEMPERATURE DIFFERENCES BETWEEN THE TEMPERATURES OF THE LIQUID AND VAPOR. THESE TEMPERATURE DIFFERENCES WERE SIGNIFICANTLY REDUCED OR ELIMINATED UPON EXCITATION OF THE ULTRASONIC PROBE. THE TENDENCY TOWARD LIQUID SUPERHEATING WAS SUBSTANTIALLY ELIMINATED UNDER MANY OPERATING CONDITIONS.

AVAILABILITY - M.M. YAROSH, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

*METAL, LIQUID + *NUCLEATE BOILING + *POTASSIUM + *SODIUM + BUBBLE NUCLEATION + REACTOR, LMCR + THERMAL PROPERTY

4-27128
 NEWBY GA
 THE USAEC SPACE NUCLEAR ELECTRIC POWER PROGRAM - ITS OBJECTIVES AND STATUS
 UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
 1 PAGE, FIGURE, PAGE 13 OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION TRANSACTIONS, 1968 ANNUAL MEETING, TORONTO, CANADA, JUNE 10-18, 1968

PRESENTS APPRAISAL OF SPACE NUCLEAR SYSTEMS REQUIREMENTS. POSSIBLE CATEGORIZATIONS NOTED FOR SPECTRUM OF MISSIONS TO BE PERFORMED.

*ELECTRIC POWER, GENERAL + *REACTOR, SPACE + AEROSPACE SAFETY + R AND D PROGRAM

4-27461
 KING LDP + BILLS CB
 SOME FEASIBILITY STUDIES OF THE NUCLEAR DESTRUCT CONCEPT FOR ROVER REACTOR DISPOSAL
 LOS ALAMOS SCIENTIFIC LABORATORY
 1 PAGE, 5 REFERENCES, PAGES 565-66 OF TRANSACTIONS OF THE 1965 WINTER MEETING OF THE AMERICAN NUCLEAR SOCIETY, HINSDALE, ILLINOIS, 8(2), NOVEMBER, 1965

A NUMBER OF POTENTIAL MEANS FOR ELIMINATING PUBLIC SAFETY PROBLEMS FROM ROCKET REENTRY ARE CONSIDERED, SUCH AS FRAGMENTING REACTOR CORE AND GRANULATION OF CORE BY NUCLEAR TRANSIENT.

*AEROSPACE SAFETY + *REENTRY, ATMOSPHERIC + *ROVER PROGRAM + NUCLEAR ROCKET

CATEGORY 4
AEROSPACE SAFETY

4-27462

CLARK AJ + BERRY RE
AEROSPACE SAFETY RESULTS FROM A NERVA POST-OPERATIONAL DESTRUCT TEST
SANDIA CORPORATION
1 PAGE, PAGE 566 OF TRANSACTIONS OF THE 1965 WINTER MEETING OF THE AMERICAN NUCLEAR SOCIETY, HINSDALE, ILLINOIS, 8(2), NOVEMBER, 1965

A SUITABLE NON-NUCLEAR EXPLOSIVE-DESTRUCT SYSTEM HAS BEEN DEVELOPED FOR POSTOPERATIONAL DESTRUCTION, BUT THE CHARACTERIZATION OF THE RESULTING DEBRIS HAS NOT BEEN FULLY DEFINED. THE OBJECTIVE OF THE FULL-SCALE DESTRUCT TEST WAS TO COMPLETELY CHARACTERIZE THE DEBRIS FORMED AS A RESULT OF THE NON-NUCLEAR EXPLOSIVE DESTRUCT.

*NUCLEAR EXPLOSION DEBRIS + *TEST, DESTRUCTIVE + AEROSPACE SAFETY + NERVA PROGRAM + REACTOR, AIRCRAFT

4-27463

CAMPBELL EE + IDE HM + MOSS WD + REITHEL RJ
PARTICLE-SIZE DISTRIBUTION FROM ROVER FUEL-ELEMENT FRAGMENTATION STUDIES
LOS ALAMOS SCIENTIFIC LABORATORY
2 PAGES, 1 FIGURE, 2 TABLES, PAGES 566-67 OF TRANSACTIONS OF THE 1965 WINTER MEETING OF THE AMERICAN NUCLEAR SOCIETY, HINSDALE, ILLINOIS, 8(2), NOVEMBER, 1965

THE PRIMARY PURPOSE OF THIS STUDY WAS TO DETERMINE THE PARTICLE-SIZE DISTRIBUTION RESULTING FROM HIGH-EXPLOSIVE DESTRUCTION OF ROVER FUEL ELEMENTS. THIS INFORMATION IS OF INTEREST IN DETERMINING THE HEALTH HAZARD ASSOCIATED WITH THE RADIOACTIVE PARTICULATES FROM VARIOUS DESTRUCT SYSTEMS FOR NUCLEAR-ROCKET-PROPULSION MOTORS.

*FUEL ELEMENT + *PARTICLE SIZE DISTRIBUTION + *ROVER PROGRAM + AEROSPACE SAFETY +
NUCLEAR EXPLOSION DEBRIS + NUCLEAR ROCKET

4-27464

HARGROVE HG + TRAMMELL MR
AN ANALYSIS FOR CORRELATING GROUND DESTRUCT TESTS WITH IN-FLIGHT DESTRUCT OF NUCLEAR ROCKETS
WESTINGHOUSE ELECTRIC CORPORATION
1 PAGE, PAGES 567-68 OF TRANSACTIONS OF THE 1965 WINTER MEETING OF THE AMERICAN NUCLEAR SOCIETY, HINSDALE, ILLINOIS, 8(2), NOVEMBER, 1965

A HIGH-EXPLOSIVE DESTRUCT SYSTEM IS BEING CONSIDERED AS A SAFETY COUNTERMEASURE SYSTEM FOR USE IN NUCLEAR ROCKETS DURING EARTH-ORBITAL AND SUBORBITAL FLIGHT. THE PURPOSE OF THE SYSTEM IS TO FRAGMENT THE RADIOACTIVE CORE INTO A CLOUD OF SMALL PARTICLES, THE MAJORITY OF WHICH WILL SURVIVE ATMOSPHERIC RE-ENTRY AND DEPOSIT ON THE EARTH'S SURFACE.

*NUCLEAR ROCKET + *TEST, DESTRUCTIVE + *TESTING + AEROSPACE SAFETY + PARTICLE, RADIOACTIVE + PARTICULATE

4-27466

ELLETT WH + BERGER MJ + HOGAN OL
DOSE MODELS FOR EVALUATING THE RADIATION HAZARD FROM REACTOR DEBRIS
NAVAL RESEARCH LABORATORY + NATIONAL BUREAU OF STANDARDS
1 PAGE, 1 FIGURE, 5 REFERENCES, P. 568 OF TRANSACTIONS OF THE 1965 WINTER MEETING OF THE AMERICAN NUCLEAR SOCIETY, HINSDALE, ILLINOIS, 8(2), NOVEMBER 15-18, 1965

THE RADIOLOGICAL EFFECTS WORKING GROUP OF THE SPACE NUCLEAR PROPULSION OFFICE WAS ORGANIZED TO PREPARE DATA AND STUDIES FOR USE IN THE EVALUATION OF POSSIBLE RADIATION HAZARD FROM NUCLEAR ROCKET DEBRIS. SEVERAL MODELS FOR CALCULATING THE ABSORBED DOSE FROM FISSION-PRODUCT SOURCES WERE DEVELOPED. THESE BETA- AND GAMMA-DOSE MODELS HAVE GENERAL APPLICABILITY TO OTHER HOT-PARTICLE HAZARD PROBLEMS ASSOCIATED WITH REACTOR ACCIDENTS.

*DOSE CALCULATION, INTERNAL + *NUCLEAR EXPLOSION DEBRIS + AEROSPACE SAFETY + NUCLEAR ROCKET

4-27467

SPEIS TP + ORTENBERG LI + MOWERY AI
THE DESIGN AND ANALYSIS OF A POISON SYSTEM FOR SAFE SHIPPING THE NERVA REACTOR
WESTINGHOUSE ELECTRIC COMPANY
2 PAGES, 1 TABLE, 2 REFERENCES, PAGES 568-569 OF THE TRANSACTIONS OF THE 1965 WINTER MEETING OF THE AMERICAN NUCLEAR SOCIETY, HINSDALE, ILLINOIS, 8(2), NOVEMBER 1965

ALTHOUGH THE NERVA REACTOR IS HIGHLY UNDERMODERATED, A NUCLEAR POISON SYSTEM HAS BEEN DESIGNED TO KEEP THE EFFECTIVE MULTIPLICATION BELOW 0.9 EVEN WHEN COMPLETELY WATER FLOODED.

*AEROSPACE SAFETY + *POISON, SOLUBLE + *SHUTDOWN SYSTEM, SECONDARY + NERVA PROGRAM + REACTOR, AIRCRAFT

4-27579

ALSO IN CATEGORIES 9 AND 6

CATEGORY 4
AEROSPACE SAFETY

4-27579 *CONTINUED*

FRIEDMAN ST + RANKIN WD

INDIRECT MEASUREMENT OF NUCLEAR HEATING RATES IN POISON CONTROL VANES

LOS ALAMOS SCIENTIFIC LABORATORY

1 PAGE, ANS TRANSACTIONS 11(1), PAGE 25, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE ACCURATE PREDICTION OF NUCLEAR HEATING RATES IN HIGH CAPTURE CROSS-SECTION CONTROL MATERIALS IS A MAJOR RADIATION ANALYSIS PROBLEM. THE PROBLEM IS PARTICULARLY ACUTE IN NUCLEAR ROCKET REACTOR SYSTEMS SUCH AS NERVA WHERE THE RELATIVELY THIN CONTROL VANES ARE LOCATED IN HIGHLY MODERATING BERYLLIUM REFLECTOR REGION IMMEDIATELY ADJACENT TO A HIGH-POWER DENSITY CORE. OPERATIONAL CONSIDERATIONS, INCLUDING EFFECTS ON REACTOR SAFETY AND RELIABILITY, REQUIRE ACCURATE PREDICTIONS OF VANE HEATING RATES AND AN ADEQUATE FLOW OF LIQUID HYDROGEN TO THE VANES, DRUMS, REFLECTOR, AND PRESSURE VESSEL, BUT ESPECIALLY TO THE VANES SINCE THESE INVOLVE THE CONTROL SYSTEM.

*MEASUREMENT, TEMPERATURE + *NUCLEAR ROCKET + HEAT TRANSFER + INSTRUMENTATION, CONTROL + NERVA PROGRAM

4-27818 ALSO IN CATEGORY 7

POUCHER FW + KOHL AL

CLEANING TECHNIQUES FOR SODIUM SYSTEM COMPONENTS

ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA

2 PAGES, 2 REFERENCES, ANS TRANS. 11(1), PAGES 114-115, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

SPECIALIZED TECHNIQUES ARE REQUIRED FOR CLEANING SURFACES THAT HAVE BEEN IN CONTACT WITH LIQUID SODIUM. ALTHOUGH A GREAT MANY PROCESSES HAVE BEEN INVESTIGATED, ONLY TWO HAVE PROVED GENERALLY USEFUL FOR A WIDE VARIETY OF APPLICATIONS AT ATOMICS INTERNATIONAL. THESE ARE REACTION WITH STEAM (WITH OR WITHOUT AN INERT GAS DILUENT) FOR MAJOR SYSTEMS AND COMPONENTS, AND REACTION WITH LIQUID 2-BUTOXYETHENOL (ETHYLENE GLYCOL MONOBUTYL ETHER, BUTYL CELLOSOLVE, DOWANOL E.B.) FOR SMALLER ITEMS AND HOT-CELL APPLICATIONS. IN ADDITION, DIPPING COMPONENTS IN HOT OIL HAS PROVED HELPFUL AS AN INITIAL STEP TO REDUCE THE QUANTITY OF SODIUM REQUIRING REACTION. LIQUID AMMONIA WASHING HAS BEEN SHOWN TO BE APPLICABLE FOR SPECIAL CASES WHERE HYDROGEN EVOLUTION MUST BE MINIMIZED.

*COOLANT CHEMISTRY + *DECONTAMINATION + *SODIUM + *STEAM + METAL, ALKALI + METAL, LIQUID + REACTOR, LMCR + REACTOR, LMFBR

4-27819 ALSO IN CATEGORY 7

MCPHEETERS CC + BIERY JC

THE DYNAMIC CHARACTERISTICS OF A SODIUM OXIDE PLUGGING INDICATOR

LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

2 PAGES, 6 REFERENCES, ANS TRANS. 11(1), PAGES 115-116, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

WORK AT LOS ALAMOS SCIENTIFIC LABORATORY HAS INDICATED THAT THE PLUGGING INDICATOR CAN BE A USEFUL ANALYTICAL INSTRUMENT FOR INDICATING OXYGEN CONCENTRATIONS IN SODIUM. AS COMPARED TO THE DISTILLATION SAMPLER OF EMF CELLS, THE PLUGGING INDICATOR DATA HAD A MUCH LOWER STATISTICAL STANDARD DEVIATION. HOWEVER, THE METER REQUIRED CALIBRATION. THE PLUGGING TEMPERATURE WAS CORRELATED WITH FLOW RATE, COOLING RATE, AND OXYGEN CONCENTRATION.

*ANALYTICAL TECHNIQUE, CALIBRATION + *COOLANT CHEMISTRY + *FLOW ORIFICE + *OXIDE + *SODIUM + METAL, ALKALI + METAL, LIQUID + REACTOR, LMCR + REACTOR, LMFBR

4-27820 ALSO IN CATEGORY 7

MCPHEETERS CC

MASS TRANSFER OF OXYGEN IN SODIUM COLD TRAPS

LOS ALAMOS SCIENTIFIC LABORATORY

2 PAGES, 5 REFERENCES, ANS TRANS. 11(1), PAGES 116-117, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

COLD TRAPS HAVE BEEN USED EXTENSIVELY FOR CONTROLLING OXYGEN CONCENTRATION IN SODIUM SYSTEMS. COLD TRAPS UTILIZE THE POSITIVE TEMPERATURE DEPENDENCE OF THE SOLUBILITY OF SODIUM MONOXIDE IN SODIUM AND THE RESULTANT PRECIPITATION OF SODIUM MONOXIDE AT LOW SODIUM TEMPERATURES. SODIUM MONOXIDE PRECIPITATION IS HERE ASSUMED TO BE HETEROGENEOUS BECAUSE OF THE STRONG EFFECT OF SURFACE AREA ON THE PRECIPITATION RATE SHOWN IN PREVIOUS PACKLESS COLD TRAP EXPERIMENTS. A PACKLESS COLD TRAP OF SIMPLE GEOMETRY AND OPERATING WITH A TEMPERATURE GRADIENT WAS USED IN THIS STUDY. IN THE PRESENCE OF THE TEMPERATURE GRADIENT, THE EFFECTIVE PRECIPITATION SURFACE AREA WAS A FUNCTION OF THE OXYGEN CONCENTRATION IN THE SODIUM ENTERING THE COLD TRAP.

*ANALYTICAL TECHNIQUE, CALIBRATION + *COOLANT CHEMISTRY + *FLOW ORIFICE + *OXIDE + *SODIUM + FILTER, TRAP + METAL, ALKALI + METAL, LIQUID + REACTOR, LMCR + REACTOR, LMFBR

4-27821

LITMAN AP + LEONARD WJ + LLOYD DB

COMPATIBILITY OF NAK WITH TYPE-316 STAINLESS STEEL AND NB-1%Zr ALLOY IN A HEAT REJECTION SYSTEM

OAK RIDGE NATIONAL LABORATORY

CATEGORY 4
AEROSPACE SAFETY

4-27821 *CONTINUED*

1 PAGE, ANS TRANS. 11(1), PAGE 117, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

A PROGRAM AT OAK RIDGE NATIONAL LABORATORY EVALUATED THE METALLURGICAL DESIGN OF A SNAP-50-TYPE RADIATOR CIRCUIT. THE SNAP-50 CONCEPT EMPLOYS A URANIUM CARBIDE- OR URANIUM NITRIDE-FUELED LITHIUM-COOLED FAST REACTOR WITH A RANKINE-CYCLE POTASSIUM POWER-CONVERSION SYSTEM. THE TEST LED TO A BETTER DEFINITION OF ACCEPTABLE RESIDENCE TIMES AND TEMPERATURE CONDITIONS FOR NB-1ZR ALLOY AND TYPE-316 STAINLESS STEEL IN NAK.

*CORROSION + *METAL, LIQUID + *NAK + *NIOBIUM + *SNAP 50 (SR) + *STEEL, STAINLESS + CARBON + FILTER, TRAP + LITHIUM + METAL, ALKALI + NITROGEN + POTASSIUM + REACTOR, SPACE + ZIRCALOY

4-27822

ROMANO AJ + WACHTEL SJ + KLAMUT CJ

CORROSION BEHAVIOR OF COBALT, IRON, AND MOLYBDENUM BASE ALLOYS IN HIGH-TEMPERATURE SODIUM BROOKHAVEN NATIONAL LABORATORY

1 PAGE, 2 FIGURES, ANS TRANS. 11(1), PAGES 118-119, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

CORROSION STUDIES ARE BEING CARRIED OUT WITH POTENTIAL FUEL-CLADDING MATERIALS FOR ADVANCED LIQUID-METAL FAST-BREEDER REACTORS. THE MATERIALS UNDER TEST AT TEMPERATURES AS HIGH AS 760 C INCLUDE REFRACTORY METAL BASE ALLOYS, COBALT BASE ALLOYS, AND STAINLESS STEELS. TWO PUMPED LOOPS, MADE ENTIRELY OF STABILIZED STAINLESS STEELS, ARE BEING USED TO CARRY OUT THE INVESTIGATIONS. THE SPECIMENS ARE EXPOSED TO HIGH-VELOCITY SODIUM IN A 24-IN.-LONG RISING TEMPERATURE REGION. A 1655-H CORROSION RUN WAS COMPLETED AT THE FOLLOWING OPERATING CONDITIONS - (1) SPECIMEN TEMPERATURE RANGE--710 TO 760 C, (2) OXYGEN CONCENTRATION IN SODIUM--4 TO 8 PPM, (3) SODIUM VELOCITY--22 FT/SEC. THE MATERIALS EVALUATED WERE HAYNES-25 AND UMCO-51 (COBALT-BASE ALLOYS), TYPES-304 AND -231 STAINLESS STEELS, AND UNALLOYED MOLYBDENUM.

*CORROSION + *METAL, LIQUID + *METAL, REFRACTORY + *SODIUM + *STEEL, STAINLESS + CLADDING + COBALT + FUEL ELEMENT + HIGH TEMPERATURE + IRON + MOLYBDENUM + REACTOR, LMCR + REACTOR, LMFBR + THERMAL EXPERIMENT

4-27823

ROMANO AJ + KLAMUT CJ

CORROSION OF OXYGEN-CONTAMINATED NB-1ZR AND TA-8W-2HF ALLOYS BY REFLUX-BOILING SODIUM AT 1095 C BROOKHAVEN NATIONAL LABORATORY

3 PAGES, 2 FIGURES, ANS TRANS. 11(1), PAGES 118-20, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

REFRACTORY-METAL ALLOYS ARE OF INTEREST AS CONTAINMENT MATERIALS FOR HIGH-TEMPERATURE ALKALI-METAL-COOLED REACTORS PROPOSED FOR RANKINE-CYCLE POWER CONVERSION SYSTEMS. OF PARTICULAR INTEREST ARE NB-1ZR AND TA-8W-2HF IN WHICH THE ZR AND HF ACT AS OXYGEN GETTERS.

*CORROSION + *METAL, LIQUID + *METAL, REFRACTORY + *SODIUM + HAFNIUM + HIGH TEMPERATURE + METAL, ALKALI + NIOBIUM + REACTOR, LMCR + REACTOR, LMFBR + TANTALUM + THERMAL EXPERIMENT

4-27859

ALSO IN CATEGORY 15

BILLINGHAM J + ROBBINS DE + EWING D

A METHOD OF EVALUATING RADIATION RISKS FOR MANNED SPACE FLIGHTS AMES RESEARCH CENTER + MANNED SPACECRAFT CENTER

16 PAGES, 8 FIGURES, 1 TABLE, 14 REFERENCES, RADIATION RESEARCH, 30, PAGES 541-546 (MARCH 1967)

PROBLEMS CONCERNING AN EVALUATION OF THE HAZARD FROM DOSES OF IONIZING RADIATION DURING MANNED SPACE FLIGHT 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.

*AIRCRAFT + *DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + *RADIATION SAFETY AND CONTROL + *RADIOBIOLOGY + *SPACECRAFT + ATMOSPHERIC POLLUTION + HAZARDS ANALYSIS + METEOROLOGICAL SUPPORT

CATEGORY 5
ACCIDENT ANALYSIS

5-25160 ALSO IN CATEGORY 8
MORRISON DL + WILSON TR
CURRENT RESEARCH ON COOLANT BLOWDOWN IN THE USA
BATELLE MEMORIAL INSTITUTE + PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
34 PAGES, 17 FIGURES, 18 REFERENCES, FROM THE RECORD OF THE THIRD CREST MEETING, PARIS, NOVEMBER, 1967

THE COURSE AND CONSEQUENCES OF A LOSS-OF-COOLANT ACCIDENT ARE DIRECTLY RELATED TO THE BLOWDOWN AFTER RUPTURE, AND CURRENT RESEARCH IS CARRIED OUT TO CHARACTERIZE THIS OCCURRENCE. AREAS OF INTEREST ARE - DECOMPRESSION, TWO-PHASE FLOW, MECHANICAL EFFECTS, ETC. THE EFFORT IS BEING PURSUED AT LOFT, CSE, AND IIT. THE DEVELOPMENT OF ANALYTICAL MODELS AND COMPUTER CODES IS ALSO DISCUSSED, AND COMPARISON BETWEEN CALCULATIONS AND EXPERIMENTS IS MADE.

AVAILABILITY - D.L. MORRISON, BATELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES

*ACCIDENT, LOSS OF COOLANT + *BLOWDOWN + *CREST + *CSE + *LOFT (S-RR) + ANALYTICAL MODEL + COMPUTER PROGRAM + REACTOR, SAFETY RESEARCH

5-25161
MONTAGNANI M + HOLTBECKER H
PROGRESS OF ISRA SAFETY ACTIVITIES IN THE MECHANICAL FIELD
EUROPEAN ATOMIC ENERGY COMMISSION
4 PAGES, 6 REFERENCES, PRESENTED AT THE THIRD CREST MEETING, NOVEMBER 15-17, 1967, PARIS

BASIC STUDIES IN PRESSURE-WAVE GENERATION, PROPAGATION OF WAVES AND THEIR INTERACTION WITH OBSTACLES, MATERIAL AND STRUCTURAL RESPONSE TO DYNAMIC LOADING, AND HIGH-FREQUENCY SHORT-RESPONSE-TIME INSTRUMENTATION IS DISCUSSED. SPECIFIC SAFETY PROBLEMS IN THE CIREM BOILING-WATER PRESSURE-TUBE REACTOR, AND FLAMMABILITY AND EXPLOSION PROBLEMS IN ORGANIC-COOLED REACTORS ARE ALSO DISCUSSED.

AVAILABILITY - M. MONTAGNANI OR H. HOLTBECKER, EUROPEAN ATOMIC ENERGY COMMISSION

*CREST + EXPLOSION + INSTRUMENTATION, PRESSURE + REACTOR, ORGANIC COOLED + REACTOR, PRESSURE TUBE + REACTOR, PRESSURE TUBE, BOILING + WAVE, STRESS

5-25162
VOLTA G
PROGRESS OF RELIABILITY STUDIES CARRIED OUT AT CCR EURATOM ISRA
EUROPEAN ATOMIC ENERGY COMMISSION
3 PAGES, PRESENTED AT THE THIRD CREST MEETING, NOVEMBER 15-17, 1967, PARIS

MECHANICAL AND ELECTROMECHANICAL COMPONENTS WERE CODIFIED FOR DATA COLLECTION FOR APPLICATION OF LIFE-EXPECTANCY ANALYSIS IN ESSOR REACTOR PRIMARY CIRCUITS. RELIABILITY ANALYSIS IS USED IN THE ESSOR SAFETY REPORT BY ASSIGNING DEGREES OF RELIABILITY TO EACH PROTECTIVE ACTION. ONE OF THE PROBLEMS WAS IN THE USE OF EXPERIMENTAL FAILURE DATA.

AVAILABILITY - G. VOLTA, EUROPEAN ATOMIC ENERGY COMMISSION

CREST + RELIABILITY ANALYSIS + RELIABILITY, COMPONENT + RELIABILITY, SYSTEM

5-25163
GRASS G
PROGRESS OF ISRA SAFETY ACTIVITIES IN THE HEAT TRANSFER FIELD
EUROPEAN ATOMIC ENERGY COMMISSION
4 PAGES, PRESENTED AT THE THIRD CREST MEETING, NOVEMBER 15-17, 1967, PARIS

TESTS WERE PERFORMED ON BOILING AND SUPERHEATED SODIUM TO DETERMINE EJECTION VELOCITIES THROUGH SMALL-DIAMETER TUBES. RESULTS ARE REPORTED RATHER SUPERFICIALLY. EJECTION STUDIES FOR WATER AFTER RAPID DEPRESSURIZATION (BOTH FROM STAGNANT AND FORCED CIRCULATION CONDITIONS) ARE SIMILARLY REPORTED.

AVAILABILITY - G. GRASS, EUROPEAN ATOMIC ENERGY COMMISSION

BLOWDOWN + CREST + HEAT TRANSFER + SODIUM + WATER, GENERAL

5-25164 ALSO IN CATEGORY 2
BOWEN JH
PROGRESS IN THE U.K. ON THE SAFETY ASSESSMENT OF A.G.R., USING THE PROBABILITY METHOD
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY
10 PAGES, 6 REFERENCES, PRESENTED AT THE THIRD CREST MEETING, NOVEMBER 15-17, 1967, PARIS

THE ADVANCE TO URBAN SITING HAS BEEN ACCOMPLISHED BY THE DETERMINATION TO REFINE AND IMPROVE THE SAFETY CHARACTERISTICS OF THE AGR. THE MCA CONCEPT WOULD BE INAPPROPRIATE FOR THIS PURPOSE SO THE PROBABILISTIC METHOD OF SAFETY ASSESSMENT IS DISCUSSED (SEE ALSO NSIC 18210). THE ANALYSIS IS MADE BY ASSIGNING OR CALCULATING A PERCENTAGE RELEASE FOR A GIVEN

CATEGORY 5
ACCIDENT ANALYSIS

5-25164 *CONTINUED*

FISSION-PRODUCT INVENTORY AND THUS DETERMINING THE EXPECTED PROBABILITY AND FREQUENCY OF SUCH A RELEASE.

AVAILABILITY - J. H. BOWEN, SAFEGUARDS DIVISION, UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY

ACCIDENT, PROBABILITY OF + CREST + REACTOR, GCR + SAFETY EVALUATION + SITING, REACTOR + SITING, URBAN + UNITED KINGDOM

5-25165

KARWAT H

STUDIES RELATED TO THE DEPRESSURIZATION OF WATER-COOLED POWER REACTORS PERFORMED IN 1967 IN THE FEDERAL REPUBLIC OF GERMANY

TECHNISCHE HOCHSCHULE MUNICH, GERMANY

13 PAGES, 4 FIGURES, 3 REFERENCES, PRESENTED AT THE THIRD CREST MEETING, NOVEMBER 15-17, 1967, PARIS

STUDIES ARE REPORTED WHICH ARE CONCERNED WITH (1) DEVELOPMENT OF ANALYTICAL METHODS TO PREDICT THERMOHYDRAULIC EFFECTS RELATED TO THE DEPRESSURIZATION OF THE PRIMARY COOLANT SYSTEM AND (2) EXPERIMENTAL STUDIES TO INVESTIGATE SPECIFIC PROBLEMS AND BACK UP ANALYTICAL MODELS. SEVERAL COMPUTER CODES HAVE BEEN DEVELOPED AND TESTED AS A PART OF THIS STUDY.

AVAILABILITY - H. KARWAT, INSTITUT FÜR KERN- UND REGELUNGSTECHNIK, TECHNISCHE, MUNICH, GERMANY

ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + BLOWDOWN + CONTAINMENT VESSEL LOADING + CREST + GERMANY + HEAT TRANSFER

5-25884

ALSO IN CATEGORIES 18 AND 17

BELL PSAR SECT 3.3.7 DESCRIPTION OF CORE ANALYSIS

NEW YORK STATE ELECTRIC + GAS CORPORATION

85 PAGES, 20 FIGURES, 5 TABLES, PAGE III-3-5 THRU -7. MARCH 1968 50-319.

A COMPUTER PROGRAM (UNSPECIFIED) IS USED TO ANALYZE THE THERMAL AND HYDRAULIC CHARACTERISTICS OF THE CORE AS A WHOLE. OUTPUT AND INPUT DISCUSSED BRIEFLY. RECENT MODIFICATIONS IN CORE DESIGN AND IN THERMAL HYDRAULIC EVALUATION TECHNIQUES ALLOW HIGHER FEEDWATER TEMP. WITHOUT ENCROACHING ON THERMAL MARGINS. THE ITEMS AND THEIR EFFECT ON INLET SUBCOOLING (BTU/LB) MCHFR ARE - (1) INLET ENTHALPY NOW BASED ON 1920 PSIA DOME PRESSURE, RATHER THAN 1050 INLET (+4/+0.06). (2) CORE BYPASS FLOW NOW ESTABLISHED AS 7% (-/+0.03). (3) CORE MIDPLANE PRESSURE OF 1035 NOW USED INSTEAD OF INLET PRESSURE (-/-0.02). (4) ZIRCONIUM SPACER TEST DATA (-/-0.02). ***THE NET EFFECT, WHEN FEEDWATER INCREASED TO 420 F, IS TO INCREASE SUBCOOLING 0.3 BTU/LB AND MCHFR BY 0.02.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFILM

*ANALYTICAL MODEL + *COMPUTER PROGRAM + *SUBCOOLING + BELL (BWR) + COMPARISON, THEORY AND EXPERIENCE + HEAT FLUX, CRITICAL + HEAT TRANSFER, BOILING + REACTOR, BWR + REPORT, PSAR + SAFETY MARGIN

5-25903

ALSO IN CATEGORIES 18 AND 12

DRAY AP + IANNI P + MURRAY JL

GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 40 PAGES, 5 FIGURES, 4 TABLES, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY (MAR. 14, 1967) INDICATED THAT ADDITIONAL TESTING OR ANALYSIS WAS REQUIRED. THE TEST OR ANALYSIS PROGRAM IS DESCRIBED FOR THE FOLLOWING - (1) EFFECTS OF FUEL-ROD FAILURE ON ECCS PERFORMANCE, (2) EFFECTS OF FUEL-BUNDLE FLOW BLOCKAGE, (3) VERIFICATION OF FUEL-DAMAGE-LIMIT CRITERION, (4) EFFECTS OF CLADDING TEMPERATURE AND MATERIAL ON ECCS PERFORMANCE, (5) CLOSURE OF MAIN-STEAM-LINE ISOLATION VALVE, (6) TESTS OF DIESEL-GENERATOR PERFORMANCE, (7) STEAM-LINE-BREAK ACCIDENT, AND (8) DEPRESSURIZATION PERFORMANCE OF HPCI SYSTEM.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ENGINEERED SAFETY FEATURE + *R AND D PROGRAM + ACCIDENT, LOSS OF COOLANT + ACCIDENT, STEAM LINE RUPTURE + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CONTAINMENT ISOLATION + CORE SPRAY + FLOW BLOCKAGE + FUEL ELEMENT + GENERATOR, ENGINE + PERFORMANCE LIMIT + SYSTEM OPERABILITY IN ACCIDENT

5-25904

ALSO IN CATEGORIES 12 AND 18

EFFECTS OF FUEL ROD FAILURE ON ECCS PERFORMANCE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 4 PAGES, PAGES 2-1 THROUGH 2-5 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY VOICED CONCERN FOR EFFECT ON HEAT-TRANSFER EFFECTIVENESS OF ECCS RESULTING FROM FUEL-CLAD BULGING OR PERFORATION IN LOSS-OF-COOLANT ACCIDENTS. ANALYTICAL AND EXPERIMENTAL PROGRAMS TO RESOLVE THE CONCERN ARE DESCRIBED. FAILURE TEMPERATURES, WITH SINGLE ROD TESTS HAVING GAS-PLENUM PRESSURES FROM 130 TO 1500 PSIG, WERE 1348 TO 1732 F. NIN-ROD-BUNDLE TESTS SHOWED THAT GROSS FLOW BLOCKAGE DOES NOT OCCUR AS A RESULT OF MULTI-ROD

CATEGORY 5
ACCIDENT ANALYSIS

5-25904 *CONTINUED*

PERFORATIONS. FULL-SIZE HEATER-BUNDLE TESTS WILL BE PERFORMED. ANALYSIS TO BE MADE OF WORST CONFIGURATION OF FLOW PATH AND INCLUDE RADIATION EFFECTS ON CHANNEL WALLS. PROGRESS TO BE COMPLETED IN 1969.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT, LOSS OF COOLANT + *SYSTEM OPERABILITY IN ACCIDENT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CORE SPRAY + EMERGENCY COOLING CONSIDERATIONS + FAILURE, CLADDING + FLOW BLOCKAGE + PERFORMANCE LIMIT + REACTOR, BWR + SYSTEM CAPABILITY + TEST, PROOF

5-25905 ALSO IN CATEGORY 18
EFFECTS ON FUEL BUNDLE FLOW BLOCKAGE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 4 PAGES, 1 TABLE, PAGES 3-1 THROUGH 3-3 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY VOICED CONCERN ABOUT FISSION-PRODUCT RELEASE, HIGH PRESSURE, AND SEQUENTIAL FUEL-ELEMENT FAILURE RESULTING FROM INLET-COOLANT-ORIFICE BLOCKAGE. PROGRAM TO RESOLVE CONCERN EARLY IN 1969 IS DESCRIBED. THE TWO ASPECTS TO BE INVESTIGATED ARE (1) BOILOUT AND HEATUP FOLLOWING PARTIAL OR COMPLETE FLOW BLOCKAGE AND (2) WATER EXPULSION AND PRESSURE-RISE EFFECTS DUE TO OVERHEATING AND REENTRY OF WATER TO THE OVERHEATED PORTION.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT, CONSEQUENCES + *FLOW BLOCKAGE + ACCIDENT, LOSS OF FLOW + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FAILURE, FUEL ELEMENT + FAILURE, SEQUENTIAL + FLOW ORIFICE + FLOW THEORY AND EXPERIMENTS + R AND D PROGRAM + REACTOR, BWR

5-25906 ALSO IN CATEGORY 18
VERIFICATION OF FUEL DAMAGE LIMIT CRITERION

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 6 PAGES, 3 TABLES, PAGES 4-1 THROUGH 4-6 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS THAT TESTS INCLUDE HEAT-GENERATION RATES IN EXCESS OF THOSE CALCULATED FOR WORST TRANSIENT AND FUEL BURNUPS. GE STATES LIMIT OF 28 HW/FT (CORRESPONDING TO 1% PLASTIC STRAIN) IS ADEQUATELY SUPPORTED BY 6 TO 7 YEARS OF DEVELOPMENT PROGRAMS AND EXPERIENCE. SEVEN HEAVILY (1400 PPM) HYDRIDED ZIRCALOY-CLAD RODS OPERATING WITH CENTERLINE MELTING WERE TESTED IN GETR AT HEAT-GENERATION RATES UP TO 22 KW/FT, WITH CLAD STRAINS UP TO 0.6%. NO DETRIMENTAL EFFECTS. TABLES SUMMARIZE PRODUCT-FUEL AND DEVELOPMENT-FUEL IRRADIATION EXPERIENCE, LISTING EXPOSURE, HEAT FLUX, PEAK GENERATION RATE, AND TIME IN CORE.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CENTERLINE MELTING + *FUEL BURNUP + *OPERATING EXPERIENCE SUMMARY + *PERFORMANCE LIMIT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FAILURE, CLADDING + FUEL ELEMENT + FUEL INTEGRITY + HYDRIDE + IRRADIATION TESTING + REACTOR, BWR + ZIRCALOY

5-25907 ALSO IN CATEGORY 18
EFFECTS OF CLADDING TEMPERATURE AND MATERIALS ON ECCS PERFORMANCE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 4 PAGES, PAGES 5-1 THROUGH 5-4 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS TESTING ECCS EFFECTIVENESS AT FUEL TEMPERATURES HIGHER THAN THOSE USED TO DATE. TESTS HAVE BEEN MADE WITH PEAK TEMPERATURES OF 2400 F. GE RESPONDS THAT TESTS WILL BE EXTENDED AFTER DEVELOPING A ZIRCALOY-CLAD ELECTRICAL HEATER AND SUITABLE INSTRUMENTATION FOR USE AT TEMPERATURE IN EXCESS OF 2500 F. TEST PROGRAM IS DESCRIBED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CLADDING + *CORE REFLOODING SYSTEM + *CORE SPRAY + *HIGH TEMPERATURE + *SYSTEM OPERABILITY IN ACCIDENT + *TEST, PROOF + ACCIDENT, LOSS OF COOLANT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + EMERGENCY COOLING CONSIDERATIONS + FUEL ELEMENT + INSTRUMENTATION, TEMPERATURE + REACTOR, BWR + STEEL, STAINLESS + ZIRCALOY

5-25910 ALSO IN CATEGORIES 18 AND 11
REEVALUATION OF STEAM LINE BREAK ACCIDENT

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 2 PAGES, PAGES 8-1 THROUGH 8-2 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS IN JUNE 15, 1967, VERMONT YANKEE REVIEW FURTHER EVALUATION OF FUEL CLAD TEMPERATURES FOLLOWING A STEAM-LINE BREAK. GE WILL DEVELOP AN IMPROVED ANALYTICAL MODEL, AND ANALYSIS WILL BE COMPLETED IN FALL OF 1968, BASED ON STEAM-LINE-ISOLATION-VALVE CLOSURE IN 3-10 SEC.

CATEGORY 5
ACCIDENT ANALYSIS

5-25910 *CONTINUED*
AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT ANALYSIS + *ACCIDENT, STEAM LINE RUPTURE + ACCIDENT MODEL + ACCIDENT, CONSEQUENCES + ACRS +
AEC QUESTION + BROWNS FERRY (BWR) + CONTAINMENT ISOLATION + REACTOR, BWR + RESPONSE TIME

5-25935 ALSO IN CATEGORIES 17 AND 1
MACPHERSON RE
FAST REACTOR SAFETY CONFERENCE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
8 PAGES, TABLE, REFERENCE, NUCLEAR SAFETY, 9(3), PAGES 202-209 (MAY-JUNE, 1968)

BRIEFLY SUMMARIZES THE SESSIONS COVERING (1) CORE MELTDOWN ACCIDENTS, (2) SODIUM BOILING AND SUPERHEATING, (3) INCIDENTS IN REACTORS, AND (4) SAFETY. MALFUNCTIONS IN THE BRS WERE (1) FUEL-ELEMENT LEAKS CAUSED BY HEATER SHORTING, PLUS AIP INLEAKAGE CAUSING MASSIVE SODIUM OXIDE PLUGGING, AND (2) REACTIVITY PERTURBATIONS DUE TO ENTRAINMENT OF ARGON BY THE SODIUM STREAM. ***PLUGGING OF SUBASSEMBLIES BY OXIDE HAS BEEN DETECTED PRIMARILY BY THE EFFECT ON PRIMARY FLOW. A PANEL DISCUSSION SHOWED THAT ATTENTION IS SWITCHING FROM THE LARGE, LESS PROBABLE ACCIDENT TO THE SMALLER, MORE FREQUENT ACCIDENTS WHICH AFFECT PLANT USE.

*REACTOR, FAST + *SAFETY PRINCIPLES AND PHILOSOPHY + ACCIDENT ANALYSIS + ACCIDENT, MAXIMUM CREDIBLE (MCA) +
COOLANT QUALITY + FLOW BLOCKAGE + INCIDENT, GENERAL + REACTOR, LMCR + REVIEW

5-25944 ALSO IN CATEGORIES 6 AND 7
MORRISON DL + CARBIENER WA + RITZMAN RL + BLUTREICH JN + CLARK WE + DENNING RS + GIESEKE JA + WOOTON RO
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR
ACCIDENT, QUARTERLY PROGRESS REPORT FOR JANUARY THROUGH MARCH, 1968
BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO
BMI-1835 +. 30 PAGES, 4 FIGURES, 8 TABLES, 30 REFERENCES, APRIL 1, 1963

PROGRESS REPORT ON THE FOLLOWING AREAS - ECCS4 COMPUTER CODE DEVELOPMENT, CALCULATIONS OF
ACCIDENT HEAT TRANSFER, EVALUATION OF REACTOR KINETICS PROBLEMS, REACTIVITY-ACCIDENT
INITIATION OF A LOSS-OF-COOLANT ACCIDENT, FISSION PRODUCT RELEASE FROM UO₂, AEROSOL-PARTICLE
CHARGING, PARTICLE COLLECTION IN PRESSURE-SUSPENSION POOLS, FISSION-PRODUCT TRANSPORT AND
DEPOSITION MODELS, AND CONDITIONS AND CRITERIA FOR PAINT PERFORMANCE IN REACTOR CONTAINMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + *FISSION PRODUCT TRANSPORT + *REACTOR KINETICS +
ACCIDENT, REACTIVITY + AEROSOL + COMPUTER PROGRAM + CONTAINMENT PAINT + FISSION PRODUCT RELEASE, GENERAL +
FISSION PRODUCT RETENTION + HEAT TRANSFER + SPACE DEPENDENT DYNAMICS

5-26113
LAWRENCE WT + CHATO JC
HEAT-TRANSFER EFFECTS ON THE DEVELOPING LAMINAR FLOW INSIDE VERTICAL TUBES
UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS
9 PAGES, 10 FIGURES, 20 REFERENCES, JOURNAL OF HEAT TRANSFER, TRANSACTIONS OF ASME, SERIES C, 88(2), PAGES
214-222 (JUNE 14, 1966)

A NUMERICAL METHOD WAS DEVELOPED FOR THE CALCULATION OF ENTRANCE FLOWS IN VERTICAL TUBES FOR
THE CASES OF UPFLOW OR DOWNFLOW AND CONSTANT WALL HEAT FLUX OR CONSTANT WALL TEMPERATURE.
THE SOLUTIONS WERE IN EXCELLENT AGREEMENT WITH EXPERIMENTAL DATA OBTAINED WITH WATER FLOWING
UPWARD IN A VERTICAL HEATED TUBE. THE TRANSITION TO TURBULENT FLOW WAS ALSO STUDIED. THE
EXPERIMENTAL MEASUREMENTS DEMONSTRATED THAT THE TRANSITION PROCESS DEPENDS ON THE DEVELOPING
VELOCITY PROFILES. FOR THE EXPERIMENTAL RESULTS, A TENTATIVE TRANSITION CRITERION WAS
OBTAINED, WHICH DEPENDS ONLY ON THE VELOCITY PROFILE SHAPE, FLUID VISCOSITY, AND THE ENTRANCE
REYNOLDS NUMBER.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TUBE + *HEAT TRANSFER, CONVECTION + FLOW, LAMINAR + FLOW, TURBULENT +
HEAT TRANSFER

5-26114
MELESE-D HOSPITAL G
THERMAL PERFORMANCE OF CERAMIC-CLAD GAS-COOLED REACTOR CORES
GENERAL DYNAMICS, GENERAL ATOMIC DIVISION
11 PAGES, 6 FIGURES, 6 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 7(4), PAGES 323-333 (APRIL, 1968)

SIMPLE RELATIONSHIPS BETWEEN DIMENSIONLESS CORE PARAMETERS HAVE BEEN DERIVED FOR THE CASE
WHERE THE MAXIMUM INTERNAL FUEL TEMPERATURE IS FIXED. THE LINEAR RATING IS FOUND TO BE
NEARLY PROPORTIONAL TO THE DIFFERENCE BETWEEN MAXIMUM FUEL AND COOLANT TEMPERATURES (T-SUB-M
MINUS T-SUB-E) AND TO THE EFFECTIVE FUEL CONDUCTIVITY. NUMERICAL RESULTS FOR A TYPICAL HIGH
TEMPERATURE GAS COOLED REACTOR DESIGN SHOW THE LACK OF SENSITIVITY OF THERMAL POWER TO
CHANNEL DIMENSIONS AND THE RAPID VARIATIONS OF PUMPING POWER WITH CHANNEL GEOMETRY.

*CLADDING + *HEAT TRANSFER ANALYSIS + *REACTOR, GCR + *REACTOR, HTGR + *THERMAL ANALYSIS + CERAMICS +
HEAT TRANSFER + HEAT TRANSFER CORRELATION + REACTOR, PEBBLE BED

CATEGORY 5
ACCIDENT ANALYSIS

5-26115
BEDENIG D + RAUSCH W + SCHMIDT G
PARAMETER STUDIES CONCERNING THE FLOW BEHAVIOUR OF A PEBBLE WITH REFERENCE TO THE FUEL ELEMENT MOVEMENT IN THE CORE OF THE THTR 300 MWE PROTOTYPE REACTOR
BROWN BOVERI/KRUPP REAKTORBAU GMBH., JULICH, GERMANY
12 PAGES, 14 FIGURES, 8 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 7(4), PAGES 367-378 (APRIL, 1968)

THE KNOWLEDGE OF THE PEBBLE-BED FLOW BEHAVIOUR IS OF GREAT IMPORTANCE FOR GAS-COOLED HIGH TEMPERATURE REACTORS OF THE PEBBLE BED TYPE. COMPREHENSIVE EXPERIMENTAL INVESTIGATIONS WERE CARRIED OUT IN THIS RESPECT. AFTER A SHORT DESCRIPTION OF THE METHODS OF MEASUREMENT THE RESULTS OF PARAMETER STUDIES WITH REFERENCE TO THE FLOW BEHAVIOUR OF A PEBBLE BED ARE DISCUSSED. VARIOUS PARAMETERS OF GEOMETRY ARE INVESTIGATED AS WELL AS THE INFLUENCE OF FRICTION, OF SPECIFIC BALL WEIGHT AND OF RELATIVE BALL DIAMETER AS FUNCTIONS OF PEBBLE BED HEIGHT. RESULTS ARE PLOTTED IN FORM OF RESIDENCE SPECTRA. FROM THESE RESULTS THE FLOW BEHAVIOUR OF THE THTR 300-MWE PROTOTYPE REACTOR IS PREDICTED BY INTERPOLATION.

*REACTOR, CIRCULATING FUEL + *REACTOR, HTGR + *REACTOR, PEBBLE BED + FLOW THEORY AND EXPERIMENTS

5-26116
NEBRENSKY J
MECHANISM OF HEAT TRANSFER TO A MECHANICALLY MIXED BED OF GRANULAR MATERIAL
CESKOSLOVENSKA AKADEMIE VED
12 PAGES, 5 FIGURES, 3 TABLES, 20 REFERENCES, COLL. CZECH. CHEM. COMMS, 31(10), PAGES 3960-3971 (OCTOBER, 1966)

IN THE PROPOSED MECHANISM OF HEAT TRANSFER FROM A CYLINDRICAL WALL TO A MECHANICALLY MIXED BED IT IS ASSUMED THAT THE STEADY-STATE PROCESS CAN BE CONCEIVED AS ONE CONSISTING OF REPEATING EQUAL CYCLES DURING WHICH THE MATERIAL IN THE PROXIMITY OF THE WALL IS HEATED UNDER UNSTEADY CONDITIONS OF HEAT TRANSFER. ON THE BASIS OF THIS CONCEPTION, THE THEORETICAL EQUATION WAS DERIVED FOR THE CALCULATION OF THE HEAT TRANSFER COEFFICIENT, AND THE SIMPLIFIED FORM OF THIS EQUATION WAS COMPARED WITH THE PREVIOUSLY PUBLISHED EXPERIMENTAL RESULTS. THIS COMPARISON IS YET THE ONLY POSSIBILITY OF EVALUATING QUANTITATIVELY THE RADIAL EFFECTIVENESS OF MIXING OF GRANULAR MATERIALS.

*HEAT TRANSFER ANALYSIS + *HIGH TEMPERATURE + HEAT TRANSFER + HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, CONVECTION

5-26118
KUMAR R
HEAT TRANSFER IN STEADY ROTATORY FLOW OF BINGHAM MATERIAL BETWEEN TWO CO-AXIAL CYLINDERS
INDIAN INSTITUTE OF TECHNOLOGY
13 PAGES, FIGURE, 9 REFERENCES, JOURNAL OF THE FRANKLIN INSTITUTE, 281(2), PAGES 136-142 (FEBRUARY, 1966)

ANALYZES HEAT TRANSFER IN STEADY ROTATORY FLOW OF BINGHAM MATERIAL BETWEEN TWO COAXIAL CYLINDERS SUCH THAT THE INNER CYLINDER IS AT REST WHILE THE OUTER CYLINDER IS ROTATING WITH A CONSTANT ANGULAR VELOCITY. THE HEAT ENERGY EQUATION ADMITS AN EXACT SOLUTION AND THE TEMPERATURE DISTRIBUTIONS ARE FOUND TO DEPEND ON THE RATIO OF THE RADII OF TWO CYLINDERS, THE POSITION OF YIELD SURFACE AND THE BRINKMAN NUMBER. THE EFFECT OF DISSIPATION IS TO INCREASE THE TEMPERATURE AT A PLACE. A CRITICAL VALUE OF THE BRINKMAN NUMBER, ABOVE OR BELOW WHICH THE HEATING OR COOLING OF THE INNER CYLINDER TAKES PLACE, IS FOUND.

*FLOW THEORY AND EXPERIMENTS + *FLOW, ANNULAR + *FLOW, LAMINAR + *FLOW, NONNEWTONIAN + *HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, CONVECTION

5-26185
DELCHAMBRE PP + MILLOT JP
STUDY OF FLOW INSTABILITIES AND OF THEIR CONSEQUENCES ON THE SAFETY OF WATER REACTORS
COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE
16 PAGES 10 FIGURES, BULL. INFORM. SCI. TECH., NO. 112, PAGES 71-86 (FEBRUARY 1967) IN FRENCH

THE POWER THRESHOLD FOR NUCLEATE BOILING AND FLOW INSTABILITY WAS MEASURED IN OUT-OF-PILE EXPERIMENTS PERFORMED IN GRENoble AS A FUNCTION OF THE FLOW RATE (WITH A GIVEN WATER CHANNEL). THE TESTS PERFORMED ON CABRI, TAKING INTO ACCOUNT THE COUPLING BETWEEN VOID AND POWER, SHED LIGHT ON THE CONSEQUENCES OF THESE PHENOMENA FOR THE WHOLE CORE. WE HAVE MEASURED FOR A GIVEN CORE AND UP TO THE INSTABILITY THRESHOLD, THE POWER VARIATION AS A FUNCTION OF THE REACTIVITY INSERTION NECESSARY TO OBTAIN A GIVEN LEVEL, FROM CRITICAL POINT AT ZERO POWER. IN CASE OF INSTABILITY, WE HAVE INVESTIGATED SOME INSTANCES OF THE BEHAVIOUR OF POWER AND OF FUEL PLATES TEMPERATURES AFTER THE BEGINNING OF THE PHENOMENA.

*BUBBLE NUCLEATION + *FRANCE + *NUCLEATE BOILING + *OUT OF PILE LOOPS AND EXPERIMENTS + BUBBLE + FLOW, GENERAL

5-26186
BIASI L + CLERCI GC + GARRIBBA S + SALA R + TOZZI A

CATEGORY 5
ACCIDENT ANALYSIS

5-26186 *CONTINUED*
STUDIES ON BURNOUT, PART 3 - A NEW CORRELATION FOR ROUND DUCTS AND UNIFORM HEATING AND ITS COMPARISON WITH
WORLD DATA
COMITATO NAZIONALE PER LE RICERCHE NUCLEARI, ITALY
5 PAGES, 13 FIGURES, 5 TABLES, 11 REFERENCES, ENERGIA NUCLEARE, 14(9), PAGES 530-536 (SEPTEMBER 1967)

A NEW BURNOUT CORRELATION HAVING A LARGE RANGE OF VALIDITY AND APPLICABLE TO CIRCULAR DUCTS
WITH UNIFORM HEAT FLUX DISTRIBUTION IS DESCRIBED. THE PREDICTED VALUES ARE COMPARED WITH
NEARLY ALL THE BURNOUT DATA WITH NEGATIVE INLET QUALITY PRESENTLY AVAILABLE. THE RESULTING
MEAN QUADRATIC ERROR OF OVER 4551 EXPERIMENTAL DATA IS 7.26% AND 85.5% OF THE EXAMINED DATA
HAS AN ABSOLUTE ERROR LESS THAN 10%. A STUDY OF THE ERROR DEPENDENCE ON THE VARIOUS
PARAMETERS IS ALSO PRESENTED.

*HEAT FLUX, CRITICAL + *HEAT TRANSFER ANALYSIS + *HEAT TRANSFER CORRELATION + HEAT TRANSFER +
HEAT TRANSFER, CONVECTION

5-26187
FALLON TA
GAS SIDE HEAT TRANSFER - MEASUREMENT AND PREDICTION
BABCOX AND WILCOX COMPANY
4 PAGES, 5 FIGURES, 11 REFERENCES, CHEMICAL AND PROCESS ENGINEERING, 48(8) PAGES 147-150 (AUGUST 1967)

DESIGNERS ARE ABLE TO PRODUCE TECHNICALLY SOUND, ECONOMICALLY JUSTIFIED HEAT-TRANSFER
EQUIPMENT, GIVEN DATA FROM THE MEASUREMENT AND CORRELATION OF GAS-SIDE HEAT TRANSFER AND
PRESSURE LOSS. THE AUTHOR INDICATED HOW THIS INFORMATION IS OBTAINED AND DESCRIBES THE RIGS
AND TECHNIQUES USED IN AN INDUSTRIAL HEAT TRANSFER LABORATORY TO INVESTIGATE THE PERFORMANCE
OF PLAIN AND FINNED TUBES AS APPLIED TO GAS-COOLED REACTOR BOILER DESIGN.

*HEAT TRANSFER + *HEAT TRANSFER ANALYSIS + *REACTOR, GCR + FLOW, AXIAL + FLOW, CROSS +
FUEL ELEMENT CLUSTER + HEAT TRANSFER, CONVECTION

5-26188
GRANT ID
PROGRESS IN HEAT TRANSFER - REVIEW OF 1966 LITERATURE
BABCOX AND WILCOX COMPANY
11 PAGES, 302 REFERENCES, CHEM. PROCESS ENG. 48(8), PAGES 125-135 (AUGUST 1967)

OVER 300 REFERENCES ON HEAT TRANSFER ARE REVIEWED IN THIS ARTICLE, SELECTED FROM THE 1966
LITERATURE WITH THE NEEDS OF THE CHEMICAL ENGINEER IN MIND. SOME IDEA OF THE SIZE OF THIS
FIELD IS GIVEN BY THE 7,000 REFERENCES ON HEAT TRANSFER WHICH HAVE GONE TO MAKE UP THE 1966
NEL HEAT BIBLIOGRAPHY. THE REVIEW IS DIVIDED INTO SECTIONS ON CONDUCTION, RADIATION,
CONVECTION, CHANGE OF PHASE, HEAT-EXCHANGER DYNAMICS, UNSTEADY HEAT TRANSFER, AND HEAT
EXCHANGERS.

*HEAT TRANSFER + *REVIEW + *SOURCE MATERIAL + BIBLIOGRAPHY + HAZARDS ANALYSIS + HEAT TRANSFER ANALYSIS

5-26189
HOLY ZJ
TEMPERATURE AND THERMOELASTIC STRESS FIELDS IN A HEAT PRODUCING SPHERE DUE TO AXISYMMETRIC SURFACE HEAT
TRANSFER
UNIVERSITY OF NEW SOUTH WALES, AUSTRALIA
13 PAGES, 8 FIGURES, 9 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 4(5) PAGES 433-445 (1966)

AN ITERATIVE PERTURBATION-SERIES METHOD IS DEVELOPED FOR SOLUTION OF TEMPERATURE AND STRESS
FIELDS DUE TO AXISYMMETRIC HEAT TRANSFER COEFFICIENT VARIATION OVER THE SURFACE OF A HEAT
PRODUCING SPHERE. THE METHOD IS APPLIED TO A NUMBER OF HEAT TRANSFER DISTRIBUTIONS OF
PRACTICAL INTEREST AND RESULTS ARE PLOTTED. CONCLUSIONS ARE DRAWN REGARDING THE EFFECT OF
VARIOUS DISTRIBUTIONS AND THEIR AMPLITUDE VARIATIONS ON THE TEMPERATURES AND STRESSES.

*HEAT TRANSFER ANALYSIS + *REACTOR, PEBBLE BED + *SPHERE + *STRESS ANALYSIS + HEAT TRANSFER +
HEAT TRANSFER, CONVECTION + HEAT TRANSFER, GAS + TEMPERATURE GRADIENT

5-26260
ULYBIN SA
COOLANTS FOR NUCLEAR POWER ENGINEERING INSTALLATIONS (TRANSLATION FROM RUSSIAN)
JPRS-38717 +. 5 PAGES, 1966

CONSIDERS THE OPERATIONAL CHARACTERISTICS OF COOLANTS IN POWER REACTORS. THE DATA ON
DIFFERENT PROPERTIES OF COOLANTS HAVE BEEN SYSTEMATIZED. THE EFFECTS OF RADIATION ON THE
PROPERTIES OF COOLANTS AND CORROSION OF STRUCTURAL MATERIALS HAVE BEEN DESCRIBED.
APPROXIMATE METHODS FOR THE CALCULATION OF THE RADIOACTIVITY OF COOLANTS ARE CITED.
THERMOPHYSICAL, CORROSIVE, AND OTHER PROPERTIES OF WATER, ORGANIC, LIQUID-METAL, AND GAS
COOLANTS WHICH ARE USED IN NUCLEAR POWER ENGINEERING ARE DESCRIBED IN DETAIL. THE
CHARACTERISTICS OF CONSTRUCTION AND OPERATION OF REACTORS AS DETERMINED BY THE USE OF
DIFFERENT COOLANTS ARE DISCUSSED. THIS BOOK IS FOR STUDENTS OF INSTITUTES SPECIALIZING IN
DESIGN AND OPERATION OF POWER REACTORS. IT MAY ALSO BE USEFUL FOR ENGINEERING AND TECHNICAL
PERSONNEL.

CATEGORY 5
ACCIDENT ANALYSIS

5-26260 *CONTINUED*

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE.

*COOLANT QUALITY + *HEAT TRANSFER + *REACTOR COOLANT + COOLANT CHEMISTRY + FLOW THEORY AND EXPERIMENTS

5-26283

BLANC H + LIONS N + MILLOT JP

THE CABRI SODIUM LOOP

CENTRE D ETUDES NUCLEAIRES DE CADARACHE, FRANCE

28 PAGES, 10 FIGURES, 2 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER 1967

THE USE OF A WATER REACTOR FOR THE IRRADIATION OF FAST REACTOR PINS OFFERS MANY ADVANTAGES BY PROVIDING A LARGE FLEXIBILITY IN THE EXPERIMENTS AS WELL AS A HIGH POWER DENSITY CAPABILITY DESPITE THE PRECAUTIONARY MEASURES SET BY SAFETY CONSIDERATIONS. THE BASIC KNOWLEDGE OF SODIUM BOILING AND THE BEHAVIOR DURING THE MELTDOWN OF A FAST REACTOR FUEL PIN IS VERY LIMITED. FOR THIS REASON WE CONSIDERED THE CONSTRUCTION OF A LOOP LOCATED IN THE CENTER OF THE CABRI REACTOR CORE TO STUDY THESE TWO PROBLEMS. DURING A LOSS OF COOLING ACCIDENT IT WILL PERMIT THE MEASUREMENT OF TEMPERATURE, FLOW AND PRESSURE HISTORIES OF THE SODIUM AS WELL AS CLADDING AND FUEL TEMPERATURES. IN ADDITION, IT WILL PROVIDE USEFUL INFORMATION ON THE RELEASE OF FISSION PRODUCTS INTO SODIUM.

AVAILABILITY - H. BLANC, J.P. MILLOT, C.E.N. CADARACHE, FRANCE

*ACCIDENT, LOSS OF COOLANT + *IN PILE LOOP + *SODIUM + FRANCE + IN PILE EXPERIMENT + OUT OF PILE LOOPS AND EXPERIMENTS + REACTOR, FAST

5-26284

GRASS G + KOTTOWSKI H + SPILLER KH

MEASUREMENTS OF THE SUPERHEATING AND STUDIES ABOUT BOILING PHENOMENA IN LIQUID METALS

EUROPEAN ATOMIC ENERGY COMMUNITY, ISPRA, ITALY

25 PAGES, 13 FIGURES, 10 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER 1967

BOILING OF POTASSIUM AND SODIUM HAS BEEN STUDIED IN STAGNANT CONDITIONS AND IN THE CASES OF NATURAL AND FORCED CONVECTION. THE MAXIMUM SUPERHEATING TEMPERATURE OF THE LIQUID METAL WAS MEASURED BEFORE BOILING. THE MEASURED SUPERHEATING VARIED FROM ABOUT 20 TO 820 C DEPENDING OF THE USED LIQUID METAL AND THE TEST CONDITIONS. VAPORISATION WAS GENERALLY FOLLOWED BY EXPULSION OF LIQUID METAL COLUMNS DUE TO THE GENERATED VAPOUR. THE EXPANSION OF THE FORMED VAPOUR VOLUMINA WAS MEASURED. IMPORTANT PARAMETERS FOR THE EJECTION TIME WERE THE INITIAL VAPOUR PRESSURE (CORRESPONDING TO THE INITIAL SUPERHEATING AT THE MOMENT OF INCIPIENT BOILING) AND THE PRESSURE EVOLUTION WHILE EJECTION. A MODEL DESCRIBING THE PHENOMENON IS GIVEN.

AVAILABILITY - K.H. SPILLER, ISPRA, P.B. NO. 1, (VARESE) ITALY

*POOL BOILING + *POTASSIUM + *SODIUM + CONVECTIVE BOILING + EURATOM + HEAT TRANSFER, BOILING + HEAT TRANSFER, BOILING + HEAT TRANSFER, CONVECTION + HEAT TRANSFER, NATURAL CONVECTION + REACTOR, FAST

5-26285

PINCHERA GC + TOMASSETTI G + GAMBARDILLA G + FARRELLO GE

EXPERIMENTAL BOILING STUDIES RELATED TO FAST REACTOR SAFETY

COMITATO NAZIONALE PER L ENERGIA NUCLEARE, ITALY

35 PAGES, 16 FIGURES, 23 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER 1967

THE RESEARCH PROGRAM ENA IS AIMED TO STUDY, EXPERIMENTALLY AND THEORETICALLY, THE BEHAVIOUR OF SODIUM DURING REACTOR ACCIDENTS THAT LEAD TO THE COOLANT BOILING IN A SIMULATED CLUSTER OF RODS. REQUIRED HYDRODYNAMIC SIMULATION AND FLOW DIAGRAMS FOR EXPERIMENTAL SODIUM LOOPS ARE DISCUSSED. THE DEVELOPMENT OF AN INSTRUMENTED SIMULATED FUEL ROD IS DESCRIBED. DURING THE BOILING OF SODIUM ON THE SURFACE OF A VERTICAL CYLINDRICAL HEATER, STEADY-STATE BOILING CURVES AND POWER TRANSIENT LIQUID SUPERHEATS HAVE BEEN MEASURED AS A FUNCTION OF SYSTEM PRESSURE, SURFACE FINISH AND HISTORY. TRANSIENT TESTS GIVE VERY DIFFERENT SUPERHEAT VALUES, GENERALLY UP TO 10 C WALL SUPERHEAT FOR ROUGH SURFACES AND UP TO 60 C LIQUID SUPERHEAT FOR AS-RECEIVED SURFACES. INITIAL TRANSIENT BOILING STUDIES IN A WATER ANALOG FORCED CONVECTION LOOP ARE DESCRIBED.

AVAILABILITY - G.C. PINCHERA + G. TOMASSETTI, CNEN, CSN, CASACCIA, S. MARIA DI GALERIA, ROME, ITALY

*REACTOR, FAST + *SAFETY ANALYSIS + *SODIUM + CONVECTIVE BOILING + FUEL ELEMENT CLUSTER + HEAT TRANSFER, BOILING + HYDRODYNAMIC ANALYSIS + OUT OF PILE LOOPS AND EXPERIMENTS + REACTOR TRANSIENT

5-26286

KOSKY PG

SOME ASPECTS OF BOILING AND VAPOUR VOIDAGE GROWTH PROBLEMS IN A LIQUID-METAL-COOLED REACTOR

UKAEA, BERKS HARWELL

24 PAGES, 14 FIGURES, 21 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR

CATEGORY 5
ACCIDENT ANALYSIS

5-26286 *CONTINUED*
REACTORS, SEPTEMBER 1967

PRESENTS SOME THEORETICAL STUDIES OF THE INITIATION OF BOILING OF A LIQUID METAL IN FORCED CONVECTIVE FLOW WHICH SUGGEST THAT THE BURN-OUT HEAT FLUX MAY BE EXCEEDED WHEN THE FIRST VAPOUR VOID IS FORMED. THE HYPOTHESIS IS DISCUSSED IN THE LIGHT OF PUBLISHED EXPERIMENTAL DATA. IT LEADS DIRECTLY TO AN INTEREST IN THE GROWTH RATE AND CONFIGURATION OF VAPOUR VOIDS. PUBLISHED ASYMPTOTIC-GROWTH-RATE EQUATIONS CANNOT BE DIRECTLY APPLIED TO THIS PARTICULAR VOID-GROWTH PROBLEM BECAUSE OF THE ENHANCED RATE OF HEAT TRANSFER TO THE EVAPORATION INTERFACE DUE TO THE VERY HIGH THERMAL CONDUCTIVITY OF LIQUID METAL. A SIMPLE MODEL IS THEREFORE PROPOSED TO TAKE ACCOUNT OF THIS EFFECT AND CALCULATIONS BASED ON THIS MODEL ARE GIVEN FOR SODIUM UNDER VARIOUS CONDITIONS.

AVAILABILITY - P.G. KOSKY, CHEMICAL ENGINEERING AND PROCESS TECHNOLOGY DIVISION, A.E.R.E. HARWELL, ENGLAND

*BURNOUT HEAT FLUX + *CONVECTIVE BOILING + *METAL, LIQUID + HEAT TRANSFER, BOILING + HEAT TRANSFER, CONVECTION + REACTOR, FAST + REACTOR, LMCR

5-26287
JUDD AM

BOILING AND CONDENSATION OF SODIUM IN RELATION TO FAST REACTOR SAFETY
ATOMIC ENERGY ESTABLISHMENT, WINFRITH

38 PAGES, 11 FIGURES, 3 TABLES, 21 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER 1967

THIS PAPER DEALS WITH VARIOUS ASPECTS OF SODIUM BOILING WHICH ARE OF IMPORTANCE IN ASSESSING THE COURSE AND CONSEQUENCES OF AN OVERHEATING ACCIDENT IN A SODIUM-COOLED FAST REACTOR. BUBBLE NUCLEATION AND THE LIQUID SUPERHEAT NECESSARY TO START VAPOUR FORMATION ARE DISCUSSED, AND AN APPROXIMATE METHOD OF CALCULATING THE DYNAMICS OF SODIUM VAPOUR BUBBLES IS DESCRIBED. THIS IS USED TO PREDICT THE EFFECTS WHEN SEVERAL BUBBLES GROW SIMULTANEOUSLY, AND THE RESULTS ARE APPLIED TO THE VOIDING OF AN OVERHEATED FAST REACTOR COOLANT CHANNEL TO FIND THE RATES OF COOLANT EXPULSION AND THE PRESSURE TRANSIENTS INVOLVED. THE CONDENSATION OF VAPOUR BUBBLES WHICH MOVE INTO REGIONS OF COOLER LIQUID IS ALSO DISCUSSED, AND THE RATES OF COLLAPSE AND ACCOMPANYING PRESSURE PULSES ARE CALCULATED.

AVAILABILITY - A.M. JUDD, U.K.A.E.A., ATOMIC ENERGY ESTABLISHMENT, WINFRITH, DORCHESTER, DORSET, ENGLAND

*ACCIDENT ANALYSIS + *NUCLEATE BOILING + *REACTOR, FAST + *SODIUM + BUBBLE + BUBBLE NUCLEATION + REACTOR DYNAMICS + REACTOR TRANSIENT

5-26454
ROUHANI SZ

VOID MEASUREMENTS IN THE REGIONS OF SUB-COOLED AND LOW-QUALITY BOILING
AKIEBOLAGET ATOMENERGI, STOCKHOLM (SWEDEN)

AE-238 +. 18 PAGES, FIGURES, TABLES, REFERENCES, JULY 1966

BY THE APPLICATIONS OF THE (GAMA, NEUTRON) REACTION TO BOILING HEAVY WATER, VOID VOLUME FRACTIONS HAVE BEEN MEASURED IN A VERTICAL ANNULAR CHANNEL WITH 25 MM O.D. AND 12 MM I.D. AT A HEATED LENGTH OF 1090 MM. THE EXPERIMENTS COVERED PRESSURES FROM 10 TO 50 BARS, MASS VELOCITIES FROM 50 TO 1450 KG/M²-SEC, HEAT FLUXES FROM 30 TO 90 W/CM² SUBCOOLINGS FROM 30 TO 0 C, AND STEAM QUALITIES FROM 0 TO 15. THE RESULTS INDICATE NOTICEABLE EFFECTS OF PRESSURE, HEAT FLUX AND EVEN MASS VELOCITY UPON THE VARIATIONS OF VOID WITH SUBCOOLING AND STEAM QUALITY. A NOVEL EXPLANATION OF THE MECHANISM OF THEIR EFFECTS HAS BEEN FOUND AND PROVED BY QUALITATIVE ANALYSIS.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*FLOW, ANNULAR + *FLOW, TWO PHASE + *VOID FRACTION + FLOW DISTRIBUTION + FLOW THEORY AND EXPERIMENTS + STEAM

5-26455
ROUHANI SZ

VOID MEASUREMENTS IN THE REGIONS OF SUB-COOLED AND LOW-QUALITY BOILING. PART 2
AKIEBOLAGET ATOMENERGI, STOCKHOLM (SWEDEN)

AE-239 +. 9 PAGES, FIGURES, TABLES, REFERENCES, JULY 1966

THIS REPORT CONSISTS MOSTLY OF TABLES OF EXPERIMENTAL DATA OBTAINED IN VOID MEASUREMENTS. IT IS A CONTINUATION AND THE COMPLETING PART OF A PREVIOUS REPORT WITH THE SAME TITLE. THE DATA ARE FROM THE MEASUREMENTS IN A VERTICAL ANNULAR CHANNEL WITH 25 MM O.D. AND 12 MM I.D. AT A HEATED LENGTH OF 1090 MM. THESE EXPERIMENTS COVERED PRESSURES FROM 10 TO 50 BARS, MASS VELOCITIES FROM 650 TO 1450 KG/M²-SEC, HEAT FLUXES FROM 60 TO 120 W/CM², SUB-COOLINGS FROM 30 TO 0 C, AND STEAM QUALITIES FROM 0 TO 12. THE TABLES INCLUDE THE INLET TEMPERATURES AND MEASURED WALL SUPER-HEAT.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*FLOW, ANNULAR + *FLOW, TWO PHASE + *VOID FRACTION + FLOW DISTRIBUTION + FLOW THEORY AND EXPERIMENTS + STEAM

CATEGORY 5
ACCIDENT ANALYSIS

5-26478
REILLY IG + TIEN C + ADELMAN M
EXPERIMENTAL STUDY OF NATURAL CONVECTIVE HEAT TRANSFER IN A NON-NEWTONIAN FLUID
UNIVERSITY OF WINDSOR, WINDSOR, ONTARIO
3 PAGES, 5 FIGURES, 6 REFERENCES, THE CANADIAN JOURNAL OF CHEMICAL ENGINEERING, 44(2), PAGES 61-63 (APRIL 1966)

EXPERIMENTAL DATA OF NATURAL CONVECTION HEAT TRANSFER FROM A HEATED HORIZONTAL PLATE, BOTH FACING UPWARD AND DOWNWARD, TO A NON-NEWTONIAN FLUID ARE REPORTED. EMPIRICAL EXPRESSIONS ESSENTIALLY SIMILAR TO THOSE DEVELOPED FOR THE VERTICAL PLATE CASE ARE OBTAINED WHICH CORRELATE THE DATA WITH REASONABLE ACCURACY.

*FLOW, NONNEWTONIAN + *HEAT TRANSFER CORRELATION + *HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-26481
LYS LA
EINIGE PROBLEME DER THERMISCHEN BERECHNUNG DES KERNES EINES DAMPFGEKUEHLTEN DRUCKROHRLEISTUNGSTREAKTORS
EDGEOSSESCHES INSTITUT FUR REAKTORSCHEUNG, SWITZERLAND
11 PAGES, 14 FIGURES, 16 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 5(2), PAGES 123-133 (MARCH 1967) IN GERMAN

THE ARTICLE DESCRIBES SOME THERMAL ANALYSIS PROBLEMS AND THE MANNER IN WHICH THEY WERE SOLVED WITHIN THE FRAMEWORK OF A CONCEPTUAL DESIGN STUDY FOR A STEAM COOLED PRESSURE-TUBE POWER REACTOR. CORRELATIONS FOR DETERMINING THE HEAT TRANSFER IN A FUEL CHANNEL, TOGETHER WITH THE MEASUREMENTS PERFORMED TO DETERMINE THEM, ARE DESCRIBED. FURTHERMORE, THE PROCEDURE USED FOR CALCULATING THE AVERAGE MASS FLOW RATE OF THE COOLANT PER FUEL CHANNEL AND THE NUMBER OF CHANNELS IS GIVEN.

*HEAT TRANSFER ANALYSIS + *HOT CHANNEL + *REACTOR, BWR + FUEL ELEMENT CLUSTER + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + REACTOR, PRESSURE TUBE

5-26586 ALSO IN CATEGORY 18
TWISTED TAPE BOILING WATER REACTOR
ALIGENEINE ELEKTRICITAETS-GESELLSCHAFT, FRANKFURT AM MAIN, WEST GERMANY
EUR-3651 +. 109 PAGES, REFERENCES, FINAL REPORT, JULY 1965-SEPTEMBER, 1966, SOCIETE NATIONALE D ETUDE ET DE CONSTRUCTION DE MOTEURS D AVIATION, SURESNES (FRANCE), SEPTEMBER 15, 1967

AN OUT-OF-PILE EXPERIMENT WAS CONDUCTED ON A 9-ROD TWISTED-TAPE BUNDLE. NO FRETTING CORROSION WAS OBSERVED. THERMAL TESTS WERE PERFORMED, AND A ROD SURFACE TEMPERATURE RISE WAS DETECTED AT THE OUTLET BUT COULD NOT BE CORRELATED WITH THE LOCATION OF BURNOUT. DISCUSSES PARAMETRIC AND ECONOMIC STUDIES, PLUS FABRICATION OF A PROTOTYPE FUEL BUNDLE.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*HEAT TRANSFER AUGMENTATION + *R AND D PROGRAM + BURNOUT HEAT FLUX + CORROSION + ECONOMICS + EURATOM + FLOW THEORY AND EXPERIMENTS + FRANCE + GERMANY + HEAT TRANSFER EXPERIMENT + OUT OF PILE LOOPS AND EXPERIMENTS + REACTOR, BWR

5-26589 ALSO IN CATEGORIES 18 AND 17
BANNELLA, R
BEHAVIOR OF GARGILIANO REACTOR CORE IN SIMULATED CYCLE AT INCREASED POWER
ENTE NAZIONALE PER L ENERGIA ELETTRICA, ROME, ITALY
EURAC-1956 + EUR-3766 +. 38 PAGES, SPECIAL REPORT NO. 4, CONTRACT 101-63-11-RD1, NOVEMBER, 1966

USING PLANT COMPUTER, POWER OF 620 MWT (122.46% OF RATED POWER OF 506.3 MWT) WAS STUDIED. RESULTS INDICATE CORE CAN OPERATE AT THAT LEVEL WITHOUT EXCEEDING THE LIMIT OF THERMAL FLUX OR BURNOUT RATIO. HOWEVER, IMPROVEMENT IN FUEL ELEMENT REQUIRED. THE PURPOSE OF STUDY WAS TO FIND THE SHAPE OF LIMITING FUEL PARAMETERS - OTHER COMPONENTS ARE DISREGARDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*PERFORMANCE LIMIT + *REACTOR POWER + *THEORETICAL INVESTIGATION + EURATOM + GARIGLIANO (BWR) + HEAT TRANSFER ANALYSIS + POWER UPGRATING + REACTOR, BWR -

5-26590 ALSO IN CATEGORY 17
FRESHLEY MD + GOLDSMITH S
OPERATING EXPERIENCE WITH PLUTONIUM FUELS IN PRTR
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-1204 +. 31 PAGES, AUGUST 25, 1967

BASIC FUEL-ELEMENT DESIGN IS DESCRIBED. HIGH-POWER-DENSITY FUEL IRRADIATIONS WERE SATISFACTORY. IRRADIATED UO₂-PUO₂ FUEL SPECIMEN WERE RADIOGRAPHED 48 HR AFTER SHUTDOWN.

CATEGORY 5
ACCIDENT ANALYSIS

5-26590 *CONTINUED*

HIGH CONCENTRATIONS OF FISSION PRODUCTS WERE OBSERVED ON INNER SURFACES AND CRACKS BUT DISAPPEARED WITH TIME. FURTHER STUDIES UNDERWAY. GAS-RELEASE AND PRESSURE-BUILDUP STUDIES DISCUSSED (MOSTLY A DISCUSSION OF PRESENT PROGRAM).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FUEL BURNUP + *IRRADIATION TESTING + *PLUTONIUM DIOXIDE + *URANIUM DIOXIDE + FUEL ELEMENT + OPERATING EXPERIENCE SUMMARY + PRTR (TR) + REACTOR, TEST

5-26600

SHOTKIN LM

STABILITY CONSIDERATIONS IN TWO-PHASE FLOW

BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK

8 PAGES, 10 FIGURES, TABLE, 18 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING, 28(3), PAGES 317-324 (JUNE, 1967)

A SPATIAL-AVERAGED MODEL OF BOILING FLOW IN AN ELECTRICALLY HEATED VERTICAL PIPE IS USED TO INVESTIGATE AND EXPLAIN EXPERIMENTAL DATA OF VARIOUS LABORATORIES. THE AGREEMENT WITH DATA IS GOOD OVER A VARIETY OF CONDITIONS RANGING IN PRESSURE FROM ATMOSPHERIC TO 1000 PSIA, AND IN HEATED LENGTH FROM 2 TO 16 FT. TWO SLIP-RATIO CORRELATIONS ARE COMPARED IN TESTING THE MODEL AGAINST THE STABILITY DATA. THE CORRELATION OF BANKOFF BEING LESS SUCCESSFUL AT LOW SUBCOOLING THAN THE MODIFIED BANKOFF CORRELATION DUE TO JONES. A VALUE OF BANKOFF'S K RECOMMENDED BY KHOLODOVSKI IS ALSO COMPARED FOR SPIGTS EXPERIMENT. THE CRUCIAL BOILING LENGTH, WHERE THE SYSTEM IS LEAST STABLE, IS USED TO DEMONSTRATE THE DEPENDENCE OF STABILITY ON HEATING RATE, FLOW RATE, AND DEGREE OF SUBCOOLING.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TWO PHASE + *MATHEMATICAL STUDY + BNL + CONVECTIVE BOILING + FLOW, TUBE + HEAT TRANSFER, BOILING

5-26604

LEE DH

BOILING BURNOUT - A REVIEW OF RECENT WORK

6 PAGES, 7 FIGURES, 69 REFERENCES, BRITISH CHEMICAL ENGINEERING 12(9), PAGES 1363-68 (SEPTEMBER 1967)

GENERAL REVIEW OF DEVELOPMENTS IN BOILING WATER BURNOUT OVER THE PAST THREE YEARS. DESCRIBES IN DETAIL THE TREND OF THE VARIOUS PARAMETERS AFFECTING BURNOUT, TOGETHER WITH A SUMMARY OF SOURCES OF DATA FOR TUBES, ANNULI AND ROD CLUSTERS. THEN FOLLOWS A REVIEW OF CORRELATIONS FOR PREDICTING BURNOUT IN THESE GEOMETRIES, AND AN ACCOUNT OF A NEW TECHNIQUE WHICH USES OTHER FLUIDS AT LOW PRESSURE TO SIMULATE QUANTITATIVELY BURNOUT WITH HIGH PRESSURE WATER. SELECTED REFERENCES ARE GIVEN FOR RECENT DEVELOPMENTS IN TWO-PHASE FLOW, PRESSURE DROP, NATURAL-CIRCULATION BOILING, AND WETTING OF HOT SURFACES.

*BURNOUT HEAT FLUX + *CONVECTIVE BOILING + *HEAT FLUX, DRYOUT + BIBLIOGRAPHY + HEAT FLUX, CRITICAL + HEAT TRANSFER, BOILING + HEAT TRANSFER, CONVECTION

5-26605

RESHOTKO E

AN ANALYSIS OF THE LAMINAR INSTABILITY PROBLEM IN GAS-COOLED NUCLEAR REACTOR PASSAGES

CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO

10 PAGES, 7 FIGURES, REFERENCES, AIAA JOURNAL 5(9), PAGES 1606-15 (SEPTEMBER 1967)

NUCLEAR REACTOR PASSAGES IN LAMINAR FLOW HAVE LONG BEEN REGARDED AS UNSTABLE IN THAT REGION OF OPERATION WHERE THE RATE OF CHANGE OF PRESSURE DROP WITH WEIGHT FLOW AT CONSTANT HEAT INPUT IS NEGATIVE. IN THE PRESENT PAPER A TIME-DEPENDENT STABILITY ANALYSIS OF THE PROBLEM AFFIRMS THAT THIS CRITERION IS VALID FOR EXCURSIONS AT CONSTANT PRESSURE DROP AND SHOWS THAT THE INSTABILITY IS ASSOCIATED WITH THE THERMAL RESPONSE OF THE REACTOR CORE TO AN INFINITESIMAL DISTURBANCE. THE ANALYSIS ALSO ALLOWS THE CALCULATION OF A COMPLETE EXCURSION AT CONSTANT PRESSURE DROP FROM AN INITIALLY UNSTABLE LAMINAR EQUILIBRIUM POINT. THROUGHOUT, THE METHOD OF ANALYSIS IS SUCH THAT GROWTH RATES MAY BE OBTAINED FOR ANY REACTOR WHOSE STEADY-STATE CONDITIONS ARE KNOWN WHETHER THEY BE FOR UNIFORM HEATING, COSINE HEATING, OR ANY FORM OF ZONED HEATING.

*FLOW, LAMINAR + *HOT CHANNEL + *REACTOR, GCR + FLOW THEORY AND EXPERIMENTS + HYDRODYNAMIC ANALYSIS + PRESSURE DROP

5-26606

GRANT ID

PROGRESS IN HEAT TRANSFER - REVIEW OF 1966 LITERATURE

BABCOCK AND WILCOX LTD.

11 PAGES, 302 REFERENCES, CHEMICAL AND PROCESS ENGINEERING 48, PAGES 125-35 (AUGUST 1967)

OVER 300 REFERENCES ON HEAT TRANSFER ARE REVIEWED. THEY WERE SELECTED FROM THE 1966 LITERATURE, WITH THE NEEDS OF THE CHEMICAL ENGINEER IN MIND. SOME IDEA OF THE SIZE OF THIS FIELD IS GIVEN BY THE 7000 REFERENCES ON HEAT TRANSFER WHICH HAVE GONE TO MAKE UP THE 1966 NEE HEAT BIBLIOGRAPHY. THE REVIEW IS DIVIDED INTO SECTIONS ON CONDUCTION, RADIATION, CONVECTION, CHANGE OF PHASE, HEAT-EXCHANGER DYNAMICS, UNSTEADY HEAT TRANSFER, AND HEAT

CATEGORY 5
ACCIDENT ANALYSIS

5-26606 *CONTINUED*
EXCHANGERS. FOR THE FIFTH YEAR IN SUCCESSION IT IS COMPILED BY NEL.

*HEAT TRANSFER + BIBLIOGRAPHY + HEAT TRANSFER CORRELATION + HEAT TRANSFER EXPERIMENT +
HEAT TRANSFER, BOILING + HEAT TRANSFER, CONDENSATION + HEAT TRANSFER, CONDUCTION +
HEAT TRANSFER, CONVECTION + HEAT TRANSFER, GAS + HEAT TRANSFER, NATURAL CONVECTION +
HEAT TRANSFER, RADIANT + HEAT TRANSFER, TWO PHASE + METAL, LIQUID + REVIEW

5-26607
MAINES D
SLIP RATIOS AND FRICTION FACTORS IN THE BUBBLE FLOW REGIME IN VERTICAL TUBES
INSTITUTT FOR ATOMENERGI, KJELLER, NORWAY
KR-110 +. 174 PAGES, REFERENCES, MAY 1966

SLIP RATIOS IN THE VERTICAL BUBBLE FLOW REGIME HAVE BEEN MEASURED IN ADIABATIC AIR-WATER AND
STEAM-WATER FLOW. THE EXPERIMENTAL DATA CONFIRM THAT THE SLIP RATIO IN BUBBLE FLOW MAY BE
REPRESENTED BY TWO TERMS. THE FIRST TERM IS DUE TO THE RELATIVE VELOCITY BETWEEN BUBBLES AND
WATER. THE SECOND TERM IS CAUSED BY THE RELATIVE DISTRIBUTION OF GAS AND LIQUID.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*FLOW THEORY AND EXPERIMENTS + *FLOW, TUBE + *FLOW, TWO PHASE + AIR + BUBBLE + STEAM + VOID FRACTION +
WATER, GENERAL

5-26608
KEMME JE
HEAT PIPE CAPABILITY EXPERIMENTS
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
LA-DC-7938 + CONF-661116-1 +. 10 PAGES, REFERENCES, FROM THERMIONIC CONVERSION SPECIALIST CONFERENCE,
HOUSTON, TEXAS, 1965

AXIAL HEAT TRANSFER LIMITS WERE DETERMINED FOR SEVERAL HEAT PIPE SYSTEMS TO SHOW METHODS FOR
INCREASING HEAT TRANSFER CAPABILITY AND TO CHECK THE VALIDITY OF EXISTING HEAT PIPE
EQUATIONS. MEASUREMENTS WERE MADE AT OPERATING TEMPERATURES FROM 450 TO 850 C. SODIUM AND
POTASSIUM WERE USED AS WORKING FLUIDS. TWO-COMPONENT WICKS WERE TESTED BECAUSE THEY PROVIDE
MEANS FOR INCREASING HEAT PIPE PERFORMANCE BY UTILIZING FINE PORES FOR FLUID PUMPING AND A
LESS RESTRICTIVE PATH FOR LIQUID RETURN. IN THIS PAPER, HEAT PIPE CONSTRUCTION AND
PREPARATION TECHNIQUES ARE DESCRIBED. PERTINENT FLUID PROPERTIES ARE PLOTTED AS A FUNCTION
OF TEMPERATURE. HEAT PIPE EQUATIONS ARE LISTED AND THE EXPERIMENTAL RESULTS ARE COMPARED
WITH CALCULATED HEAT TRANSFER LIMITS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*HEAT PIPE + *HEAT TRANSFER ANALYSIS + *HEAT TRANSFER EXPERIMENT + HEAT TRANSFER + LASL + POTASSIUM +
SODIUM

5-26609
KUGE Y + ISHIKAWA M + NAITOH Y + ITOH T
NUCLEAR, THERMAL-HYDRAULIC PERFORMANCE ANALYSIS OF JPDR CORE BY THE ONE-DIMENSIONAL BWR CORE PERFORMANCE
ANALYSER CODE, KINAK
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO
JAERI-1114 +. 43 PAGES, TABLES, REFERENCES, MAY 1966

THE CORE PERFORMANCE OF JPDR (A NATURAL CIRCULATION BWR) WAS ANALYZED BY THE ONE-DIMENSIONAL
BWR CORE PERFORMANCE ANALYSER CODE, KINAK. THIS CODE COMPUTES THE NUCLEAR, THERMAL-HYDRAULIC
PERFORMANCE OF A BWR CORE BY A COMPREHENSIVE SCHEME. THE AXIAL POWER DISTRIBUTION, THE POWER
AND VOID COEFFICIENTS OF REACTIVITY AND THE EXCESS REACTIVITY AT THE RATED POWER LEVEL WERE
CALCULATED AND COMPARED WITH THOSE MEASURED AT JPDR (OR THE GE DESIGN VALUES). THROUGH THESE
COMPARATIVE STUDIES, THE AUTHORS CONCLUDE THAT THE COMPUTATIONAL MODEL OF THE CODE AND
NUCLEAR GROUP CONSTANTS USED ARE ABLE TO REPRESENT THE NUCLEAR PERFORMANCE OF THE JPDR CORE
WITHIN REASONABLE ACCURACY. THERE IS A DISCREPANCY OF ABOUT 10% BETWEEN THE CALCULATED
VALUES AND THOSE MEASURED BY THE INSTRUMENTED FUEL ASSEMBLY OF THE RECIRCULATION FLOW RATE
AND THE CORE EXIT QUALITY.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*COMPUTER PROGRAM + *HEAT TRANSFER ANALYSIS + *HYDRODYNAMIC ANALYSIS + *REACTOR, BWR + JAPAN +
REACTOR DESCRIPTION

5-26611
POPPENDIAK HF + SABIN CM + FEIGENBUTS LV + MORTON WA + CONNELLY DA
DYNAMIC ANALYSIS OF A LITHIUM-BOILING POTASSIUM REFRACTORY METAL RANKINE CYCLE POWER SYSTEM FOR THE JET
PROPULSION LABORATORY
GEOSCIENCE LTD., LA JOLLA, CALIF.
N-66-19135 + NASA-CR-70371 + GLR-39 +. 133 PAGES, NOVEMBER 1965

THIS REPORT CONTAINS A NUMBER OF STEADY STATE AND TRANSIENT ANALYSES OF IDEALIZED MODELS OF

CATEGORY 5
ACCIDENT ANALYSIS

5-26611 *CONTINUED*

THE JET PROPULSION LABORATORY LITHIUM-BOILING POTASSIUM RANKINE CYCLE SPACE POWER SYSTEM. A NUMBER OF THE PROCESSES WHICH TAKE PLACE IN A BOILING LIQUID METAL SYSTEM ARE ONLY APPROXIMATELY UNDERSTOOD. SUITABLE IDEALIZATIONS MUST BE MADE TO ALLOW ITS STUDY BY ANALYSIS. THE ANALYSES PRESENTED IN THIS REPORT ARE BASED ON SUCH IDEALIZATIONS WHICH YIELD SOLUTIONS WHICH ADEQUATELY REPRESENT THE MAIN FEATURES OF THE LOOP UNDER CONSTRUCTION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONVECTIVE BOILING + *LITHIUM + *METAL, LIQUID + FLOW, TWO PHASE + HEAT TRANSFER ANALYSIS + POTASSIUM

5-26614

HETSRONI G

USE OF HYDRAULIC MODELS IN NUCLEAR REACTOR DESIGN

WESTINGHOUSE ATOMIC POWER DIVISION, PA.

11 PAGES, 9 FIGURES, 1 TABLE, NUCLEAR SCIENCE AND ENGINEERING 28(1), PAGES 1-11 (1967)

EXPERIMENTAL STUDIES WERE CONDUCTED ON SCALED HYDRAULIC MODELS OF LARGE PRESSURIZED-WATER REACTORS. MEASUREMENTS WERE MADE OF THE EFFECT OF VARIOUS INTERNAL GEOMETRIES ON THE FLOW DISTRIBUTION AT THE CORE INLET AND ON THE EULER NUMBERS. ATTENTION WAS FOCUSED ON THE RELATIONSHIP BETWEEN THE FLOW DISTRIBUTION AND THE LENGTH OF THE FLOW SKIRT, THE LENGTH OF THE LOWER PLENUM AND THE LAYOUT OF INSTRUMENTATION TUBES. THE DESIGN OF THESE COMPONENTS WAS OPTIMIZED. FLOW DISTRIBUTIONS IN THE ANNULI FORMED BY THE THERMAL SHIELD AND IN THE LOWER PLENUM WERE DETERMINED ANALYTICALLY AND CONFIRMED EXPERIMENTALLY.

*FLOW THEORY AND EXPERIMENTS + *FUEL ELEMENT CLUSTER + *REACTOR, PWR + BETTIS + FLOW, TURBULENT + WATER, GENERAL

5-26624

HEAT TRANSFER

10 PAGES, 35 FIGURES, BRITISH CHEMICAL ENGINEERING EQUIPMENT SUPPLEMENT, 11(11), PAGES 41-50 (NOVEMBER, 1966)

A SUMMARY OF CURRENT DEVELOPMENTS AND TRENDS (1966) IN THE DESIGN, CONSTRUCTION, AND APPLICATION OF HEAT-TRANSFER EQUIPMENT, AN APPRECIATION OF NEW MATERIALS, AND COMMENTS UPON THE PERFORMANCE OF NEW TYPES OF EQUIPMENT. REFERENCES TO 14 PAPERS.

*EQUIPMENT DESIGN + *HEAT TRANSFER + *MATERIAL + BIBLIOGRAPHY + EQUIPMENT, GENERAL + HEAT EXCHANGER

5-26625

DEEV VI + DUBROVSKII GP + KOKOREV LS + NOVIKOV II + PETROVICHEV VI

HEAT TRANSFER IN FREE-CONVECTION SODIUM BOILING

2 PAGES, 2 FIGURES, 6 REFERENCES, SOVIET ATOMIC ENERGY, 22, PAGES 56-57 (JANUARY, 1967)

THE LACK OF EXPERIMENTAL DATA ON THE HEAT-TRANSFER CHARACTERISTICS OF BOILING SODIUM MAKES IT DIFFICULT TO DETERMINE THE RANGE WITHIN WHICH THIS OPERATION IS UNSTABLE. TO MEET THIS NEED, A SERIES OF HEAT-TRANSFER EXPERIMENTS WERE CARRIED OUT ON THE POOL BOILING OF SODIUM AT VARIOUS PRESSURE AND HEAT-LOAD CONDITIONS. A WIDE RANGE OF THESE CONDITIONS WERE INVESTIGATED. THE RESULTS INDICATED THAT AT LOW PRESSURES NO SURFACE BOILING OCCURS. IN THE PRESSURE RANGE OF 4000 TO 20,000 N/SQ. METER, THE BOILING PROCESS WAS UNSTABLE, EXHIBITING STRONG TEMPERATURE FLUCTUATIONS. AT THE UPPER LIMIT OF THE ABOVE-MENTIONED PRESSURE RANGE, THE BOILING BECAME STABLE, WITH A MINIMUM OF TEMPERATURE FLUCTUATIONS.

*CONVECTIVE BOILING + *HEAT TRANSFER, NATURAL CONVECTION + *SODIUM + HEAT TRANSFER, BOILING + POOL BOILING + USSR

5-26627

SCHROCK VE

HEAT-TRANSFER MODES FOR A CYLINDRICAL SOURCE EMBEDDED IN LIQUID-FILLED POROUS MEDIA

UNIVERSITY OF CALIFORNIA, BERKELEY

1 PAGE, 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, 10(1) PAGE 7, JUNE 11-15, 1967

RADIONUCLIDES ARE USED AS NUCLEAR ENERGY SOURCES FOR SMALL POWER UNITS FOR A WIDE VARIETY OF APPLICATIONS, PRINCIPALLY IN THE SNAP PROGRAM. AS THIS USE OF ISOTOPES BECOMES MORE EXTENSIVE, QUESTIONS OF SAFETY MUST BE ANSWERED. ONE OF THE CIRCUMSTANCES THAT REQUIRES EVALUATION IS THE BEHAVIOR OF A RADIOISOTOPE FUEL ELEMENT THAT IS ACCIDENTALLY LOST IN THE OCEAN AND SUBSEQUENTLY BURIED. THE THERMAL ENVIRONMENT EXPERIENCED WILL PLAY A PROMINENT ROLE IN DETERMINING THE LONG-TERM INTEGRITY OF ENCAPSULATION. THIS PAPER DESCRIBES THE FIRST RESULTS OF A RESEARCH PROGRAM TO DETERMINE THE MODES OF HEAT TRANSFER THAT MAY BE ENCOUNTERED AND TO IDENTIFY THE PARAMETERS THAT GOVERN TRANSITION BETWEEN MODES.

*ACCIDENT ANALYSIS + *HEAT GENERATION, INTERNAL + *ISOTOPIC GENERATOR + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + OCEAN AND SEA + SOURCE, RADIATION, LOST

CATEGORY 5
ACCIDENT ANALYSIS

5-26628

REUSCHER JA

THERMAL STRESS ANALYSIS FOR THE SANDIA PULSED REACTOR II
LOS ALAMOS SCIENTIFIC LAB

2 PAGES, 3 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 242-243 OF THE 1967 ANNUAL MEETING OF AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE SANDIA PULSED REACTOR II IS A GODIVA-TYPE FAST-BURST REACTOR CAPABLE OF PRODUCING POWER PULSES WITH HALF-WIDTHS OF 30 MICROSEC AND A TOTAL FISSION YIELD OF 1.9×10^{17} TH. DUE TO THE INERTIA OF THE FUEL AND THE RAPID RATE OF FISSION ENERGY DEPOSITION, THE TEMPERATURE IN THE REACTOR RISES FASTER THAN THE CORE MATERIAL CAN RESPOND BY THERMAL EXPANSION. SOME OF THE THERMAL ENERGY IS THEN CONVERTED INTO MECHANICAL ENERGY, STRESS WAVES ARE PRODUCED IN THE CORE, AND THE FUEL MATERIAL IS SUBJECTED TO LARGE DYNAMIC STRESSES. AT PRESENT, THERE IS NO SUITABLE TECHNIQUE AVAILABLE FOR SOLVING THE LINEAR THERMOELASTIC EQUATIONS, WHICH INCLUDE THE INERTIA TERMS, FOR FINITE CYLINDRICAL GEOMETRY.

*MATHEMATICAL STUDY + *STRESS ANALYSIS + GODIVA (FBR) + REACTOR, AEC OWNED + REACTOR, FAST BURST + STRESS + STRUCTURAL ANALYSIS, DYNAMIC + THERMAL MECHANICAL EFFECT

5-26629

RHODES WA

SNAPTRAN TEMPERATURE COEFFICIENT CALCULATION VS EXPERIMENT
ATOMICS INTERNATIONAL

1 PAGE, FIGURE, 3 REFERENCES, ANS TRANSACTIONS 10(1), PAGE 245 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE SNAPTRAN EXPERIMENTS RESULTED IN MEASUREMENTS OF TEMPERATURE, FEEDBACK COEFFICIENTS OVER WIDE RANGES OF TEMPERATURES, PERIODS, AND POWER LEVELS. A PREVIOUS PAPER REPORTED LARGE VARIATIONS IN THE DATA, APPARENTLY DEPENDENT ON THE TEMPERATURE AND PERIOD RANGES INVOLVED. WE HAVE NOW SIMULATED THESE EXPERIMENTS IN COMPUTER CALCULATIONS. THE CALCULATIONS INCLUDE SOME RELATIVELY UNUSUAL TECHNIQUES, INCLUDING A SPATIALLY DEPENDENT KINETICS CALCULATION WITH TEMPERATURE FEEDBACK.

*COMPUTER PROGRAM + *REACTOR DYNAMICS + *SNAPTRAN (S-RR) + COMPARISON, THEORY AND EXPERIENCE + MATHEMATICAL TREATMENT + REACTOR, SAFETY RESEARCH + TEMPERATURE COEFFICIENT

5-26630

ALSC IN CATEGORY 6

KLICKMAN AE + HIRAKAWA N

AN ANALYSIS OF THE KIWI-TNT EXPERIMENT WITH MARS
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC.

1 PAGE, TABLE, 4 REFERENCES, ANS TRANSACTIONS 10(1), PAGE 246 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE KIWI-TNT EXPERIMENT HAS BEEN ANALYZED BY APPLYING A NEW TWO-DIMENSIONAL EXPLOSION CODE, MARS, TO AN APPROPRIATE MODEL. THE CORE WAS CONSIDERED TO BE A CYLINDER 140 CM HIGH AND 85 CM IN DIAM. THE REACTOR WAS CONSIDERED TO BE 50 CENTS SUBCRITICAL, AND 8.5 OF REACTIVITY WAS INSERTED AND THE RATE OF \$300/SEC. THE EQUATION OF STATE WAS TAKEN TO BE THE HIGH-TEMPERATURE VAPOR-PRESSURE EQUATION, AND THE SPECIFIC HEAT WAS AN ANALYTICAL FIT TO THE AVAILABLE DATA. THE TEMPERATURE COEFFICIENT WAS ASSIGNED THE NOMINAL VALUE OF $1.32 \times 10/C$. HOWEVER, IT WAS ALSO ASSIGNED PARAMETRIC VALUES OF 0.5, 1.0, 1.5, AND $2.0 \times 10/C$.

*EXPLOSION + *KIWI TNT (S-RR) + *MATHEMATICAL TREATMENT + *REACTOR DYNAMICS + COMPUTER PROGRAM + EXCURSION, LARGE + REACTOR, SAFETY RESEARCH

5-26631

ROBINSON LE + PURVIANCE R + WILLIS L

RESULTS FROM HIGH SPECIFIC ENERGY INPUT SINGLE-PIN, SODIUM LOOP MELTDOWN EXPERIMENTS IN TREAT
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS

1 PAGE, 4 REFERENCES, ANS TRANSACTIONS 10(1), PAGE 343 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THREE MELTDOWN SAMPLES HAVE BEEN RUN IN TRANSIENT LOOP EXPERIMENTS IN THE TRANSIENT REACTOR TEST FACILITY (TREAT) USING THE MARK-I INTEGRAL SODIUM LOOP. EACH SAMPLE CONSISTED OF A SINGLE EBR-II MARK-I PROTOTYPE FUEL PIN, EITHER OF 4.1 OR 6% ENRICHMENT, SURROUNDED BY SIX ARGON-FILLED HOLLOW CLADDING TUBES, IN A HEXAGONAL CLUSTER ON AN EBR-II PITCH. EXPERIMENTAL CONDITIONS INCLUDED AN INITIAL LOOP SODIUM COOLANT TEMPERATURE OF 260 C, FLOW CONDITIONS RANGING FROM 1.5 M/SEC TO THE MAXIMUM PUMP OUTPUT OF 4 M/SEC SODIUM VELOCITY IN THE TEST SECTION, AND BOTH CONSTANT AND CHOPPED-COSINE AXIAL POWER DISTRIBUTIONS.

*FUEL MELTDOWN + *IN PILE LOOP + *TREAT (PRR) + ACCIDENT ANALYSIS + IN PILE EXPERIMENT + REACTOR, PULSED + REACTOR, SAFETY RESEARCH

5-26632

JOHANNSEN K

CATEGORY 5
ACCIDENT ANALYSIS

5-26632 *CONTINUED*

ANALYTICAL INVESTIGATION OF THE EFFECT OF VARIABLE WALL HEAT FLUX ON TURBULENT LIQUID-METAL HEAT-TRANSFER COEFFICIENTS IN REACTOR COOLANT CHANNELS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
2 PAGES, FIGURE, 4 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 352-353 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE FOLLOWING INVESTIGATION DEALS WITH THE PROBLEM OF FORCED CONVECTION HEAT TRANSFER TO A LIQUID METAL FLOWING TURBULENTLY BETWEEN PARALLEL PLATES WITH A VARIABLE WALL HEAT FLUX IN THE FLOW DIRECTION. THE IDEALIZED MODEL UNDERLYING THIS APPROXIMATION WAS PROPOSED BY POPPENDIEK AND IS BASED ON TWO MAIN POSTULATES - (1) THE ESTABLISHED TURBULENT VELOCITY PROFILE IS INVARIANT WITH THE TRANSVERSE CHANNEL COORDINATE Y, (2) THE EDDY DIFFUSIVITY DISTRIBUTION OF MOMENTUM $EM(Y)$ VARIES LINEARLY WITH Y AND AS THE NINETENTHS POWER OF THE REYNOLDS NUMBER.

*FLOW, TURBULENT + *HOT CHANNEL + *METAL, LIQUID + HEAT TRANSFER + HEAT TRANSFER, CONVECTION

5-26633

WITTE LC + BAKER L + HAWORTH DR
HEAT TRANSFER FROM HIGH-TEMPERATURE SPHERES TO LIQUID SODIUM
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS + UNIVERSITY OF NEBRASKA
2 PAGES, FIGURE, 2 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 351-352 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

HEAT-TRANSFER RATES FROM HIGH-TEMPERATURE SPHERES HAVE BEEN OBTAINED AS THE SPHERES MOVED THROUGH LIQUID SODIUM. KNOWLEDGE OF THE RATE, QUANTITY, AND MECHANISM OF ENERGY TRANSFER THAT OCCURS BETWEEN FUEL PARTICLES AND THE COOLANT IS NECESSARY TO ANALYZE THE CONSEQUENCES OF A FAST-REACTOR INCIDENT IN WHICH HOT FUEL MATERIALS MAY BE DISPERSED INTO THE LIQUID COOLANT. BEFORE THIS STUDY, NEITHER EXPERIMENTAL NOR THEORETICAL HEAT-TRANSFER RATES FROM SPHERICAL PARTICLES MOVING THROUGH LIQUID SODIUM WERE AVAILABLE. THE HEAT-TRANSFER DATA WERE OBTAINED USING A TRANSIENT TECHNIQUE IN WHICH A SPHERE ATTACHED TO A SWINGING ARM APPARATUS WAS PASSED THROUGH A POOL OF LIQUID SODIUM.

*HEAT TRANSFER + *METAL, LIQUID + *SODIUM + *SPHERE + HIGH TEMPERATURE

5-26634

HOCHREITER LE + SESONSKE A
TURBULENT TEMPERATURE FLUCTUATIONS IN FLOWING SODIUM-POTASSIUM
PURDUE UNIVERSITY
2 PAGES, 2 FIGURES, 5 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 353-354 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

AS PART OF A STUDY OF THE MECHANISM OF LIQUID-METAL HEAT TRANSFER APPLICABLE TO SODIUM-COOLED REACTORS, MEASUREMENTS WERE MADE OF TURBULENT TEMPERATURE-FLUCTUATION CHARACTERISTICS IN NAK-56. VERTICAL TRAVERSES WERE MADE WITH AN ESPECIALLY DESIGNED FAST-RESPONSE THERMOCOUPLE ACROSS A 1.0-IN.-I.D. HORIZONTAL TEST SECTION WITH THE FLUID AT ABOUT 200 F HEATED BY A CONSTANT WALL FLUX (12,000 BTU/HR-FT.²). THE TEST SECTION WAS PRECEDED BY A 40-DIAM NONHEATED SECTION FOLLOWED BY A 50-DIAM THERMAL ENTRANCE SECTION.

*FLOW, TURBULENT + *NAK + *TEMPERATURE TRANSIENT + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + REACTOR, LMCB

5-26635

MACFARLANE DR
THEORETICAL STUDIES OF THE TRANSIENT BOILING OF SODIUM IN FAST-REACTOR COOLANT CHANNELS
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
1 PAGE, FIGURE, 2 REFERENCES, ANS TRANSACTIONS 10(1), PAGE 354 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE WORK DESCRIBED IS PART OF A CONTINUING PROGRAM TO OBTAIN A BETTER UNDERSTANDING OF SODIUM COOLANT VAPORIZATION EFFECTS IN LARGE CERAMIC-FUELED FAST-POWER BREEDER REACTORS. THE APPROACH TAKEN IN THE ANALYSIS WAS TO SEEK NUMERICAL SOLUTIONS ON THE COMPUTER FOR THE COUPLED, NONLINEAR, PARTIAL DIFFERENTIAL EQUATIONS OF FLUID DYNAMICS AND HEAT CONDUCTION WRITTEN FOR A SINGLE REACTOR COOLANT CHANNEL AND FUEL ROD.

*CONVECTIVE BOILING + *SODIUM + *TEMPERATURE TRANSIENT + HOT CHANNEL + METAL, LIQUID + REACTOR, LMFBR

5-26636

KASCAK AF
THE EFFECT OF TURBULENCE ON RADIANT TRANSFER IN A GASEOUS-CORE NUCLEAR ROCKET ENGINE
NASA, LEWIS RESEARCH CENTER
2 PAGES, 2 FIGURES, REFERENCE, ANS TRANSACTIONS 10(1), PAGES 354-355 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE GASEOUS-FUELED NUCLEAR ROCKET IS A PROPOSED PROPULSION SYSTEM WHICH FEATURES A HIGH SPECIFIC IMPULSE (SAY 1500 OR 2000 SEC) AND RELATIVELY HIGH THRUST. ONE TYPE OF CONFIGURATION IS KNOWN AS THE COAXIAL FLOW CONCEPT. THE REGIONS IN THE REACTOR WHERE TURBULENCE CAN BE EXPECTED TO HAVE AN EFFECT ON HEAT TRANSFER ARE - (1) NEAR THE INLET BETWEEN THE LOW-VELOCITY FUEL STREAM AND FASTER MOVING PROPELLANT STREAM, (2) AT THE WALLS OF

CATEGORY 5
ACCIDENT ANALYSIS

5-26636 *CONTINUED*

THE REACTOR AND THE NOZZLE, AND (3) DOWNSTREAM IN THE MIXING REGIONS OF THE REACTOR. THE OBJECT OF THIS STUDY IS TO INVESTIGATE TURBULENCE IN THE DOWNSTREAM MIXING REGION OF THE REACTOR AND TO ESTIMATE ITS EFFECT ON FUEL TEMPERATURE.

*HEAT TRANSFER + *REACTOR, SPACE + *TURBULENCE, CONVECTIVE + FLOW, TURBULENT + ROVER PROGRAM

5-26637

PUTRE HA

PERFORMANCE LIMITATIONS ON A RADIATING LIQUID-CORE NUCLEAR ROCKET DUE TO SUPPORT-WALL TEMPERATURE REQUIREMENTS

NASA, LEWIS RESEARCH CENTER

1 PAGE, 2 FIGURES, ANS TRANSACTIONS 10(1), PAGE 356 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

A RECENT EVALUATION OF A NEW LIQUID-FUEL NUCLEAR ROCKET CONCEPT INDICATES THAT A 1430-SEC SPECIFIC IMPULSE COULD BE ATTAINED WITH A URANIUM AND NIOBIUM CARBIDE FUEL MIXTURE RADIATING HEAT AT 9500 R TO SEEDED HYDROGEN PROPELLANT, PROVIDED THE FRACTION OF NUCLEAR HEAT GENERATION USED TO COOL THE SOLID SUPPORT WALL IS LESS THAN 0.25. THE LIQUID ROCKET PERFORMANCE, HOWEVER, WAS FOUND TO BE STRONGLY AFFECTED BY THE WALL COOLING FRACTION NECESSARY TO MAINTAIN THE SUPPORT-WALL TEMPERATURE BELOW REALISTIC WALL-MATERIAL MELTING POINTS. THIS PAPER GIVES THE RESULTS OF A DETAILED ANALYSIS OF HEAT-TRANSFER MECHANISMS IN THE LIQUID FUEL, THEN EVALUATES THE LIMITATIONS ON ROCKET PERFORMANCE BY REALISTIC SUPPORT-WALL TEMPERATURES.

*HEAT TRANSFER ANALYSIS + *REACTOR, SPACE + *ROVER PROGRAM + HEAT TRANSFER + HEAT TRANSFER, CONVECTION

5-26638

ROSEN M + SHUSTER WM

THE BEHAVIOR OF AIR BUBBLES IN CIRCULAR TUBES

RENSSELAER POLYTECHNIC INSTITUTE

3 PAGES, 4 FIGURES, 4 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 357-359 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

INFORMATION ON THE BEHAVIOR OF GAS BUBBLES IN LIQUIDS IS PERTINENT TO AN UNDERSTANDING OF REACTOR PROBLEMS, SUCH AS TWO-PHASE PRESSURE DROPS AND REACTIVITY EFFECTS DUE TO VOIDS. MOST AVAILABLE EXPERIMENTAL DATA ON BUBBLE BEHAVIOR, WITH THE NOTABLE EXCEPTION OF THAT OF BAKER AND CHAO, IS RESTRICTED TO SINGLE BUBBLE RISE VELOCITIES IN A STAGNANT FLUID. OUR INVESTIGATION WAS AN ATTEMPT TO EXPAND THE EXISTING DATA BY OBTAINING INFORMATION AND REACHING CONCLUSIONS ON SINGLE BUBBLE BEHAVIOR IN VERTICAL TUBES UNDER FORCED FLOW AS WELL AS STAGNANT CONDITIONS. ALSO INCLUDED IN THE STUDY WAS SOME MULTI-BUBBLE BEHAVIOR, AND THE UTILIZATION OF INCLINED TUBES.

*FLOW, TWO PHASE + *REACTIVITY EFFECT, VOID + *VOID FRACTION + AIR + BUBBLE + REACTIVITY EFFECT

5-26639

SCHRÖCK VE + JOHNSON HA

TRANSIENT VOID AT HIGH PRESSURE

UNIVERSITY OF CALIFORNIA, BERKELEY

1 PAGE, 2 FIGURES, 3 REFERENCES, ANS TRANSACTIONS 10(1), PAGE 359 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE ANALYSIS OF SUPERPROMPT CRITICAL EXCURSIONS IN REACTORS, COOLED AND MODERATED BY WATER, DEPENDS UPON THE TRANSIENT VOID DEVELOPED IN THE CORE. TRANSIENT BOILING EXPERIMENTS WERE PERFORMED ON EXPONENTIALLY HEATED RIBBONS TO SIMULATE THE ACTUAL REACTOR TRANSIENT. THE RIBBONS SERVED AS RESISTANCE THERMOMETERS TO OBTAIN THE AVERAGE RIBBON TRANSIENT TEMPERATURE. AN X-RAY DENSITOMETER WAS USED TO MEASURE THE TRANSIENT VOID GROWTH WITH A RESOLUTION OF 0.03 CC/SQ.MM.

*REACTIVITY EFFECT, VOID + *REACTOR, WATER + *VOID FRACTION + ACCIDENT ANALYSIS + REACTIVITY EFFECT

5-26640

BASSO G

A NEW THERMODYNAMIC INTERPRETATION OF THE BOILING CRISIS

COMITATO NAZIONALE PER L'ENERGIA NUCLEARE, ITALY

2 PAGES, 3 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 360-361 OF THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

THE FLOW OF LIQUIDS THROUGH CHANNELS OF CONSTANT CROSS-SECTION WITH AN INTENSIVE HEAT ADDITION GIVES RISE TO INSTABILITIES WHICH ARE TO A CERTAIN EXTENT SIMILAR TO THOSE OCCURRING IN GASES AT SONIC OR SUPERSONIC VELOCITIES, AND NAMELY, STRONG DENSITY DISCONTINUITIES IN THE FLOW FIELD AT THE LIQUID-VAPOR INTERFACE, EXPLOSIVE BUBBLE-FORMATION PATTERNS, LIQUID JET SEPARATION FROM THE WALLS IN THE CASE OF FILM BOILING, ETC. A NEW ANALYSIS OF WAVE PROPAGATION IN VISCO-ELASTIC FLUIDS DEVELOPED IN THIS REPORT SHOWS THAT THE SONIC VELOCITY IN AN INDEFINITE AND ISOTROPIC MEDIUM (BOTH CONDITIONS FORMING THE BASIC ASSUMPTION IN ACOUSTICS) DIFFERS SUBSTANTIALLY FROM THE SONIC VELOCITY WHEN (1) THE FLOW FIELD IS LIMITED, AND (2) AN INTENSIVE HEAT ADDITION TAKES PLACE THROUGH THE CHANNEL WALLS.

CATEGORY 5
ACCIDENT ANALYSIS

5-26640 *CONTINUED*
*CONVECTIVE BOILING + *HOT CHANNEL + *SHOCK WAVE + HEAT TRANSFER + HEAT TRANSFER ANALYSIS +
HEAT TRANSFER, BOILING + THERMODYNAMICS

5-26641
JORDAN ED + STEFFENS J
AN INVESTIGATION OF THE EFFECT OF VIBRATIONS ON HEAT TRANSFER IN A PRESSURIZED WATER SYSTEM
CATHOLIC UNIVERSITY OF AMERICA
2 PAGES, 2 FIGURES, 9 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 361-362 OF THE 1967 ANNUAL MEETING OF THE
AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

EXPERIMENTS INVOLVING ACOUSTIC VIBRATIONS IN AIR AND WATER AND MECHANICAL VIBRATIONS OF A
HEATER IN AIR AND WATER HAVE SHOWN THAT THE HEAT TRANSFER GENERALLY INCREASES WHEN THE
VIBRATIONAL FIELD IS STRONG ENOUGH TO AFFECT THE BOUNDARY LAYER. IN AN INVESTIGATION IN A
PRESSURIZED WATER LOOP, A 0.5-IN-O.D. THIN-WALLED STAINLESS-STEEL TUBE, WHICH SERVED AS THE
INNER MEMBER IN VERTICAL ANNULAR FLOW AND AS A RESISTANCE HEATER, WAS MECHANICALLY VIBRATED
SINUSOIDALLY IN A DIRECTION NORMAL TO ITS AXIS BY AN ELECTRODYNAMIC VIBRATION SYSTEM.

*HEAT TRANSFER + *VIBRATION ANALYSIS + AIR + REACTOR, PWR + VIBRATION + WATER, GENERAL

5-26642
LAFFERTY JF + HAMMITT FC
EXPERIMENTAL INVESTIGATION OF A VAPOR-DRIVEN TWO-PHASE VORTEX
UNIVERSITY OF MICHIGAN
2 PAGES, FIGURE, 5 REFERENCES, ANS TRANSACTIONS 10(1), PAGES 362-363 OF THE 1967 ANNUAL MEETING OF THE
AMERICAN NUCLEAR SOCIETY, JUNE 11-15, 1967

ALTHOUGH THE TWO-PHASE VORTEX HAS BEEN CONSIDERED IN SOME ANALYTICAL INVESTIGATIONS IN
CONNECTION WITH THE LIQUID-CORE (CAVITY REACTOR) NUCLEAR-ROCKET CONCEPT AND THE VORTEX MHD
GENERATOR, LITTLE ATTENTION HAS BEEN GIVEN TO EXPERIMENTAL INVESTIGATIONS OF THIS FLOW
REGIME. THERE HAVE BEEN, TO OUR KNOWLEDGE, NO DATA PUBLISHED ON TWO-PHASE GAS-DRIVEN VORTEX
FLOW. THE EXPERIMENTS REPORTED HERE WERE PERFORMED USING AIR AND WATER AS THE TWO PHASES.
THE VORTEX WAS CONTAINED IN A CYLINDRICAL CHAMBER 5.0 IN. IN DIAM X 1.0 IN. LONG. THE
CYLINDRICAL WALL OF THE CHAMBER CONTAINED EIGHT CONVERGING NOZZLES WHICH DIRECTED AIR
TANGENTIALLY INTO THE CHAMBER AT VELOCITIES OF 200 TO 660 FT/SEC.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TWO PHASE + *FLOW, VORTEX + AIR + WATER, GENERAL

5-26698
MUHURI PK + MATTI MK
FREE CONVECTION OSCILLATORY FLOW FROM A HORIZONTAL PLATE
INDIAN INSTITUTE OF TECHNOLOGY
15 PAGES, 5 FIGURES, 3 TABLES, 4 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(6), PAGES
717-732 (JUNE, 1967)

UNSTEADY FREE CONVECTION FROM A SEMI-INFINITE HORIZONTAL PLATE IS ANALYZED WHEN THE PLATE
TEMPERATURE VARIES PERIODICALLY IN TIME ABOUT A CONSTANT MEAN. SEPARATE SOLUTIONS FOR LOW
AND HIGH FREQUENCY RANGES ARE DEVELOPED. IT IS FOUND THAT FOR LOW FREQUENCIES THE
OSCILLATORY COMPONENT OF THE NUSSELT NUMBER AT THE PLATE INCREASES AS THE PRANDTL NUMBER
INCREASES. FOR VERY HIGH FREQUENCIES THE TEMPERATURE FIELD IS OF THE SHEAR-WAVE TYPE
UNAFFFECTED BY THE STEADY MEAN FLOW.

*FLOW, TURBULENT + *HEAT TRANSFER, NATURAL CONVECTION + *MATHEMATICAL STUDY + HEAT TRANSFER +
HEAT TRANSFER ANALYSIS

5-26699
BRAIN TJS
NEW THERMAL CONDUCTIVITY MEASUREMENTS FOR ARGON, NITROGEN AND STEAM
GLASGOW UNIVERSITY
8 PAGES, 5 FIGURES, 2 TABLES, 19 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(6), PAGES
737-744 (JUNE, 1967)

THIS PAPER DESCRIBES THE EXPERIMENTAL MEASUREMENT OF THE COEFFICIENT OF THERMAL CONDUCTIVITY
OF ARGON AND NITROGEN IN THE RANGE 100-300 C AT ATMOSPHERIC PRESSURE UTILIZING A GUARDED
CONCENTRIC CYLINDER CELL MADE OF SILVER. ALSO GIVEN ARE RESULTS FOR ARGON, NITROGEN, AND
STEAM IN THE RANGE 140-180 C AT ATMOSPHERIC PRESSURE UTILIZING A CONCENTRIC CYLINDER CELL
MADE OF BRASS. THE RESULTS SHOW GOOD AGREEMENT WITH RECENT PUBLISHED VALUES. THE MEAN
DEVIATION OF THE POINTS FROM THE RECENTLY PUBLISHED CORRELATIONS, FOR THESE GASES, OF
VARGAFIK AND ZIMINA IS ABOUT 1%.

*ARGON + *NITROGEN + *STEAM + *THERMAL PROPERTY + HEAT TRANSFER EXPERIMENT

5-26700
ROSE JW
ON THE MECHANISM OF DROPWISE CONDENSATION

CATEGORY 5
ACCIDENT ANALYSIS

5-26700 *CONTINUED*

UNIVERSITY OF LONDON

8 PAGES, 6 FIGURES, 23 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(6), PAGES 755-762 (JUNE, 1967)

AN EXTENSION TO A RECENT THEORY OF HEAT TRANSFER BY DROPWISE CONDENSATION IS PROPOSED. THE MODIFIED THEORY IS COMPARED WITH RECENT HEAT-TRANSFER MEASUREMENTS. GRAPHS SHOW PREDICTIONS OF THE THEORY FOR HEAT FLUXES OUTSIDE THE PRESENT EXPERIMENTAL RANGES AND FOR DIFFERENT PRESSURES.

*CONDENSATION + *HEAT TRANSFER, CONDENSATION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER EXPERIMENT

5-26701

SZUCS L + TASNADI CS

A PROCESS FOR THE DIMENSIONING OF THE HIGH EFFICIENCY PLATE FINS OF COMPACT HEAT EXCHANGERS

11 PAGES, 8 FIGURES, 6 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(6), PAGES 771-781 (JUNE, 1967)

IT IS POINTED OUT THAT THE NONUNIFORM TEMPERATURE CHANGES OF A MEDIUM FLOWING ALONG PLATE FINS, RESULTING FROM DIFFERENT TEMPERATURE CHANGES TAKING PLACE ADJACENT TO THE FIN BASE AND AT THE FIN TIP AND THE HEAT CONDUCTANCE OF THE FIN IN THE DIRECTION OF FLOW, MUST NOT BE NEGLECTED WHEN DIMENSIONING THE FINNED SURFACE. IT IS SHOWN THAT WITH SMALL MASS RATES OF FLOW, WITH EFFICIENT FIN DESIGN, OR WITH LONG FINS IN THE DIRECTION OF FLOW, AS FOR INSTANCE WITH COMPACT FINS HAVING VERY GOOD HEAT-TRANSFER COEFFICIENTS, TUBES FINNED LONGITUDINALLY IN AN AXIAL DIRECTION, ETC., SUCH NEGLECT MAY LEAD TO ERRORS OF 10-30 PER CENT. THE AUTHORS FINALLY DESCRIBE A PROCEDURE, BASED ON THEIR CHARTS, WHICH ENABLES THE RESULTS OF MEASUREMENTS ON FINNED SURFACES TO BE EVALUATED MORE SIMPLY, QUICKLY AND ACCURATELY THAN WITH THE USUAL FIN EFFICIENCY FORMULA WHICH NEGLECTS THE ABOVE EFFECTS.

*EQUIPMENT DESIGN + *FIN + *HEAT EXCHANGER + EQUIPMENT, GENERAL + HEAT TRANSFER + HEAT TRANSFER, CONVECTION + HEAT TRANSFER, NATURAL CONVECTION

5-26702

ALSO IN CATEGORY 19

ECKERT ERG + SPARROW EM + IBELE WE + GOLDSTEIN RJ

HEAT TRANSFER BIBLIOGRAPHY

UNIVERSITY OF MINNESOTA

17 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(6), PAGES 823-839 (JUNE, 1967)

AN EXTENSIVE BIBLIOGRAPHY COVERING ALL ASPECTS OF HEAT TRANSFER DURING 1965-66. PREPARED BY THE DEPARTMENT OF MECHANICAL ENGINEERING OF THE UNIVERSITY OF MINNESOTA.

*BIBLIOGRAPHY + *HEAT TRANSFER + BOUNDARY LAYER + FLOW, TWO PHASE + FLUIDIZED BED + HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER, RADIANT + HEAT TRANSFER, TWO PHASE + HOT CHANNEL + HYDRODYNAMIC ANALYSIS + MASS TRANSFER + MEASUREMENT, GENERAL + METAL, LIQUID + THERMODYNAMICS + TRANSPORT PROPERTY + TRANSPORT THEORY

5-26772

MOERK-MOERKENSTEIN P + HERKENRATH H

TRANSFER OF HEAT TO WATER DURING FORCED FLOW WITHIN THE CRITICAL PRESSURE RANGE UNDER CONDITIONS OF HIGH LOADS ON THE HEATING SURFACE

EUROPEAN ATOMIC ENERGY COMMUNITY, ISPRA, ITALY

4 PAGES, 4 FIGURES, 2 TABLES, 15 REFERENCES, CHEMIE-INGENIEUR-TECH, 39, PAGES 250-253 (MARCH 20, 1967) IN GERMAN

IN DESIGNING REACTORS, A KNOWLEDGE OF THE HEAT TRANSFER CONDITIONS IS OF GREAT IMPORTANCE, ESPECIALLY AT CRITICAL LOADING CONDITIONS OF THE HEATED SURFACE. THE HEAT TRANSFER NUMBERS HAVE BEEN MEASURED FOR A PRESSURE AND BOILING-WATER CIRCULATING SYSTEM AT PRESSURES OF 170 TO 240 BARS, AND THEIR DEPENDENCE ON VARIOUS PARAMETERS, SUCH AS HEAT FLOW DENSITY, MASS FLOW AND PRESSURE, WAS INVESTIGATED. THUS, THE HEAT TRANSFER CAN BE CONTROLLED, EVEN AT PRESSURES OF UP TO 240 BARS, BY AN APPROPRIATE CHOICE OF PARAMETERS.

*HEAT TRANSFER + *HEAT TRANSFER CORRELATION + *REACTOR, WATER + CONVECTIVE BOILING + REACTOR, BWR + REACTOR, PWR

5-26773

BOGDANOV FF

INTENSIFICATION OF HEAT TRANSFER IN CHANNEL

5 PAGES, 3 FIGURES, TABLE, 4 REFERENCES, ATOMNAYA ENERGIYA, 22(6), PAGES 428-432 (1967) IN RUSSIAN

EXPERIMENTS ON THE EFFECT OF ARTIFICIAL ROUGHNESS ON HEAT EXCHANGE AND HYDRAULIC RESISTANCE IN THE EXOTHERMIC SURFACE OF A HEAT-EXCHANGE APPARATUS ARE DESCRIBED. EMPIRICAL RELATIONS FOR CALCULATING THE HEAT LOSS AND HYDRAULIC RESISTANCE IN HEAT EXCHANGERS WITH SUCH SURFACES ARE GIVEN.

*EQUIPMENT DESIGN + *HEAT EXCHANGER + EQUIPMENT, GENERAL + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER CORRELATION

CATEGORY 5
ACCIDENT ANALYSIS

5-26774
WASMUND B + SMITH JW
WALL TO FLUID HEAT TRANSFER IN LIQUID FLUIDIZED BEDS
UNIVERSITY OF TORONTO, CANADA
10 PAGES, 12 FIGURES, 2 TABLES, 34 REFERENCES, CANADIAN JOURNAL OF CHEMICAL ENGINEERING, 45(3), PAGES 156-165 (1967)

WALL TO FLUID HEAT TRANSFER COEFFICIENTS AND RADIAL TEMPERATURE PROFILES HAVE BEEN OBTAINED FOR BEDS OF HYDRODYNAMICALLY SIMILAR SPHERES FLUIDIZED WITH WATER IN A 2.058 INCH PIPE AT A CONSTANT HEAT FLUX. FROM PACKED BED TO OPEN PIPE CONDITIONS, HEAT TRANSPORT OCCURS MAINLY BY TURBULENT MIXING, ALTHOUGH CONDUCTION THROUGH THE PARTICLES AND POSSIBLE PARTICLE CONVECTION HAVE SOME EFFECT AT LOW POROSITIES. THIS RESULT CONTRADICTS A PREVIOUSLY PUBLISHED PREDICTION BASED ON MODEL CALCULATIONS USING ERRONEOUS TEMPERATURE PROFILES. THE MODEL PREDICTS A MINOR ROLE FOR PARTICLE CONVECTION WHEN APPROPRIATE TEMPERATURE PROFILES ARE USED. A SERIES MODEL BASED ON THE OBSERVED SHIFT OF THERMAL RESISTANCE FROM THE WALL REGION TO THE BULK OF THE BED WITH DECREASING POROSITY IS USED TO CORRELATE HEAT TRANSFER COEFFICIENTS. THE SHIFT IN RESISTANCE LARGELY ACCOUNTS FOR THE MAXIMUM IN HEAT TRANSFER COEFFICIENT PLOTS.

*FLUIDIZED BED + *HEAT TRANSFER, CONVECTION + *LIQUID + HEAT TRANSFER + HEAT TRANSFER COEFFICIENT + TEMPERATURE GRADIENT

5-26775
MURTHY MLR + RAMACHANDRAN A
SHAPE FACTORS IN CONDUCTION HEAT TRANSFER
2 PAGES, 5 FIGURES, 3 REFERENCES, BRITISH CHEMICAL ENGINEERING, 12(5), PAGES 730-731 (MAY, 1967)

FOR CALCULATING THE HEAT TRANSFER BETWEEN TWO SURFACES IN CONTACT SHAPE FACTORS ARE WIDELY USED - HOWEVER, THERE ARE MANY CONFIGURATIONS FOR WHICH NO SUCH FACTORS ARE AVAILABLE. HERE BY MEANS OF DETERMINATIONS CARRIED OUT WITH AN ELECTRICAL ANALOGUE, SHAPE FACTORS HAVE BEEN OBTAINED FOR THREE SHAPES, THE CIRCLE WITH SQUARE HOLE, CIRCLE WITH HEXAGONAL HOLE, AND HEXAGON WITH A CIRCULAR HOLE.

*HEAT TRANSFER ANALYSIS + *HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, CONDUCTION + HEAT TRANSFER

5-26776
FELDMAN KT + WHITING GH
HEAT PIPE
UNIVERSITY OF NEW MEXICO, ALBUQUERQUE, NEW MEXICO
4 PAGES, 4 FIGURES, TABLE, 11 REFERENCES, MECHANICAL ENGINEERING, 89(2), PAGES 30-33 (FEBRUARY, 1967)

THE PRINCIPLE OF THE HEAT PIPE IS AN AMAZINGLY SIMPLE ONE. PHENOMENA INVOLVED ARE SURFACE TENSION AND LATENT HEAT OF THE WORKING FLUID. THERE ARE NO MOVING PARTS. ITS EFFECTIVE THERMAL CONDUCTIVITY IS HUNDREDS OF TIMES MORE THAN SOLID CONDUCTOR LIKE COPPER AND SILVER. A OVERVIEW OF HEAT-PIPE PRINCIPLES IS PRESENTED, WITH ELEVEN REFERENCES.

*HEAT PIPE + *HEAT TRANSFER, CONDUCTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-26778
HOLY ZJ
TEMPERATURE AND THERMOELASTIC STRESS FIELDS IN AN INFINITE HALF-SPACE DUE TO AXISYMMETRIC SURFACE HEAT TRANSFER
UNIVERSITY OF NEW SOUTH WALES, AUSTRALIA
8 PAGES, 5 FIGURES, 5 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 5(4), PAGES 367-374 (JULY, 1967)

SOLUTIONS FOR TEMPERATURE AND THERMOELASTIC STRESS FIELDS ARE DEVELOPED FOR AXISYMMETRIC HEAT TRANSFER COEFFICIENT VARIATION OVER THE SURFACE OF A HEAT PRODUCING INFINITE HALF-SPACE, IN TERMS OF A TRUNCATED SERIES OF WEIGHTED MUTUALLY ORTHOGONAL POLYNOMIALS. THE METHOD IS APPLIED TO A NUMBER OF HEAT TRANSFER DISTRIBUTIONS. THE RESULTS ARE COMPARED WITH KNOWN SOLUTIONS, AND CONCLUSIONS ARE DRAWN AS TO THE ACCURACY AND APPLICABILITY OF THE METHOD.

*HEAT TRANSFER, CONDUCTION + *MATHEMATICAL TREATMENT + *STRESS ANALYSIS + HEAT TRANSFER + HEAT TRANSFER COEFFICIENT

5-26779
TONG LS + KITZES AS + GREEN J + STORMER TD
DEPARTURE FROM NUCLEATE BOILING ON A FINNED-SURFACE HEATER ROD
WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER DIVISION, PITTSBURGH, PENNSYLVANIA
5 PAGES, 8 FIGURES, 3 TABLES, 6 REFERENCES, NUCLEAR ENGINEERING, 5(4), PAGES 386-390 (JULY, 1967)

TESTS WERE PERFORMED TO DETERMINE THE DNB HEAT FLUXES AND POST-DNB HEAT TRANSFER COEFFICIENTS ON A SINGLE UNIFORMLY ELECTRIC HEATED ROD CENTERED IN AN UNHEATED SQUARE CHANNEL. THE HEATED ROD HAS A SERIES OF 0.00025-IN.-HIGH FINS AT THE DOWNSTREAM END. TEST RESULTS ARE PRESENTED FOR THE UPWARD FLOW OF WATER AT PRESSURES OF 1600 TO 2300 PSIA, INLET TEMPERATURES OF 520 AND 600 F, AND FLOW RATES OF 1,000,000 TO 3,000,000 LB/HR-SQ. FT. THEY SHOW THAT THE DNB HEAT

CATEGORY 5
ACCIDENT ANALYSIS

5-26779 *CONTINUED*

FLUX IS NOT AFFECTED BY THE FINS IN THE SUBCOOLED REGION. THE POST-DNB HEAT TRANSFER IS IMPROVED BY THE FINS.

*FIN + *HEAT TRANSFER, BOILING + *NUCLEATE BOILING + BUBBLE + BUBBLE NUCLEATION + CONVECTIVE BOILING + HEAT TRANSFER EXPERIMENT

5-26780

BOGAARDT M + SPIGT CL

APPLICATION OF A BOILING WATER LOOP MODEL TO BOILING SODIUM

TECHNOLOGICAL UNIVERSITY OF EINDHOVEN, EINDHOVEN, THE NETHERLANDS

12 PAGES, 13 FIGURES, 2 TABLES, 5 REFERENCES, NUCLEAR ENGINEERING, 5(4), PAGES 465-476 (JULY, 1967)

GIVES RESULTS OF AN ANALYTICAL STUDY ON THE APPLICABILITY TO A BOILING SODIUM SYSTEM OF EXISTING PHYSICAL-MATHEMATICAL FORMULATIONS FOR THE PERFORMANCE CHARACTERISTICS OF A BOILING WATER SYSTEM UNDER STEADY OR TRANSIENT CONDITIONS. FURTHERMORE, THE EFFECT OF LIQUID SUPERHEAT ON THE CALCULATED PERFORMANCE CHARACTERISTICS HAS BEEN EVALUATED. IT IS SHOWN THAT THE APPLICATION OF THEORETICAL MODELS DEVELOPED FOR WATER SYSTEMS TO LIQUID METAL SYSTEMS DOES NOT LEAD TO DIFFICULTIES BUT THAT THE EFFECT OF LIQUID SUPERHEAT SHOULD BE TAKEN INTO ACCOUNT IN CASE APPRECIABLE SUPERHEATS ARE FOUND TO OCCUR.

*HEAT TRANSFER, BOILING + *MATHEMATICAL STUDY + *SODIUM + HEAT TRANSFER ANALYSIS + METAL, LIQUID + OUT OF PILE LOOPS AND EXPERIMENTS + WATER, GENERAL

5-26781

KELLEHER MD + KWANG-TZU Y

HEAT TRANSFER RESPONSE OF LAMINAR FREE-CONVECTION BOUNDARY LAYERS ALONG A VERTICAL HEATED PLATE TO SURFACE-TEMPERATURE OSCILLATIONS

NOTRE DAME UNIVERSITY

14 PAGES, 2 FIGURES, 1 TABLE, 20 REFERENCES, ZEITSCHRIFT FUR ANGEWENDETE MATHEMATIK AND PHYSIK, 19(1), PAGES 31-44 (1968)

A LINEARIZED THEORY IS USED TO STUDY HEAT-TRANSFER RESPONSES OF A LAMINAR FREE-CONVECTION BOUNDARY LAYER ALONG A VERTICAL HEATED PLATE TO SURFACE TEMPERATURE OSCILLATIONS, WHEN THE MEAN SURFACE TEMPERATURE VARIES AS A POWER, N , OF THE DISTANCE FROM THE LEADING EDGE. FOR N EQUALS 1, IT IS SHOWN THAT EXACT SOLUTIONS ARE POSSIBLE FOR THE ENTIRE FREQUENCY RANGE CONSIDERED. FOR N LESS THAN 1, ASYMPTOTIC SERIES SOLUTIONS FOR LOW- AND HIGH-FREQUENCY RANGES ARE FORMALLY OBTAINED. RESPONSE CHARACTERISTICS OF THE VELOCITY AND TEMPERATURE PROFILES AND OF THE LOCAL RATE OF SURFACE HEAT FLUX ARE DERIVED. NUMERICAL CALCULATIONS HAVE BEEN CARRIED OUT FOR N VALUES OF 0, 0.2, AND 1.0, PRANDTL NUMBERS OF 0.72, 1.0, AND 10.0, AND FOR A COMPLETE RANGE OF FREQUENCIES.

*FLOW, LAMINAR + *HEAT TRANSFER, NATURAL CONVECTION + *MATHEMATICAL TREATMENT + FLOW DISTRIBUTION + HEAT TRANSFER ANALYSIS + TEMPERATURE GRADIENT

5-26782

TAKHAR HS

THERMAL CONVECTION NEAR A PARTLY INSULATED VERTICAL FLAT PLATE

23 PAGES, 4 FIGURES, 7 REFERENCES, ZEITSCHRIFT FUR ANGEWENDETE MATHEMATIK AND PHYSIK, 19(1), PAGES 45-57 (1968)

A NUMERICAL SOLUTION OF THE PROBLEM OF FREE-CONVECTION HEAT TRANSFER NEAR AN INSULATED PLATE IS PRESENTED FOR PRANDTL NUMBERS RANGING FROM 0.1 TO 10.0. A STUDY IS MADE OF THE CONVECTION PRODUCED BY HEATING A SEMI-INFINITE VERTICAL FLAT-PLATE OF LENGTH, 1. THE HEATED PORTION STARTS AT THE BOTTOM EDGE OF THE PLATE, WHICH IS ASSUMED TO BE THERMALLY INSULATED APART FROM THE HEATED REGION. AT A GREAT HEIGHT ABOVE THE HEATED PART, THE VELOCITY AND TEMPERATURE DISTRIBUTION WILL BE AS IF ALL THE HEAT HAD BEEN PUT IN AS A LINE SOURCE NEAR THE BASE OF THE PLATE, AND A SIMILARITY SOLUTION WILL RESULT. THIS SIMILARITY SOLUTION IS FIRST STUDIED BY MEANS OF A POHLHAUSEN TYPE METHOD. THE SOLUTION CONTAINS AN ARBITRARY CONSTANT THAT REPRESENTS THE AMOUNT OF HEAT PUT IN AT THE BASE, AND HENCE THE HEAT FLUX IN THE CONVECTION FLOW. FOR THE CASE IN WHICH THE LOWEST PORTION OF THE PLATE IS HEATED TO A UNIFORM TEMPERATURE, A POHLHAUSEN SOLUTION IS GIVEN, AND FROM IT THE POSITION OF THE EFFECTIVE ORIGIN OF THE SIMILARITY SOLUTION IS ESTIMATED IN TERMS OF THE LENGTH OF THE HEATED PART OF THE PLATE.

BOUNDARY LAYER + *HEAT TRANSFER, CONVECTION + *MATHEMATICAL TREATMENT + FLOW DISTRIBUTION + HEAT TRANSFER ANALYSIS + TEMPERATURE GRADIENT

5-26921

ZERKLE RD + SUNDERLAND JE

THE EFFECT OF LIQUID SOLIDIFICATION IN A TUBE UPON LAMINAR-FLOW HEAT TRANSFER AND PRESSURE DROP UNIVERSITY OF CINCINNATI + GEORGIA INSTITUTE OF TECHNOLOGY, GA.

8 PAGES, 11 FIGURES, 2 TABLES, 7 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2) SERIES C, PAGES 183-90 (MAY 1968), TRANSACTION OF THE ASME

THE EFFECT OF LIQUID SOLIDIFICATION AT THE INNER SURFACE OF A CIRCULAR TUBE UPON LAMINAR-FLOW HEAT TRANSFER AND PRESSURE DROP IS INVESTIGATED. STEADY-STATE CONDITIONS AND A UNIFORM WALL TEMPERATURE, WHICH IS LOWER THAN THE LIQUID FREEZING TEMPERATURE, ARE ASSUMED. THEORETICAL

CATEGORY 5
ACCIDENT ANALYSIS

5-26921 *CONTINUED*

SOLUTIONS FOR HEAT TRANSFER, RADIUS OF THE LIQUID-SOLID INTERFACE, AND PRESSURE DROP ARE DETERMINED ASSUMING NEGLIGIBLE FREE CONVECTION. EXPERIMENTATION SHOWS THAT FREE CONVECTION MAY PRODUCE CONSIDERABLE DEVIATIONS BETWEEN THEORETICAL AND OBSERVED RESULTS. A SEMIEMPIRICAL METHOD FOR OBTAINING APPROXIMATE SOLUTIONS IS DEVELOPED. A NUMERICAL EXAMPLE WHICH DEMONSTRATED HOW FREE CONVECTION EFFECTS THE SOLID-PHASE SHELL PROFILE IS PRESENTED.

*FLOW, LAMINAR + *HEAT TRANSFER, CONVECTION + *PRESSURE DROP + HEAT TRANSFER + LIQUID + MATHEMATICAL TREATMENT + SOLID

5-26922

HABERSTROH RD + BALDWIN LV

APPLICATION OF A SIMPLIFIED VELOCITY PROFILE TO THE PREDICTION OF PIPE-FLOW HEAT TRANSFER
COLORADO STATE UNIVERSITY, COLO.

10 PAGES, 11 FIGURES, 2 TABLES, 21 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 191-200 (MAY 1968), TRANSACTIONS OF ASME

THE TEMPERATURE PROFILES AND HEAT-TRANSFER COEFFICIENTS ARE PREDICTED FOR FULLY DEVELOPED TURBULENT PIPE FLOW WITH CONSTANT WALL HEAT FLUX FOR A WIDE RANGE OF PRANDTL AND REYNOLDS NUMBERS. THE BASIS FOR INTEGRATING THE ENERGY EQUATION COMES FROM A CONTINUOUSLY DIFFERENTIABLE VELOCITY PROFILE WHICH FITS THE PHYSICAL BOUNDARY CONDITIONS AND IS A RIGOROUS (THOUGH NOT NECESSARILY UNIQUE) SOLUTION OF THE REYNOLDS EQUATIONS. THE RESULTS DEGENERATE IDENTICALLY TO THE CASE OF LAMINAR FLOW. THE HEAT-TRANSFER CALCULATION REQUIRES NEITHER ADJUSTABLE FACTORS NOR DATA-FITTING BEYOND THE EMPIRICAL CONSTANTS IN THE MOMENTUM EQUATION. THUS THIS ANALYSIS CONSTITUTES A HEAT-TRANSFER PREDICTION TO BE TESTED AGAINST HEAT-TRANSFER DATA.

*FLOW DISTRIBUTION + *FLOW, TUBE + *HEAT TRANSFER CORRELATION + *HEAT TRANSFER, CONVECTION + FLOW, LAMINAR + FLOW, TURBULENT + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + MATHEMATICAL TREATMENT

5-26923

ANDEEN GB + GRIFFITH P

MOMENTUM FLUX IN TWO-PHASE FLOW

CHRISTINA LABORATORY, E. I. DU PONT DE NEMOURS AND CO., DEL. + MASS. INSTITUTE OF TECHNOLOGY, MASS.

12 PAGES, 21 FIGURES, 1 TABLE, 14 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 211-222 (MAY 1968), TRANSACTIONS OF ASME

MEASUREMENTS OF THE MOMENTUM FLUX THROUGH A SECTION OF PIPE WITH STEAM-WATER AND AIR-WATER TWO-PHASE FLOW ARE REPORTED. THE RESULTS ARE USED TO EVALUATE THE UTILITY OF VARIOUS TWO-PHASE FLOW MODELS AND THE UNDERLYING ASSUMPTIONS. THE SLIP MODEL WAS FOUND TO YIELD LOW VALUES. THE HOMOGENEOUS MODEL CORRELATED THE DATA WELL, BUT THIS IS BECAUSE OF COMPENSATING ERRORS IN THE ASSUMPTIONS. THE STEADY FLOW ASSUMPTION OF MOST TWO-PHASE FLOW MODELS IS CONSIDERED TO BE INADEQUATE FOR PREDICTION OF THE MOMENTUM FLUX AT LOW QUALITY. AT HIGHER QUALITY THE VELOCITY PROFILE IS THE DOMINANT CONSIDERATION.

*FLOW, TUBE + *FLOW, TWO PHASE + *MATHEMATICAL STUDY + FLOW THEORY AND EXPERIMENTS + PRESSURE DROP

5-26924

KOUMOUTSOS N + MOISSIS R + SPYRIDONOS A

A STUDY OF BUBBLE DEPARTURE IN FORCED-CONVECTION BOILING

GREECE ATOMIC ENERGY COMMISSION, NUCLEAR RESEARCH CENTER, DEMOCRITUS

8 PAGES, 6 FIGURES, 2 TABLES, 16 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 223-230 (MAY 1968), TRANSACTIONS OF ASME

VISUAL OBSERVATIONS IN A BOILING LIQUID FLOW INDICATE THAT, AS THE FLOW VELOCITY IS INCREASED, THE SIZE OF BUBBLES LEAVING THE HEATING SURFACE DECREASES. THE PURPOSE OF THIS INVESTIGATION IS TO ARRIVE AT A CRITERION FOR BUBBLE DEPARTURE IN FORCED-CONVECTION NUCLEATE BOILING. PHOTOGRAPHIC STUDIES INDICATE THAT A LITTLE BEFORE DEPARTURE A NECK IS FORMED JOINING THE ALMOST SPHERICAL BUBBLE TO THE HEATING SURFACE. FROM A CONSIDERATION OF THE HYDRODYNAMIC STABILITY OF THE BUBBLE-AND-NECK MODEL, THE DEPARTURE-SIZE-TO-VELOCITY RELATIONSHIP MAY BE PREDICTED. MEASURED DEPARTURE RADIUS IN A FORCED-CONVECTION BOILING WATER SYSTEM TAKEN BY MEANS OF HIGH-SPEED PHOTOGRAPHY ARE SATISFACTORILY CORRELATED WITH THE RESULTS DERIVED ANALYTICALLY.

*CONVECTIVE BOILING + *FLOW THEORY AND EXPERIMENTS + *HYDRODYNAMIC ANALYSIS + HEAT TRANSFER + HEAT TRANSFER, BOILING + NUCLEATE BOILING

5-26925

VACHON RI + TANGER GE + DAVIS DL + NIX GH

POOL BOILING ON POLISHED AND CHEMICALLY ETCHED STAINLESS-STEEL SURFACES

AUBURN UNIVERSITY, AUBURN, ALA.

8 PAGES, 13 FIGURES, 4 TABLES, 20 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 231-238 (MAY 1968), TRANSACTIONS OF ASME

THIS PAPER PRESENTS POOL BOILING DATA AT ATMOSPHERIC PRESSURE FOR MECHANICALLY POLISHED AND CHEMICALLY ETCHED 304 STAINLESS-STEEL SURFACES IN CONTACT WITH DISTILLED WATER. THE SURFACES WERE PREPARED BY THESE TECHNIQUES TO PRODUCE VARIATION IN NUCLEATION SITES. SURFACE ROUGHNESS WAS VARIED FROM 2-61 RMS. THE RESULTS SHOW THE CHANGES IN HEAT TRANSFER WITH

CATEGORY 5
ACCIDENT ANALYSIS

5-26925 *CONTINUED*

VARYING RMS SURFACE ROUGHNESS AND PREPARATION TECHNIQUE. THE ROHSENOW POOL BOILING CORRELATION WAS USED TO DISCUSS THE DATA.

*BUBBLE NUCLEATION + *POOL BOILING + *STEEL, STAINLESS + NUCLEATE BOILING + SURFACE, GENERAL

5-26926

VACHON RI + NIX GH + TANGER GE

EVALUATION OF CONSTANTS FOR THE ROHSENOW POOL-BOILING CORRELATION

AUBURN UNIVERSITY, AUBURN, ALA.

9 PAGES, 12 FIGURES, 4 TABLES, 21 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 239-247 (MAY 1958), TRANSACTIONS OF ASME

THE PAPER CONTAINS RESULTS OF APPLYING THE ROHSENOW POOL-BOILING CORRELATION TO DATA FROM THE LITERATURE. RECENT EVIDENCE SUPPORTS THE PREMISE THAT THE COEFFICIENT C-SUB-SF AND THE EXPONENT R OF THE ROHSENOW EQUATION VARY WITH SURFACE PREPARATION TECHNIQUE AS WELL AS WITH LIQUID-SURFACE COMBINATION. ELEVEN SEPARATE STUDIES INVOLVING SEVEN LIQUID-SURFACE COMBINATIONS AND SEVEN DIFFERENT SURFACE PREPARATION TECHNIQUES HAVE BEEN CORRELATED. APPROPRIATE VALUES OF R AND C-SUB-SF HAVE BEEN DETERMINED USING LEAST SQUARES TECHNIQUES IN CONJUNCTION WITH THE ROHSENOW EQUATION TO REPRESENT THE VARIOUS DATA INVESTIGATED.

*HEAT TRANSFER CORRELATION + *POOL BOILING + *SURFACE, GENERAL + BUBBLE NUCLEATION + HEAT TRANSFER + HEAT TRANSFER, BOILING + MATHEMATICAL STUDY

5-26927

VISKANTA R + MERRIAM RL

HEAT TRANSFER BY COMBINED CONDUCTION AND RADIATION BETWEEN CONCENTRIC SPHERES SEPARATED BY RADIATING MEDIUM

PURDUE UNIVERSITY, LAFAYETTE, IND.

9 PAGES, 11 FIGURES, 7 TABLES, 14 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 248-256 (MAY 1968), TRANSACTIONS OF ASME

STEADY-STATE HEAT TRANSFER BY SIMULTANEOUS CONDUCTION AND RADIATION THROUGH A SPHERICAL SHELL OF ABSORBING, EMITTING, AND SCATTERING MEDIUM HAS BEEN INVESTIGATED ANALYTICALLY. THE MEDIUM IS CONFINED BETWEEN TWO GRAY, DIFFUSE, ISOTHERMAL SPHERES KEPT AT DIFFERENT BUT UNIFORM TEMPERATURES AND IS CAPABLE OF GENERATING HEAT. THE PROBLEM IS FORMULATED RIGOROUSLY USING EXACT RADIATIVE TRANSFER METHODS. THE GOVERNING EQUATIONS WERE SOLVED NUMERICALLY USING AN ITERATIVE SCHEME. THE RESULTS REPORTED ILLUSTRATE THE INTERACTION OF CONDUCTION WITH RADIATION HEAT TRANSFER AS WELL AS REVEAL THE EFFECTS OF THE PARAMETERS ON THE HEAT TRANSFER CHARACTERISTICS. A SIMPLE APPROXIMATION IS SUGGESTED FOR PREDICTING TOTAL HEAT TRANSFER THROUGH A SPHERICAL SHELL FROM THE RESULTS THROUGH A PLANE LAYER. THE RESULTS ARE COMPARED WITH AVAILABLE SOLUTIONS AND SUPERPOSITION APPROXIMATIONS.

*HEAT TRANSFER, CONDUCTION + *HEAT TRANSFER, RADIANT + *SPHERE + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + MATHEMATICAL STUDY

5-26928

TAITEL Y + HARTNETT JD

EQUILIBRIUM TEMPERATURES IN A BOUNDARY-LAYER FLOW OVER A FLAT PLATE OF ABSORBING-EMITTING GAS

UNIVERSITY OF ILLINOIS, CHICAGO, ILL.

10 PAGES, 12 FIGURES, 15 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 257-266 (MAY 1968) TRANSACTIONS OF ASME

THE EFFECT OF RADIATION ON THE EQUILIBRIUM TEMPERATURE FOR A FLOW OF EMITTING-ABSORBING GAS OVER A FLAT PLATE IS STUDIED. THREE METHODS OF SOLUTION ARE FORMULATED - AND APPROXIMATE SOLUTION FOR A THIN BOUNDARY LAYER, A SIMILARITY SOLUTION FOR THE LIMITING CASE WHEN THE BOUNDARY LAYER IS OPTICALLY THICK, AND AN EXACT SOLUTION. IT IS SHOWN THAT, FOR SMALL ABSORPTION COEFFICIENT, HIGH WALL EMISSIVITY, AND MACH NUMBER, THE RESULTS APPROACH THE CASE WHERE THE GAS IS TRANSPARENT.

*BOUNDARY LAYER + *HEAT TRANSFER ANALYSIS + GAS + HEAT TRANSFER + HEAT TRANSFER, RADIANT + MATHEMATICAL TREATMENT + TEMPERATURE GRADIENT

5-26929

SOLIMAN M + SCHUSTER JR + BERENSON PJ

A GENERAL HEAT TRANSFER CORRELATION FOR ANNULAR FLOW CONDENSATION

AIRESEARCH MANUFACTURING COMPANY, CALIF.

10 PAGES, 11 FIGURES, 18 REFERENCES, JOURNAL OF HEAT TRANSFER 90(2), SERIES C, PAGES 267-76 (MAY 1968) TRANSACTIONS OF ASME

THE INTERACTION BETWEEN FRICTION, MOMENTUM, AND GRAVITY, AS THEY AFFECT THE HEAT TRANSFER PROCESS DURING ANNULAR FLOW CONDENSATION INSIDE TUBES, IS STUDIED. ANALYTICAL FORMS FOR EACH OF THESE FORCES ARE DERIVED AND INCORPORATED IN A CORRELATION THAT PREDICTS THE LOCAL HEAT TRANSFER COEFFICIENT. THE PREDICTIONS AGREE WELL WITH THE AVAILABLE EXPERIMENTAL DATA OVER A WIDE RANGE OF VAPOR VELOCITIES AND OVER A RANGE OF PRANDTL NUMBERS FROM 1 TO 10. THE ANALYSIS ALSO YIELDS A MEANS FOR PREDICTING THE ONSET OF LIQUID RUNBACK IN THE PRESENCE OF AN ADVERSE GRAVITATIONAL FIELD.

*FLOW, TUBE + *HEAT TRANSFER CORRELATION + *HEAT TRANSFER, CONDENSATION + HEAT TRANSFER ANALYSIS +

CATEGORY 5
ACCIDENT ANALYSIS5-26929 *CONTINUED*
MATHEMATICAL TREATMENT

5-27043 ALSO IN CATEGORY 4
YAROSH MM
AN EXPERIMENT EMPLOYING ULTRASONIC ENERGY TO PROMOTE BOILING IN LIQUID METAL
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
30 PAGES, 13 FIGURES, 14 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

THE TENDENCY FOR LIQUID METALS SUCH AS NA AND K TO UNDERGO SUBSTANTIAL LIQUID SUPERHEATING AND SUBSEQUENT EXPLOSIVE BOILING HAS BEEN DEMONSTRATED AT OAK RIDGE NATIONAL LABORATORY AND AT OTHER RESEARCH INSTALLATIONS. AN EXPERIMENT WAS CONDUCTED EMPLOYING ULTRASONIC ENERGY EXCITATION TO INITIATE AND MAINTAIN STABLE BOILING IN K UNDER CONDITIONS THAT NORMALLY PRODUCED LIQUID SUPERHEATING AND UNSTABLE, EXPLOSIVE BOILING. UNSTABLE BOILING IS CHARACTERIZED BY LARGE AND ERRATIC TEMPERATURE DIFFERENCES BETWEEN THE TEMPERATURES OF THE LIQUID AND VAPOR. THESE TEMPERATURE DIFFERENCES WERE SIGNIFICANTLY REDUCED OR ELIMINATED UPON EXCITATION OF THE ULTRASONIC PROBE. THE TENDENCY TOWARD LIQUID SUPERHEATING WAS SUBSTANTIALLY ELIMINATED UNDER MANY OPERATING CONDITIONS.

AVAILABILITY - M.M. YAROSH, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

*METAL, LIQUID + *NUCLEATE BOILING + *POTASSIUM + *SODIUM + BUBBLE NUCLEATION + REACTOR, LMCR + THERMAL PROPERTY

5-27044
GOSE EE + MUCCIARDI AN + BAER E
MODEL FOR DROPWISE CONDENSATION OF RANDOMLY DISTRIBUTED SITES
8 PAGES, 6 FIGURES, 12 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(1), PAGES 15-22 (JANUARY, 1967)

A MODEL FOR HEAT TRANSFER DURING DROPWISE CONDENSATION OF RANDOMLY DISTRIBUTED NUCLEATION SITES WAS DEVELOPED AND SIMULATED ON A DIGITAL COMPUTER. THE THEORY ACCOUNTED FOR DROP NUCLEATION AND GROWTH, COALESCENCE WITH NEIGHBORS, REMOVAL, AND RENUCLEATION ON SITES EXPOSED BY THE REMOVAL AND COALESCENCE MECHANISMS. FOR STEADY-STATE DROP CONDENSATION, THE THEORY SHOWED THAT SMALL DROPS GROW BY VAPOR CONDENSATION AND THAT LARGER DROPS GROW PREDOMINANTLY BY COALESCENCES. LARGER HEAT-TRANSFER COEFFICIENTS THAN HAVE BEEN OBSERVED TO DATE SHOULD BE POSSIBLE IF CONDENSER SURFACES CONTAINING BETWEEN $1.E+07$ TO $1.E+08$ SITES/CM² AND DROP-REMOVAL TECHNIQUES FOR VERY SMALL (LT 5.E-04CM) CAN BE DEVELOPED.

*COMPUTER PROGRAM + *DROPLET + *HEAT TRANSFER, CONDENSATION + HEAT TRANSFER ANALYSIS + MATHEMATICAL STUDY

5-27045
MORI Y + NAKAYAMA W
STUDY ON FORCED CONVECTIVE HEAT TRANSFER IN CURVED PIPES (2ND REPORT, TURBULENT REGION)
13 PAGES, 15 FIGURES, 11 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(1), PAGES 37-50 (JANUARY, 1967)

FOR THIS PAPER THE EFFECT OF CURVATURE ON HEAT TRANSFER FOR FULLY DEVELOPED TURBULENT FLOW IN CURVED PIPES ON THE CONDITION OF CONSTANT HEAT FLUX WAS STUDIED THEORETICALLY AND EXPERIMENTALLY. IN THE ANALYSIS A BOUNDARY LAYER IS CONSIDERED TO EXIST ALONG THE PIPE WALL. LOCAL SHEAR STRESS AND LOCAL HEAT FLUX AT THE WALL ARE GIVEN ON THE BASIS OF REDUCING THE RESISTANCE AND THE NUSSELT NUMBER FORMULA FOR STRAIGHT PIPES TO THE LOCAL RELATION OF FRICTION AND HEAT TRANSFER. THE NUSSELT NUMBERS OBTAINED FROM MEASUREMENT OF THE VELOCITY AND TEMPERATURE DISTRIBUTIONS IN THE AIR FLOW THROUGH THE CURVED PIPES OF $R/A = 40$ AND 18.7 ARE IN GOOD AGREEMENT WITH THE THEORETICAL RESULTS.

*FLOW, TUBE + *FLOW, TURBULENT + *HEAT TRANSFER CORRELATION + *HEAT TRANSFER, CONVECTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER EXPERIMENT

5-27046
DVORAK FA + HEAD MR
HEAT TRANSFER IN THE CONSTANT PROPERTY TURBULENT BOUNDARY LAYER
21 PAGES, 27 FIGURES, 27 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(1), PAGES 61-81 (JANUARY, 1967)

A NEW METHOD HAS BEEN DEVELOPED FOR CALCULATING HEAT TRANSFER IN THE CONSTANT PROPERTY TURBULENT BOUNDARY LAYER WITH ARBITRARY DISTRIBUTIONS OF WALL TEMPERATURE AND STREAM VELOCITY. THE PROCEDURE IS AS FOLLOWS. THE DEVELOPMENT OF THE BOUNDARY LAYER IS CALCULATED BY ONE OR ANOTHER OF THE METHODS CURRENTLY AVAILABLE AND FROM THE CALCULATED VALUES OF H AND O VELOCITY PROFILES ARE SPECIFIED BY THE USE OF A SUITABLE TWO-PARAMETER FAMILY. WITH SOME PLAUSIBLE ASSUMPTION FOR TURBULENT PRANDTL NUMBER THE HEAT-TRANSFER EQUATION CAN THEN BE SOLVED DIRECTLY BY A DIGITAL COMPUTER TO OBTAIN TEMPERATURE PROFILES AND THE HEAT TRANSFER AT THE WALL. THE METHOD HAS BEEN APPLIED IN ZERO AND ADVERSE PRESSURE GRADIENTS WITH A STEP IN WALL TEMPERATURE FOLLOWING AN INITIAL UNHEATED ENTRY LENGTH. TEMPERATURE PROFILES ARE WELL BEHAVED AND SHOW A REGION OF NEAR SIMILARITY IN THE WALL REGION AS OBSERVED EXPERIMENTALLY ELSEWHERE. IT IS NOTICEABLE THAT IN THE ADVERSE PRESSURE GRADIENT HEAT TRANSFER FALLS OFF VERY MUCH LESS RAPIDLY THAN SKIN FRICTION AS SEPARATION IS APPROACHED.

CATEGORY 5
ACCIDENT ANALYSIS

5-27046 *CONTINUED*
 *BOUNDARY LAYER + *FLOW, TURBULENT + *HEAT TRANSFER ANALYSIS + HEAT TRANSFER + MATHEMATICAL STUDY

5-27047
 VAN WIJNGAARDEN L
 THE GROWTH OF SMALL CAVITATION BUBBLES BY CONVECTIVE DIFFUSION
 8 PAGES, 2 FIGURES, 9 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(2), PAGES 127-134
 (FEBRUARY, 1967)

SOME YEARS AGO BEAUTIFULLY CONDUCTED EXPERIMENTS ON THE GROWTH OF SMALL CAVITATION BUBBLES WERE REPORTED BY KERMEEN ET AL. AN APPROXIMATIVE CALCULATION FOR THE TIME IN WHICH BUBBLES GROW TO A CERTAIN SIZE BY CONVECTIVE DIFFUSION WAS GIVEN BY TWO OF THESE AUTHORS AS WELL. HOWEVER, VAPOR CONTENT OF THE BUBBLES AND SURFACE TENSION AT THE INTERFACE WITH THE FLUID WERE LEFT OUT OF ACCOUNT. IN THE PRESENT PAPER THE THEORY IS RE-EXAMINED. ALLOWANCE IS MADE FOR THE ABOVE-MENTIONED EFFECTS. A MODEL DUE TO LEVICH IS PROPOSED FOR THE CALCULATION OF THE MASS FLUX BY DIFFUSION IN THE BUBBLES. RESULTS ARE OBTAINED FOR THE DATA OCCURRING IN THE EXPERIMENTS OF PARKIN AND KERMEEN AND DISCUSSED IN CONNECTION WITH THESE EXPERIMENTS. AN EXPLANATION FOR THE DIFFERENCE BETWEEN THEORETICAL AND EXPERIMENTAL VALUES IS SUGGESTED.

*BUBBLE + *FUEL ELEMENT CLUSTER + *MASS TRANSFER + FLOW, AXIAL + FLOW, TURBULENT + REACTOR CONTROL + REACTOR DYNAMICS

5-27048
 LARSEN FW
 RAPID CALCULATION OF TEMPERATURE IN A GENERATIVE HEAT EXCHANGER HAVING ARBITRARY INITIAL SOLID AND ENTERING FLUID TEMPERATURES
 20 PAGES, 6 FIGURES, 5 TABLES, 9 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(2), PAGES 149-168 (FEBRUARY, 1968)

BY MEANS OF SIMPLE HAND CALCULATIONS IT IS POSSIBLE TO DETERMINE FLUID AND SOLID TEMPERATURES AT ANY TIME AND LOCATION IN THE REGENERATIVE HEAT EXCHANGER. THE METHODS DESCRIBED APPLY TO CASES WHERE THE INITIAL TEMPERATURE VARIES ARBITRARILY WITH LONGITUDINAL POSITION IN THE MATRIX AND THE ENTERING FLUID TEMPERATURE VARIES ARBITRARILY WITH TIME. THE SOLUTIONS FOR THE LINEAR INITIAL MATRIX TEMPERATURE AND LINEAR ENTERING FLUID TEMPERATURES ARE ALSO PRESENTED IN THE FORM OF TABLES AND CURVES FOR THE SAME RANGE OF PARAMETERS. BY SUPERPOSITION, THESE RESULTS ARE EXTENDED TO THE CASES OF ARBITRARY INITIAL MATRIX TEMPERATURE AND ARBITRARY ENTERING FLUID TEMPERATURE. EITHER OF TWO METHODS IS USEFUL IN OBTAINING NUMERICAL RESULTS. ONE IS TO EVALUATE A CONVOLUTION INTEGRAL WHICH INVOLVES THE ARBITRARY CONDITION. THE OTHER IS TO APPROXIMATE THE ARBITRARY INITIAL (AND/OR BOUNDARY) CONDITION BY A NUMBER OF LINEAR SEGMENTS AND TO SUPERIMPOSE THE TABULATED SOLUTIONS.

*HEAT EXCHANGER + *HEAT TRANSFER, CONVECTION + *MATHEMATICAL TREATMENT + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + TEMPERATURE GRADIENT

5-27049
 SOLIMAN M + CHAMBRE PL
 ON THE TIME-DEPENDENT LEVEQUE PROBLEM
 12 PAGES, 5 FIGURES, TABLE, 13 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(2), PAGES 169-180 (FEBRUARY, 1968)

THE CLASSICAL STEADY-STATE LEVEQUE PROBLEM IS GENERALIZED TO INCLUDE THE TIME DEPENDENCE. EXACT ANALYTICAL SOLUTIONS ARE PRESENTED FOR THE SURFACE HEAT FLUX DUE TO A TIME STEP IN THE SURFACE TEMPERATURE AND FOR THE CASE OF THE SURFACE TEMPERATURE DUE TO A TIME STEP IN THE WALL HEAT FLUX. THE INITIAL AND FINAL TIME BEHAVIOR OF THE SOLUTION IS EXPLORED ANALYTICALLY, AND THIS IS SUPPLEMENTED BY A NUMERICAL EVALUATION FOR THE ENTIRE TIME SPAN IN THE CASE OF A STEP IN THE SURFACE TEMPERATURE.

*HEAT TRANSFER, CONVECTION + *MATHEMATICAL TREATMENT + *TEMPERATURE GRADIENT + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27052
 ST. PIERRE CC + BANKOFF SG
 VAPOR VOLUME PROFILES IN DEVELOPING TWO-PHASE FLOW
 13 PAGES, 7 FIGURES, TABLE, 24 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(2), PAGES 237-249 (FEBRUARY, 1968)

TRANSVERSE VOID-FRACTION DISTRIBUTIONS AND AXIAL, CROSS-SECTIONAL AVERAGE VOID-FRACTION DATA HAVE BEEN OBTAINED FOR A RECTANGULAR FLOW CHANNEL AT ELEVATED PRESSURES EMPLOYING THE Y-ATTENUATION TECHNIQUE. THE ABILITY OF SEVERAL CROSS-SECTIONAL MODELS AND CORRELATIONS TO PREDICT THE AXIAL, AVERAGE VOID DISTRIBUTIONS HAS ALSO BEEN TESTED. THE DEVELOPMENT OF VOID PROFILES IN BOTH THE AXIAL AND TRANSVERSE DIRECTIONS IN A FLOWING TWO-PHASE SYSTEM IS OF CURRENT INTEREST.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TWO PHASE + *VOID FRACTION + FLOW, AXIAL + FLOW, CROSS + HEAT TRANSFER, TWO PHASE + HOT CHANNEL

CATEGORY 5
ACCIDENT ANALYSIS

5-27053
KAUTZKY DE + WESTWATER JW
FILM BOILING OF A MIXTURE ON A HORIZONTAL PLATE
4 PAGES, 3 FIGURES, 7 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(2), PAGES 253-256
(FEBRUARY, 1968)

THE GOAL OF THIS NEW RESEARCH WAS TO OBTAIN ACCURATE FILM-BOILING DATA FOR A MISCIBLE MIXTURE OF VOLATILE LIQUIDS. IT WAS OF INTEREST TO SHOW WHETHER THE RESULTS WOULD AGREE WITH PREDICTIONS BASED ON THE USE OF WEIGHTED PHYSICAL PROPERTIES IN THE EXISTING EQUATIONS FOR PURE LIQUIDS. THE FLAT-PLATE GEOMETRY WAS CHOSEN BECAUSE THE FILM-BOILING THEORY HAS BEEN WELL WORKED OUT FOR THIS GEOMETRY.

*FILM BOILING + *HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, BOILING + HEAT TRANSFER

5-27054
LOWE PA
A TWO DIMENSIONAL TURBULENT-FLOW MIXING MODEL FOR PARALLEL-FLOW ROD BUNDLES
BROOKHAVEN NATIONAL LABORATORY
8 PAGES, 5 FIGURES, 2 TABLES, 13 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING, 32(1), PAGES 1-7 (APRIL, 1968)

A TWO-DIMENSIONAL STEADY-STATE ENERGY EQUATION, IN TERMS OF THE FLUID ENTHALPY RISE, FOR A NUCLEAR REACTOR CHANNEL IS FORMULATED AND SOLVED. TO FACILITATE ITS USEFULNESS TO THE REACTOR DESIGNER, THE SOLUTION IS PRESENTED IN THE FORM OF A HOT-CHANNEL FACTOR. PARAMETRIC RESULTS ARE PRESENTED SO THE INFORMATION MAY BE RELATED TO OTHER CHANNEL DIMENSIONS. MIXING WAS FOUND TO BE A FUNCTION OF THE NONDIMENSIONAL GEOMETRY FACTOR AND THE PECLET NUMBER.

*FLOW, TURBULENT + *FUEL ELEMENT CLUSTER + *MATHEMATICAL TREATMENT + FLOW THEORY AND EXPERIMENTS + FLOW, AXIAL + FLOW, MIXING

5-27055
BRANDON CA + KIDD GJ
IN-PILE HEAT-TRANSFER STUDIES OF ROUGHENED HELIUM-COOLED REACTOR FUEL ELEMENTS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
8 PAGES, 7 FIGURES, TABLE, 14 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING, 32(1), PAGES 8-15 (APRIL, 1968)

DURING A SERIES OF IN-PILE EXPERIMENTS DESIGNED TO STUDY IRRADIATION EFFECTS ON HIGH-PERFORMANCE OXIDE FUEL ELEMENTS FOR ADVANCED GAS-COOLED REACTORS, HEAT-TRANSFER DATA WERE OBTAINED FROM FOUR SPECIALLY INSTRUMENTAL FUEL RODS. AN ANNULAR GEOMETRY WAS UTILIZED WITH RODS OF 1.9- AND 2.18-CM DIAM BEING CONTAINED IN CHANNELS OF 2.44- AND 2.67-CM DIAM, RESPECTIVELY. THE EFFECTS OF WIRE-WRAPPED AND MACHINED SQUARE-THREAD SURFACE ROUGHNESS WERE MEASURED AND COMPARED WITH THE RESULTS OBTAINED FROM A SMOOTH ROD. ROUGHENING THE RODS INCREASED THE HEAT TRANSFER BY APPROXIMATELY A FACTOR OF 2 WITH NO SIGNIFICANT DIFFERENCE BETWEEN THE WIRE-WRAPPED AND MACHINED ROUGHNESSES.

*FUEL ELEMENT + *HEAT TRANSFER, CONVECTION + *IN PILE LOOP + HEAT TRANSFER EXPERIMENT + ORR (RR) + REACTOR, TEST

5-27056 ALSO IN CATEGORY 7
FONTANA MH
THE CHEMICAL EQUILIBRIA OF FISSION PRODUCT NUCLEAR FUEL MIXTURES -- THE URANIUM OXYGEN AND THE URANIUM OXYGEN STRONTIUM SYSTEM
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2105 +. 272 PAGES, 31 FIGURES, 28 TABLES, 74 REFERENCES, SUBMITTED TO THE FACULTY OF PURDUE UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY, JULY 1968

THE TRANSPORT OF FISSION PRODUCTS RELEASED DURING A REACTOR ACCIDENT DEPENDS IN PART UPON THE CHEMICAL STATE IN WHICH THEY EXIST. COMPUTATION OF CHEMICAL EQUILIBRIA IN THE GAS PHASE AROUND A MELTED FUEL ELEMENT IS DIFFICULT BECAUSE THE FUEL MAY ACT AS A SOLVENT FOR FISSION PRODUCTS. ALSO, FUELS SUCH AS URANIUM OXIDE FORM A NONSTOICHIOMETRIC CONDENSED PHASE. METHODS OF USING MULTICOMPONENT CHEMICAL-EQUILIBRIUM COMPUTER TECHNIQUES HAVE BEEN DEVELOPED FOR TREATING THIS PROBLEM, AND THEY HAVE BEEN TESTED AGAINST PUBLISHED KNUDSEN CELL-MASS SPECTROMETER DATA FOR THE U-O SYSTEM. THIS SERVED AS A BASE POINT FROM WHICH THE U-SR-O SYSTEM WAS EXTENDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CHEMICAL EQUILIBRIUM + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT TRANSPORT + OXYGEN + STRONTIUM + URANIUM DIOXIDE + URANIUM, NATURAL

5-27057
SMITH EC + GUNTER AY + VICTORY SP
FIN TUBE PERFORMANCE

CATEGORY 5
ACCIDENT ANALYSIS

5-27057 *CONTINUED*
RICE UNIVERSITY, HOUSTON, TEXAS
11 PAGES, 14 FIGURES, 5 TABLES, 22 REFERENCES, CHEMICAL ENGINEERING PROGRESS, 62(7), PAGES 57-67 (JULY, 1966)

SINGLE-TUBE HEAT TRANSFER AND MECHANICAL-STRAIN-GAUGE TEST DATA ARE PRESENTED FOR BIMETAL EXTRUDED AND FOOTED-TENSION-WOUND INTERFERENCE-FIT FIN TUBES. THESE TUBES WERE ALSO TESTED ON A SEMIPLANT-SCALE APPARATUS AT STEADY-STATE AND CYCLING CONDITIONS WITH AIR AND WATER.

*FIN + *HEAT TRANSFER, CONVECTION + AIR + EQUIPMENT DESIGN + HEAT EXCHANGER + HEAT TRANSFER

5-27059
FROST W + DZAKOWIC GS
GRAPHICAL ESTIMATION OF NUCLEATE BOILING HEAT TRANSFER
UNIVERSITY OF TENNESSEE SPACE INSTITUTE, TULLAHOMA, TENNESSEE
2 PAGES, FIGURE, 2 TABLES, 4 REFERENCES, I + EC PROCESS DESIGN AND DEVELOPMENT, 6(3), PAGES 346-347 (JULY, 1967)

A METHOD FOR GRAPHICALLY PRESENTING FULLY DEVELOPED NUCLEATE-BOILING HEAT-TRANSFER CORRELATIONS CURRENTLY USED FOR DESIGN PURPOSES ENABLES THE ENGINEER TO COMPUTE A NUMERICAL VALUE OF THE BOILING HEAT FLUX, OR CORRESPONDING WALL SUPERHEAT, RAPIDLY AND WITHOUT KNOWLEDGE OF THE PHYSICAL PROPERTIES OF THE FLUID, OTHER THAN AT ONE ARBITRARY REFERENCE STATE.

*BUBBLE NUCLEATION + *HEAT TRANSFER, BOILING + *NUCLEATE BOILING + FLOW, TWO PHASE + HEAT TRANSFER CORRELATION + HEAT TRANSFER, TWO PHASE

5-27060
THOMAS DG
ENHANCEMENT OF FORCED CONVECTION HEAT TRANSFER COEFFICIENT USING DETACHED TURBULENCE PROMOTERS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
6 PAGES, 4 FIGURES, 2 TABLES, 16 REFERENCES, I + EC PROCESS DESIGN AND DEVELOPMENT, 6(3), PAGES 385-390 (JULY, 1967)

THE EFFECT OF SQUARE-CROSS-SECTION RINGS SUPPORTED AWAY FROM THE HEAT-TRANSFER SURFACE (DETACHED TURBULENCE PROMOTERS) ON THE RATE OF FORCED CONVECTION FROM CONDENSING STEAM TO WATER WAS STUDIED IN A VERTICAL-TUBE GEOMETRY. UNIFORMLY SPACED DETACHED PROMOTERS PRODUCED SIGNIFICANT INCREASES IN HEAT-TRANSFER COEFFICIENTS, BUT THE PRESSURE DROP WAS RELATIVELY LARGE. BY COMBINING RINGS IN PAIRS WITH CONSIDERABLE SEPARATION BETWEEN PAIRS, IT WAS POSSIBLE TO INCREASE THE OVERALL HEAT-TRANSFER COEFFICIENT WITH SIGNIFICANTLY SMALLER INCREASE IN PUMPING POWER THAN WOULD HAVE BEEN REQUIRED BY SIMPLY INCREASING THE VELOCITY.

*FLOW, TURBULENT + *HEAT TRANSFER, CONVECTION + HEAT TRANSFER + HEAT TRANSFER COEFFICIENT + HEAT TRANSFER EXPERIMENT + ORNL

5-27061
CLERICI GC + GARRIARA S + SALA R + TOZZI A
STUDIES ON BURNOUT. PART I - ALTERNATIVE FORMS FOR SOME BURNOUT CORRELATIONS.
CENTRO STUDI NUCLEARI DELLA CASACCIA, CNEN, ITALY
9 PAGES, 5 FIGURES, 17 REFERENCES, ENERGIA NUCLEARE, 14(5), PAGES 280-288 (MAY, 1967)

IN THIS PAPER IT IS SHOWN HOW SOME CORRELATIONS CAN BE REDUCED TO THE LINEAR FORM T EQUALS $A(B-X)$ BY MEANS OF SUITABLE TRANSFORMATIONS OF APPROXIMATIONS. THE EXPRESSIONS OBTAINED IN SUCH A WAY HAVE CONSIDERABLE SIMILARITY IN THE DEPENDENCE OF A AND B ON THE PHYSICAL AND GEOMETRICAL PARAMETERS. GRAPHICAL COMPARISONS, GIVEN FOR A PARTICULAR CASE, SHOW A GOOD AGREEMENT AMONGST THE ALTERNATIVE FORMS AND THE ORIGINAL ONES.

*BURNOUT HEAT FLUX + *FLOW, TWO PHASE + *HEAT TRANSFER CORRELATION + HEAT FLUX, CRITICAL + HEAT FLUX, DRYOUT + HEAT TRANSFER + HEAT TRANSFER, TWO PHASE

5-27064
SHOTKIN LM
EFFECT OF SLIP RATIO ON THE CRUCIAL BOILING LENGTH IN TWO-PHASE INSTABILITY
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
BNL-11532 + CONF-670912-2 +. 16 PAGES, 14 REFERENCES, FROM SYMPOSIUM ON THE DYNAMICS OF TWO PHASE FLOW, EINDHOVEN, NETHERLANDS, JUNE, 1967

THE CRUCIAL BOILING LENGTH FOR A SINGLE CHANNEL IS THAT POSITION OF THE BOILING BOUNDARY WHERE THE CHANNEL IS LEAST STABLE, OR WHERE THE RATIO OF HEAT INPUT TO COOLANT FLOW RATE, Q/G , IS A MINIMUM. THE ANALYTICAL RELATION BETWEEN Q/G AND THE REST OF THE CHANNEL PARAMETERS DEPENDS VERY MUCH ON THE THEORETICAL MODEL USED AND, IN PARTICULAR, ON THE EMPIRICAL FORM OF THE SLIP RATIO. WE HAVE USED A SPATIALLY AVERAGED MODEL TO COMPUTE Q/G SUB-MIN AND COMPARED IT WITH EXPERIMENT FROM SEVERAL LABORATORIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONVECTIVE BOILING + *FLOW, TWO PHASE + *HEAT TRANSFER, TWO PHASE + HEAT TRANSFER ANALYSIS +

CATEGORY 5
ACCIDENT ANALYSIS

5-27064 *CONTINUED*
HEAT TRANSFER, BOILING + MATHEMATICAL TREATMENT

5-27301
POOTS G + MILES RG
EFFECTS OF VARIABLE PHYSICAL PROPERTIES ON LAMINAR FILM CONDENSATION OF SATURATED STEAM ON A VERTICAL FLAT PLATE
DEPARTMENT OF APPLIED MATHEMATICS, UNIVERSITY OF HULL
16 PAGES, 1 FIGURE, 6 TABLES, 19 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12),
PAGES 1677-1692 (DECEMBER 1967)

A THEORETICAL STUDY IS MADE OF STEADY TWO-DIMENSIONAL LAMINAR FILM CONDENSATION OF PURE SATURATED STEAM AT 100 C AND ATMOSPHERIC PRESSURE ON AN ISOTHERMAL VERTICAL WALL. THE VARIABLE PHYSICAL PROPERTIES OF THE LIQUID CONDENSATE ARE TAKEN TO BE THOSE OF SATURATED WATER AT THE APPROPRIATE TEMPERATURES. THE RELATED RESULTS ON WALL HEAT TRANSFER AND MASS FLOW IN THE LIQUID PHASE ARE PRESENTED AND COMPARED IN DETAIL WITH THOSE FROM EXISTING THEORIES.

*CONDENSATION + *FILM, LIQUID + COMPARISON, THEORY AND EXPERIENCE + FLOW, LAMINAR + HEAT TRANSFER + STEAM

5-27302
HSU C
ANALYTICAL STUDY OF HEAT TRANSFER TO LIQUID METALS FLOWING ALONG A ROW OF SPHERES
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
16 PAGES, 3 FIGURES, 2 TABLES, 11 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12),
PAGES 1693-1708 (DECEMBER 1967)

ON THE POSTULATION OF INVISCID POTENTIAL FLOW, THEORETICAL ANALYSES HAVE BEEN PERFORMED FOR HEAT TRANSFER TO LIQUID METALS FLOWING ALONG A ROW OF EQUALLY-SPACED SPHERES, THE PITCH-TO-DIAMETER RATIO OF WHICH RANGES FROM UNITY (TOUCHING SPHERES) TO INFINITY (A SINGLE SPHERE IN THE FLUID STREAM). EXPLICIT EXPRESSIONS FOR THE AVERAGE NUSSELT NUMBER WERE OBTAINED FOR UNIFORM SURFACE TEMPERATURE AND FOR UNIFORM SURFACE HEAT FLUX. IT WAS REVEALED THAT THE SURFACE VELOCITY POTENTIAL FACTOR IS SOLELY A FUNCTION OF THE PITCH-TO-DIAMETER RATIO. NUMERICAL VALUES OF THE Φ PRIME SUB π/R CUBED WERE DETERMINED BY MEANS OF AN IBM DIGITAL COMPUTER. IT WAS FOUND TO VARY FROM 20 FOR FLOW PAST A SINGLE SPHERE TO ABOUT 1-6639 FOR FLOW ALONG A ROW OF TOUCHING SPHERES.

*METAL, LIQUID + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + LIQUID + SPHERE

5-27305
BARD Y + LEONARD EF
HEAT TRANSFER IN SIMULATED BOILING
COLUMBIA UNIVERSITY, NEW YORK, N.Y.
8 PAGES, 6 FIGURES, 19 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES
1727-1734 (DECEMBER 1967)

AN EXPERIMENTAL STUDY WAS UNDERTAKEN TO DETERMINE THE VARIATIONS OF HEAT-TRANSFER COEFFICIENT ON A SUBMERGED HEATING SURFACE WHILE AIR BUBBLES WERE INJECTED INTO THE LIQUID THROUGH AN ORIFICE IN THE PLATE. THE RESULTS INDICATED THAT HEAT TRANSFER IS MOST INTENSIVE DURING THE TIME THAT THE BUBBLE DETACHES FROM THE SURFACE. THIS CASTS DOUBTS ON BOILING HEAT-TRANSFER CORRELATIONS BASED ON BUBBLE GROWTH OR RISING PHASE CONSIDERATIONS. IN CONCLUSION, IT SUGGESTED THAT THE AGITATION AND LATENT HEAT VIEWS OF BOILING HEAT TRANSFER MAY BE COMBINED IN A UNIFIED MODEL.

*HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, TWO PHASE + *NUCLEATE BOILING + CONVECTIVE BOILING + HEAT TRANSFER

5-27306
PY B
RAYONNEMENT THERMIQUE DES METAUX MICRORUGUEUX OU DISPERSES
LABORATOIRE DE MECANIQUE, ECOLE NATIONALE SUPERIEURE D ELECTRICITE ET DE MECANIQUE, NANCY
8 PAGES, 9 FIGURES, 1 TABLE, 6 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES
1735-1742 (DECEMBER 1967)

THE INCREASE OF THERMAL RADIATION OF ALUMINUM AND TITANIUM WITH SURFACES HAVING A GREAT NUMBER OF DIMENSIONS INFERIOR TO THE WAVELENGTH OF RADIATION HAS BEEN STUDIED (BY COMPARISON WITH POLISHED METALS). WE OBSERVE AN INCREASE IN THE ENERGY RADIATED WHEN MICRO PARTICLES OF PLATINUM ARE EMBEDDED IN A THIN FILM OF ALUMINA ON WIRES OR STRIPS OF ALUMINUM. THE RESULTS SHOW THE DIFFERENCE BETWEEN THE PHENOMENON OF RADIATION AND THAT OF THERMAL ACCOMMODATION FROM THE POINT OF VIEW OF EFFECT OF ROUGHNESS.

*HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, RADIANT + *THEORETICAL INVESTIGATION + ALUMINUM + TITANIUM

5-27308
SIH PH + NEWMAN J

CATEGORY 5
ACCIDENT ANALYSIS

5-27308 *CONTINUED*

MASS TRANSFER TO THE REAR OF A SPHERE IN STOKES FLOW
UNIVERSITY OF CALIFORNIA, BERKELEY8 PAGES, 2 FIGURES, 3 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1749-1756
(DECEMBER 1967)

MASS TRANSFER TO A SPHERE, INCLUDING THE REAR REGION, IN STOKES FLOW AND AT LARGE PECLET NUMBERS, IS INVESTIGATED. BY THE SINGULAR-PERTURBATION TECHNIQUE, SIX DISTINCT REGIONS OF DIFFERENT MASS-TRANSFER MECHANISMS ARE FOUND. ONE OF THESE REGIONS, THE DIFFUSION LAYER, HAS ALREADY BEEN SOLVED BY THE BOUNDARY-LAYER METHOD. ANOTHER AREA, THE REGION AT THE REAR OF THE SPHERE, IS SOLVED HERE. TO PREDICT THE MASS TRANSFER RATE EVERYWHERE ON THE SPHERE, A COMPOSITE SOLUTION CAN BE FORMED FROM THE BOUNDARY-LAYER SOLUTION AND THE REAR-REGION SOLUTION. IN HEAT- AND MASS-TRANSFER PROBLEMS, THE METHOD USED HERE COMPLEMENTS THE BOUNDARY-LAYER METHODS IN PREDICTING THE HEAT- OR MASS-TRANSFER RATE AT THE REAR OF AXISYMMETRIC OBJECT.

*FLOW, LAMINAR + *MASS TRANSFER + *SPHERE + BOUNDARY LAYER + DIFFUSION + DIFFUSION COEFFICIENT

5-27309

ESHGHI S + HORNBECK RW

FLOW AND HEAT TRANSFER IN THE AXISYMMETRIC BOUNDARY LAYER OVER A CIRCULAR CYLINDER

CARNEGIE-MELLON UNIVERSITY, PITTSBURGH, PENNSYLVANIA

10 PAGES, 6 FIGURES, 2 TABLES, 7 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1757-1766 (DECEMBER 1967)

THE PROBLEM OF LAMINAR BOUNDARY-LAYER FLOW AND HEAT TRANSFER OVER A LONG THIN CYLINDER IN UNIFORM FLOW HAS BEEN ANALYZED. SOLUTIONS ARE OBTAINED FOR SMALL AS WELL AS LARGE VALUES OF THE CURVATURE PARAMETER. SOLUTIONS VALID FOR SMALL VALUES OF CURVATURE ARE EXTENDED TO APPLY TO INTERMEDIATE VALUES OF CURVATURE AS WELL. THIS IS DONE BY CASTING THE EXPRESSIONS INTO FRACTIONS. FINALLY, THESE FRACTIONS ARE JOINED WITH THE ASYMPTOTIC SOLUTION TO PRODUCE HEAT-TRANSFER AND SKIN FRICTION RESULTS OF ALL VALUES OF THE CURVATURE PARAMETER. THE SHAPES OF THE VELOCITY AND TEMPERATURE PROFILES ARE GIVEN GRAPHICALLY.

*CYLINDER + *FLOW, AXIAL + *HEAT TRANSFER, CONVECTION + FLOW, GENERAL + HEAT TRANSFER ANALYSIS + MATHEMATICAL TREATMENT

5-27310

CHISHOLM D

A THEORETICAL BASIS FOR THE LOCKHART-MARTINELLI CORRELATION FOR TWO-PHASE FLOW

NATIONAL ENGINEERING LABORATORY, APPLIED HEAT TRANSFER DIVISION, EAST KILBRIDE, GLASGOW

12 PAGES, 6 FIGURES, 5 TABLES, 15 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1767-1778 (DECEMBER 1967)

EQUATIONS ARE DEVELOPED IN TERMS OF THE LOCKHART-MARTINELLI CORRELATING GROUPS FOR THE FRICTION PRESSURE GRADIENT DURING THE FLOW OF GAS-LIQUID OR VAPOUR-LIQUID MIXTURES IN PIPES. THE THEORETICAL DEVELOPMENT DIFFERS FROM PREVIOUS TREATMENTS IN THE METHOD OF ALLOWING FOR THE INTERFACIAL SHEAR FORCE BETWEEN THE PHASES. SOME OF THE ANOMALIES OCCURRING IN PREVIOUS JUMPED FLOW MODELS ARE AVOIDED. GOOD AGREEMENT WITH LOCKHART-MARTINELLI EMPIRICAL CURVES ARE OBTAINED. SIMPLIFIED EQUATIONS FOR USE IN ENGINEERING DESIGN ARE ALSO GIVEN.

*FLOW THEORY AND EXPERIMENTS + *FLOW, TUBE + *FLOW, TWO PHASE + MATHEMATICAL STUDY + PRESSURE DROP

5-27312

ZABRODSKY SS

ON SOLID-TO-FLUID HEAT TRANSFER IN FLUIDIZED SYSTEMS

B.S.S.R. ACADEMY OF SCIENCES, MINSK, R.S.S.R., U.S.S.R.

8 PAGES, 4 FIGURES, 13 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1793-1800 (DECEMBER 1967)

THE COMPARISON OF THE HEAT-TRANSFER COEFFICIENTS FOR PARTICLES AND FOR BODIES IMMERSED IN A FLUIDIZED BED, CONFIRMS THE OPINION THAT LOW EFFECTIVE VALUES OF NU OF SOLID PARTICLES APPEAR HERE SIMULTANEOUSLY WITH HIGH TRUE VALUES OF NU MAINLY BECAUSE OF THE NON-UNIFORMITY OF GAS DISTRIBUTION. AN APPROXIMATE SIMPLE INTERPRETATION IS GIVEN OF THE REDUCTION OF THE SOLID-TO-FLUID HEAT TRANSFER IN CONVENTIONALLY UNIFORM GRANULAR BEDS AT LOW PECLET NUMBERS. ALSO SHOWN IS THE INFLUENCE OF SYSTEMS OF GRANULAR BED HEAT EXCHANGERS AND OF SOLID MIXING ON THE POSITION OF THE ZONE OF ACTIVE HEAT EXCHANGE.

*FLUIDIZED BED + *HEAT TRANSFER, TWO PHASE + HEAT TRANSFER + HEAT TRANSFER COEFFICIENT + HEAT TRANSFER CORRELATION + HEAT TRANSFER, CONVECTION

5-27313

MORI Y + FUTAGAMI K

FORCED CONVECTIVE HEAT TRANSFER IN UNIFORMLY HEATED HORIZONTAL TUBES (2ND REPORT, THEORETICAL STUDY)

DEPARTMENT OF MECHANICAL ENGINEERING, TOKYO INSTITUTE OF TECHNOLOGY, MEGURO-KU, TOKYO

13 PAGES, 9 FIGURES, 7 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1801-1813 (DECEMBER 1967)

EFFECTS OF BUOYANCY FORCE ON FORCED LAMINAR CONVECTIVE HEAT TRANSFER IN A UNIFORMLY HEATED

CATEGORY 5
ACCIDENT ANALYSIS

5-27313 *CONTINUED*

HORIZONTAL TUBE MAY NOT BE NEGLECTED AT LARGE RE RA. THIS 2ND REPORT DEALS WITH A THEORETICAL INVESTIGATION OF THIS PROBLEM ON A FULLY DEVELOPED LAMINAR FLOW AND COMPARES THE RESULTS WITH EXPERIMENTAL RESULTS REPORTED IN THE 1ST REPORT. IN ORDER TO BACK UP ASSUMPTIONS MADE IN THE FOLLOWING ANALYSIS, PATTERNS OF SECONDARY FLOW DUE TO BUOYANCY ARE OBSERVED IN FLOW OBSERVED IN FLOW VISUALIZATION EXPERIMENTS. AN APPROXIMATE SOLUTION FOR VERY LARGE RE RA IS OBTAINED. NUSSELT NUMBERS ARE SHOWN AS A FUNCTION OF RE RA AND PR AND ARE SHOWN TO BE IN FAIRLY GOOD AGREEMENT WITH EXPERIMENTAL RESULTS ON AIR. RESISTANCE COEFFICIENTS ARE ALSO OBTAINED AS A FUNCTION OF RE RA AND PR.

*FLOW, LAMINAR + *FLOW, TUBE + *HEAT TRANSFER, CONVECTION + *THEORETICAL INVESTIGATION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27314

MILLS AF + SEBAN RA
THE CONDENSATION COEFFICIENT OF WATER
UNIVERSITY OF CALIFORNIA, LOS ANGELES + UNIVERSITY OF CALIFORNIA, BERKELEY
13 PAGES, 4 FIGURES, 4 TABLES, 36 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1815-1827 (DECEMBER 1967)

FILMWISE CONDENSATION OF STEAM AT LOW PRESSURE ON A VERTICAL FLAT PLATE WAS INVESTIGATED EXPERIMENTALLY IN ORDER TO ASCERTAIN THE EXISTENCE OF AN INTERFACIAL HEAT-TRANSFER RESISTANCE AND HENCE DEDUCE A VALUE OF THE MASS ACCOMMODATION OR CONDENSATION COEFFICIENT OF WATER. DATA IS PRESENTED FOR THE CONDENSATION OF SATURATED STEAM BETWEEN 45 AND 50 F AT HEAT FLUXES BETWEEN 9000 AND 12000 BTU/H-FT²-DEGF. IT WAS FOUND THAT NO SIGNIFICANT INTERFACIAL RESISTANCE WAS PRESENT AND THE CONDENSATION COEFFICIENT WAS DEDUCED TO HAVE A VALUE BETWEEN 0-45 AND INITY. THAT THE CONDENSATION COEFFICIENT IS AT LEAST GREATER THAN 0-45 ENSURES THAT THE INTERFACIAL RESISTANCE WILL BE NEGLIGIBLE IN INDUSTRIAL APPLICATION OF FILMWISE CONDENSATION. THE INABILITY TO DETERMINE A MORE EXACT VALUE FOR THE COEFFICIENT WAS DUE TO AN INHERENT LIMITATION IN THE TECHNIQUE AND THE RANGE QUOTED MUST NOT BE TAKEN TO FAVOR AN INTERMEDIATE VALUE.

*HEAT TRANSFER, CONDENSATION + *MASS TRANSFER + *WATER, GENERAL + HEAT TRANSFER EXPERIMENT + STEAM

5-27315

SPARROW EM + MINKOWYCZ WJ + SADDY M
FORCED CONVECTION CONDENSATION IN THE PRESENCE OF NONCONDENSABLES AND INTERFACIAL RESISTANCE
UNIVERSIDADE DO BRASIL, RIO DE JANEIRO + UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE, CHICAGO, ILLINOIS
17 PAGES, 9 FIGURES, 1 TABLE, 12 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1829-1845 (DECEMBER 1967)

THE EFFECT OF A NONCONDENSABLE GAS ON CONDENSATION IN A FORCED CONVECTION LAMINAR BOUNDARY-LAYER FLOW IS EXPLORED ANALYTICALLY. THE GENERAL FORMULATION IS APPLIED TO THE STEAM-AIR SYSTEM, AND THE HEAT TRANSFER WITH AND WITHOUT THE NONCONDENSABLE IS COMPARED FOR A WIDE RANGE OF OPERATING CONDITIONS. THE REDUCTIONS IN HEAT TRANSFER DUE TO THE NONCONDENSABLE ARE ACCENTUATED AT LOW OPERATING PRESSURES. IN GENERAL, CONDENSATION IN THE FORCED CONVECTION FLOW IS MUCH LESS SENSITIVE THAN THAT IN A GRAVITY FLOW. THE EFFECT OF AN INTERFACIAL RESISTANCE (I.E., A TEMPERATURE JUMP AT THE LIQUID-VAPOR INTERFACE) IS ALSO EXAMINED. THE COMPUTED RESULTS REVEAL A NEGLIGIBLE EFFECT ON THE HEAT TRANSFER.

*BOUNDARY LAYER + *HEAT TRANSFER, CONDENSATION + *HEAT TRANSFER, CONVECTION + *MASS TRANSFER + DIFFUSION COEFFICIENT + HEAT TRANSFER

5-27316

CHIESEWRIGHT R
NATURAL CONVECTION FROM A PLANE, VERTICAL SURFACE IN NON-ISOTHERMAL SURROUNDINGS
UNIVERSITY OF MICHIGAN
13 PAGES, 4 FIGURES, 2 TABLES, 17 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1847-1859 (DECEMBER 1967)

THIS PAPER PRESENTS A THEORETICAL INVESTIGATION OF LAMINAR NATURAL CONVECTION FROM A PLANE, VERTICAL SURFACE IN NON-ISOTHERMAL SURROUNDINGS. CONDITIONS ARE DERIVED FOR THE EXISTENCE OF SIMILARITY SOLUTIONS. A METHOD IS PROPOSED FOR GENERALIZING THE CONDITIONS PERTAINING TO EXISTING SIMILARITY SOLUTIONS SO AS TO INCLUDE THE EFFECT OF NON-ISOTHERMAL SURROUNDINGS. NUMERICAL SOLUTIONS OF THE ORDINARY DIFFERENTIAL EQUATIONS RESULTING FROM THE SIMILARITY TRANSFORMATION ARE REPORTED FOR THE SPECIAL CASE OF AN ISOTHERMAL SURFACE. THESE RESULTS SUGGEST THAT SOME VARIATIONS OF SURROUNDING TEMPERATURE MAY LEAD TO FLOW REVERSAL IN THE BOUNDARY LAYER. EXPERIMENTAL EVIDENCE SUGGESTS THAT THIS MAY BE AN UNSTABLE CONDITION.

*FLOW, LAMINAR + *HEAT TRANSFER, NATURAL CONVECTION + *THEORETICAL INVESTIGATION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27317

INCROPERA FP + LEPPERT G
LAMINAR FLOW HEAT TRANSFER FROM ARGON PLASMA IN A CIRCULAR TUBE
STANFORD UNIVERSITY, STANFORD, CALIFORNIA
13 PAGES, 6 FIGURES, 2 TABLES, 16 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1861-1873 (DECEMBER 1967)

CATEGORY 5
ACCIDENT ANALYSIS

5-27317 *CONTINUED*

THE LAMINAR FLOW OF A PLASMA IN THE ENTRANCE REGION OF CIRCULAR TUBE HAS BEEN ANALYZED USING AN IMPLICIT FINITE-DIFFERENCE SCHEME. THE SOLUTION IS BASED UPON THE BOUNDARY-LAYER EQUATIONS WITH THE PLASMA RADIATION TERM RETAINED IN THE ENERGY EQUATION, AND THE TRANSVERSE CONVECTION TERM RETAINED IN BOTH THE MOMENTUM AND ENERGY EQUATIONS. NUMERICAL RESULTS HAVE BEEN OBTAINED FOR AN ARGON PLASMA HAVING A LINEAR ENTHALPY AND CUBIC VELOCITY PROFILE AT THE TUBE ENTRANCE. AT THE LOW TEMPERATURE LIMIT OF THE ANALYSIS, THE FRICTION FACTOR IS IN AGREEMENT WITH PREVIOUSLY PUBLISHED RESULTS. AND IN ALL BUT A VERY SMALL REGION NEAR THE TUBE ENTRANCE THE LOCAL NUSSELT NUMBER AGREES WITH THE NUSSELT NUMBER FOR CONSTANT PROPERTY, FULLY-DEVELOPED FLOW TO WITHIN APPROXIMATELY 17 PERCENT.

*ARGON + *HEAT TRANSFER, CONVECTION + *PLASMA + BOUNDARY LAYER + MATHEMATICAL TREATMENT

5-27318 ALSO IN CATEGORY 19

LUIKOV AV

HEAT TRANSFER BIBLIOGRAPHY - RUSSIAN WORKS

HEAT AND MASS TRANSFER INSTITUTE OF THE B.S.S.R. ACADEMY OF SCIENCE, 25 PODLESNAYA, MINSK, B.S.S.R., U.S.S.R.

15 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1875-1889 (DECEMBER 1967)

AN EXTENSIVE BIBLIOGRAPHY OF RUSSIAN LITERATURE ON HEAT AND MASS TRANSFER.

*HEAT TRANSFER + *MASS TRANSFER + *THERMODYNAMICS + *TRANSPORT PROPERTY + BIBLIOGRAPHY + USSR

5-27319

KROGER DG + ROHSENOW WM

SHORTER COMMUNICATION - FILM CONDENSATION OF SATURATED POTASSIUM VAPOR

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASSACHUSETTS

4 PAGES, 2 FIGURES, 1 TABLE, 9 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1891-1894 (DECEMBER 1967)

SATURATED POTASSIUM VAPOR WAS CONDENSED ON TWO DIFFERENT VERTICAL SURFACES - NICKEL 200 AND STAINLESS STEEL 316. THE TEST SURFACE WAS A 4- X 4-IN. SLAB 0.75 IN. THICK. HEAT WAS REMOVED AT THE COLD SIDE OF THE PLATE BY TRANSFER TO BOILING WATER. DATA WAS OBTAINED FOR CONDENSATION COEFFICIENT AS A FUNCTION OF SATURATION PRESSURE. EQUATIONS ARE PRESENTED WHICH PREDICT CONDITIONS DURING FILM CONDENSATION TO AN ACCURACY SUFFICIENT FOR DESIGN PURPOSES.

*HEAT TRANSFER, CONDENSATION + *METAL, LIQUID + *POTASSIUM + HEAT TRANSFER CORRELATION + HEAT TRANSFER EXPERIMENT

5-27320

HASEGAWA S + FUJITA Y

TURBULENT HEAT TRANSFER IN A TUBE WITH PRESCRIBED HEAT FLUX

DEPARTMENT OF NUCLEAR ENGINEERING, KYUSHU UNIVERSITY, FUKUOKA, JAPAN

20 PAGES, 17 FIGURES, 5 TABLES, 10 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 943-962 (JUNE 1968)

AN APPROXIMATE METHOD IS PROPOSED TO PREDICT NUSSELT NUMBER FOR TURBULENT FLOW IN A TUBE WITH AN ARBITRARY AXIALLY VARYING HEAT FLUX DISTRIBUTION. EVALUATION OF SUMS OF INFINITE SERIES WITH POOR CONVERGENCE IS REQUIRED FOR THIS METHOD AND DONE CORRECTLY. THE PREDICTED RESULTS BY THE PROPOSED METHOD WERE EXAMINED EXPERIMENTALLY WITH AIR FOR UNIFORM HEAT FLUX, EXPONENTIALLY VARYING HEAT FLUX AND RECTILINEARLY VARYING HEAT FLUX. PREDICTED NUSSELT NUMBERS ARE IN GOOD AGREEMENT WITH THE EXPERIMENTAL DATA.

*FLOW, TUBE + *FLOW, TURBULENT + *HEAT TRANSFER, CONVECTION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27321

LEWIS GK

SHAPE FACTORS IN CONDUCTION HEAT FLOW FOR CIRCULAR BARS AND SLABS WITH VARIOUS INTERNAL GEOMETRIES

UNIVERSITY OF ASTON IN BIRMINGHAM, ENGLAND

8 PAGES, 4 FIGURES, 2 TABLES, 5 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 985-992 (JUNE 1968)

SHAPE FACTORS DESCRIBING THE STEADY-STATE, TWO-DIMENSIONAL FLOW OF HEAT IN CIRCULAR BARS AND SLABS WITH VARIOUS INTERNAL GEOMETRIES AND ISOTHERMAL BOUNDARY CONDITIONS ARE COMPUTED BY A CONFORMAL MAPPING PROCEDURE.

*HEAT TRANSFER, CONDUCTION + *THERMAL ANALYSIS + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27322

KATTO Y + YOKOYA S

PRINCIPAL MECHANISM OF BOILING CRISIS IN POOL BOILING

DEPARTMENT OF MECHANICAL ENGINEERING, UNIVERSITY OF TOKYO, HONGO, TOKYO, JAPAN

8 PAGES, 13 FIGURES, 15 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 993-1002 (JUNE 1968)

CATEGORY 5
ACCIDENT ANALYSIS

5-27322 *CONTINUED*

HIGH-SPEED PHOTOGRAPHY WAS USED TO STUDY THE MECHANISM OF THE BOILING CRISIS IN POOL BOILING OF SATURATED WATER AT HIGH HEAT FLUXES. THREE CONFIGURATIONS HAVE BEEN EXAMINED - NORMAL FREE BOILING ON A HEATED 10-MM DIA. HORIZONTAL COPPER DISC AND THE SAME SYSTEM SUBJECTED TO THE INTERFERENCE OF A FLAT PLATE AND A SHORT TUBE HELD ABOVE THE HEATED DISC. PREVIOUS THEORIES OF BOILING CRISIS AND TRANSITION BOILING ARE DISCUSSED IN RELATION TO THE MECHANISM REVEALED BY THE PRESENT STUDY.

*POOL BOILING + *THEORETICAL INVESTIGATION + HEAT TRANSFER EXPERIMENT + HEAT TRANSFER, BOILING + HEAT TRANSFER, SUPERCRITICAL

5-27324

LEE K + BARROW H

TRANSPORT PROCESSES IN FLOW AROUND A SPHERE WITH PARTICULAR REFERENCE TO THE TRANSFER OF MASS UNIVERSITY OF LIVERPOOL, ENGLAND

14 PAGES, 14 FIGURES, 25 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 1013-1026 (JUNE 1968)

THE INTEGRATED BOUNDARY-LAYER EQUATIONS ARE SOLVED TO CALCULATE THE DEVELOPMENT OF THE DIFFUSION (OR THERMAL) BOUNDARY LAYER FROM THE FORWARD STAGNATION POINT OF A SPHERE UP TO THE POINT OF SEPARATION, FOR VARIOUS VALUES OF THE SCHMIDT (OR PRANDTL) NUMBER. THE POHLHAUSEN POLYNOMIAL PROFILES ARE USED TO DESCRIBE THE SHAPES OF THE TRANSFER LAYERS IN THE LAMINAR REGION. THE EXPERIMENTAL RESULTS FOR THE LAMINAR REGION ARE COMPARED WITH THOSE ACCORDING TO THE THEORY. FOR THE WAKE, A STUDY OF THE EXPERIMENTAL DATA SHOWS THAT IT IS POSSIBLE TO SPECIFY THREE SEPARATE REGIMES CORRESPONDING TO DIFFERENT REYNOLDS NUMBER RANGES. THE PRESENT RESULTS ARE COMBINED WITH THOSE OF OTHER EXPERIMENTERS IN HEAT AND MASS TRANSFER TO OBTAIN AN OVERALL TRANSFER COEFFICIENT FROM A SPHERE FOR A REYNOLDS NUMBER RANGE OF 200-200,000.

*MASS TRANSFER + *MATHEMATICAL TREATMENT + *SPHERE + BOUNDARY LAYER + COMPARISON, THEORY AND EXPERIENCE + DIFFUSION + DIFFUSION COEFFICIENT

5-27325

HAUPTMANN EG

THE INFLUENCE OF TEMPERATURE DEPENDENT VISCOSITY ON LAMINAR BOUNDARY-LAYER STABILITY THE UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER, B.C., CANADA

4 PAGES, 2 FIGURES, 6 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 1049-1052 (JUNE 1968)

THE TITLE PROBLEM IS ANALYZED FOR SMALL VARIATION IN VISCOSITY BY USING A PERTURBATION PROCEDURE. CONSIDERATION IS RESTRICTED TO INCOMPRESSIBLE, FLAT PLATE FLOW. THE RESULTS SHOW THAT APPRECIABLE STABILIZATION MAY OCCUR IN WATER OR OTHER LIQUIDS, WHILE AIR IS SLIGHTLY DESTABILIZED. REASONABLE AGREEMENT WITH PREVIOUS EXPERIMENTAL RESULTS IN AIR IS OBTAINED.

*BOUNDARY LAYER + *FLOW, LAMINAR + *TRANSPORT PROPERTY + FLOW STABILITY + FLOW THEORY AND EXPERIMENTS + FLOW, GENERAL

5-27326

APELBLAT A + KATCHALSKY A

MASS TRANSFER WITH A MOVING INTERFACE

ISRAEL ATOMIC ENERGY COMMISSION, NUCLEAR RESEARCH CENTER, NEGEV AND POLYMER DEPARTMENT, THE WEIZMANN INSTITUTE OF SCIENCE, REHOVOTH, ISRAEL

15 PAGES, 6 FIGURES, 14 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 1053-1067 (JUNE 1968)

MASS TRANSFER IN THE LAMINAR, CO-CURRENT FLOW OF TWO FLUIDS IN A RECTANGULAR CHANNEL IS INVESTIGATED. DISTRIBUTION OF CONCENTRATIONS AND THE LOCAL MASS-TRANSFER COEFFICIENTS ARE CALCULATED FOR THE IDEAL FLOW, THE COUETTE FLOW AND FOR THE FLOW WITH PARABOLIC PROFILE. ANALYTICAL AND APPROXIMATE SOLUTIONS FOR FINITE AND SEMI-INFINITE FLOWS IN A TWO-PHASE SYSTEM ARE PRESENTED. THE RESULTS OBTAINED SHOW THAT THE FORMAL MATHEMATICAL SOLUTIONS FOR ONE- AND TWO-PHASE SYSTEMS ARE SIMILAR. IN THE LATTER CASE, THE DIFFUSIONAL RESISTANCE TO THE MASS TRANSFER IS GREATER BY A FACTOR WHICH IS CLOSE TO THE VALUE OF THE DISTRIBUTION COEFFICIENT.

*FLOW, LAMINAR + *FLOW, TWO PHASE + *MASS TRANSFER + DIFFUSION + DIFFUSION COEFFICIENT

5-27327

ALSO IN CATEGORY 19

SATO T

HEAT TRANSFER BIBLIOGRAPHY - JAPANESE WORKS

DEPARTMENT OF MECHANICAL ENGINEERING, KYOTO UNIVERSITY, JAPAN

2 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 1069-1070 (JUNE 1968)

A BIBLIOGRAPHY OF JAPANESE HEAT AND MASS TRANSFER LITERATURE PREPARED BY THE DEPARTMENT OF MECHANICAL ENGINEERING OF KYOTO UNIVERSITY. FIFTY-TWO REFERENCES.

*BIBLIOGRAPHY + *HEAT TRANSFER + *MASS TRANSFER + HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, CONVECTION + HEAT TRANSFER, RADIANT + TRANSPORT PROPERTY

CATEGORY 5
ACCIDENT ANALYSIS

5-27329
SCHLUNDER EU
HEAT AND MATERIAL TRANSFER IN PIPES FILLED WITH PARTICLES
2 PAGES, CHEM-ING-TECH, 38(11), PAGES 1161-1163 (NOVEMBER 1966)

AFTER A THEORY ON HEAT AND MASS TRANSFER BETWEEN FLOW-TRAVERSED PACKINGS AND ADJOINING SURFACES HAD BEEN FORMULATED, THE USEFULNESS COULD BE CONFIRMED BY THE EXPERIMENTAL RESULTS OBTAINED WITH A SINGLE BODY IMBEDDED IN FLOW-TRAVERSED PACKINGS, THIS THEORY IS NOW APPLIED TO THE CASE OF HEAT AND MASS TRANSFER IN PACKED TUBES. A COMPARISON OF THE RESULTS WITH THE MEASUREMENTS OF OTHERS AND OF THE PRESENT AUTHOR SHOWS GOOD AGREEMENT AND THUS DEMONSTRATES THE JUSTIFICATION OF THE PHYSICAL MODEL UTILIZED ALSO FOR THIS CASE.

*FLOW, TUBE + *HEAT TRANSFER + *MASS TRANSFER + COMPARISON, THEORY AND EXPERIENCE + FLOW, GENERAL + HEAT TRANSFER, CONVECTION

5-27330
NISHIKAWA K + MIYABE K
ON THE BOILING-LIKE PHENOMENA AT SUPERCRITICAL PRESSURES
KYUSHU TECHNICAL COLLEGE
25 PAGES, 16 FIGURES, 1 TABLE, 16 REFERENCES, MEM. FAC. ENG., KYUSHU UNIV., 25(1), PAGES 1-25 (DECEMBER 1965)

THE PROBLEM OF HEAT TRANSFER TO FLUIDS NEAR THE CRITICAL PRESSURE HAS ARISEN BECAUSE OF THE INDUSTRIAL NEED FOR SUPERCRITICAL PRESSURE BOILERS, COOLING OF ROCKET MOTORS AND GAS TURBINE BLADES, AND HEAT REMOVAL FROM NUCLEAR REACTORS. A STUDY WAS MADE TO ELUCIDATE THE HEAT TRANSFER MECHANISM OF A SUPERCRITICAL FLUID. WITH THE EXPERIMENTAL APPARATUS OF FREE CONVECTION, THE BOILING-LIKE PHENOMENON WAS EXAMINED BY PHOTOGRAPHIC OBSERVATION AND HEAT TRANSFER COEFFICIENT MEASUREMENT. FOR THE HEATING SURFACE A PLATINUM WIRE WAS USED, AND CARBON DIOXIDE AS THE TEST FLUID.

*CONVECTIVE BOILING + *HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, SUPERCRITICAL + HEAT TRANSFER + HEAT TRANSFER, BOILING

5-27436
TURNER GA
A METHOD OF FINDING SIMULTANEOUSLY THE VALUES OF THE HEAT TRANSFER COEFFICIENT, THE DISPERSION COEFFICIENT, AND THE THERMAL CONDUCTIVITY OF PACKING IN A PACKED BED OF SPHERES- PART I. MATHEMATICAL ANALYSIS
UNIVERSITY OF WATERLOO
5 PAGES, 1 TABLE, 18 REFERENCES, ALCHE JOURNAL, 13(4), PAGES 678-682 (JULY 1967)

THE RESPONSE OF A PACKED BED TO A SINE WAVE OF TEMPERATURE IN A STREAM OF FLUID THROUGH IT WILL DEPEND UPON THE AMOUNT OF DISPERSION IN THE FLUID, THE RESISTANCE TO TRANSFER BETWEEN FLUID AND SOLID, AND THE THERMAL PROPERTIES OF THE SOLID. A METHOD IS PRESENTED THAT ALLOWS THE EFFECTS OF THESE THREE PHENOMENA ON THE AMPLITUDE AND PHASE ANGLE TO BE UNRAVELLED AND HENCE ALL THEIR MAGNITUDES TO BE COMPUTED SIMULTANEOUSLY. IT THUS PRESENTS A WAY OF DETERMINING THESE THREE QUANTITIES IN SITUATIONS WHERE THEY WERE PREVIOUSLY OBTAINABLE EITHER WITH GREAT UNCERTAINTY OR NOT AT ALL. THE METHOD REQUIRES MEASUREMENTS OF THE RELATIVE AMPLITUDES AND PHASE ANGLES AT THREE FREQUENCIES, AND (PREFERABLY) AT TWO APPROACHES ZERO, AS WELL, ALL TO BE CARRIED OUT WITH HIGH ACCURACY.

*HEAT TRANSFER COEFFICIENT + *REACTOR, PEBBLE BED + *THERMAL PROPERTY + DISPERSION + MATHEMATICAL STUDY

5-27437
VAN MEEL DA + VAN GASSELT MLG
RESEARCH ON THE INFLUENCE OF CONDITIONS OF FLOW, SUBCOOLING, AND COMPOSITION ON THE BURNOUT HEAT FLUX OF POLYPHENYL REACTOR COOLING AGENTS
TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK, CENTRAAL LABORATORIUM
EUR-3120.E +. 50 PAGES, JUNE 6, 1966

SUMMARIZES RESEARCH CARRIED OUT BY THE CENTRAL TECHNICAL INSTITUTE TNO HOLLAND FROM JUNE 1, 1964, UNDER CONTRACT NO. 166-64-6 ORGN WITH EURATOM ON FORCED CONVECTION NON-BOILING, SUBCOOLED BOILING, AND SUBCOOLED BURNOUT HEAT TRANSFER AND PRESSURE DROP OF TERPHENYL MIXTURES IN VERTICAL TEST SECTIONS. RECOMMENDED CORRELATIONS ARE PRESENTED FOR HEAT TRANSFER AND PRESSURE DROP, FOR UPFLOW THROUGH THE ROUND, 5-MM VERTICAL TUBE, 500 MM IN LENGTH.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*HEAT TRANSFER, BOILING + *HEAT TRANSFER, CONVECTION + *REACTOR, ORGANIC COOLED + BURNOUT HEAT FLUX + CONVECTIVE BOILING + EURATOM + PRESSURE DROP

5-27438
SEMERIA R
SODIUM BOILING IN FAST NEUTRON REACTOR CORES

CATEGORY 5
ACCIDENT ANALYSIS

5-27438 *CONTINUED*

CENTRE D ETUDES NUCLEAIRES DE GRENOBLE, FRANCE

5 PAGES, 16 REFERENCES, BULLETIN D'INFORMATIONS SCIENTIFIQUES ET TECHNIQUES, 122, PAGES 19-23 (JANUARY 1968)

A DESCRIPTION OF THE PHYSICAL PHENOMENA WHICH OCCUR DURING SODIUM BOILING, AND FLASHING OUT OF THE REACTOR CORE, IS ATTEMPTED. THE CHARACTERISTICS OF THE CALCULATION CODES AS WELL AS THE GOALS OF THESE CODES ARE BRIEFLY PRESENTED. THE IMPORTANT RESULTS GAINED FROM THE CURRENT STUDIES ARE OUTLINED.

*ACCIDENT, LOSS OF COOLANT + *HEAT TRANSFER, BOILING + *SODIUM + COMPUTER PROGRAM + REACTOR, FAST + REACTOR, LMFBR

5-27439

GRASS G + KOTTOWSKI H + SPILLER JH

SUPERHEAT MEASUREMENT AND STUDY OF LIQUID METAL BOILING

EUROPEAN ATOMIC ENERGY COMMUNITY

10 PAGES, 13 FIGURES, 10 REFERENCES, BULLETIN D'INFORMATIONS SCIENTIFIQUES ET TECHNIQUES, 122, PAGES 25-34 (JANUARY 1968)

TO STUDY THE MECHANISM OF LIQUID METAL BOILING, ITS MAXIMUM POSSIBLE SUPERHEAT HAS BEEN MEASURED. TO START WITH, POTASSIUM WAS CHOSEN AS A WORKING LIQUID. THIS PERMITS TO AVOID STUDYING IMMEDIATELY AT VERY HIGH TEMPERATURE. VERY IMPORTANT SUPERHEATING--GOING UP AS FAR AS 800 C IN PARTICULAR CASES--HAVE BEEN OBTAINED IN HIGHLY PURIFIED STAGNANT POTASSIUM. IN THE LOOP, WHERE THE DEGREE OF PURIFICATION IS LESSER, THE OBSERVED SUPERHEATINGS HAVE BEEN MUCH LOWER AND REMAIN BELOW 130 C. TAKING INTO ACCOUNT THE TECHNIQUE USED, THE BOILING MECHANISM SHOWED TO BE A SERIES OF LIQUID METAL EJECTIONS, EXPELLED BY THE VAPOR BUBBLES. THE FREQUENCY AND EXPULSION RATE DEPEND ON THE ORIGINAL SUPERHEAT AND ON THE CORRESPONDING VAPOUR PRESSURE.

*EXPERIMENT, GENERAL + *HEAT TRANSFER, BOILING + *METAL, LIQUID + CONVECTIVE BOILING + POTASSIUM

5-27440

FARLANE M

THEORETICAL STUDIES OF THE RESPONSE OF FAST REACTORS DURING SODIUM BOILING ACCIDENTS

ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS

18 PAGES, 13 FIGURES, 2 TABLES, 10 REFERENCES, BULLETIN D'INFORMATION SCIENTIFIQUES AND TECHNIQUES, 122, PAGES 35-52 (JANUARY 1968)

THIS PAPER DESCRIBES A CALCULATIONAL METHOD FOR THE TRANSIENT PHENOMENA WHICH CAN TAKE PLACE DURING COOLANT BOILING IN A REACTOR CORE. IT IS THUS POSSIBLE TO STUDY THE WEAK OVERPOWER TRANSIENTS ORIGINATING FROM THE REACTIVITY ADDITION OR THOSE ORIGINATING FROM THE COOLANT FLOW SHUT DOWN. THE MODEL SHOULD ALSO PERMIT THE FORMULATION AND ANALYSIS OF TRANSIENT BOILING EXPERIMENTS WHICH SHOULD SUPPLY STILL MISSING DATA. THE CALCULATIONS APPLY PARTICULARLY TO CERAMICS-FUELED AND SODIUM-COOLED FAST-BREEDER POWER REACTORS.

*ACCIDENT ANALYSIS + *CONVECTIVE BOILING + *SODIUM + HEAT TRANSFER, BOILING + REACTOR, FAST + REACTOR, LMFBR

5-27452

SPARROW EM + FARIAS FN

UNSTEADY HEAT TRANSFER IN DUCTS WITH TIME-VARYING INLET TEMPERATURE AND PARTICIPATING WALLS

UNIVERSIDADE DO BRASIL, RIO DE JANEIRO

17 PAGES, 8 FIGURES, 1 TABLE, 9 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 837-853 (MAY 1968)

AN ANALYSIS IS MADE OF UNSTEADY LAMINAR HEAT TRANSFER IN A DUCT WITH PERIODICALLY VARYING INLET TEMPERATURE AND TIME- AND SPACE-DEPENDENT WALL TEMPERATURE. THE WALL TEMPERATURE VARIATION IS NOT SPECIFIED IN ADVANCE, BUT RATHER, IS DYNAMICALLY DETERMINED BY A BALANCE OF THE HEAT-TRANSFER RATE AND THE ENERGY STORAGE. IN THE ANALYTICAL FORMULATION, THE COMMONLY AND QUASI-STEADY ASSUMPTION IS LIFTED IN FAVOR OF THE LOCAL APPLICATION OF THE ENERGY EQUATION, THE SOLUTION OF WHICH LEADS TO AN EIGENVALUE PROBLEM IN WHICH THE EIGENVALUES ARE COMPLEX (REAL AND IMAGINARY PARTS). IT WAS FOUND THAT, FOR A RANGE OF OPERATING CONDITIONS, THE QUASI-STEADY MODEL IS ABLE TO GIVE ACCURATE PERFORMANCE PREDICTIONS, ESPECIALLY WHERE IT IS USED IN CONJUNCTION WITH SPATIALLY VARYING HEAT-TRANSFER COEFFICIENTS.

*HEAT TRANSFER ANALYSIS + *HEAT TRANSFER, CONVECTION + *HOT CHANNEL + COMPARISON, THEORY AND EXPERIENCE + FLOW, LAMINAR + HOT CHANNEL ANALYSIS + MATHEMATICAL STUDY

5-27453

KUBAIR VG + PEI DCT

COMBINED LAMINAR FREE AND FORCED CONVECTION HEAT TRANSFER TO NON-NEWTONIAN FLUIDS

UNIVERSITY OF WATERLOO, WATERLOO, ONTARIO, CANADA

15 PAGES, 12 FIGURES, 5 TABLES, 17 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 855-869 (MAY 1968)

A THEORETICAL ANALYSIS FOR THE COMBINED LAMINAR FREE AND FORCED CONVECTION HEAT TRANSFER TO NON-NEWTONIAN FLUIDS IN EXTERNAL FLOWS IS PRESENTED. THE PARAMETER CONTROLLING THE FREE AND FORCED CONVECTION IS FOUND TO BE $Gr/Re^{2/(2-N)}$ WHERE N IS THE FLOW-BEHAVIOUR INDEX.

CATEGORY 5
ACCIDENT ANALYSIS

5-27453 *CONTINUED*

NUMERICAL SOLUTION OF THE TRANSFORMED BOUNDARY-LAYER EQUATIONS HAS BEEN CARRIED OUT FOR THE CASE OF A FLAT PLATE WITH UNIFORM WALL TEMPERATURE, FOR DIFFERENT FLOW-BEHAVIOUR INDICES AND DIFFERENT VALUES OF THE CONTROLLING PARAMETER. THE RESULTS OF HEAT TRANSFER, SHEAR STRESS, VELOCITY AND TEMPERATURE PROFILES AS FUNCTIONS OF FLOW-BEHAVIOUR INDEX AND THE CONTROLLING PARAMETER AT DIFFERENT PRANDTL NUMBERS ARE DISCUSSED FOR OPPOSING AND AIDING FLOWS.

*FLOW, LAMINAR + *FLOW, NONNEWTONIAN + *HEAT TRANSFER, CONVECTION + *HEAT TRANSFER, NATURAL CONVECTION + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27454

ARPACI VS

EFFECT OF THERMAL RADIATION ON THE LAMINAR FREE CONVECTION FROM A HEATED VERTICAL PLATE
UNIVERSITY OF MICHIGAN, ANN ARBOR, MICHIGAN

11 PAGES, 4 FIGURES, 9 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 871-881
(MAY 1968)

AN ANALYTICAL ATTEMPT IS MADE TO UNDERSTAND THE NONEQUILIBRIUM INTERACTION BETWEEN THERMAL RADIATION AND LAMINAR FREE CONVECTION IN TERMS OF A HEATED VERTICAL PLATE IN A STAGNANT RADIATING GAS. THE EFFECT OF RADIATION IS TAKEN INTO ACCOUNT IN THE INTEGRAL FORMULATION OF THE PROBLEM AS A ONE-DIMENSIONAL HEAT FLUX, EVALUATED BY INCLUDING THE ABSORPTION IN THIN GAS APPROXIMATION AND THE WALL EFFECT IN THICK GAS APPROXIMATION. THE LOCAL NUSSELT NUMBERS THUS OBTAINED HELP TO INTERPRET THE GAS DOMAINS FROM TRANSPARENT TO OPAQUE AND FROM COLD TO HOT.

*HEAT TRANSFER, NATURAL CONVECTION + *HEAT TRANSFER, RADIANT + *MATHEMATICAL TREATMENT + FLOW, LAMINAR + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER CORRELATION

5-27455

TOOR JS + VISKANTA R

A NUMERICAL EXPERIMENT OF RADIANT HEAT INTERCHANGE BY THE MONTE CARLO METHOD
PURDUE UNIVERSITY, LAFAYETTE, INDIANA

15 PAGES, 9 FIGURES, 5 TABLES, 18 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 883-897 (MAY 1968)

RADIANT HEAT INTERCHANGE BETWEEN SIMPLY ARRANGED SURFACES HAVING DIRECTION DEPENDENT CHARACTERISTICS HAS BEEN STUDIED BY THE STATISTICAL METHOD KNOWN AS MONTE CARLO. THE DIFFUSE AND SPECULAR CONSISTANT PROPERTY, THE SPECULAR DIRECTIONAL EMISSION AND REFLECTION, AND THE DIRECTIONAL EMISSION AND THE BIDIRECTIONAL REFLECTION MODELS HAVE BEEN EXPLORED WITH THE PRELIMINARY GOAL OF UNDERSTANDING WHAT LEVEL OF DETAIL IS IMPORTANT IN THE DESCRIPTION OF THE RADIATION PROPERTIES OF SURFACES. FOUR SIMPLE CONFIGURATIONS WHICH PERMIT A CRITICAL EXAMINATION OF THE DIRECTIONAL EFFECTS HAVE BEEN EXAMINED. RESULTS SHOWED THAT UNDER SOME CONDITIONS THE CHOICE OF THE MODEL FOR RADIATION SURFACE CHARACTERISTICS CAN BE VERY CRITICAL FOR BOTH THE LOCAL RADIANT HEAT FLUX AND FOR OVERALL RADIANT INTERCHANGE CALCULATIONS.

*HEAT TRANSFER ANALYSIS + *HEAT TRANSFER, RADIANT + *MONTE CARLO + HEAT TRANSFER + NUMERICAL METHOD

5-27456

ALSO IN CATEGORY 19

ECKERI ERG + SPARROW EM + IBELE WE + GOLDSTEIN RJ

HEAT TRANSFER BIBLIOGRAPHY

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINNESOTA

17 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 899-915 (MAY 1968)

AN EXTENSIVE BIBLIOGRAPHY OF HEAT AND MASS TRANSFER LITERATURE. PREPARED BY THE HEAT TRANSFER LABORATORY OF THE UNIVERSITY OF MINNESOTA.

*BIBLIOGRAPHY + *HEAT TRANSFER + *MASS TRANSFER + BOUNDARY LAYER + FLOW, TWO PHASE + FLUIDIZED BED + HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER, RADIANT + HOT CHANNEL + MEASUREMENT, GENERAL + METAL, LIQUID + REACTOR, PEBBLE BED + THERMODYNAMICS + TRANSPORT PROPERTY + TRANSPORT THEORY

5-27457

LYNCH JH

TWO NEW THEOREMS IN HEAT CONDUCTION

LEWIS RESEARCH CENTER, CLEVELAND, OHIO

8 PAGES, 2 FIGURES, 3 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 917-924
(MAY 1968)

FREQUENTLY, IN PARAMETRIC SURVEY AND DESIGN FEASIBILITY STUDIES, ONE IS INTERESTED IN SOME PARAMETER THAT CHARACTERIZES THE OVERALL PERFORMANCE RATHER THAN THE DETAILED BEHAVIOUR OF THE SYSTEM IN QUESTION. EXAMPLES OF SUCH PARAMETERS WOULD BE THE EFFECTIVE MULTIPLICATION CONSTANT FOR NUCLEAR REACTORS OR THE TOTAL HEAT-TRANSFER RATE FOR HEAT EXCHANGERS. THIS PAPER DESCRIBES THE DEVELOPMENT AND APPLICATION OF THEOREMS WHICH MAY BE USED TO RELATE CHANGES IN THE PARAMETERS THAT CHARACTERIZE AN EXCLUSIVELY STEADY-STATE HEAT CONDUCTING SYSTEM (GEOMETRY, CONDUCTIVITIES AND SOURCE STRENGTHS) TO THE AVERAGE SOURCE TEMPERATURE IN ALL SOURCE REGIONS. IF THIS SOURCE TEMPERATURE IS TAKEN AS THE CHARACTERISTIC INDEX OF THE SYSTEM PERFORMANCE, SEVERAL AREAS OF PRACTICAL APPLICATION ARE POSSIBLE.

*HEAT TRANSFER, CONDUCTION + *THEORETICAL INVESTIGATION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS +

CATEGORY 5
ACCIDENT ANALYSIS

5-27457 *CONTINUED*
MATHEMATICAL STUDY

5-27458
SMITH AG + HAY N
RECALCULATION OF THE SPALDING FUNCTION FOR CONTINUOUS AND SOURCE HEAT FLUX
UNIVERSITY OF NOTTINGHAM, ENGLAND
5 PAGES, 4 FIGURES, 1 TABLE, 4 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 924-928 (MAY 1968)

THE EXACT SOLUTION TO THE PROBLEM OF PREDICTING THE TEMPERATURE FIELD WITHIN THE FULLY DEVELOPED TURBULENT BOUNDARY LAYER HAS BEEN FORMULATED BY SPALDING. IN THE PRESENT PAPER A RECALCULATION OF THE SMITH AND SHAH SOLUTION FOR THE CASE OF CONSTANT HEAT FLUX PARAMETER IS PRESENTED. THE PRESENT SOLUTION REMOVES SOME ERRORS IN THE EARLIER ONE. AN ADDITIONAL FORM OF THE SPALDING FUNCTION FOR A SOURCE HEAT FLUX IS DERIVED FROM THE SOLUTION, AND A NEW METHOD OF PRESENTATION IS ADOPTED WHICH WILL GIVE A MORE ACCURATE AND EASIER DETERMINATION OF THE TEMPERATURE AT THE WALL AND WITHIN THE BOUNDARY LAYER.

*BOUNDARY LAYER + *TEMPERATURE GRADIENT + *THEORETICAL INVESTIGATION + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27459
KOSKY PG
NUCLEATION SITE INSTABILITY IN NUCLEATE BOILING
UKAEA, BERKS HARWELL
4 PAGES, 6 FIGURES, 1 TABLE, 10 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 929-932 (MAY 1968)

THE INITIATION OF BOILING FROM A HEATED SOLID SURFACE HAS BEEN NORMALLY TREATED IN TERMS OF A CRITICAL RADIUS OF NUCLEATION SITE AND THE PREPARATION OF BOILING SURFACES HAS NORMALLY BEEN THOUGHT OF IN TERMS OF ROUGHNESS. THE SIGNIFICANCE OF NUCLEATION SITE DEPTH HAS BEEN MOOTED BY MARTO AND ROHSENOW AS A RESULT OF THEIR STUDIES OF POOL BOILING OF LIQUID SODIUM. THEY OBSERVED SMALL SCALE IRREGULARITIES IN THE SURFACE TEMPERATURE OF THEIR BOILER AND OCCASIONAL LARGE TEMPERATURE CYCLES COINCIDENT WITH EVIDENCE THAT BOILING HAD BEEN SUPPRESSED. THE WORK DESCRIBED IN THIS PAPER USES AN ARTIFICIAL GLASS CAVITY SO THAT THE MOTION, IF ANY, OF THE FLUID WITHIN THE CAVITY COULD BE STUDIED BY HIGH SPEED PHOTOGRAPHY IN ORDER TO CONFIRM OR REFUTE THE FUNDAMENTAL ASSERTIONS OF THE MARTO AND ROHSENOW MODEL.

*BUBBLE NUCLEATION + *HEAT TRANSFER EXPERIMENT + *NUCLEATE BOILING + CONVECTIVE BOILING + FLOW, TWO PHASE + HEAT TRANSFER, BOILING

5-27469
BAW PS + PESKIN RL
SOLID DENSITY DISTRIBUTION IN GAS-SOLID PIPE FLOW
RUTGERS-STATE UNIV. OF NEW JERSEY, NEW BRUNSWICK, NEW JERSEY
NYO-2930-6, +. 48 PAGES, FIGURES, REFERENCES, APRIL, 1966

THE SOLID PHASE DENSITY DISTRIBUTION IN GAS-SOLID TURBULENT FLOW WAS MEASURED BY OPTICAL TECHNIQUES. DENSITY PROFILE COMPUTATIONS WERE ATTEMPTED USING A REYNOLDS AVERAGING TECHNIQUE AND IT WAS FOUND THAT THE MEAN DENSITY PROFILE DEPENDS ON THE CORRELATION OF AXIAL AND TRANSVERSE PARTICLE VELOCITY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$2.00 COPY, \$0.50 MICROFICHE

*FLOW THEORY AND EXPERIMENTS + *FLOW, TURBULENT + *FLOW, TWO PHASE + FLOW DISTRIBUTION + FLOW, GENERAL + FLOW, TUBE

5-27470
TRANSITION BOILING HEAT TRANSFER PROGRAM
GENERAL ELECTRIC CO., SAN JOSE, CALIFORNIA
EURAEC-17041 + GEAP-5191 +. 22 PAGES, JULY 1, 1966

THE OBJECTIVE OF THE PROGRAM IS TO OBTAIN EXPERIMENTAL MEASUREMENTS AND PERFORM THEORETICAL ANALYSES TO DEVELOP THE MEANS FOR PREDICTING THE HEAT TRANSFER COEFFICIENTS FOR FULLY-DEVELOPED FILM BOILING TO FORCED CONVECTION, DISPERSED FLOWS. THE CONDITIONS OF INTEREST FOR BOILING WATER ARE PRESSURES OF 1000, 600, AND 1400 PSIA, AND MASS VELOCITIES OF 0.5 TO 1.5 MILLION LB/H-FT OVER THE STEAM QUALITY RANGE OF 0.15 TO 0.60. FILM BOILING COEFFICIENTS WERE MEASURED IN ORDER TO RESOLVE DIFFERENCES FOUND IN PREVIOUS ANNULAR TEST DATA. INCREASING THE DISTANCE BETWEEN SPACERS WAS FOUND TO REDUCE THE FULLY-DEVELOPED FILM BOILING COEFFICIENT. THE DROPLET SLIP VELOCITY FOR MIST FLOW AND THE CONTRIBUTION OF CONVECTION TO DROPLET HEAT TRANSFER ARE EVALUATED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DROPLET + *FILM BOILING + *HEAT TRANSFER EXPERIMENT + CONVECTIVE BOILING + HEAT TRANSFER + HEAT TRANSFER ANALYSIS + HEAT TRANSFER, BOILING

CATEGORY 5
ACCIDENT ANALYSIS

5-27472 ALSO IN CATEGORY 7
PITTS SH
FACTORS INFLUENCING THE IGNITION OF METALLIC PLUTONIUM
DOW CHEMICAL COMPANY
8 PAGES, 14 FIGURES, 1 TABLE, 17 REFERENCES, NUCLEAR SAFETY, 9(2), PAGES 112-120 (MARCH-APRIL 1968)

THE FACTORS THAT INFLUENCE THE IGNITION OF PLUTONIUM WERE INVESTIGATED EXPERIMENTALLY AND FOUND TO BE RELATED TO SAMPLE SIZE AND GEOMETRY OR TO THE SURFACE COMPOSITION. THE IGNITION TEMPERATURE DECREASED AS THE SAMPLE SURFACE AREA WAS INCREASED, AS THE WEIGHT OF PLUTONIUM FILINGS WAS INCREASED, AND AS SLOWER HEATING RATES WERE USED. SAMPLES HEATED AT CONSTANT, ELEVATED TEMPERATURES IGNITED AT LOWER TEMPERATURES THAN THOSE HEATED AT A CONSTANTLY INCREASING TEMPERATURE. THIN FOIL COUPONS IGNITED AT LOWER TEMPERATURES WHEN THEY CONTAINED INDUCED INTERNAL STRESSES. LOWER IGNITION TEMPERATURES WERE OBTAINED BY FORMING PUO ON THE SAMPLE SURFACE.

*ACCIDENT ANALYSIS + *CHEMICAL REACTION + *PLUTONIUM + EXPERIMENT, GENERAL + FIRE + IGNITION + IGNITION TEMPERATURE

5-27473
DISCHINGER RH
PERFORMANCE EVALUATION OF HEAT EXCHANGERS FOR SODIUM-COOLED REACTORS
UNITED NUCLEAR CORP., ELMSFORD, N.Y.
UNC-5162 +. 26 PAGES, 1 TABLE, OCTOBER 20, 1966

THIS IS THE FIFTH QUARTERLY PROGRESS REPORT CONCERNING THE EVALUATION OF THE THERMAL-HYDRAULIC AND STRUCTURAL PERFORMANCE OF HEAT EXCHANGERS FOR SODIUM-COOLED REACTOR PLANTS. THE EVALUATION WILL BE BASED ON THE RESULTS OF TESTS OF MODEL HEAT EXCHANGERS (APPROXIMATELY 30 MWT) IN THE SODIUM COMPONENTS TEST INSTALLATION. AN INTERMEDIATE HEAT EXCHANGER DESIGNED AND MANUFACTURED BY ALCO PRODUCTS, INC., AND A STEAM GENERATOR DESIGNED BY ALCO PRODUCTS, INC. AND MANUFACTURED BY BALDWIN-LIMA-HAMILTON CORPORATION ARE THE FIRST UNITS TO BE TESTED. THE BABCOCK AND WILCOX STEAM GENERATOR IS TO BE TESTED NEXT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*HEAT EXCHANGER + *METAL, LIQUID + *SODIUM + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT

5-27480
HSIA HM + LOVE TJ
RADIATIVE HEAT TRANSFER BETWEEN PARALLEL PLATES SEPARATED BY A NONISOTHERMAL MEDIUM WITH ANISOTROPIC SCATTERING
DEPT. OF MECHANICAL ENGINEERING, NORTH DAKOTA STATE UNIVERSITY + SCHOOL OF AEROSPACE AND MECHANICAL ENGINEERING, UNIVERSITY OF OKLAHOMA, NORMA, OKLA.
8 PAGES, 8 FIGURES, 11 REFERENCES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 197-204, (AUGUST 1967)

THE PROBLEM OF RADIATIVE HEAT TRANSFER IN A NONISOTHERMAL MEDIUM IS CONSIDERED. THE ANALYSIS IS CARRIED OUT FOR A PLANE PARALLEL ATMOSPHERE SEPARATED BY A CLOUD OF PARTICLES WHICH SCATTERS RADIANT ENERGY IN AN ANISOTROPIC FASHION. LINEAR AND ISOTHERMAL TEMPERATURE PROFILES ARE COMPARED FOR ENCLOSURES WITH PARTIALLY REFLECTING DIFFUSE BOUNDARIES. THE SOLUTIONS ARE OBTAINED BY REPRESENTING THE INTEGRAL TERM OF THE RADIATIVE TRANSPORT EQUATION BY A QUADRATURE.

*HEAT TRANSFER ANALYSIS + *HEAT TRANSFER, RADIANT + HEAT TRANSFER + MATHEMATICAL STUDY + MATHEMATICAL TREATMENT

5-27481
MERONEY RN + GIEDT WH
THE EFFECT OF MASS INJECTION ON HEAT TRANSFER FROM A PARTIALLY DISSOCIATED GAS STREAM
COLORADO STATE UNIVERSITY, FORT COLLINS, COLO. + UNIVERSITY OF CALIFORNIA, DAVIS, CALIF.
14 PAGES, 15 FIGURES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 205-218, (AUGUST 1967)

AN INVESTIGATION OF THE EFFECT OF HYDROGEN AND HELIUM INJECTION ON LOCAL HEAT TRANSFER TO A POROUS SURFACE FROM AN OXYGEN-ACETYLENE COMBUSTION GAS STREAM IS DESCRIBED. THE FREE-STREAM TEMPERATURE VARIED FROM 6200 TO 5200 DEG RANKINE AND THE VOLUMETRIC PERCENTAGE OF ATOMIC HYDROGEN FROM 20 TO 8. FLOW IN THE BOUNDARY LAYER WAS FOUND TO BE TURBULENT. STUDY OF THE RESULTS LED TO SUCCESSFUL CORRELATION OF THE RATIO OF THE HEAT FLUX WITH INJECTION TO THE HEAT FLUX WITHOUT INJECTION IN TERMS OF A DIMENSIONLESS BLOWING PARAMETER IN WHICH PROPERTIES ARE EVALUATED AT AN AVERAGE REFERENCE STATE. A METHOD FOR PREDICTING HEAT FLUX WITH INJECTION WAS THEN DEVELOPED. THIS IS BASED ON A TEMPERATURE RATHER THAN AN ENTHALPY POTENTIAL BECAUSE THE LATTER RESULTED IN ANOMALOUS VALUES FOR THE STANTON NUMBER UNDER SOME OF THE TEST CONDITIONS.

*HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, GAS + *MASS TRANSFER + HEAT TRANSFER + HEAT TRANSFER CORRELATION

CATEGORY 5
ACCIDENT ANALYSIS

5-27482
EDWARDS DK + GLASSEN LK + HAUSER WC + TUCHSCHER JS
RADIATION HEAT TRANSFER IN NONISOTHERMAL NONGRAY GASES
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIF. + AERONUTRONIC DIVISION OF PHILCO CORP., NEWPORT BEACH,
CALIF. + R.O. ROBERTS, INC., SANTA FE SPRINGS, CALIF. + HUGHES AIRCRAFT CO., CULVER CITY, CALIF.
11 PAGES, 6 FIGURES, 4 TABLES, 49 REFERENCES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 219-230, (AUGUST 1967)

EXPERIMENTAL MEASUREMENTS OF ABSORPTION AND EMISSION BY NONISOTHERMAL CO-2 AND STEAM ARE REPORTED. ANALYTICAL FORMULATIONS AND CALCULATIONS OF RADIANT HEAT TRANSFER USING A SIMPLE NONGRAY GAS MODEL ARE PRESENTED. IT IS FOUND THAT A GRAY GAS MODEL CANNOT PREDICT EVEN QUALITATIVELY THE EXPERIMENTAL RESULTS, WHILE THE BAND MODEL METHOD OF CALCULATION YIELDS RESULTS IN QUANTITATIVE AGREEMENT FOR TOTAL EMISSION AND ABSORPTION IN A BAND. EFFECTS OF LINE STRUCTURE ARE SHOWN TO BE OF SECONDARY IMPORTANCE COMPARED TO BAND ENVELOPE STRUCTURE FOR LINE-WIDTH-TO-SPACING RATIOS ABOVE 0.01 IN SATURATED BANDS. AN ANALYTICAL SOLUTION FOR COUPLED CONVECTION AND RADIATION IN A PLANE-PARALLEL-WALL DUCT IS DERIVED TO ILLUSTRATE THE UTILITY OF THE EXPONENTIAL BAND MODEL FOR ANALYSIS OF RADIANT TRANSFER IN NONISOTHERMAL, NONGRAY GASES.

*HEAT TRANSFER ANALYSIS + *HEAT TRANSFER, GAS + *HEAT TRANSFER, RADIANT + CARBON DIOXIDE + HEAT TRANSFER + STEAM

5-27483
ELROD WC + CLARK JA + LADY ER + MERTE H
BOILING HEAT-TRANSFER DATA AT LOW HEAT FLUX
MECHANICAL ENGINEERING, CLEMSON UNIVERSITY, CLEMSON, S. C. + MECHANICAL ENGINEERING DEPT., UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.
9 PAGES, 13 FIGURES, 7 REFERENCES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 235-243, (AUGUST 1967)

DATA ARE PRESENTED FOR NATURAL AND FORCED CONVECTION HEAT TRANSFER FROM THE OUTSIDE OF A SINGLE 3/4-IN.-DIA TUBE TO SATURATED WATER IN THE PRESSURE RANGE FROM 535 TO 1550 PSIA. NONBOILING AND NUCLEATE BOILING AT LOW HEAT FLUX ARE CONSIDERED FOR VERTICAL AND HORIZONTAL TUBES. WATER CHEMISTRY CONTROL IS SHOWN TO BE IMPORTANT IN OBTAINING REPRODUCIBLE DATA. A NEW FACTOR, SUSPENDED SOLIDS IN THE BOILING MEDIUM, IS FOUND TO INFLUENCE THE NUCLEATE BOILING DATA IN A MANNER SIMILAR TO THAT OF A DISSOLVED GAS.

*CONVECTIVE BOILING + *HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, BOILING + HEAT TRANSFER + HEAT TRANSFER, CONVECTION + HEAT TRANSFER, NATURAL CONVECTION

5-27484
MERCER WE + PEARCE WM + HITCHCOCK JE
LAMINAR FORCED CONVECTION IN THE ENTRANCE REGION BETWEEN PARALLEL FLAT PLATES
BALLISTIC SYSTEMS DIVISION, AFSC, NORTON AFB, CALIF. + HEADQUARTERS SAAMA, AFLC, KELLY AFB, TEXAS + MECHANICAL ENGINEERING DEPT., AIR FORCE INSTITUTE OF TECHNOLOGY, WRIGHT-PATTERSON AFB, OHIO
7 PAGES, 7 FIGURES, 16 REFERENCES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 251-257, (AUGUST 1967)

INTERFEROMETER MEASUREMENTS OF LAMINAR FORCED CONVECTION TO AIR IN THE ENTRANCE REGION BETWEEN PARALLEL FLAT PLATES ARE REPORTED. EXPERIMENTAL LOCAL AND MEAN NUSSELT NUMBERS ARE GIVEN FOR REYNOLDS NUMBERS FROM 300 TO 1500 AND LENGTH-TO-PLATE SPACING RATIOS FROM 2 TO 8. THE EXPERIMENTAL DATA ARE COMPARED WITH CORRESPONDING VALUES FROM THEORETICAL ANALYSES OF SIMULTANEOUSLY DEVELOPING MOMENTUM AND THERMAL BOUNDARY LAYERS FOR THE TWO CASES CONSIDERED - AIR HEATED BY BOTH PLATES WITH THE SAME UNIFORM TEMPERATURE, AND AIR HEATED BY ONE PLATE WITH A UNIFORM TEMPERATURE AND OTHER INSULATED. EQUATIONS ARE ALSO GIVEN WHICH SUMMARIZE THE THEORETICAL RESULTS.

*FLOW, LAMINAR + *HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, GAS + HEAT TRANSFER + HEAT TRANSFER, CONVECTION

5-27485
BRADFIELD WS
ON THE EFFECT OF SUBCOOLING ON WALL SUPERHEAT IN POOL BOILING
STATE UNIVERSITY OF NEW YORK AT STONY BROOK, NEW YORK
2 PAGES, 2 FIGURES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 269-270, (AUGUST 1967)

ONE OF THE PROBLEMS OF INTEREST IN THE AREA OF TRANSITION BOILING IS THE EFFECT OF SUBCOOLING OF THE BULK LIQUID ON THE TRANSITION CURVE. A NUMBER OF INVESTIGATIONS HAVE BEEN MADE OF THE EFFECTS OF SUBCOOLING ON PEAK HEAT FLUX BOTH FOR POOL BOILING AND WITH FORCED CONVECTION. MANY OF THESE DATA ARE SUMMARIZED FOR COMPARISON WITH THE DATA OF VLIET AND LEPPERT. HOWEVER, MOST OF THESE INVESTIGATIONS OMITTED THE CONSIDERATION OF WALL SUPERHEAT. BERGLES AND ROHSENOW OBTAINED DATA INDICATING THAT A SHIFT OF THE POOL BOILING CURVE TOWARD HIGHER WALL SUPERHEATS CAN BE EXPECTED WITH INCREASING SUBCOOLING. OBSERVATIONS OF THE TRANSITION FROM FILM BOILING TO NUCLEATE POOL BOILING BY THE PRESENT WRITER SHOW THIS TREND ALSO FOR THE TRANSITION BOILING REGION. THE PRESENT DATA WERE OBTAINED FROM QUENCHING EXPERIMENTS IN WATER AT ATMOSPHERIC PRESSURE.

*HEAT TRANSFER EXPERIMENT + *POOL BOILING + *SUBCOOLING + HEAT TRANSFER + HEAT TRANSFER, BOILING

CATEGORY 5
ACCIDENT ANALYSIS

5-27486
EMERGY AF + BAILEY DA
HEAT TRANSFER TO FULLY DEVELOPED LIQUID METAL FLOW IN TUBES
MECHANICAL ENGINEERING DEPT., UNIVERSITY OF WASHINGTON, SEATTLE, WASH.
4 PAGES, 2 FIGURES, 5 REFERENCES, JOURNAL OF HEAT TRANSFER, 89(3), PAGE 272-275, (AUGUST 1967)

HEAT TRANSFER COEFFICIENTS FOR FULLY DEVELOPED LIQUID METAL FLOW IN A TUBE WITH A CONSTANT WALL HEAT FLUX ARE GIVEN FOR LAMINAR AND TRANSITIONAL FLOW. THESE EXPERIMENTAL VALUES AGREE WITH THE GRAETZ VALUE OF 4.36, AND SUPPORT THE WORK OF PETUKHOV AND YUSHIN IN CONTRADICTION TO THAT OF JOHNSON, HARTNETT, AND CLABAUGH.

*FLOW, TUBE + *HEAT TRANSFER EXPERIMENT + *METAL, LIQUID + HEAT TRANSFER + HEAT TRANSFER, CONVECTION + NAK

5-27488 ALSO IN CATEGORY 18
HEALZER JM + HENCH JE + JANSSEN E + LEVY S
DESIGN BASIS FOR CRITICAL HEAT FLUX CONDITION IN BOILING WATER REACTORS
GENERAL ELECTRIC, SAN JOSE, CALIF.
APED-5286 +. 50 PAGES, FIGURES, TABLES, 11 REFERENCES, SEPTEMBER 1966, DOCKETS 50-259/260, TYPE--BWR, MFG--G.E., AE--TVA

A NEW DESIGN BASIS FOR PREDICTING THE CRITICAL HEAT FLUX IN BOILING WATER REACTORS WAS DEVELOPED. THE DESIGN BASIS IS FORMULATED UPON EXTENSIVE TESTS WITH MULTI-ROD GEOMETRIES WHICH ACCURATELY DUPLICATE THE REACTOR FUEL ASSEMBLY FLOW CONDITIONS. THE TEST RESULTS WERE EMPLOYED TO FORMULATE LIMIT LINES WHICH FALL BELOW THE EXPERIMENTAL DATA. AN ANALYTICAL MODEL TO PREDICT LOCAL FLOW AND STEAM QUALITY IN COMPLEX GEOMETRIES WAS ALSO DEVELOPED. THE MODEL WAS APPLIED TO THE REACTOR FUEL ASSEMBLIES AND TO THE MULTI-ROD TEST SECTIONS TO SHOW THAT THE TEST SECTIONS SATISFACTORILY MOCKUP THE IN-REACTOR BEHAVIOR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C., 20545 (\$0.25 CENTS/COPY)

*HEAT FLUX, CRITICAL + BROWNS FERRY (BWR) + REACTOR, BWR

5-27491
WALTERS CT + GENCO JM + RAINES GE
HEAT-TRANSFER ANALYSIS IN LOSS-OF-COOLANT ACCIDENTS
BATTELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES, COLUMBUS, OHIO
18 PAGES, 11 FIGURES, 1 TABLE, 44 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 7(2), PAGE 123-140, (FEB. 1968)

A COMPUTER PROGRAM HAS BEEN WRITTEN FOR THE COMPREHENSIVE ANALYSIS OF CORE-PRESSURE-VESSEL HEAT TRANSFER DURING A LOSS-OF-COOLANT ACCIDENT. THE PROGRAM, NURLOC-1.0, IS BASED UPON A GENERALIZED PROCEDURE FOR NUMERICALLY SOLVING THE TWO-DIMENSIONAL HEAT-CONDUCTION EQUATION OVER MULTI-CONNECTED REGIONS WITH VARIOUS COMPLICATING FACTORS SPECIFIC TO THIS APPLICATION. THE NUMERICAL PROCEDURE CONSISTS OF SOLVING THE EXPLICIT FINITE-DIFFERENCE FORM OF THE CONDUCTION EQUATION AT MESH INTERSECTIONS. BOUNDARY CONDITIONS AND HEAT-GENERATION RATES ARE SET BY MODELS THAT CHARACTERIZE VARIOUS COMPLEX CHEMICAL AND PHYSICAL PROCESSES WHICH CAN OCCUR DURING AN ACCIDENT. THE PROCESSES CONSIDERED IN NURLOC-1.0 INCLUDE BOIL-OFF OF RESIDUAL COOLANT WATER, METAL-WATER REACTIONS, RADIATIVE EXCHANGE, AND PRODUCT-DEBRIS HEATING, AND DELAYED-NEUTRON HEATING.

*ACCIDENT, LOSS OF COOLANT + *COMPUTER PROGRAM + *HEAT TRANSFER ANALYSIS + ACCIDENT ANALYSIS + HEAT TRANSFER + REACTOR, POWER

5-27494 ALSO IN CATEGORIES 9 AND 17
WYLLIC RD
TENSILE AND IMPACT PROPERTIES OF ELK RIVER REACTOR CONTROL ROD MATERIAL. FINAL REPORT
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
SWRI-1228-55 +. 21 PAGES, FIGURES, 5 REFERENCES, FEB. 19, 1965

THE BORON STAINLESS STEEL SPECIMENS WHICH WERE REMOVED FROM THE ELK RIVER REACTOR DURING THE SHUT DOWN IN EARLY NOVEMBER 1964 WERE TESTED AT SOUTHWEST RESEARCH INSTITUTE. BOTH SUBSIZE TENSILE AND IMPACT SPECIMENS WERE INCLUDED IN THE SURVEILLANCE PROGRAM. AN ESTIMATE OF THE FLUX LEVEL WAS MADE BY ALLIS CHALMERS AS 1.3 X 10¹⁰ (20TH) NVT THERMAL AS OF AUGUST 31, 1964. THIS CORRESPONDS TO APPROXIMATELY 0.22 ATOM PERCENT BURN-UP. THE DUCTILITY OF THE SPECIMENS WAS MEASURED AS 1-2% ELONGATION WHICH WAS BELOW THE 3.4% REQUIRED BY THE TECHNICAL SPECIFICATIONS. A LITERATURE REVIEW INDICATED THAT THE MEASURED DUCTILITY WAS IN THE RANGE OF THE OTHER TEST DATA AVAILABLE ON BORON STAINLESS STEELS WITH APPROXIMATELY 2% B.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151

*CONTROL ROD + *IMPACT PROPERTY + *TENSILE PROPERTY + ELK RIVER (BWR) + EXPERIMENT, GENERAL + MATERIAL + REACTOR, BWR + SURVEILLANCE PROGRAM

CATEGORY 5
ACCIDENT ANALYSIS

5-27533

TAYLOR MF

A METHOD OF CORRELATING LOCAL AND AVERAGE FRICTION COEFFICIENTS FOR BOTH LAMINAR AND TURBULENT FLOW OF GASES THROUGH A SMOOTH TUBE WITH SURFACE TO FLUID BULK TEMPERATURE RATIOS FROM 0.35 TO 7.35
LEWIS RESEARCH CENTER, CLEVELAND, OHIO
6 PAGES, 5 FIGURES, 1 TABLE, 13 REFERENCES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(8), PAGE 1123-1128, (AUGUST 1967)

THERE HAS LONG BEEN A NEED OF A MEANS OF CORRELATING BOTH LAMINAR AND TURBULENT FRICTION COEFFICIENTS FOR GASES WITH LARGE VARIATIONS IN THE PHYSICAL PROPERTIES FLOWING THROUGH SMOOTH TUBES. THIS PAPER PRESENTS METHODS OF CORRELATING BOTH LOCAL AND AVERAGE FRICTION COEFFICIENTS FOR LAMINAR AND TURBULENT FLOW OF GASES THROUGH SMOOTH TUBES WITH SURFACE TO FLUID BULK TEMPERATURE RATIOS FROM 0.35 TO 7.35, AND FOR THE GASES, HELIUM, HYDROGEN, NITROGEN, AIR AND CARBON DIOXIDE, WHICH REPRESENT THE WORK OF SEVEN INVESTIGATORS.

*FLOW CORRELATION + *FLOW THEORY AND EXPERIMENTS + *FLOW, TUBE + FLOW, GENERAL + FLOW, LAMINAR + FLOW, TURBULENT + FRICTION FACTOR

5-27545

LINDAUER GC

HEAT TRANSFER IN PACKED AND FLUIDIZED BEDS BY THE METHOD OF CYCLIC TEMPERATURE VARIATIONS
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
7 PAGES, 8 FIGURES, 20 REFERENCES, ALCHE JOURNAL, 13(6), PAGES 1181-1187 (1967)

PARTICLE-TO-GAS HEAT-TRANSFER COEFFICIENTS WERE DETERMINED IN PACKED AND FLUIDIZED BEDS WITH LARGE-DIAMETER PARTICLES AND HIGH MASS VELOCITIES, USING THE CYCLIC TEMPERATURE METHOD. EXPERIMENTAL RESULTS FOR PACKED BEDS WERE SATISFACTORILY CORRELATED WITHIN 10 PERCENT DEVIATION AS $(\text{VOID FRACTION}) \times (\text{STANTON NUMBER}) \times (\text{PRANDTL NUMBER}^{.666})$ VS THE REYNOLDS NUMBER AND WERE FOUND TO COMPARE FAVORABLY WITH RESULTS OF OTHER EXPERIMENTERS OBTAINED WITH MUCH LOWER MASS VELOCITIES AND LARGER PARTICLES. THE PARTICLE-TO-GAS HEAT-TRANSFER COEFFICIENT VARIED AS $G^{.60}$ FOR STEEL SPHERES, AS $G^{.66}$ FOR TUNGSTEN SPHERES, AND AS $(\text{PARTICLE DIAMETER})^{-.44}$. HEAT-TRANSFER COEFFICIENTS OBTAINED AT MINIMUM FLUIDIZATION WERE IN GOOD AGREEMENT WITH THOSE OBTAINED WITH PACKED BEDS. AS THE MASS VELOCITY WAS INCREASED ABOVE THAT REQUIRED FOR MINIMUM FLUIDIZATION, HEAT TRANSFER COEFFICIENTS REMAINED ESSENTIALLY THE SAME.

*FLUIDIZED BED + *HEAT TRANSFER CORRELATION + *PACKED BED + HEAT TRANSFER + HEAT TRANSFER COEFFICIENT + HEAT TRANSFER EXPERIMENT + SPHERE + STEEL + TUNGSTEN

5-27546

BERTOLETTI S + GASPARI GP + LOMBARDI C + SOLDAINI G + ZAVATTARELLI R

HEAT TRANSFER CRISIS IN STEAM-WATER MIXTURES -- EXPERIMENTAL DATA IN ROUND TUBES AND VERTICAL UPFLOW OBTAINED DURING THE CAN-2 PROGRAM
CENTRO INFORMAZIONI STUDI ESPERIENZE, MILAN
EURAE-1084 +. 67 PAGES, 4 FIGURES, 41 TABLES, 8 REFERENCES, JUNE 1964

PRESENTS ALL THE EXPERIMENTAL DATA ON THE HEAT TRANSFER CRISIS WITH STEAM-WATER MIXTURES FLOWING UPWARDS IN ROUND TUBES, INCLUDING THE DATA EARLIER PUBLISHED AND ALSO THE SIGNIFICANT DATA OBTAINED WITH CISE TEST PLANT NO. 1, DURING THE CAN-2 PROGRAM. DURING THE PERIOD UNDER CONTRACT, HEAT-TRANSFER-CRISIS DATA IN ANNULI AND CLUSTERS WERE ALSO COLLECTED. THESE DATA TOGETHER WITH THOSE COLLECTED IN ANALOGOUS GEOMETRIES IN CISE TEST PLANT NO. 2 WILL BE PUBLISHED IN THE NEXT TOPICAL REPORT. NO ATTEMPT IS MADE TO GIVE AN INTERPRETATION OF OR TO DISCUSS THE DATA. THIS WILL BE MADE IN CISE R-99 (1964)-REPORT IN PREPARATION- WHERE A NEW HEAT-TRANSFER-CRISIS CORRELATION IS ALSO PROPOSED.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*HEAT FLUX, CRITICAL + *HEAT TRANSFER + *HEAT TRANSFER CORRELATION + BOILING + CONVECTIVE BOILING + EURATOM

5-27547

BECKMAN WA

RADIATION AND CONVECTION HEAT TRANSFER IN A POROUS BED
UNIVERSITY OF WISCONSIN, MADISON, WIS.

4 PAGES, 5 FIGURES, 4 REFERENCES, JOURNAL OF ENGINEERING FOR POWER, 90(1), PAGES 51-54 (JANUARY 1968)

THE ONE-DIMENSIONAL STEADY-STATE TEMPERATURE DISTRIBUTION WITHIN A ISOTROPIC POROUS BED SUBJECTED TO A COLLIMATED AND/OR DIFFUSE RADIATION HEAT FLUX AND A TRANSPARENT FLOWING FLUID HAS BEEN DETERMINED BY NUMERICAL METHODS. THE POROUS BED WAS ASSUMED TO BE NONSCATTERING AND TO HAVE A CONSTANT ABSORPTION COEFFICIENT. PART OF THE RADIATION ABSORBED BY THE POROUS BED IS RERADIATED AND THE REMAINDER IS TRANSFERRED TO THE FLUID BY CONVECTION. DUE TO THE ASSUMED FINITE VOLUMETRIC HEAT TRANSFER COEFFICIENT, THE BED AND FLUID HAVE DIFFERENT TEMPERATURES. A BED WITH AN OPTICAL DEPTH OF SIX AND WITH A NORMAL INCIDENT COLLIMATED RADIATION HEAT FLUX WAS INVESTIGATED IN DETAIL. THE RADIATION INCIDENT ON THE BED AT THE FLUID EXIT WAS ASSUMED TO ORIGINATE FROM A BLACK SURFACE AT THE FLUID EXIT TEMPERATURE.

*HEAT TRANSFER, CONVECTION + *HEAT TRANSFER, RADIANT + *PACKED BED + HEAT TRANSFER + MATHEMATICAL TREATMENT + NUMERICAL METHOD + THEORETICAL INVESTIGATION

CATEGORY 5
ACCIDENT ANALYSIS

5-27557

BOURE J

HYDRODYNAMIC INSTABILITIES LIMITING THE POWER OF BOILING WATER REACTORS

CENTRE DETUDES NUCLEAIRES DE GRENOBLE

EURAC-1464 (VOL.2) + EUR-2389 +. 300 PAGES, FIGURES, TABLES, REFERENCES, JUNE 1965, CENTRE DETUDES NUCLEAIRES DE GRENOBLE

A BIBLIOGRAPHIC STUDY IS MADE ON THE HYDRODYNAMIC OSCILLATIONS PHENOMENON. THIS PHENOMENON OCCURS, UNDER SOME CONDITIONS, IN HEATED CHANNELS IN WHICH BOILING OF THE FLUID IS ALLOWED (SUCH AS NUCLEAR REACTORS CHANNELS). IT IS SHOWN THAT THE UNDERSTANDING OF THE MECHANISM OF THESE OSCILLATIONS CAN ONLY BE OBTAINED BY MEANS OF VERY SIMPLIFIED MODELS. TWO SUCH MODELS ARE PROPOSED BUT ONLY ONE, THE DENSITY EFFECT MODEL IS STUDIED HERE. QUALITATIVE AND QUANTITATIVE RESULTS SHOW VERY GOOD AGREEMENTS WITH EXPERIENCE. THEY DEMONSTRATE THE REALITY OF THE ABOVE MECHANISM, THE GENERAL VALUE OF THE MODEL DIMENSIONLESS PARAMETERS AND THE WEAK IMPACT ON OSCILLATION THRESHOLDS OF THE PHENOMENONS NEGLECTED IN THE MODEL. THE GREAT IMPORTANCE OF THE SUBCOOLING PARAMETER AND OF THE LOCAL BOILING PHENOMENON IS SHOWN. A NUMBER OF POSSIBLE MODIFICATIONS OR USES OF THE DENSITY-EFFECT MODEL ARE GIVEN.

AVAILABILITY - USAEC, DIVISION OF TECHNICAL INFORMATION EXTENSION, P.O. BOX 62, OAK RIDGE, TENN.

*CONVECTIVE BOILING + *HOT CHANNEL + *HYDRODYNAMIC ANALYSIS + HEAT TRANSFER, BOILING + INSTABILITY + OSCILLATION

5-27560

LITTMAN H

STUDIES OF GAS-PARTICLE HEAT TRANSFER COEFFICIENTS IN PACKED AND FLUIDIZED BEDS BY FREQUENCY RESPONSE TECHNIQUES

RENSSELAER POLYTECHNIC INST., TROY, N.Y.

RPI-3639-1 +. 48 PAGES, REFERENCES, OCTOBER 1966

PART A DEALS WITH THE WORK IN PACKED BEDS DISCUSSING FIRST THE MODELS USED FOR INTERPRETING THE HEAT TRANSFER MEASUREMENTS FOLLOWED BY A DISCUSSION OF THE DATA OBTAINED HEAT TRANSFER COEFFICIENTS, SOLID PHASE CONDUCTIVITIES AND GAS PHASE DISPERSION COEFFICIENTS. BEDS OF COPPER, LEAD AND GLASS PARTICLES WERE STUDIED IN THE REYNOLDS NUMBER RANGE FROM 1.92 TO 99.2 BY FREQUENCY RESPONSE TECHNIQUES USING A PERIODIC TEMPERATURE WAVE IN THE GAS ENTERING THE BED. PART B DETAILS THE WORK IN FLUIDIZED BEDS AND IS BASED MAINLY ON THE PAPER BY LITTMAN, HEALY, AND BARILE (A COMPARISON OF GAS-PARTICLE HEAT TRANSFER COEFFICIENTS IN FLUIDIZED BEDS OBTAINED FROM PERIODIC AND NON-PERIODIC INPUTS).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$2.00 COPY, \$0.50 MICROFICHE

*FLUIDIZED BED + *HEAT TRANSFER ANALYSIS + *HEAT TRANSFER EXPERIMENT + HEAT TRANSFER + HEAT TRANSFER, CONVECTION

5-27576

ALSO IN CATEGORY 17

HBWR QUARTERLY PROGRESS REPORT, JULY TO SEPTEMBER 1966

INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY

HPR-69 +. 102 PAGES, 34 FIGURES, 12 TABLES, 16 REFERENCES, NOVEMBER 1966

THIS QUARTERLY PROGRESS REPORT IS THE TWENTY-SECOND FROM THE OECD HALDEN REACTOR PROJECT TO RECEIVE GENERAL DISTRIBUTION, AND COVERS ACTIVITIES WITHIN THE THREE YEAR JOINT PROGRAM COMMENCED ON 1 JANUARY 1964. THE PROGRAM COMPRISES FUEL IRRADIATION AND DEVELOPMENT OF IN-CORE INSTRUMENTATION. OTHER PROGRAM ITEMS ARE BURNUP AND STABILITY STUDIES AND WATER-CHEMISTRY EXPERIMENTS. THE REPORT DOES NOT INTEND TO GIVE A SUMMARY OF ALL ACTIVITIES WITHIN THE OECD HALDEN REACTOR PROJECT BUT RATHER CONCENTRATE ON ITEMS OF GENERAL INTEREST ABOUT THE DEVELOPMENTS AT THE HALDEN BOILING WATER REACTOR.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*ACCIDENT ANALYSIS + *HEAT TRANSFER + *REACTOR TEST FACILITY + CHEMICAL REACTION + FISSION PRODUCT RELEASE, GENERAL + FUEL BURNUP + OECD

5-27595

ALSO IN CATEGORIES 9 AND 17

HARRIGAN PM + MATTEL J + TOTH WL

OPTICAL, LIGHTING, AND PHOTOGRAPHIC EQUIPMENT FOR THE ENRICO FERMI ATOMIC POWER PLANT REPAIR PROGRAM POWER REACTOR DEVELOPMENT COMPANY + ATOMIC POWER DEVELOPMENT ASSOCIATES

1 PAGE, 1 FIGURE, ANS TRANSACTIONS 11(1), PAGE 358, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

A MELTDOWN OF TWO CORE SUBASSEMBLIES REQUIRED THE USE OF VERY LONG OPTICAL INSTRUMENTS AND LIGHTING EQUIPMENT FOR THE PURPOSE OF INSPECTION OF THE CORE AND REACTOR COMPONENTS. BECAUSE LITTLE INFORMATION WAS AVAILABLE ON THE DESIGN OF SUITABLE VIEWING AND LIGHTING EQUIPMENT FOR USE IN SODIUM REACTOR ENVIRONMENTS, MUCH DEVELOPMENTAL WORK AND TESTING HAD TO BE DONE TO PROVIDE SUITABLE EQUIPMENT. MUCH DEVELOPMENT WAS REQUIRED TO PROVIDE LIGHTING EQUIPMENT WITH ADEQUATE LAMP LIFE AND MANEUVERABILITY. THE USE OF PHOTOGRAPHY THROUGH THE VIEWING INSTRUMENTS WAS NOT SUCCESSFUL INITIALLY, BUT IMPROVEMENTS BOTH IN TECHNIQUE AND EQUIPMENT

CATEGORY 5
ACCIDENT ANALYSIS

5-27595 *CONTINUED*

LED TO REMARKABLY GOOD RESULTS IN THE LATTER PART OF THE PROGRAM.

*INSTRUMENTATION, IN CORE + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT DESIGN + FERMI (LMFBR) + INSTRUMENTATION, SURVEILLANCE + MAINTENANCE AND REPAIR + MAINTENANCE, REMOTE + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR

5-27596 ALSO IN CATEGORIES 9 AND 17

DUFFY JG + MATTE J + RYAN JD + WARBERG HS

OBJECT RETRIEVAL TOOLS FOR THE ENRICO FERMI ATOMIC POWER PLANT REPAIR PROGRAM

ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT, MICHIGAN

3 PAGES, 2 FIGURES, ANS TRANSACTIONS 11(1), PAGES 358-360, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE METHOD OF RETRIEVING FROM THE BOTTOM OF THE FERMI REACTOR AN OBJECT THAT CAUSED A MELTDOWN INVOLVED PROCEDURES AND TOOLS WHICH ARE UNIQUE AND COULD HAVE APPLICATION IN FUTURE PROBLEMS. TOOLS WERE DEVELOPED TO CUT THE OBJECT INTO PIECES SMALL ENOUGH TO BE REMOVED UPWARD THROUGH THE SUPPORT PLATE. SEVERAL GRIPPERS FOR THIS PURPOSE WERE ALSO DEVELOPED. SIMULTANEOUSLY, SPECIAL TOOLS WERE DEVELOPED TO REMOVE THE OBJECT INTACT VIA THE SODIUM INLET PIPE.

*INSTRUMENTATION, IN CORE + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT DESIGN + FERMI (LMFBR) + MAINTENANCE AND REPAIR + MAINTENANCE, REMOTE + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR

5-27620 ALSO IN CATEGORIES 18 AND 16

RUSSELVILLE SUPPLEMENT 6 - TORNADO ANALYSIS

ARKANSAS POWER AND LIGHT COMPANY

8 PAGES, 12 REFERENCES, PAGES 1-8 OF SUPPLEMENT 6 TO THE APPLICATION FOR RUSSELVILLE LICENSES (DOCKET 50-313) JULY 11, 1968

PROVIDES REVISED PSAR PAGES AND (RESPONDING TO INFORMAL DRL QUESTIONS) JUSTIFICATION OF TORNADO DESIGN CRITERIA AND BEHAVIOR OF SPENT FUEL POOL DURING TORNADO. DESCRIBES BEST OBSERVATIONAL DATA FOR WIND VELOCITY (USE 300 MPH BROAD FRONT WIND INSTEAD OF 200 MPH VORTEX), PRESSURE DROP (1.7 PSI/4 SEC), WATER LOSS FROM POOLS AND WELLS (2 FT MOUND OF WATER APPEARS FROM LOW PRESSURE, SPRAY AND SUCKING DISPLACE WATER, SURVEY REQUESTED IN PILGRIM STATION REVIEW WILL BE COMPLETED SEPT. 1968 BUT SO FAR RESULTS NEGATIVE), AND MISSILES (ONLY LIGHT WEIGHT MISSILES WOULD REACH REFUELING FLOOR 50 FT ABOVE GRADE, MISSILES FROM REFUELING FLOOR ARE MOSTLY SIDING AND HAND CARTS).

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*DESIGN CRITERIA + *DESTRUCTIVE WIND + *FUEL STORAGE + BIBLIOGRAPHY + CONTAINMENT DESIGN + MISSILE GENERATION AND PROTECTION + PRESSURE TRANSIENT + PRESSURE, SUBATMOSPHERIC + REACTOR, PWR + REPURT, PSAR

5-27629

PINEISKI AA + BAGDASAROV IE + MITENKOV FM + PINCHASKI MS + PISCHIN WK

COOLANT SYSTEM SAFETY OF THE REACTORS BN 350 AND BOR

18 PAGES, 6 FIGURES, 6 REFERENCES, BULLETIN D'INFORMATIONS SCIENTIFIQUES ET TECHNIQUES, 122, PAGES 53-60 (JANUARY 1968)

BASIC INFORMATION ON THE CONSTRUCTION OF THE NUCLEAR POWER STATION BN350 AND THE BOR EXPERIMENTAL REACTOR HAVE BEEN PUBLISHED AT THE LONDON CONFERENCE. SOME COOLING PROBLEMS OF THE BN350 REACTOR UNDER ACCIDENTAL CONDITIONS WERE ALSO EXAMINED. IN THE PRESENT PAPER POSSIBLE ACCIDENTS WHICH CAN OCCUR IN THE THERMAL CIRCUITS OF BN350 AND BOR ARE ANALYZED. THESE ACCIDENTS CAN LEAD TO THE SHUT-DOWN OF THE COOLANT FLOW IN THE REACTOR, IN THE LIQUID METAL CIRCUITS AND IN THE STEAM CIRCUITS. MAINLY PRECAUTIONS TAKEN IN THE FACILITIES TO ENSURE THE SAFETY OF HEAT EXTRACTION ARE STUDIED.

*ACCIDENT ANALYSIS + *REACTOR, POWER + *REACTOR, RESEARCH + COOLING, GENERAL + COOLING, SHUTDOWN + SAFETY REVIEW

5-27647

ALSO IN CATEGORY 6

BRIGHT GO

A REVIEW OF THE GENERALIZED REACTIVITY ACCIDENT FOR WATER-COOLED AND -MODERATED UO2-FUELED POWER REACTORS

PHILLIPS PETROLEUM COMPANY

12 PAGES, 1 FIGURE, 69 REFERENCES, NUCLEAR SAFETY 8(2), PAGES 116-127 (WINTER 1966-1967)

A REVIEW WAS MADE OF WHAT IS KNOWN AND WHAT IS UNKNOWN ABOUT THE FACTORS THAT ENTER INTO THE DETERMINATION OF THE COURSE AND CONSEQUENCES OF A REACTIVITY ACCIDENT, AND AN ATTEMPT TO COLLATE THE AVAILABLE INFORMATION ON THE VARIOUS PHASES OF REACTIVITY-ACCIDENT ANALYSIS IN ORDER TO IDENTIFY THE MAJOR PROBLEM AREAS IS REPORTED. THE REVIEW OF EXISTING KNOWLEDGE OF BOTH NEUTRONIC AND NONNEUTRONIC PHENOMENA, AS WELL AS THE CONSIDERATION OF THE LIMITS OF CONFIDENCE IN ANALYTICAL METHODS AND THE ACCURACY OF VALUES FOR FUNDAMENTAL PARAMETERS USED IN THE ANALYSES, MADE IT INCREASINGLY EVIDENT THAT A REALLY QUANTITATIVE ANALYSIS OF A LARGE REACTIVITY ACCIDENT IN A POWER-REACTOR SYSTEM IS NOT POSSIBLE AT THIS TIME.

ACCIDENT ANALYSIS + ACCIDENT, REACTIVITY + HAZARDS ANALYSIS + HEAT TRANSFER ANALYSIS + REACTOR KINETICS + REACTOR, BWR + REACTOR, PWR + REACTOR, WATER

CATEGORY 5
ACCIDENT ANALYSIS

5-27651 ALSO IN CATEGORY 8

WHITE JF

PHYSICO-CHEMICAL STUDIES OF CLAD UO₂ IN POTENTIAL MELTDOWN ENVIRONMENT (TASK NO. 1175)

GENERAL ELECTRIC COMPANY, CINCINNATI, OHIO

GEMP-1104 +. 35 PAGES, FIGURES, TABLES, EXTRACTED FROM SEVENTH ANNUAL REPORT - AEC FUELS AND MATERIALS DEVELOPMENT PROGRAM, MARCH 29, 1968

SUMMARY OF EXPERIMENTAL WORK BY GE-NMPO DURING CY-67 TOWARDS DETERMINING THE FUEL PIN BEHAVIOR DURING A LOSS-OF-COOLANT ACCIDENT. WORK INCLUDED (1) DYNAMIC DEFORMATION AND FAILURE STUDIES OF ZIRCALOY-4 TUBES WITH HIGH INTERNAL PRESSURES AT HIGH TEMPERATURES IN ARGON OF STEAM ENVIRONMENTS, (2) CHEMICAL KINETIC STUDIES OF THE OXIDATION OF TYPE 304 STAINLESS STEEL BY STEAM OR AIR, (4) CHEMICAL KINETIC STUDIES OF THE OXIDATION OF UO₂ BY STEAM, (5) MEASUREMENTS OF THE TENSILE STRENGTH AND THE THERMAL CONDUCTIVITY OF TYPE 304L STAINLESS STEEL, AND (6) MEASUREMENTS OF THE TOTAL EMITTANCE OF UNOXIDIZED AND OXIDIZED AIRCALLOY-4.

*AIR + *BURST PRESSURE + *CHEMICAL KINETICS + *CHEMICAL REACTION + *DEFORMATION + *FUEL ELEMENT + *METAL WATER REACTION + *STEAM + *STEEL, STAINLESS + *THERMAL PROPERTY + *URANIUM DIOXIDE + *ZIRCALOY + ACCIDENT, LOSS OF COOLANT + CREEP BEHAVIOR + OXIDATION + STRUCTURAL ANALYSIS, DYNAMIC + THERMAL EXPERIMENT

5-27707 ALSO IN CATEGORY 6

MOORE KV + RETTIG WH

RELAP2--A DIGITAL PROGRAM FOR REACTOR BLOWDOWN AND POWER EXCURSION ANALYSIS

PHILLIPS PETROLEUM COMPANY

100-17263 +. 75 PAGES, 4 FIGURES, 4 TABLES, 8 REFERENCES, MARCH 1968

RELAP2 IS A FORTRAN-IV DIGITAL PROGRAM WHICH CALCULATED FLOW, MASS INVENTORIES, TEMPERATURES, PRESSURES, REACTIVITIES, AND TRANSIENT POWER FOR THE PRIMARY SYSTEM OF A WATER REACTOR DURING A REACTIVITY OR A LOSS-OF-COOLANT ACCIDENT. ALTHOUGH RETAINING THE SIMPLIFIED GEOMETRY (THREE VOLUMES PLUS A CORE REGION) OF THE FLASH AND RELAPSE PROGRAMS, MANY IMPROVEMENTS AND EXTENSIONS HAVE BEEN MADE. THE GEOMETRY CAN BE MADE TO APPROXIMATE EITHER A PRESSURIZED OR A BOILING WATER REACTOR SYSTEM. THE CORE IS TREATED AS A TWO-POINT MODEL FOR POWER GENERATION, HEAT TRANSFER, AND REACTIVITY FEEDBACKS AND AS A ONE-POINT MODEL FOR THE REACTOR KINETICS, PRESSURE BALANCES, AND FLOW BALANCES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT, LOSS OF COOLANT + *COMPUTER PROGRAM + BLOWDOWN + REACTOR DYNAMICS + REACTOR KINETICS + REACTOR, BWR + REACTOR, PWR

5-27709 ALSO IN CATEGORIES 17 AND 12

SAXTON-LOSS OF COOLANT ACCIDENT PREVENTION AND PROTECTION

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

150 PAGES, FIGURES, TABLES, JUNE, 1968, DOCKET 50-146, TYPE--PWR, MFG--WEST., AE--GILBERT ASSOC.

RESPONDS TO DEC. 1966, DRL REQUEST FOR REANALYSIS WITH MODERN TECHNIQUES. SYSTEMS WILL LIMIT CLAD MELT TO LESS THAN 3 PER CENT OF CLAD AREA FOR A DOUBLE ENDED COOLANT LINE RUPTURE. NO EVIDENCE OF REACTOR VESSEL OR STEAM GENERATOR LEAKS. SAFETY VALVE LEAKS HAVE BEEN SHOWN BY BORIC ACID CRYSTALS. ***PAST VISUAL AND RADIOGRAPH INSPECTIONS HAVE BEEN GOOD, BUT A SPECIFIC INSPECTION PROGRAM WILL BE REPEATED EVERY 5 YEARS. MODIFICATIONS TO BE MADE INCLUDE BETTER ISOLATION BETWEEN BUILDING COMPARTMENTS, RECIRC. PUMP PRESSURE INDICATORS, RELAY REDUNDANCY IN SAFETY INJECTION SYSTEMS, AND TO PREVENT A SINGLE FAILURE FROM CLOSING INJECTION ISOLATION VALVE. APPENDIX D DESCRIBES COMPUTER PROGRAMS USED (FLASH, CHICK-KIN, LOCTA-R2).

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + CORE REFLOODING SYSTEM + EXAMINATION + LEAK + MODIFICATION, SYSTEM OR EQUIPMENT + PIPING + PLANT PROTECTIVE SYSTEM + PRESSURE RELIEF + PRESSURE VESSEL + REACTOR, PWR + SAXTON (PWR) + SURVEILLANCE PROGRAM + TEST, NONDESTRUCTIVE

5-27714

PATE NC

HYDRODYNAMIC STABILITY OF A ROD BUNDLE AT ATMOSPHERIC PRESSURE

THOMPSON RAMO WOOLDRIDGE INC.

2 PAGES, 1 FIGURE, 2 REFERENCES, ANS TRANS. 9(2), PAGES 573-74 (NOVEMBER 1966)

THE ROD BUNDLE IS THE ONLY COMMERCIAL BOILING-WATER REACTOR-FUEL CONFIGURATION, YET THERE ARE VERY FEW EXPERIMENTAL DATA AVAILABLE ON ITS HYDRODYNAMIC STABILITY. THE PURPOSE OF THIS EXPERIMENT WAS TO DETERMINE THE SIGNIFICANT DIFFERENCES AND SIMILARITIES BETWEEN THE HYDRODYNAMIC STABILITIES OF A ROD BUNDLE AND A RECTANGULAR CHANNEL OPERATED UNDER SIMILAR CONDITIONS. MEASUREMENTS WERE MADE IN AN ATMOSPHERIC LOOP CONSISTING OF INLET AND EXIT PLENUMS CONNECTED BY A TEST SECTION AND A DOWNCOMER.

*FUEL ELEMENT CLUSTER + *HYDRODYNAMIC ANALYSIS + *REACTOR, BWR + FLOW, GENERAL + FLOW, TWO PHASE + HOT CHANNEL

CATEGORY 5
ACCIDENT ANALYSIS

5-27716
LAWSON CG + KEDL RJ + MCDONALD RE
ENHANCED HEAT-TRANSFER TUBES FOR HORIZONTAL CONDENSERS WITH POSSIBLE APPLICATIONS IN NUCLEAR POWER PLANT DESIGN
OAK RIDGE NATIONAL LABORATORY
1 PAGE, 1 FIGURE, ANS TRANS. 9(2), PAGE 656 (NOVEMBER 1966)

THE DEVELOPMENT OF IMPROVED PERFORMANCE HEAT TRANSFER SURFACE FOR THE CONDENSERS OF LARGE MULTISTAGE, FLASH-DISTILLATION, SEAWATER-CONVERSION PLANTS HAS LED TO TUBE DESIGNS THAT WE BELIEVE WOULD LOWER COSTS IN NUCLEAR POWER PLANTS. THESE TUBES, HAVING SHAPES APPROACHING HYDROFOIL SURFACES (WHEN VIEWED AXIALLY) AND CERTAIN EXTERNAL METALLIC PLATINGS, PROMOTE TURBULENCE ON THE INSIDE AND DROP-WISE CONDENSATION ON THE OUTSIDE. SUCH SIMULTANEOUS MODIFICATION OF A SMOOTH TUBE RESULTED IN DOUBLING THE OVERALL HEAT-TRANSFER COEFFICIENT FOR THE SAME COOLANT FLOW RATE, STEAM TEMPERATURE, AND OTHER PROCESS BOUNDARY CONDITIONS. WHILE THE PRESSURE-DROP GRADIENT ALSO DOUBLED, HALVING THE TUBE LENGTH WOULD LEAVE THE OVERALL PRESSURE DROP UNCHANGED.

*HEAT EXCHANGER + EQUIPMENT, GENERAL + FLOW, TUBE + HEAT TRANSFER + ORNL

5-27719
LIIMATAINEN RC + TESTA FJ
THERMAL-REACTOR SAFETY STUDIES ON UO₂ CORE FUEL-PIN CLUSTERS - TRANSIENT MELTDOWNS
ARGONNE NATIONAL LABORATORY
1 PAGE, 1 FIGURE, 1 REFERENCE, ANS TRANS. 9(2), PAGE 561 (NOVEMBER 1966)

ONE OF THE PROBLEMS OF IMPORTANCE IN THE EVALUATION OF THE SAFETY OF NUCLEAR REACTORS HAS BEEN SIMULATED QUITE REALISTICALLY IN THIS EXPERIMENTAL INVESTIGATION. THIS PROBLEM IS THE HIGH-TEMPERATURE MELTDOWN BEHAVIOR OF A PORTION OF THE CORE OF A WATER-COOLED NUCLEAR REACTOR HAVING FUEL ELEMENTS OF METAL-CLAD UO₂. THE DATA REPORTED HERE ON FUEL CLUSTERS REPRESENT A SCALEUP (BY A FACTOR OF ABOUT 100) OF EARLIER TESTS CONDUCTED IN THIS TREAT PROGRAM. THESE SCALEUP EXPERIMENTS WERE CONTAINED WITHIN A STAINLESS-STEEL AUTOCLAVE APPROXIMATELY 4-IN. IN DIAM X 4 FT LONG.

*FUEL ELEMENT CLUSTER + *FUEL MELTDOWN + *URANIUM DIOXIDE + ACCIDENT ANALYSIS + EXPERIMENT, GENERAL + REACTOR, PULSED + REACTOR, SAFETY RESEARCH + TEMPERATURE TRANSIENT + TREAT (PRR)

5-27725
HIRAKAWA N + KLINKMAN AE
A COMPARISON OF THE METHODS USED IN FAST-REACTOR MELTDOWN CALCULATIONS
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC. + JAPAN ATOMIC ENERGY COMMISSION
1 PAGE, 1 TABLE, 4 REFERENCES, ANS TRANS. 9(2), PAGE 552 (NOVEMBER 1966)

BECAUSE LITTLE INFORMATION HAS BEEN MADE AVAILABLE ON THE COMPARISON OF VARIOUS METHODS USED IN THE CALCULATION OF THE ENERGY RELEASE IN A FAST-REACTOR MELTDOWN, A STUDY EMPLOYING THE VARIOUS METHODS ON A SIMPLIFIED MODEL OF THE CORE OF THE ENRICO FERMI REACTOR HAS BEEN COMPLETED. FOUR METHODS WERE USED - THE JANKUS METHOD, THE NICHOLSON METHOD, THE AX-1 METHOD, AND THE WEAK EXPLOSION CODE. THE FIRST TWO ARE HAND CALCULATIONS, AND THE LATTER TWO ARE DIGITAL COMPUTER METHODS.

*ACCIDENT ANALYSIS + *FERMI (LMFBR) + *FUEL MELTDOWN + REACTOR, FAST + REACTOR, LMFBR

5-27726
SINGER RM
EXPERIMENTS ON WATER EXPULSION FOLLOWING RAPID TRANSIENT HEATING
ARGONNE NATIONAL LABORATORY
1 PAGE, 1 FIGURE, ANS TRANS. 9(2), PAGE 550 (NOVEMBER 1966)

TO INVESTIGATE THE MECHANICS OF EXPULSION OF WATER FROM A SIMULATED REACTOR CHANNEL DURING RAPID POWER EXCURSIONS, AN EXPERIMENT WAS CONDUCTED IN WHICH WATER WAS RAPIDLY HEATED. THE WATER WAS CONTAINED IN A TRANSPARENT ANNULUS, 0.750 IN. I.D. AND 1.00 IN. O.D., CLOSED AT THE BOTTOM, OPEN AT THE TOP, AND THE INNER STEEL CYLINDER WAS HEATED OVER ITS LOWER 10 IN. THE HEATING WAS ACCOMPLISHED BY STORAGE BATTERIES AND YIELDED RECTANGULAR POWER BURSTS WITH RISE TIMES OF 1 MSEC, DURATIONS OF 60 TO 100 MSEC, AND PEAK POWERS OF 110 KW.

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + *TEMPERATURE TRANSIENT + HEAT TRANSFER EXPERIMENT + WATER, GENERAL

5-27728
PEAK RD
DESIGN OF THE LOFT REACTOR INTERNALS
PHILLIPS PETROLEUM COMPANY
1 PAGE, 1 TABLE, 3 REFERENCES, ANS TRANS. 9(2), PAGE 549 (NOVEMBER 1966)

AN IMPORTANT OBJECTIVE FOR THE LOSS-OF-FLUID TEST (LOFT) HAS BEEN TO DESIGN A 50-MW(TH)

CATEGORY 5
ACCIDENT ANALYSIS

5-27728 *CONTINUED*

REACTOR THAT MAY BE CONSIDERED REPRESENTATIVE OF THE PRESSURIZED-WATER POWER REACTORS NOW UNDER CONSTRUCTION OR UNDER DESIGN FOR CONSTRUCTION IN THE NEAR FUTURE. THE LOFT REACTOR INTERNALS ARE AN ATTEMPT TO ACHIEVE A DESIGN REPRESENTATIVE OF THIS CURRENT DESIGN TECHNOLOGY. THE DESIGN AND ANALYSIS OF THE REACTOR INTERNALS ARE UNIQUE IN THE SENSE THAT THE REACTOR WILL EXPERIENCE A LOSS-OF-COOLANT MAXIMUM ACCIDENT.

*EQUIPMENT, GENERAL + *LOFT (S-RR) + *REACTOR DESCRIPTION + EQUIPMENT DESIGN + REACTOR, PWR + REACTOR, SAFETY RESEARCH

5-27737

LEE OI + BONILLA CF
THE VISCOSITY OF THE ALKALI METAL VAPORS
COLUMBIA UNIVERSITY, NEW YORK
15 PAGES, 11 FIGURES, 5 TABLES, 44 REFERENCES, NUCLEAR ENGINEERING AND DESIGN 7, PAGES 455-469 (1968)

THE VISCOSITIES OF CS, RB, K, AND NA VAPORS WERE MEASURED UP TO 1000 C IN THE PRESSURE RANGE OF 0.4 TO 5 ATM BY A STEADY FLOW HIGH-TEMPERATURE COILED CAPILLARY VISCOMETER. THE INTERACTION POTENTIAL ENERGIES FOR THE SINGLET AND TRIPLET STATES OF ALKALI METAL ATOMS HAVE BEEN OBTAINED FROM THOSE OF HYDROGEN ATOMS BY A SEMI-EMPIRICAL SCALING PROCEDURE BASED ON THE REPULSIVE-CORE THEORY, AND THOSE FOR THE DIMER-DIMER, AND MONOMER-DIMER INTERACTIONS HAVE ALSO BEEN CALCULATED FROM THOSE FOR THE TRIPLET STATES BY A SEMI-EMPIRICAL PAIRING PROCEDURE. THERE IS GOOD AGREEMENT BETWEEN VALUES EXTRAPOLATED FROM THE EXPERIMENTAL RESULTS AND THE CALCULATED VALUES OF THE VISCOSITY OF THE ALKALI METAL MONATOMIC VAPORS, BUT THOSE OF THE EQUILIBRIUM VAPORS DIFFER FROM THE CALCULATED VALUES. THIS SUGGESTS THAT THE CHAPMAN-ENSKOG METHOD MAY NOT BE APPLICABLE TO THE VISCOSITY OF CHEMICALLY ASSOCIATING GASES.

*METAL, ALKALI + *TRANSPORT PROPERTY + CESIUM + POTASSIUM + RUBIDIUM + SODIUM

5-27740

BURCHILL WE + JONES BG
THE INFLUENCE OF AXIAL CONDUCTION ON HEAT TRANSFER TO LIQUID METALS IN REACTOR COOLANT CHANNELS
UNIVERSITY OF ILLINOIS
2 PAGES, 1 FIGURE, 1 TABLE, 4 REFERENCES, ANS TRANS. 9(2), PAGES 568-69 (NOVEMBER 1966)

PRESENTS AN ANALYTICAL INVESTIGATION OF THE EFFECT OF AXIAL CONDUCTION ON THE HEAT TRANSFER TO A LIQUID-METAL COOLANT IN A CIRCULAR TUBE (PIPE) OR BETWEEN PARALLEL FLAT PLATES (CHANNEL) AS WOULD BE FOUND IN A NUCLEAR REACTOR. A NUMERICAL EVALUATION OF THE ANALYTICAL RESULTS FOR THE TEMPERATURE PROFILES, NU VARIATIONS, AND THERMAL ENTRY AND EXIT LENGTHS WAS PERFORMED FOR A CONSTANT WALL FLUX. THE EXTENSION TO ARBITRARY WALL FLUX IS PRESENTLY BEING PURSUED.

*HEAT TRANSFER, CONDUCTION + *HOT CHANNEL + *METAL, LIQUID + FLOW, AXIAL + HEAT TRANSFER + HEAT TRANSFER ANALYSIS

5-27741

MORGAN RP + PAGE RJ
THE EFFECT OF VARIABLE WALL HEAT FLUX ON HEAT TRANSFER IN THE THERMAL ENTRANCE REGION OF REACTOR COOLANT CHANNELS
UNIVERSITY OF MISSOURI
2 PAGES, 1 FIGURE, 2 REFERENCES, ANS TRANS. 9(2), PAGES 567-68 (NOVEMBER 1966)

IN RECENT YEARS, LINEAR SUPERPOSITION TECHNIQUES HAVE BEEN EMPLOYED TO ANALYZE HEAT TRANSFER TO SINGLE-PHASE, CONSTANT-PROPERTY, BOUNDARY-LAYER FLOWS WITH VARIABLE WALL TEMPERATURE OR HEAT FLUX. IN OUR STUDY, A STEP IN WALL HEAT FLUX TECHNIQUE DEVELOPED BY HANNA WAS USED TO COMPUTE LOCAL HEAT-TRANSFER COEFFICIENTS IN THE THERMAL ENTRANCE REGION OF A COOLANT CHANNEL IN WHICH THE WALL HEAT FLUX FOLLOWS THE CHOPPED-COSINE DISTRIBUTION CHARACTERISTIC OF NUCLEAR REACTORS. RESULTS FOR BOTH FULLY DEVELOPED LAMINAR AND TURBULENT FLOW WERE OBTAINED.

*BOUNDARY LAYER + *HEAT TRANSFER ANALYSIS + *MATHEMATICAL TREATMENT + HEAT TRANSFER + HOT CHANNEL

5-27742

MACPHEE J + LUMB RF + HALL WF
COMPARISON OF NATURAL- AND FORCED-CONVECTION COOLING FOR A PULSED URANIUM-OXIDE REACTOR
METAL FLOW CORP. + NATIONAL ACADEMY OF SCIENCES
1 PAGE, ANS TRANS. 9(2), PAGE 567 (NOVEMBER 1966)

PULSTAR REPRESENTS A UNIQUE CONCEPT AMONG RESEARCH REACTOR DESIGNS IN THAT USE OF LOW-ENRICHMENT OXIDE FUEL PERMITS THE ALTERNATIVES OF PULSE OR STEADY-STATE OPERATION. IT WAS CONCLUDED THAT DEPARTURE FROM NUCLEATE BOILING (DNB) HAD OCCURRED IN ALL SIX TEST PINS AND IN THE HOTTER CORE PINS.

*HEAT TRANSFER, CONVECTION + *HEAT TRANSFER, NATURAL CONVECTION + *REACTOR, PULSED + ACCIDENT ANALYSIS + DNB + HEAT TRANSFER EXPERIMENT + REACTOR DESCRIPTION + URANIUM OXIDE

5-27747

CATEGORY 5
ACCIDENT ANALYSIS

5-27747 *CONTINUED*
BEASLEY EG + COFFEY JA + MILLS LM
PROCEDURE FOR DETERMINING THE DEPRESSURIZATION RATE OF THE EGCR PRIMARY SYSTEM IN THE EVENT OF COMPONENT FAILURE
TENNESSEE VALLEY AUTHORITY, OAK RIDGE, TENNESSEE
TID-22740 +. 21 PAGES, TABLES, SEPTEMBER 1964

THE PURPOSE OF THIS PAPER IS TO ESTABLISH A CALCULATIONAL PROCEDURE FOR DETERMINING THE PRESSURE DIFFERENTIAL ACROSS THE EGCR PRIMARY SYSTEM COMPONENTS AND THE RATE OF DEPRESSURIZATION OF THE PRIMARY SYSTEM IN THE EVENT RUPTURES OF VARIOUS SIZES AND LOCATIONS OCCUR IN THE PRIMARY SYSTEM. THE COMPONENTS OF SPECIFIC INTEREST ARE THE REACTOR CORE, THE STEAM GENERATORS, AND THE BLOWERS. IN BRIEF, THE SYSTEM HAS BEEN DIVIDED INTO SIX NODES, WHERE EACH NODE CONSISTS OF A BODY WITH NO INTERNAL FLOW RESISTANCE, AND THE NODES WERE CONNECTED BY FLOW RESISTANCE THAT DID NOT HAVE VOLUME.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$1.00 COPY, \$0.50 MICROFICHE

*PRESSURE DROP + *PRESSURE TRANSIENT + *REACTOR, GCR + ACCIDENT ANALYSIS + CONTAINMENT, PRESSURE VENTING

5-27748
GAMBILL W R
RECENT STUDIES OF BOILING BURNOUT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-P-18 + CONF-537-3 +. 12 PAGES, 5 REFERENCES, FROM USAEC-EURATOM CONFERENCE ON TWO-PHASE FLOW PROBLEMS, WASHINGTON, D.C., APR-MAY, 1964

FIVE RECENT INVESTIGATIONS OF THE CRITICAL HEAT FLUX IN WATER SYSTEMS ARE SUMMARIZED. THESE STUDIES WERE CONDUCTED IN THE INTERNAL FROM EARLY 1963 THROUGH THE PRESENT. A. POOL STUDIES - (1) INHERENT UNCERTAINTY IN THE CRITICAL HEAT FLUX. (2) HEAT TRANSFER INSIDE OF HORIZONTAL, OPEN ENDED HEATED TUBES IMMERSSED IN A POOL. (3) NATURAL-CONVECTION BURNOUT OF CLOSED VERTICAL CHANNELS. B. FORCED CONVECTION INVESTIGATIONS - (1) SUBCOOLED BOILING AND BURNOUT WITH HEATED TWISTED TAPES. (2) SWIRL-FLOW FORCED-CONVECTION, BULK-BOILING LOOP.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*HEAT FLUX, CRITICAL + *HEAT TRANSFER, CONVECTION + *HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER EXPERIMENT + ORNL

5-27751
GRASS G + KOTTOWSKI H + WARNSING R
BOILING OF LIQUID ALKALI METALS
EUROPEAN ATOMIC ENERGY COMMUNITY, ISPRA (ITALY), JOINT NUCLEAR RESEARCH CENTER
ANL-TRANS-390 +. 37 PAGES, TRANSLATED FROM REPORT, SEPT. 1966

BOILING OF LIQUID METALS AT LOW PRESSURES IS UNSTABLE UNDER STAGNANT CONDITIONS AS WELL AS UNDER CONDITIONS OF NATURAL AND FORCED CONVECTION. THIS UNSTABLE TYPE OF BOILING MAY BE INTERPRETED AS AN EJECTION SEQUENCE OF SINGLE BUBBLES. THE KINETICS INVOLVED IN THIS EJECTION PROCESS ARE SIGNIFICANTLY INFLUENCED BY THE VAPOR PRESSURE IN THE BUBBLE. IN THE WORK HERE DESCRIBED INITIAL SUPERHEAT, INITIAL PRESSURE AND SUBSEQUENT PRESSURE VARIATIONS, WERE FOR VARIOUS EXPERIMENTAL CONDITIONS COMPARED WITH THE KINETICS OF THE SINGLE BUBBLE EJECTIONS. A CALCULATION MODEL WAS SET UP TO CORRELATE QUANTITATIVELY THE PHENOMENA.

AVAILABILITY - SPECIAL LIBRARIES ASSOCIATION TRANSLATION CENTER, JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILLINOIS 60616

*BOILING + *CONVECTIVE BOILING + *METAL, ALKALI + BUBBLE + BUBBLE NUCLEATION + NUCLEATE BOILING + REACTOR, LMFBR + SODIUM + VOID FRACTION

5-27802
COATES NH + GALLI AF
FILM COEFFICIENTS OF HEAT TRANSFER FOR HELIUM AT 2,000 DEG TO 2,500 DEG F IN TURBULENT FLOW
BUREAU OF MINES, WASHINGTON, D. C.
BM-RI-6856 +. 25 PAGES, 10 FIGURES, 2 TABLES, 1966

THE BUREAU OF MINES DETERMINED AVERAGE FILM COEFFICIENTS OF HEAT TRANSFER FOR HELIUM FLOWING THROUGH SMOOTH, WATER-COOLED TUBES AT REYNOLDS' NUMBERS OF 5,000 TO 25,000, HELIUM INLET TEMPERATURES OF 1,600 TO 2,600 F, AVERAGE TEMPERATURE DIFFERENCE ACROSS THE HELIUM FILM OF 900 TO 1,300 F, AND HEAT FLUX TO 215,000 BTU/(HR)(SQ FT). SINCE HELIUM WAS THE ONLY GAS USED, THE RANGES OF VALUES FOR PHYSICAL PROPERTIES OF THE FLUID ARE LIMITED--THERMAL CONDUCTIVITY FROM 0.15 TO 0.20 BTU/(HR)(SQ FT)(F/FT), VISCOSITY FROM 0.082 TO 0.104 LB/(FT)(HR), AND PRANDTL NUMBER FROM 0.63 TO 0.68. FOUR EQUATIONS, THREE OF THEM DIMENSIONLESS, CORRELATE THESE COEFFICIENTS WITH OTHER PROPERTIES OF THE HELIUM--BULK TEMPERATURE, FILM TEMPERATURE, DIMENSIONLESS PARAMETERS BASED ON TEMPERATURE, AND THE RATIO OF WALL TEMPERATURE TO BULK TEMPERATURE. VALUES OF THE AVERAGE INSIDE FILM COEFFICIENT OF HEAT TRANSFER DETERMINED FROM THESE EQUATIONS AGREE WITHIN 10 PERCENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151

*HEAT TRANSFER COEFFICIENT + *HEAT TRANSFER CORRELATION + *HELIUM + FLOW, TURBULENT + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + HEAT TRANSFER, CONVECTION

CATEGORY 5
ACCIDENT ANALYSIS

5-27803

FAIN AM

APPLICATION OF THE VARIATIONAL METHOD FOR SOLUTION OF HEAT CONDUCTION PROBLEMS WITH INTERNAL HEAT SOURCES
ARGONNE NATIONAL LAB., ILL.
ANL-TRANS-392 +. 11 PAGES, TRANSLATED FROM INZH. FIZ. ZH., 10(5), PAGE 668-75 (1966)

THE VARIATION METHOD CONSIDERED WHICH REDUCES THE SOLUTION OF THE TWO-DIMENSIONAL HEAT-CONDUCTION EQUATION TO A SET OF LINEAR DIFFERENTIAL EQUATIONS IS VERY SIMPLE AND SHOWS GOOD CONVERGENCE. THE METHOD SUGGESTED FOR CHOOSING THE COORDINATE FUNCTIONS AND THE POSSIBILITY OF APPLICATION OF THE SIMPLEST INTEGRATORS FOR CALCULATION OF COEFFICIENTS OF EULERS EQUATION SET MAKE THIS METHOD VERY CONVENIENT FOR PRACTICAL USE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151

*HEAT TRANSFER, CONDUCTION + *MATHEMATICAL STUDY + *MATHEMATICAL TREATMENT + HEAT TRANSFER +
HEAT TRANSFER ANALYSIS

5-27805

ALSO IN CATEGORY 11

BIRSS IR

CALCULATION OF RELATIVE DISPLACEMENT DAMAGE RATES IN DIFFERING REACTOR TYPES
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, DOUNREAY (SCOTLAND)
TRG-REPORT-1561 +. 18 PAGES, 6 FIGURES, 3 TABLES, 10 REFERENCES, 1967

A NUMBER OF MATERIALS NOT NECESSARILY DESTINED FOR USE IN FAST REACTORS, IN WHICH ATOMIC DISPLACEMENTS ARE THE MAIN DAMAGE MECHANISM UNDER OBSERVATION, ARE PRESENTLY BEING IRRADIATED IN THE DOUNREAY FAST REACTOR. IN THIS PAPER IT IS SHOWN THAT, IF IT CAN BE ACCEPTED THAT THE RATIO OF ATOMIC DISPLACEMENT RATE IN THE TEST REACTOR TO DISPLACEMENT RATE IN THE PARENT REACTOR IS AN ACCEPTABLE PARAMETER FOR COMPARISON PURPOSES, THEN THE ATOMIC DISPLACEMENT ENERGY AND THE ELECTRONIC CUT OFF ENERGY OF A MATERIAL ARE NOT CRITICAL PARAMETERS IN THE DERIVATION OF THIS RATIO. IT IS ALSO SHOWN THAT, IF THE EQUIVALENT FISSION FLUX CONCEPT IS USED TO DESCRIBE REACTOR SPECTRA, IT CAN LEAD TO APPRECIABLE ERRORS IN DERIVING THE DAMAGE RATIO, BUT THAT INTEGRATION OVER THE REAL SPECTRUM IS UNNECESSARY BELOW ABOUT 0.1 MEV.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DAMAGE + *IRRADIATION TESTING + *MATERIAL + IN PILE EXPERIMENT + METAL

5-27834

ALSO IN CATEGORIES 18 AND 16

BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2, PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME II
CAROLINA POWER + LIGHT COMPANY
400 PAGES FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

VOL. II CONTAINS SECT. VII (INSTRUMENTATION AND CONTROL - INCLUDES AUTO LOAD DISPATCH FROM RALEIGH, N. C.), VIII (ELECTRICAL POWER - 4 DIESELS), IX (RAD WASTE), X (AUXILIARIES), XI (POWER CONVERSION), XII (PLANT OPERATIONS - PERSONNEL WILL BE AVAILABLE FROM ROBINSON 2), XIII (TECH. SPECS.), AND XIV (SAFETY AND ACCIDENT ANALYSIS). 40 PAGES DESCRIBE THE OFFSITE DOSE CALCULATION MODEL USED IN RADOS COMPUTER CODE, ISOTOPE FRACTIONS RELEASED FROM FUEL IN EXPERIMENTS AND IN THESE ACCIDENTS, AND PROVIDED BOTH A CONSERVATIVE BASE CASE AND A BEST ESTIMATE (MARGINS RANGE FROM FACTORS OF 8400 TO 16,700), 6 PAGES PROVIDE A SENSITIVITY ANALYSIS AND A SPECIAL COMPARISON WITH TID 14844 AND RECENT AEC-DRI SAFETY EVALUATION.

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

*DOSE + *OFF SITE + ACCIDENT MODEL + BRUNSWICK (BWR) + COMPARISON, THEORY AND EXPERIENCE + ERROR ANALYSIS +
REACTOR, BWR + REPORT, PSAR + SAFETY EVALUATION + STAFFING, TRAINING, QUALIFICATION

5-27881

TOUBA RF + MCFADDEN PW

COMBINED TURBULENT CONVECTION HEAT TRANSFER TO NEAR CRITICAL WATER
PURDUE RESEARCH FOUNDATION, LAFAYETTE, IND.
COO-1177-18 +. 255 PAGES, FIGURES, TABLES, JANUARY 1966

THIS EXPERIMENTAL STUDY DEALS WITH AN INVESTIGATION OF HEAT TRANSFER TO NEAR CRITICAL WATER FLOWING THROUGH A HEATED VERTICAL TUBE. TURBULENT FREE AND FORCED CONVECTION FLOW WAS PRESENT. LOCAL HEAT TRANSFER AND STANTON NUMBERS WERE COMPUTED FROM THE DATA. THE DATA WAS CHECKED AGAINST THE DITTUS-BOELTER EQUATION AND GOOD AGREEMENT WAS OBTAINED FOR TEMPERATURES BELOW 650 F OR PRANDTL NUMBER, BASED ON THE BULK FLUID TEMPERATURE, NOT EXCEEDING 1.20.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FLOW, TURBULENT + *HEAT TRANSFER, CONVECTION + *WATER, GENERAL + FLOW, TUBE + HEAT TRANSFER EXPERIMENT +
TRANSPORT PROPERTY

CATEGORY 5
ACCIDENT ANALYSIS

5-27882 ALSO IN CATEGORY 11
VANDENBERG SR
STATUS OF PIPE-RUPTURE STUDY AT GENERAL ELECTRIC
8 PAGES, 8 FIGURES, 13 REFERENCES, NUCLEAR SAFETY 8(2), PAGES 148-55 (WINTER 1966-67)

THIS PIPE-RUPTURE STUDY IS CONCERNED WITH IMPROVING CURRENT UNDERSTANDING OF FAILURE-CAUSING MECHANISMS AND PROVIDING IMPROVED CAPABILITY FOR EVALUATING AND MONITORING REACTOR PIPING SYSTEMS TO MINIMIZE THE PROBABILITY OF FAILURES. THIS STATUS REPORT SUMMARIZES THE ACCOMPLISHMENTS DURING THE INITIAL YEAR OF A BROAD 4-YEAR PROGRAM IN (1) RELIABILITY ENGINEERING OF ACTUAL REACTOR PIPING SYSTEMS, (2) SOLUTION OF HERETOFORE INTRACTABLE PROBLEMS IN STRESS ANALYSIS, (3) APPLICATION OF FRACTURE MECHANICS TO DUCTILE MATERIALS, AND (4) FATIGUE STUDIES THROUGH BOTH BENCH-SCALE AND LARGE-COMPONENT TESTS.

*ACCIDENT ANALYSIS + *FAILURE, PIPE + *PIPING + ACCIDENT, STEAM LINE RUPTURE + FAILURE, TUBING + PLANT PROTECTIVE SYSTEM

5-27883
TURNER GE
AN EXPERIMENTAL INVESTIGATION OF THE LAMINAR FLOW INSTABILITY PROBLEM RELATED TO STRONG HEATING OF NORMAL-HYDROGEN GAS IN A SMALL-DIAMETER TUBE
UNIVERSITY OF CINCINNATI, OHIO
X65-13748 + NASA-TM-X-56224 +. 60 PAGES, FIGURES, REFERENCES, 1965

THE STEADY-STATE PRESSURE-DROP CHARACTERISTICS OF NORMAL HYDROGEN GAS FLOWING IN AN ELECTRICALLY HEATED TEST SECTION WERE DETERMINED EXPERIMENTALLY OVER A LIMITED RANGE OF REYNOLDS NUMBERS IN THE REGION OF THE LAMINAR-TURBULENT FLOW TRANSITION POINT. THE EXPERIMENTAL INVESTIGATION WAS CONDUCTED AT AVERAGE OPERATING HEAT FLUX VALUES OF 0.320, 0.485, AND 0.640 BTU/SEC-FT². THE REYNOLDS NUMBERS (BASED ON INLET CONDITIONS) RANGED FROM 600 TO 5600, AND THE RATIO OF OUTLET TO INLET FLUID TEMPERATURES RANGES FROM APPROXIMATELY 2.6 TO 10.8. THE TEST SECTION USED IN THESE EXPERIMENTS WAS A NICHROME-V TUBE WITH AN INSIDE DIAMETER OF 0.116 INCH AND A HEATED LENGTH OF APPROXIMATELY 50 INCHES. FROM A QUALITATIVE STANDPOINT, THE RESULTS OBTAINED FROM THE ANALYSIS AGREE REASONABLY WELL WITH THE EXPERIMENTAL VALUES.

AVAILABILITY - G. E. TURNER, UNIVERSITY OF CINCINNATI

*FLOW STABILITY + *HYDROGEN + *PRESSURE DROP + FLOW THEORY AND EXPERIMENTS + FLOW, LAMINAR + FLOW, TUBE

5-27884
MATZNER B
CRITICAL HEAT FLUX FOR LARGE DIAMETER, INTERNALLY HEATED ANNULI IN FORCED CONVECTION BOILING AT 1000 PSIA.
TOPICAL REPORT NO. 6
COLUMBIA UNIVERSITY, NEW YORK
TID-22321 +. 46 PAGES, 4 REFERENCES, SEPTEMBER 1965

THE WORK SUMMARIZED IN THIS REPORT WAS PERFORMED AT COLUMBIA UNIVERSITY AS PART OF THE USAEC/AECL COOPERATIVE PROGRAM FOR THE DEVELOPMENT OF HEAVY WATER REACTORS. THE SHELL-IN-TUBE FUEL ELEMENT CONCEPT HAS TENTATIVELY BEEN SELECTED FOR THE SECOND CORE OF THE AECL 250-MW BOILING LIGHT-WATER REACTOR. IN THIS FUEL DESIGN A CYLINDER OF FUEL IS PIERCED BY ABOUT 24 AXIAL COOLANT CHANNELS. COOLING IS ALSO REQUIRED AROUND THE CIRCUMFERENCE OF THE ELEMENT. THE EXPERIMENTS DESCRIBED WERE DESIGNED TO GIVE THERMAL AND HYDRAULIC INFORMATION FOR TYPICAL SIMULATIONS OF THE OUTER ANNULUS OF THE SHELL-IN-TUBE FUEL ELEMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FLOW, ANNULAR + *HEAT FLUX, CRITICAL + *HEAT GENERATION, INTERNAL + HEAT EXCHANGER + REACTOR, BWR

5-27885 ALSO IN CATEGORY 9
KARTLUKE H + WICHNER RP + HOFFMAN HW
AN ACOUSTIC INSTRUMENT FOR MEASURING SUBCOOLING IN BOILING SYSTEMS
OAK RIDGE NATIONAL LABORATORY
ORNL-P-1678 + CONF-650946-3 +. 8 PAGES, 1 REFERENCES, FROM 4TH HIGH TEMPERATURE LIQUID-METAL HEAT TRANSFER TECHNOLOGY CONFERENCE, ARGONNE, ILLINOIS, SEPTEMBER 28-29, 1965

DESCRIBES AN ACOUSTIC INSTRUMENT CAPABLE OF INDICATING THE DEGREE OF UNDERSATURATION IN A KNOWN FLUID AT UNKNOWN LOCAL TEMPERATURE AND PRESSURE CONDITIONS. THIS INCIPIENT-BOILING DETECTOR HAS BEEN TESTED WITH WATER AND SHOWN TO BE EFFECTIVE IN MONITORING THE FLOW IN PRESSURIZED WATER REACTORS, WHERE BOILING IS UNDESIRABLE AND DANGEROUS. THE CURRENT STUDY IS DIRECTED TO EVALUATING THIS DEVICE FOR POSSIBLE SIMILAR APPLICATION IN LIQUID-METAL COOLED-FAST REACTORS. PRELIMINARY TESTS IN LIQUID POTASSIUM ARE DISCUSSED. THE RESULTS WERE INCONCLUSIVE, AND EXPERIMENTS WITH A HIGHER POWER OSCILLATOR ARE PLANNED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*INSTRUMENTATION, COOLANT QUALITY + *NOISE + *SUBCOOLING + BOILING + INSTRUMENTATION, GENERAL +

CATEGORY 5
ACCIDENT ANALYSIS5-27885 *CONTINUED*
NOISE ANALYSIS

5-27886

FONTANA MH

CORE MELT-THROUGH AS A CONSEQUENCE OF FAILURE OF EMERGENCY CORE COOLING

OAK RIDGE NATIONAL LABORATORY

11 PAGES, 1 FIGURE, 21 REFERENCES, NUCLEAR SAFETY 9(1), PAGES 14-25 (JAN.-FEB. 1968)

THIS ARTICLE IS A CONDENSED COMPILATION OF SOME OF THE TECHNICAL FINDINGS OF A TASK FORCE COMMISSIONED TO INVESTIGATE THE POSSIBILITY AND CONSEQUENCES OF THE CORE MELTING THROUGH THE PRESSURE VESSEL AND THE CONTAINMENT VESSEL IN THE EVENT OF LOSS OF EMERGENCY CORE COOLING. A REASONABLE SEQUENCE OF EVENTS DURING THE HYPOTHETICAL ACCIDENT IS DESCRIBED, AND TIMES REQUIRED FOR INITIATION AND COMPLETION OF EACH EVENT ARE ESTIMATED. THE SUBSEQUENT HANDLING OF THE MOLTEN MASSES IS THEN CONSIDERED. A QUALITATIVE DESCRIPTION OF FISSION-PRODUCT BEHAVIOR IS GIVEN, AND THE POSSIBILITIES AND EFFECTS OF STEAM EXPLOSIONS ARE THEN PRESENTED, ALONG WITH ADDITIONAL OBSERVATIONS BY THE COMPILER.

*COOLING, GENERAL + *CORE MELTDOWN + *EMERGENCY SYSTEM + *FAILURE, EQUIPMENT + ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + FISSION PRODUCT TRANSPORT

5-27887

TONG LS

HEAT TRANSFER IN WATER-COOLED NUCLEAR REACTORS

WESTINGHOUSE ELECTRIC CORPORATION, PITTSBURGH, PA.

24 PAGES, 34 FIGURES, 5 TABLES, 8 REFERENCES, NUCLEAR ENGINEERING AND DESIGN 6(4), PAGES 301-324 (NOVEMBER 1967)

A NUCLEAR POWER REACTOR IS A THERMAL MACHINE. ITS SERVICE AND ECONOMIC VALUE DEPEND STRONGLY ON THERMAL PERFORMANCE OF THE FUEL AND COOLANT IN THE CORE. SOME PARAMETERS INDICATIVE OF THE CORE THERMAL PERFORMANCE ARE THE FUEL SURFACE HEAT FLUX, THE COOLANT ENTHALPY RISE, THE FUEL ROD LINEAR POWER RATE (KW/FT) AND THE FUEL SPECIFIC POWER (KW/KG U). THE HIGH THERMAL RATINGS OF THESE PARAMETERS CAN ONLY BE ACHIEVED THROUGH ADEQUATE HEAT TRANSFER MECHANISMS AND CAPABILITIES WITHIN THE FUEL ROD AND AT THE CLAD-WATER INTERFACE. THIS PAPER PRESENTS (1) THE EVALUATION OF CORE THERMAL PERFORMANCE AND (2) THE PREDICTION OF ADEQUATE HEAT TRANSFER MECHANISMS AND CAPABILITIES.

*HEAT TRANSFER + *HEAT TRANSFER ANALYSIS + *REACTOR, WATER + REACTOR POWER + REACTOR, GENERAL

5-27888

BIOT MA

GENERALIZED VARIATIONAL PRINCIPLES FOR CONVECTIVE HEAT TRANSFER AND IRREVERSIBLE THERMODYNAMICS

10 PAGES, 7 REFERENCES, JOURNAL OF MATHEMATICS AND MECHANICS 15(2), PAGES 177-86 (1966)

VARIATIONAL PRINCIPLES FOR CONVECTIVE HEAT TRANSFER ARE EXTENDED TO NONHOMOGENEOUS FLUIDS AND TO FLUIDS WITH THERMAL EXPANSION. THE RESULTS APPLY TO NONLINEAR PROBLEMS WITH TEMPERATURE-DEPENDENT PROPERTIES. THE CONTEXT IS RESTRICTED TO HEAT TRANSFER, BUT THE DERIVATION AND A DISCUSSION OF THE PHYSICS BRINGS OUT THE GENERAL VALIDITY OF THE VARIATIONAL PRINCIPLES FOR A LARGE CATEGORY OF IRREVERSIBLE PROCESSES.

*HEAT TRANSFER, CONVECTION + *MATHEMATICAL TREATMENT + *THERMODYNAMICS + HEAT TRANSFER + MATHEMATICAL STUDY

5-27889

TUNG LS + CURRIN HB + LARSEN PS + SMITH OG

INFLUENCE OF AXIALLY NON-UNIFORM HEAT FLUX ON DNB

WESTINGHOUSE ELECTRIC CORPORATION, PITTSBURGH, PA. + GENERAL ELECTRIC

AICHE PREPRINT 17 +. 27 PAGES, 9 FIGURES, 9 REFERENCES, PRESENTED AT 8TH NATIONAL HEAT TRANSFER CONFERENCE, AICHE-ASME, LOS ANGELES, AUGUST 8-11, 1965

MOST OF THE EXISTING DNB DATA HAVE BEEN OBTAINED FROM TEST SECTIONS WITH AXIALLY UNIFORM HEAT FLUXES. HOWEVER, IN A NUCLEAR REACTOR, WHERE DNB INFORMATION IS OF GREAT IMPORTANCE, THE AXIAL HEAT FLUX DISTRIBUTION IS NOT UNIFORM. THE FLOW, IN PARTICULAR IN THE BOUNDARY LAYER REGION, COMING FROM THE UPSTREAM SURFACE CARRIES SUPERHEAT AND BUBBLES WHEN IT CONTACTS THE SURFACE DOWNSTREAM. IN THIS WAY, THE EFFECT OF THE UPSTREAM HEAT FLUX DISTRIBUTION IS CONVEYED TO THE DOWNSTREAM BOUNDARY LAYER WHERE DNB OCCURS. THIS EFFECT ACTS AS A MEMORY OF THE PAST HISTORY AND IS CALLED THE MEMORY EFFECT ON DNB. THE MEMORY EFFECT OF A NONUNIFORM HEAT FLUX DISTRIBUTION IS EXPECTED TO BE DIFFERENT FROM A UNIFORM ONE, AND A CORRECTION FACTOR MAY BE DEVELOPED TO ACCOUNT FOR THE EFFECT OF FLUX NONUNIFORMITY.

*DNB + *FLOW, TWO PHASE + *HEAT TRANSFER ANALYSIS + HEAT FLUX, CRITICAL + HEAT FLUX, DRYOUT

5-27890

NIJSING R + GARGANTINI I + EIFLER W

FUNDAMENTAL STUDIES OF FLUID FLOW AND HEAT TRANSFER IN FUEL ELEMENT GEOMETRIES. I. ANALYSIS OF FLUID AND HEAT TRANSFER IN A TRIANGULAR ARRAY OF PARALLEL HEAT GENERATING RODS

CATEGORY 5
ACCIDENT ANALYSIS

5-27890 *CONTINUED*
EUROPEAN ATOMIC ENERGY COMMUNITY, ISPRA, ITALY
EUR-2193.E +. 104 PAGES, FIGURES, REFERENCES, 1964

FOR REASONS OF A NUCLEAR-PHYSICAL AND TECHNOLOGICAL NATURE, THE FUEL ELEMENT GEOMETRY IN NUCLEAR REACTORS OFTEN DIFFERS GREATLY FROM SIMPLE GEOMETRIES LIKE THE CIRCULAR DUCT. THIS IS FOR INSTANCE THE CASE FOR CLUSTER FUEL ELEMENTS. A FUEL ELEMENT OF THIS TYPE CONSISTS OF A NUMBER OF PARALLEL FUEL RODS FROM WHICH THE HEAT GENERATED BY NUCLEAR FISSION IS REMOVED BY AN AXIAL FLOW OF COOLANT. IN THE DESIGN OF THESE FUEL ELEMENTS IMPORTANT PROBLEMS ARISE WHICH PERTAIN TO FLUID FLOW AND HEAT TRANSFER. THE PURPOSE OF THE STUDY IS TO EVALUATE THEORETICALLY THE MAGNITUDE OF SEVERAL HYDRODYNAMIC AND THERMAL PARAMETERS AT VARIOUS POSITIONS IN THE CROSS-SECTION OF A ROD CLUSTER.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*FUEL ELEMENT CLUSTER + *HEAT TRANSFER ANALYSIS + *HOT CHANNEL + EURATOM + FLOW, GENERAL + FUEL ELEMENT + HEAT TRANSFER

5-27891
WAAGE JM
DESCRIPTION OF CALCULATIONAL METHODS AND DIGITAL-COMPUTER CODES FOR ANALYZING COOLANT-BLOWDOWN AND CORE-HEATUP PHENOMENA
PHILLIPS PETROLEUM COMPANY
10 PAGES, 4 TABLES, 16 REFERENCES, NUCLEAR SAFETY 8(6), PAGES 549-59 (NOV.-DEC. 1967)

AN IMPORTANT PART OF LIGHT-WATER-REACTOR ACCIDENT ANALYSIS IS THE PREDICTION OF SYSTEM AND CORE TEMPERATURES, PRESSURES, AND FORCES FOLLOWING A POSTULATED RUPTURE OF THE PRIMARY SYSTEM. THE PROGRAMS IN CURRENT USE FOR BLOWDOWN AND CORE-HEATUP STUDIES ARE REVIEWED. THIS REVIEW INCLUDES A COMPARISON OF FEATURES AND APPROXIMATION CONTAINED IN THE PROGRAMS, A SHORT SUMMARY OF THE PURPOSE AND LIMITATIONS OF EACH PROGRAM, AND A BRIEF DESCRIPTION OF THE INPUT AND OUTPUT DATA. NO ATTEMPT IS MADE, HOWEVER, TO EVALUATE THE VALIDITY OR ACCURACY OF THE PROGRAMS.

*ACCIDENT ANALYSIS + *BLOWDOWN + *COMPUTER PROGRAM + ENERGY SOURCE + HEAT GENERATION, INTERNAL + REACTOR, WATER

5-27892
OLIVER DR
FLOW AND HEAT TRANSFER PROPERTIES OF NON-NEWTONIAN LIQUIDS
UNIVERSITY OF BIRMINGHAM
3 PAGES, 3 FIGURES, 27 REFERENCES, BRITISH CHEM. ENGINEERING 11(4), PAGES 258-260 (APRIL 1966)

NON-NEWTONIAN FLOW IS BRIEFLY INTRODUCED AND THE EFFECTS OF PSEUDO-PLASTIC FLOW PROPERTIES ON LAMINAR-FLOW HEAT TRANSFER DETAILED. A SLIGHT BUT BENEFICIAL CHANGE OF HEAT TRANSFER COEFFICIENT IS REPORTED. NATURAL CONVECTION IS SHOWN TO BE IMPORTANT IN SOME CASES AND THE ADDITION OF GAS SLUGS TO THE FLOWING LIQUID TO INCREASE THE HEAT TRANSFER COEFFICIENT BY AS MUCH AS 200%.

*FLOW, GENERAL + *FLOW, NONNEWTONIAN + *HEAT TRANSFER + FLOW THEORY AND EXPERIMENTS + HEAT TRANSFER ANALYSIS

5-27894
BERGLES AE + GOLDBERG P + CLAWSON LG + ROOS J + BOURNE JG
INVESTIGATION OF BOILING FLOW REGIMES AND CRITICAL HEAT FLUX. REPORT NO. 602
DYNATICH CORPORATION, CAMBRIDGE, MASS.
NYO-3304-6 +. 38 PAGES, FIGURES, REFERENCES; OCTOBER 15, 1965

THE RESULTS FOR THE FIRST SERIES OF FLOW REGIME TESTS INVOLVING THE CORE ELECTRICAL PROBE ARE DISCUSSED IN DETAIL. IN ADDITION TO THE NORMAL DEPENDENCE ON MASS VELOCITY AND QUALITY, THE FLOW REGIME BOUNDARIES ARE SIGNIFICANTLY AFFECTED BY INLET TEMPERATURE, LENGTH, AND PRESSURE. THE FLOW PATTERNS WERE NOT ALTERED BY MINOR CHANGES IN PROBE INSTRUMENTATION OR VARIATIONS IN WATER PURITY. CRITICAL HEAT FLUX DATA ARE PRESENTED AND COMPARED WITH SEVERAL CORRELATIONS WHICH HAVE BEEN PROPOSED FOR BULK BOILING OF WATER AT HIGH PRESSURE. TEST-SECTION OSCILLATIONS WERE OBSERVED UNDER CERTAIN CONDITIONS. HOWEVER, THIS INSTABILITY DOES NOT APPEAR TO HAVE SIGNIFICANTLY AFFECTED FLOW CONDITIONS IN THE TEST SECTION. A SIMPLIFIED ANALYTICAL MODEL IS PRESENTED WHICH APPEARS TO EXPLAIN THE EXPERIMENTAL TRENDS AS WELL AS INDICATE THE CURRENT MAGNITUDE OF THE UNSTABLE OSCILLATION FREQUENCY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*BOILING + *CONVECTIVE BOILING + *HEAT FLUX, CRITICAL + BUBBLE + BUBBLE NUCLEATION + FLOW, TWO PHASE + HEAT TRANSFER + HEAT TRANSFER EXPERIMENT + NUCLEATE BOILING + REACTOR, AEC OWNED

5-27895
KUDRYAVTSEV EV + TURCHIN IA
DEPENDENCE OF TRANSIENT HEAT TRANSFER ON HEAT FLUX DENSITY
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS

CATEGORY 5
ACCIDENT ANALYSIS

5-27895 *CONTINUED*
ANL-TRANS-393 +. 6 PAGES, TRANS. FROM INZH-FIZ. ZH., 10- 573-6 (1966)

TRANSIENT NATURAL CONVECTION HEAT TRANSFER AT A THIN NICHROME RIBBON IS STUDIED. THE TEMPERATURE DISTRIBUTIONS AT ΔT EQUALS CONST ARE PRESENTED, AND THE RELATION BETWEEN THE HEAT-TRANSFER COEFFICIENT AND THE HEAT FLUX AT THE HEAT-TRANSFER SURFACE IS FOUND.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*HEAT TRANSFER CORRELATION + *HEAT TRANSFER, NATURAL CONVECTION + *TEMPERATURE TRANSIENT + HEAT TRANSFER + TEMPERATURE GRADIENT

5-27896
PROFOS P
THE DYNAMICS OF FORCED-FLOW EVAPORATOR SYSTEMS
ORNL-TR-1436 +. 18 PAGES, FIGURES, REFERENCES, DECEMBER 5, 1966, TRANSLATED FROM REGELUNGSTECHNIK 10, PAGES 529-36 (1962)

DIMENSIONLESS EQUATIONS FOR THE CALCULATION OF THE TRANSFER CHARACTERISTICS OF FORCED-FLOW EVAPORATOR SYSTEMS ARE GIVEN FOR DIFFERENT TYPES OF MALFUNCTIONS. THE CHARACTERISTIC PARAMETERS OF THE SYSTEM CAN BE DETERMINED RAPIDLY AND SIMPLY FOR THE DESIGN DATA WITH THE USE OF AUXILIARY TABLES. SUBSEQUENTLY, THE DIFFERENT TRANSFER FUNCTIONS CAN BE CALCULATED FROM THE EQUATIONS OR IN MANY CASES, CAN BE DERIVED DIRECTLY FROM DIAGRAMS. IN ADDITION, THESE DIAGRAMS GIVE GENERAL INFORMATION CONCERNING THE INFLUENCE OF THE MOST IMPORTANT PARAMETERS OF THE SYSTEM, PARTICULARLY OF THE PRESSURE, ON THE TRANSFER CHARACTERISTICS.

AVAILABILITY - SPECIAL LIBRARIES ASSOCIATION TRANSLATION CENTER, JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO, ILL. 60616

*EVAPORATION + *FLOW, HIGH SPEED + *MASS TRANSFER + EQUIPMENT, GENERAL + FLOW, GENERAL

5-28538
NISHIKAWA K + MIYABE K
ON THE BOILING-LIKE PHENOMENA AT SUPERCRITICAL PRESSURES
KYUSHU TECHNICAL COLLEGE
25 PAGES, 16 FIGURES, 1 TABLE, 16 REFERENCES, MEM. FAC. ENG., KYUSHU UNIV., 25(1), PAGES 1-25 (DECEMBER 1965)

THE PROBLEM OF HEAT TRANSFER TO FLUIDS NEAR THE CRITICAL PRESSURE HAS ARISEN BECAUSE OF THE INDUSTRIAL NEED FOR SUPERCRITICAL PRESSURE BOILERS, COOLING OF ROCKET MOTORS AND GAS TURBINE BLADES, AND HEAT REMOVAL FROM NUCLEAR REACTORS. A STUDY WAS MADE TO ELUCIDATE THE HEAT TRANSFER MECHANISM OF A SUPERCRITICAL FLUID. WITH THE EXPERIMENTAL APPARATUS OF FREE CONVECTION, THE BOILING-LIKE PHENOMENON WAS EXAMINED BY PHOTOGRAPHIC OBSERVATION AND HEAT TRANSFER COEFFICIENT MEASUREMENT. FOR THE HEATING SURFACE A PLATINUM WIRE WAS USED, AND CARBON DIOXIDE AS THE TEST FLUID.

*CONVECTIVE BOILING + *HEAT TRANSFER EXPERIMENT + *HEAT TRANSFER, SUPERCRITICAL + HEAT TRANSFER + HEAT TRANSFER, BOILING

5-28539
BEDENIG D + RAUSCH W + SCHMIDT G
PARAMETER STUDIES CONCERNING THE FLOW BEHAVIOUR OF A PEBBLE WITH REFERENCE TO THE FUEL ELEMENT MOVEMENT IN THE CORE OF THE THTR 300 MWE PROTOTYPE REACTOR
BROWN BOVERI/KRUPP REAKTORBAU GMBH., JULICH, GERMANY
12 PAGES, 1J FIGURES, 8 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 7(4), PAGES 367-378 (APRIL, 1968)

THE KNOWLEDGE OF THE PEBBLE-BED FLOW BEHAVIOR IS OF GREAT IMPORTANCE FOR GAS-COOLED HIGH TEMPERATURE REACTORS OF THE PEBBLE BED TYPE. COMPREHENSIVE EXPERIMENTAL INVESTIGATIONS WERE CARRIED OUT IN THIS RESPECT. AFTER A SHORT DESCRIPTION OF THE METHODS OF MEASUREMENT THE RESULTS OF PARAMETER STUDIES WITH REFERENCE TO THE FLOW BEHAVIOUR OF A PEBBLE BED ARE DISCUSSED. VARIOUS PARAMETERS OF GEOMETRY ARE INVESTIGATED AS WELL AS THE INFLUENCE OF FRICTION, OF SPECIFIC BALL WEIGHT AND OF RELATIVE BALL DIAMETER AS FUNCTIONS OF PEBBLE BED HEIGHT. RESULTS ARE PLOTTED IN FORM OF RESIDENCE SPECTRA. FROM THESE RESULTS THE FLOW BEHAVIOUR OF THE THTR 300-MWE PROTOTYPE REACTOR IS PREDICTED BY INTERPOLATION.

*REACTOR, CIRCULATING FUEL + *REACTOR, HTGR + *REACTOR, PEBBLE BED + FLOW THEORY AND EXPERIMENTS

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-25362
BREHM RL
ESTIMATES OF DOPPLER COEFFICIENTS FOR IN-PILE THERMIONIC REACTOR MATERIALS
CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CALIFORNIA
JPL-TR-32-1077 +. 17 PAGES, 10 FIGURES, 3 TABLES, 23 REFERENCES, OCTOBER 1, 1967

RECENT EXPERIMENTAL DATA HAVE BEEN USED TO ESTIMATE TEMPERATURE COEFFICIENTS OF REACTIVITY DUE TO DOPPLER BROADENING OF RESONANCES IN MATERIALS OF INTEREST FOR COMPACT IN-PILE THERMIONIC-REACTOR-CORE CONCEPTS. MATERIALS CONSIDERED ARE U-235, U-238, AND THE REFRACTORY METALS W, TA, MO, AND NB. EQUATIONS GIVING THE MAGNITUDE AND TEMPERATURE DEPENDENCE OF THE DOPPLER COEFFICIENT ARE GIVEN FOR EACH OF THESE ELEMENTS. ESTIMATES ARE GIVEN OF THE POSSIBLE ERROR IN THE DOPPLER COEFFICIENT INTRODUCED BY EXTRAPOLATING THE EXPERIMENTAL DATA TO THE HIGHER TEMPERATURES OF INTEREST IN THERMIONIC REACTOR CONCEPTS. A COMPARISON OF THIS METHOD WITH THE USUAL THEORETICAL METHOD IS MADE FOR THE FERMI REACTOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*DOPPLER COEFFICIENT + *REACTOR, SPACE + REACTIVITY EFFECT + REACTOR, FAST + TEMPERATURE COEFFICIENT

6-25363
NISLE RG + STEPAN LE + MILLSAP DA + FAST E
FISSION PRODUCT TRANSIENT MEASUREMENTS IN THE ADVANCED REACTIVITY MEASUREMENT FACILITIES
IDAHO NUCLEAR CORPORATION
IN-1096 +. 27 PAGES, 5 FIGURES, 1 TABLE, 16 REFERENCES, SEPTEMBER 1967

YIELDS OF I-135, IN FISSION OF U-233, PU-239, AND PU-241, RELATIVE TO THAT FOR U-235, WERE MEASURED BY AN INTEGRAL METHOD USING THE ARMF I AND II. XENON REACTIVITY TRANSIENT WAS MEASURED FOLLOWING IRRADIATION OF FISSION ISOTOPE IN THE MTR FOR PERIODS OF 2 1/2 TO 110 DAYS. USE OF TWO ARMF REACTORS PERMITTED CALCULATION OF THE ABSORPTION CROSS SECTIONS OF BOTH SIMPLE ABSORBERS AND FISSION ATOMS. CALIBRATION AND DATA REDUCTION TECHNIQUES MAKE EXTENSIVE USE OF DIGITAL COMPUTER PROGRAMS. THE I-135 YIELD RATIOS, RELATIVE TO U-235, WERE FOUND TO BE 0.825 PLUS OR MINUS 0.072 FOR U-233, 1.006 PLUS OR MINUS 0.067 FOR PU-239 AND 1.221 PLUS OR MINUS 0.089 FOR PU-241. QUOTED UNCERTAINTIES ARE CONFIDENCE INTERVALS AT THE 90% CONFIDENCE INTERVALS AT THE 90% CONFIDENCE LEVEL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FISSION PRODUCT, IODINE + *MEASUREMENT, REACTIVITY + PLUTONIUM + URANIUM-233

6-25944 ALSO IN CATEGORIES 5 AND 7
MORRISON DL + CARBIENER WA + RITZMAN RL + BLUTREICH JN + CLARK WE + DENNING RS + GIESEKE JA + WOOTON RO
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR ACCIDENT, QUARTERLY PROGRESS REPORT FOR JANUARY THROUGH MARCH, 1968
BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO
BMI-1835 +. 30 PAGES, 4 FIGURES, 8 TABLES, 30 REFERENCES, APRIL 1, 1968

PROGRESS REPORT ON THE FOLLOWING AREAS - ECCSA COMPUTER CODE DEVELOPMENT, CALCULATIONS OF ACCIDENT HEAT TRANSFER, EVALUATION OF REACTOR KINETICS PROBLEMS, REACTIVITY-ACCIDENT INITIATION OF A LOSS-OF-COOLANT ACCIDENT, FISSION PRODUCT RELEASE FROM UO₂, AEROSOL-PARTICLE CHARGING, PARTICLE COLLECTION IN PRESSURE-SUSPENSION POOLS, FISSION-PRODUCT TRANSPORT AND DEPOSITION MODELS, AND CONDITIONS AND CRITERIA FOR PAINT PERFORMANCE IN REACTOR CONTAINMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + *FISSION PRODUCT TRANSPORT + *REACTOR KINETICS + ACCIDENT, REACTIVITY + AEROSOL + COMPUTER PROGRAM + CONTAINMENT PAINT + FISSION PRODUCT RELEASE, GENERAL + FISSION PRODUCT RETENTION + HEAT TRANSFER + SPACE DEPENDENT DYNAMICS

6-25946
JANSEN A
THE LONG TERM BEHAVIOR OF FAST POWER REACTORS WITH PU-RECYCLING
GESELLSCHAFT FÜR KERNFORSCHUNG, KARLSRUHE, GERMANY
KFK630 + FUR-3674E + CONF-671043-7 + EURFNR-399 +. 22 PAGES, 4 FIGURES, 3 TABLES, 5 REFERENCES, OCTOBER 1967, FROM SYMPOSIUM ON FAST REACTOR PHYSICS AND RELATED SAFETY PROBLEMS, KARLSRUHE, GERMANY.

STUDIED THE LONG-TERM BEHAVIOR OF FAST POWER REACTORS DURING MANY RELOADING CYCLES, INCLUDING THE TIME DEPENDENCE OF THE ISOTOPIC COMPOSITION OF PLUTONIUM, THE URANIUM AND PLUTONIUM CONTENT OF THE FUEL, THE BREEDING GAIN, ETC. AFTER STARTING, THE ONLY FISSIONABLE MATERIAL CONSUMED IS THAT BRED IN THE SAME REACTOR. LOADING AND UNLOADING THE CORE AND BLANKET ARE TREATED AS DISCONTINUOUS PROCESSES, AND EXTERNAL FUEL MANAGEMENT AND TIMES FOR REPROCESSING AND REFABRICATION ARE CONSIDERED. NUMERICAL RESULTS ARE GIVEN FOR SODIUM-COOLED REACTOR NA1.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-25946 *CONTINUED*
FUEL REPROCESSING + PLUTONIUM + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR + REACTOR, POWER

6-25987 ALSO IN CATEGORY 17
COSTNER RA + CRAMER EN + SCOTT RL
REACTOR OPERATOR STUDY HANDBOOK VOLUME III - REACTOR PHYSICS
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-2034, VOL. III +. 222 PAGES, 51 FIGURES, JUNE 1968

A SELF-TEACHING (PROGRAMMED INSTRUCTION) MANUAL COVERING NEUTRON REACTIONS, DESCRIPTION OF REACTORS, REACTIVITY AND REACTOR PERIOD, FUEL BURNUP, XENON- AND SAMARIUM-POISONING EFFECTS, TEMPERATURE EFFECTS, AND NEUTRON FLUX DISTRIBUTION. EACH SECTION CONTAINS BACKGROUND MATERIAL FOR UNDERSTANDING, EXAMPLE TO CLARIFY UNDERSTANDING, AND QUESTION FOR SELFTESTING. MATERIAL IS PRESENTED IN FORM OF PARAGRAPHS, AND IN FOLLOWING PARAGRAPHS, A BLANK MAY BE LEFT FOR STUDENT TO FILL IN WITH THE MAIN WORD OR IDEA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*PROCEDURES AND MANUALS + *REACTOR PHYSICS + *STAFFING, TRAINING, QUALIFICATION + FLUX DISTRIBUTION + FUEL BURNUP + NEUTRON INTERACTION + REACTIVITY EFFECT + REACTOR DESCRIPTION + REACTOR, RESEARCH + SAMARIUM + TEMPERATURE REACTIVITY EFFECT + XENON

6-26147
CHALMERS JH
HANDBOOK OF EXPERIMENTAL CRITICALITY DATA PART I - CHAPTERS 1 TO 4
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY (ENGLAND)
AHSB(S)HANDBOOK-5 +. 90 PAGES, FIGURES, TABLES, 67 REFERENCES, 1967

RELATIVELY DETAILED DATA ON CRITICALITY EXPERIMENTS ON CLEAN SYSTEMS ARE COMPILED, AND REFERENCES TO DATA SOURCES ARE LISTED. PART 1 COVERS SINGLE UNMODERATED U-235 CORES, SINGLE UNMODERATED PLUTONIUM CORES, SINGLE U-235 CORES MODERATED BY DEUTERIUM, BERYLLIUM OR CARBON, AND SINGLE PLUTONIUM CORES MODERATED BY DEUTERIUM, BERYLLIUM, OR CARBON

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

CRITICAL MASS + CRITICALITY EXPERIMENT + MEASUREMENT, REACTIVITY + PLUTONIUM + URANIUM-235

6-26411
COFFMAN WA + DUNCKHORST FT + LYNN LL + MEYER JE
ANALYSIS OF A WATERLOGGED FUEL ELEMENT SUBJECTED TO A POWER EXCURSION
BROOKHAVEN NATIONAL LABORATORY
11 PAGES, 7 FIGURES, TABLE, 10 REFERENCES, NUCLEAR APPLICATIONS, 4(6), PAGES 372-382 (JUNE, 1968)

PRESENTS A MATHEMATICAL MODEL. COMPARISON WITH TWO OUT-OF-PILE EXPERIMENTS AND ONE IN-PILE INCIDENT IS FAIR. MODEL INCLUDES HEAT TRANSFER, LINEAR ELASTIC STRESS, AND DEFORMATION, PRESSURE, CLAD STRESS AND STRAIN, MODEL LIMITATIONS ARE - (1) IT WAS FORMULATED FOR TRANSIENTS IN WHICH PRESSURE INCREASE OF SEVERAL THOUSAND PSI OCCURS, AND (2) STRESS AND DEFORMATION EQUATIONS MAY BE INADEQUATE FOR MANY CASES WHERE PRESSURE CAUSES STRESSES NEAR RUPTURE CONDITION.

*ANALYTICAL MODEL + *FAILURE, FUEL ELEMENT WATERLOGGING + FAILURE, CLADDING + FUEL BURNUP + HEAT TRANSFER + MATHEMATICAL TREATMENT + PRESSURE, INTERNAL + REACTOR TRANSIENT + STRESS RUPTURE

6-26561 ALSO IN CATEGORY 9
ROUX DP + FRY DN + ROBINSON JC
APPLICATION OF GAMMA-RAY DETECTION FOR REACTOR DIAGNOSIS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2144 +. 17 PAGES, 3 FIGURES, 3 TABLES, MARCH 20, 1968

POWER SPECTRAL DENSITY (PSD) MEASUREMENTS OF THE FLUCTUATING CURRENT FROM A GAMMA-SENSITIVE AND A NEUTRON-SENSITIVE IONIZATION CHAMBER ARE COMPARED AS A REACTOR DIAGNOSTIC TOOL IN THE HFIR OPERATING AT POWER. AN ANALYTICAL MODEL IS PRESENTED TO DEMONSTRATE THAT WHEN BOTH OBSERVED GAMMA AND NEUTRON PSD ARE NORMALIZED BY THE SQUARE OF THE PROMPT MEAN-CURRENT OF THE CHAMBERS, THEY YIELD THE SAME ABSOLUTE PSD. THE ANALYTICAL RESULT IS VERIFIED EXPERIMENTALLY WITH A MULTISECTION IONIZATION CHAMBER COMPOSED OF ELECTRICALLY INDEPENDENT CLOSELY LOCATED NEUTRON-SENSITIVE AND GAMMA-SENSITIVE CHAMBERS. IN THE CASE OF THE GAMMA CHAMBER, AN ESTIMATE OF THE CURRENT COMPONENT CAUSED BY THE DELAYED PHOTONS EMITTED BY THE RADIOACTIVE FISSION PRODUCTS IS NECESSARY TO MEASURE THE ABSOLUTE PSD. IN THIS EXPERIMENT THE DELAYED CURRENT COMPONENT HAS BEEN ESTIMATED TO BE 13 PER CENT OF THE TOTAL GAMMA CURRENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*NOISE CROSS CORRELATION + *REACTOR DYNAMICS + ANALYTICAL MODEL + CHAMBER, ION + COMPARISON, THEORY AND EXPERIENCE + GAMMA + HFIR (FTR) + INSTRUMENTATION, NUCLEAR + NEUTRON + NOISE ANALYSIS + ORNL + REACTOR, AEC OWNED + REACTOR, FLUX TRAP + REACTOR, RESEARCH

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-26584
STABILITY TESTS ON BOILING WATER REACTORS
ALIGEMEINE ELEKTRICITAETS-GESELLSCHAFT, FRANKFURT AM MAIN, WEST GERMANY
EURAC-1964 + EUR-3773 +. 49 PAGES, FIGURES, TABLES, QUARTERLY REPORT NO. 11, JULY 1-SEPTEMBER 30, 1967

PROGRESS REPORT. FLOW-OSCILLATION TESTS ON FOUR-ROD ELEMENTS WERE COMPLETED. EFFECT ON
TRANSFER FUNCTION MEASURED FOR VARYING SPEEDS OF CIRCULATION PUMPS AND VOID-FRACTION
OSCILLATIONS. DISCUSSES PREPARATIONS FOR MEASUREMENT OF HEAT FLUX VS LOCAL VOID-FRACTION
FREQUENCY RESPONSES AT CONSTANT CHANNEL PRESSURE DROP.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*FLOW STABILITY + *FLOW THEORY AND EXPERIMENTS + *REACTIVITY EFFECT, VOID + EURATOM + GERMANY +
R AND D PROGRAM + REACTOR STABILITY + REACTOR, BWR + TESTING + TRANSFER FUNCTION

6-26591 ALSO IN CATEGORY 17
SAXTON PLUTONIUM PROJECT. QUARTERLY PROGRESS LETTER FOR THE PERIOD ENDING MARCH 31, 1967
WESTINGHOUSE ELECTRIC CORP., ATOMIC POWER DIVISION, PITTSBURGH, PA.
EURAC-1826 +. 17 PAGES, MAY, 1967

PROGRESS REPORT. A DISCREPANCY EXISTS BETWEEN CALCULATED AND OBSERVED JUST-CRITICAL BORON
CONCENTRATION. SOURCE OF ERROR IN ANALYSIS WAS FAILURE TO INCLUDE EFFECTS OF NONUNIFORM
AXIAL DEPLETION AND DIFFERENCES IN FISSION PRODUCT CROSS SECTION. ***THE HOT-CELL
VENTILATION SYSTEM WAS MODIFIED, AND DESTRUCTIVE EXAMINATION OF PELLETIZED RODS WILL BEGIN
WHERE CELL ALPHA-CONTAINMENT SYSTEM IS OPERATIONAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*FUEL BURNUP + *PLUTONIUM + ALPHA EMITTER + CHEMICAL SHIM + COMPARISON, THEORY AND EXPERIENCE +
EXAMINATION + FUEL, PELLET TYPE + HOT CELL + HOT CELL + MODIFICATION, SYSTEM OR EQUIPMENT +
REACTIVITY EFFECT, ANOMALOUS + REACTOR PHYSICS + REACTOR, PWR + REPORT, OPERATIONS + SAXTON (PWR) +
THEORETICAL INVESTIGATION

6-26621 ALSO IN CATEGORY 17
CORE VII STARTUP REACTIVITY EFFECTS
CONNECTICUT YANKEE ATOMIC POWER COMPANY
10 PAGES, 2 FIGURES, 2 TABLES, OPERATION REPORT 89 FOR MAY, 1968. FROM A LETTER TO DRL FROM W. P.
JOHNSON. JUNE 24, 1968. DOCKET 50-29. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

CORE-VII PHYSICS TESTS WERE COMPLETED AND REACTOR BROUGHT TO POWER MAY 1, AMMONIA ADDITION
(6.45 PPM IN THE MAIN COOLANT GAVE A PH OF 6.04) GAINED 0.7% DK/K, COMPARED WITH STARTUPS
WITH UNADJUSTED PH. FOUR DAYS LATER, AMMONIA FEED WAS STOPPED, AND IT WAS APPARENT THAT A
REACTIVITY GAIN WAS OCCURRING. ON MAY 8, MIXED-BED RESINS REMOVED THE AMMONIA, CANCELLING
THE REACTIVITY GAIN OF 0.2% DK/K. COOLANT PH HAS SINCE AVERAGED 5.3, AND REACTIVITY
DEPLETION IS 0.157 PPM PER MWD/MTV AT 1200 PPM. RADIATION EXPOSURE FOR MAY AVERAGED 175
MREM, WITH THE MAXIMUM AT 451. THE OUTAGE LASTED 39 DAYS.

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

*PERSONNEL EXPOSURE, RADIATION + *PH REACTIVITY EFFECT + CHEMICAL SHIM + FUEL BURNUP + FUEL HANDLING +
MAINTENANCE AND REPAIR + REACTOR, PWR + REFUELING + REPORT, OPERATIONS + YANKEE (PWR)

6-26630 ALSO IN CATEGORY 5
KLICKMAN AE + HIRAKAWA N
AN ANALYSIS OF THE KIWI-TNT EXPERIMENT WITH MARS
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC.
1 PAGE, TABLE, 4 REFERENCES, AND TRANSACTIONS 10(1), PAGE 246 OF THE 1967 ANNUAL MEETING OF THE AMERICAN
NUCLEAR SOCIETY, JUNE 11-15, 1967

THE KIWI-TNT EXPERIMENT HAS BEEN ANALYZED BY APPLYING A NEW TWO-DIMENSIONAL EXPLOSION CODE,
MARS, TO AN APPROPRIATE MODEL. THE CORE WAS CONSIDERED TO BE A CYLINDER 140 CM HIGH AND 85
CM IN DIAM. THE REACTOR WAS CONSIDERED TO BE 50 CENTS SUBCRITICAL, AND 8.5 OF REACTIVITY
WAS INSERTED AND THE RATE OF \$300/SEC. THE EQUATION OF STATE WAS TAKEN TO BE THE
HIGH-TEMPERATURE VAPOR-PRESSURE EQUATION, AND THE SPECIFIC HEAT WAS AN ANALYTICAL FIT TO THE
AVAILABLE DATA. THE TEMPERATURE COEFFICIENT WAS ASSIGNED THE NOMINAL VALUE OF 1.32×10^{-4} .
HOWEVER, IT WAS ALSO ASSIGNED PARAMETRIC VALUES OF 0.5, 1.0, 1.5, AND 2.0×10^{-4} .

*EXPLOSION + *KIWI TNT (S-RR) + *MATHEMATICAL TREATMENT + *REACTOR DYNAMICS + COMPUTER PROGRAM +
EXCURSION, LARGE + REACTOR, SAFETY RESEARCH

6-26721 ALSO IN CATEGORY 9
CHERNICK J

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-26721 *CONTINUED*

NEUTRON DYNAMICS OF BROOKHAVEN(S) HIGH FLUX BEAM REACTOR
BROOKHAVEN NATIONAL LABORATORY, UPTON, N.Y.

STI/PUB/115 + CN-22/52 +. 17 PAGES, 13 FIGURES, 7 REFERENCES, PAGES 395-411 OF NUCLEAR ELECTRONICS
CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

BROOKHAVEN(S) HIGH FLUX BEAM REACTOR (HFBR) IS A HIGH-POWER-DENSITY RESEARCH REACTOR WITH MANY
NOVEL FEATURES. THESE INCLUDE A COMPACT UNDERMODERATED CORE, COOLED, MODERATED, AND
REFLECTED BY HIGH-VELOCITY D₂O. THE LARGE D₂O REFLECTOR PLAYS THE DOMINANT ROLE IN NEUTRON
MODERATION AND IN CONTROLLING THE REACTOR. RESULTING SAFETY FEATURES INCLUDE A LONG NEUTRON
GENERATION TIME, PLUS NEGATIVE TEMPERATURE AND VOID COEFFICIENTS THROUGHOUT THE CORE AND
REFLECTOR. DYNAMIC CHARACTERISTICS OF THE REACTOR HAVE BEEN EXPLORED BOTH BY ANALOG AND
DIGITAL COMPUTING MACHINES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*REACTOR CONTROL + *REACTOR DYNAMICS + HEAVY WATER + HFBR (RR) + REACTOR, AEC OWNED + REACTOR, RESEARCH +
REACTOR, RESEARCH + REACTOR, WATER

6-26746 ALSO IN CATEGORY 17

PULSTAR DOPPLER COEFFICIENT WITH A GRAPHITE REFLECTOR
WESTERN NUCLEAR RESEARCH CENTER

4 PAGES, 2 FIGURES, LETTER TO D. J. SKOVHOLT, DRL, FROM LETTER TO D. J. SKOVHOLT FROM P. T. BURNETT. JUNE
21, 1968. DOCKET 50-57.

AS REQUIRED IN LICENSE CHANGE 30, SEVEN PULSES WERE MADE AT 4 DIFFERENT REACTIVITIES WITH FOUR
GRAPHITE ELEMENTS ALONG ONE SIDE OF THE 4X5 CORE. THE COEFFICIENT WAS OBTAINED BY DIVIDING
THE PROMPT REACTIVITY INSERTED BY THE TEMPERATURE RISE FROM A PREVIOUSLY PUBLISHED CURVE OF
FUEL TEMP. VS ENERGY DENSITY (WNY-20). THE 7 POINTS FELL WITHIN 10% OF A CURVE OF DK/DEG F
VS AV. FUEL TEMP. PLOTTED FOR WATER REFLECTOR. ON JUNE 2, THE REVISED STEADY-STATE CORE
SHOWED A REACTIVITY LOSS OF 0.00581 DK AND A TEMP. RISE OF 245 F ON GOING TO 1.25 MW. THIS
DOPPLER COEFFICIENT IS 97% OF THE WATER-REFLECTED VALUE, AND WE CONCLUDE THAT THE GRAPHITE
HAS NOT CHANGED THE COEFFICIENT.

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

*DOPPLER COEFFICIENT + *MEASUREMENT, REACTIVITY + *REFLECTOR + COMPARISON, THEORY AND EXPERIENCE +
GRAPHITE + PULSTAR (RR) + REACTOR, PULSED + REACTOR, RESEARCH

6-26783

TAUBE M

REACTIVITY CHANGES IN SALT-BOILING FAST REACTORS OF WARS AND SAWA TYPES
NATIONAL INSTITUTE OF RADIOLOGICAL SCIENCES, JAPAN

4 PAGES, FIGURES, 10 REFERENCES, NUKLEONIKA, 12, PAGES 231-234 (1967)

DISCUSSES A SPECIFIC EFFECT OF BUBBLE DILUTION IN THE FUSED CHLORIDES IN SALT-BOILING
REACTORS. THE MEAN VOLUME EXPANSION COEFFICIENT IN THE HETEROGENEOUS BOILING REACTOR WARS
WITH MERCURY AS COOLANT IS ABOUT 0.002/DEG(C), AND IN THE HOMOGENEOUS BOILING REACTOR SAWA
WITH ALUMINUM TRICHLORIDE AS COOLANT ABOUT 0.025/DEG(C). A FAST 10 PER CENT INCREASE IN POWER
DECREASES K-EFF ABOUT 10 PER CENT IN SAWA AND 0.8 PER CENT IN WARS.

REACTIVITY COEFFICIENT + REACTIVITY EFFECT + REACTIVITY EFFECT, EXPANSION + REACTOR, FAST + REACTOR, LMC +
REACTOR, MOLTEN SALT + VOID COEFFICIENT

6-26966

ALSO IN CATEGORY 18

FLUHARTY RG + SIMPSON FB + RUSSELL GJ + MORRIS RH

A PROPOSAL FOR A REPETITIVELY PULSED TEST FACILITY (RPTF)

IDAHO NUCLEAR CORP., IDAHO FALLS

IN-1149 +. 119 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1967

STUDY TO BE COMPLETED BY JULY 1968, DESIGN BY 1971, AND CONSTRUCTION COMPLETION IN 1973.
REACTOR IS A SMALL PLUTONIUM REACTOR (3 TO 10 MW AVERAGE POWER) PULSED BY ROTATING FUEL OR A
CHARGED-PARTICLE NEUTRON SOURCE AT 0 TO 200 PULSES/SEC, WITH POWER PEAKS OF 3000 MW,
PRODUCING NEUTRON FLUX INTENSITY PEAKS OF 10¹⁸TH. ***DESCRIBES REACTOR USEFULNESS AS A
RESEARCH TOOL AND PROGRAM TO DESIGN AND BUILD IT. APPENDIX (A) REVIEWS GENERAL PROPERTIES OF
REPETITIVELY PULSED SYSTEMS, (F) MODERATOR OPTIMIZATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.45 MICROFICHE

*DESIGN STUDY + *IRRADIATION FACILITY + PLUTONIUM + REACTOR KINETICS + REACTOR, PULSED

6-27039

ALSO IN CATEGORY 7

SAFETY STUDIES FOR MSBR

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-4228 +. 23 PAGES, 8 FIGURES, TABLE, 8 REFERENCES, PAGES 289-311 OF THE NSP ANNUAL PROGRESS REPORT,
APRIL, 1968

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-27039 *CONTINUED*

PROGRESS REPORT DEALING WITH - MSBR DYNAMIC STUDIES - REACTOR SYSTEM RESPONSE TO REACTIVITY CHANGES, REACTOR SYSTEM STABILITY STUDIES. MSBR TEMPERATURE COEFFICIENTS OF REACTIVITY. FISSION-PRODUCT BEHAVIOR IN MOLTEN-SALT REACTORS - FISSION-PRODUCT CONCENTRATIONS IN THE MSRE. STABILITY OF MOLYBDENUM FLUORIDES IN LiF-BE₂F₂ MELTS. MOLTEN-SALT COMPATIBILITY STUDIES. AFTERHEAT GENERATION IN AN MSBR SYSTEM - AFTERHEAT GENERATION IN AN MSBR FUEL-LOOP HEAT EXCHANGER, AFTERHEAT GENERATION IN GRAPHITE DUE TO FISSION-PRODUCT GASES AND THEIR DECAY PRODUCTS. CALCULATION OF FISSION-PRODUCT BUILDUP IN AN MSBR.

*COMPUTER, ANALOG + *DECAY HEAT + *FISSION PRODUCT TRANSPORT + *MOLTEN FUEL + *REACTIVITY EFFECT + *REACTOR STABILITY + ANALYTICAL MODEL + COMPUTER CONTROL + COMPUTER PROGRAM + EQUATION OF STATE + FISSION PRODUCT ACTIVITY, GROSS + MSRE (RE) + REACTOR, MOLTEN SALT

6-27073

SOFER GA + CHERRY BH

DESIGN AND SAFETY OPTIMIZATIONS IN THE USE OF PLUTONIUM-URANIUM CARBIDE FUEL IN LARGE FAST BREEDER REACTORS UNITED NUCLEAR CORPORATION, ELMSFORD, NEW YORK

33 PAGES, 9 FIGURES, 4 TABLES, 10 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

OPERATING CHARACTERISTICS OF A 1000-MW(E) SODIUM-COOLED PLUTONIUM-URANIUM CARBIDE REACTOR HAVING NEUTRONICALLY UNCOUPLED THREE-MODULE CORE ARE GIVEN. COUPLED-KINETICS/HEAT-TRANSFER CODE SCARE WAS USED FOR SAFETY ANALYSES OF RAMP REACTIVITY INSERTIONS. IT IS CONCLUDED THAT A NEGATIVE TEMPERATURE COEFFICIENT IS VERY IMPORTANT FOR (U-PU)C FUELED DESIGNS, AND THAT FUEL RODS USING HELIUM FOR THERMAL BINDING BETWEEN FUEL AND CLADDING HAVE BETTER SAFETY CHARACTERISTICS THAN SODIUM-BONDED RODS.

AVAILABILITY - G.A.SOFER, UNITED NUCLEAR CORPORATION, RESEARCH AND ENGINEERING CENTER, ELMSFORD, N.Y.

FUEL ELEMENT + REACTOR KINETICS + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR + SAFETY ANALYSIS + TEMPERATURE COEFFICIENT + URANIUM CARBIDE

6-27143

ALSO IN CATEGORY 17

TAXELIUS TG

QUARTERLY TECHNICAL REPORT, SPERT PROJECT, JANUARY, FEBRUARY, MARCH 1967

PHILLIPS PETROLEUM COMPANY, ATOMIC ENERGY DIVISION, IDAHO FALLS

IDO-17260 +. 46 PAGES, 36 FIGURES, 5 TABLES, 18 REFERENCES, FEBRUARY, 1968

IN (SPERT-III OXIDE CORE KINETICS PROGRAM) TESTS DEMONSTRATED THAT AS REACTOR PERIOD BECOMES SHORTER, POWER LEVEL DECREASES MORE ABRUPTLY AFTER REACHING ITS PEAK BECAUSE OF INCREASED EFFECT OF DOPPLER COEFF. SPERT-IV CDC SUBASSEMBLY TEST PROGRAM - TRANSIENT TESTS WITH PERIODS DOWN TO 3 MILLISEC WERE PERFORMED ON FUEL RODS MODIFIED TO IMPROVE WATERTIGHT INTEGRITY. POSITIVE REACTIVITY FEEDBACK HAS BEEN OBSERVED FROM FAILURE OF WATERLOGGED FUEL, INCREASING CORE ENERGY RELEASE. FIVE RODS RUPTURED DURING TRANSIENTS. PBA - TESTS ON FUEL-ROD CONCEPT CONFIRM ABILITY TO MEET DESIGN REQUIREMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*REACTOR KINETICS + *REACTOR STABILITY + *TESTING + COMPARISON, THEORY AND EXPERIENCE + FAILURE, FUEL ELEMENT + FAILURE, FUEL ELEMENT WATERLOGGING + FUEL ELEMENT + INTEGRITY + MODIFICATION, SYSTEM OR EQUIPMENT + PBF (S-RR) + R AND D PROGRAM + REACTIVITY EFFECT, ANOMALOUS + REACTOR TRANSIENT + REACTOR, SAFETY RESEARCH + SPERT 3 (S-RR) + SPERT 4 (S-RR)

6-27579

ALSO IN CATEGORIES 9 AND 4

FRIEDMAN ST + RANKIN WD

INDIRECT MEASUREMENT OF NUCLEAR HEATING RATES IN POISON CONTROL VANES

LUS ALAMOS SCIENTIFIC LABORATORY

1 PAGE, ANS TRANSACTIONS 11(1), PAGE 25, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE ACCURATE PREDICTION OF NUCLEAR HEATING RATES IN HIGH CAPTURE CROSS-SECTION CONTROL MATERIALS IS A MAJOR RADIATION ANALYSIS PROBLEM. THE PROBLEM IS PARTICULARLY ACUTE IN NUCLEAR ROCKET REACTOR SYSTEMS SUCH AS NERVA WHERE THE RELATIVELY THIN CONTROL VANES ARE LOCATED IN HIGHLY MODERATING BERYLLIUM REFLECTOR REGION IMMEDIATELY ADJACENT TO A HIGH-POWER DENSITY CORE. OPERATIONAL CONSIDERATIONS, INCLUDING EFFECTS ON REACTOR SAFETY AND RELIABILITY, REQUIRE ACCURATE PREDICTIONS OF VANE HEATING RATES AND AN ADEQUATE FLOW OF LIQUID HYDROGEN TO THE VANES, DRUMS, REFLECTOR, AND PRESSURE VESSEL, BUT ESPECIALLY TO THE VANES SINCE THESE INVOLVE THE CONTROL SYSTEM.

*MEASUREMENT, TEMPERATURE + *NUCLEAR ROCKET + HEAT TRANSFER + INSTRUMENTATION, CONTROL + NERVA PROGRAM

6-27616

ALSO IN CATEGORIES 17 AND 9

SELECTED SHIPPINGPORT OPERATING EXPERIENCE

BETTIS ATOMIC POWER LABORATORY

WAPD-MRP-122 +. 14 PAGES, PAGES 6, 20-41 AND 43 OF PRESSURIZED WATER REACTOR (PWR) PROJECT. TECHNICAL PROGRESS REPORT, JULY 22, OCTOBER 20, 1967

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-27616 *CONTINUED*

(PAGE 6) NH₄OH ADDITION AND DEGASIFICATION RATES INCREASE DRASTICALLY WITH COOLANT PH ABOVE 10.3. (PAGE 20-41) POWER LIMITS FOR VARIOUS CONTROL ROD PROGRAMS PAST 10,000 EFPH WERE CALCULATED. FOR VARIOUS LOAD SWINGS, XENON BURNOUT RATES AND AXIAL PEAK/AV NEUTRON FLUXES WERE MEASURED AND COMPARED WITH TURBO-ZIP CALCULATIONS. ON THE RETURN TO 100 MWE ON AUGUST 21, XENON OSCILLATION SET IN, GIVING +-9 IN. CONTROL ROD MOTION. OPERATIONAL DETECTORS LOCATED AT CORE MIDHEIGHT WERE IN PHASE WITH ROD BANK MOTION, WHILE TEST CHAMBERS ABOVE THE CORE WERE OUT OF PHASE. OPERATING LIMITS FOR PEAK SINGLE CHANNEL NUCLEAR INSTRUMENT READINGS WERE CALCULATED, AS WAS A CONTROL ROD PROGRAM. (PAGE 43) COMPUTER PROGRAM MO 795 WAS PLACED INTO PRODUCTION. MO 795 PERFORMS ALL FUEL ELEMENT PERFORMANCE LIMITS CALCULATIONS FOR CORE 2, INCLUDING MAXIMUM PERMISSIBLE SINGLE CHANNEL, NUCLEAR INSTRUMENT READINGS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONTROL ROD PROGRAM + *FUEL ELEMENT + *INSTRUMENTATION, ABNORMAL INDICATION + *PERFORMANCE LIMIT + *XENON OSCILLATION + COMPUTER PROGRAM + COOLANT CHEMISTRY + POWER DISTRIBUTION + REACTOR, PWR + REPORT, OPERATIONS ANALYSIS + SHIPPINGPORT (PWR)

6-27618 ALSO IN CATEGORY 17
SHIPPINGPORT REACTOR PHYSICS

BETTS ATOMIC POWER LABORATORY

WAPD-MRP-123 +. 16 PAGES, FIGURES, PAGES 21-36 OF TECHNICAL PROGRESS REPORT FOR THE PERIOD OCTOBER 21, 1967 TO JANUARY 26, 1968, PRESSURIZED WATER REACTOR (PWR) PROJECT

FOLLOWING THE 4TH 100% POWER DEMONSTRATION ON NOVEMBER 19, XENON BURNOUT AT PEAK XENON AT 72% POWER WAS ESTIMATED AT 0.0000026 DK/SEC BASED ON A TEST AT 63%. FLUX WIRES AT 100% POWER SHOWED THE AXIAL FLUX UNDER ESTIMATED IN THE LOWER AND OVER ESTIMATED IN THE UPPER PORTION OF THE CORE (TURBO-ZIP CODE). INCLUSION OF AN AXIALLY VARIABLE MODERATOR TEMP. GAVE BETTER FLUX SHAPES, BETTER ROD POSITION PREDICTIONS AND RESULTANT BETTER POWER SHAPES AND FUEL DISTRIBUTIONS. THE FUEL DISTRIBUTION WITH AND W/O THIS CORRECTION DIVERGES WITH BURNUP, BEING 4% DIFFERENT AT 7700 EFPH.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*COMPARISON, THEORY AND EXPERIENCE + *COMPUTER PROGRAM + *FUEL BURNUP + *POWER DISTRIBUTION + FLUX DISTRIBUTION + REACTOR, PWR + SHIPPINGPORT (PWR) + XENON

6-27628

BRAESS D + KUSTERS H + THURNAY K

IMPROVEMENT IN SECOND EXCURSION CALCULATIONS

23 PAGES, 8 FIGURES, 25 REFERENCES, BULLETIN D'INFORMATIONS SCIENTIFIQUES ET TECHNIQUES, 122, PAGES 61-83 (JANUARY 1968)

THE CALCULATION OF SECOND EXCURSIONS IS PERFORMED WITH A FORMALISM DEVELOPED BY BETHE AND TAIT, IMPROVED BY TAKING INTO ACCOUNT EFFECTS OF DELAYED NEUTRONS AND DOPPLER FEEDBACK AND APPLIED TO CYLINDRICAL CORES. THE PARAMETERS OF THE EQUATION OF STATE IN THE CALCULATIONS OF EXCURSIONS ARE ESTIMATED BY THE KINETIC THEORY OF GASES FOLLOWING THE MODIFI PROPOSED BY H. EYRING. THE CRITICAL DATES AND THE THERMODYNAMIC FUNCTIONS ARE OBTAINED BY AN APPROXIMATE PARTITION FUNCTION. THE RESULTS OBTAINED BY THE USE OF AXIAL AND SPHERICAL GEOMETRIES ARE COMPARED. THE IMPORTANCE OF A DELAYED DOPPLER FEEDBACK ON THE QUANTITY OF ENERGY RELEASED IS ALSO ESTIMATED.

*DELAYED NEUTRON + *ENERGY SOURCE + *EXCURSION, LARGE + DOPPLER EFFECT + THEORETICAL INVESTIGATION

6-27647 ALSO IN CATEGORY 5

BRIGHT GO

A REVIEW OF THE GENERALIZED REACTIVITY ACCIDENT FOR WATER-COOLED AND -MODERATED UO₂-FUELED POWER REACTORS
PHILLIPS PETROLEUM COMPANY

12 PAGES, 1 FIGURE, 69 REFERENCES, NUCLEAR SAFETY 8(2), PAGES 116-127 (WINTER 1966-1967)

A REVIEW WAS MADE OF WHAT IS KNOWN AND WHAT IS UNKNOWN ABOUT THE FACTORS THAT ENTER INTO THE DETERMINATION OF THE COURSE AND CONSEQUENCES OF A REACTIVITY ACCIDENT, AND AN ATTEMPT TO COLLATE THE AVAILABLE INFORMATION ON THE VARIOUS PHASES OF REACTIVITY-ACCIDENT ANALYSIS IN ORDER TO IDENTIFY THE MAJOR PROBLEM AREAS IS REPORTED. THE REVIEW OF EXISTING KNOWLEDGE OF BOTH NEUTRONIC AND NONNEUTRONIC PHENOMENA, AS WELL AS THE CONSIDERATION OF THE LIMITS OF CONFIDENCE IN ANALYTICAL METHODS AND THE ACCURACY OF VALUES FOR FUNDAMENTAL PARAMETERS USED IN THE ANALYSES, MADE IT INCREASINGLY EVIDENT THAT A REALLY QUANTITATIVE ANALYSIS OF A LARGE REACTIVITY ACCIDENT IN A POWER-REACTOR SYSTEM IS NOT POSSIBLE AT THIS TIME.

ACCIDENT ANALYSIS + ACCIDENT, REACTIVITY + HAZARDS ANALYSIS + HEAT TRANSFER ANALYSIS + REACTOR KINETICS + REACTOR, BWR + REACTOR, PWR + REACTOR, WATER

6-27705

BROWN PS + WATTS JL + DOYAS RJ

EFFECTS OF CROSS-SECTION UNCERTAINTIES IN COMPACT SPACE POWER REACTORS
CALIFORNIA UNIV., LIVERMORE. LAWRENCE RADIATION LAB.

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-27705 *CONTINUED*
UCRL-70797 + CONF-680307-3 +. 10 PAGES, FIGURES, TABLES, 3 REFERENCES, FEB. 28, 1968, PRESENTED AT 2ND CONFERENCE ON NEUTRON CROSS SECTIONS AND TECHNOLOGY, WASHINGTON, D. C.

THE EFFECTS OF CROSS-SECTION UNCERTAINTIES HAVE BEEN STUDIED IN COMPACT (20 KWE TO 10 MWE) SPACE POWER REACTORS, HAVING CORE SIZES OF 12, 78, AND 525 LITERS AND MEDIAN FISSION ENERGIES OF 560, 380, AND 200 KEV. EACH CORE CONTAINED UN FUEL, W-RE-MO ALLOY CLADDING, AND LI COOLANT WITHIN A TA PRESSURE VESSEL AND BEO REFLECTOR. CALCULATIONS WERE DONE TO DETERMINE THE SENSITIVITY OF THE SPECTRUM SHAPE, FISSION RATIOS, REACTIVITY WORTHS, AND NEUTRON LIFETIME TO CROSS-SECTION UNCERTAINTIES, AND TO EVALUATE WHETHER MEASUREMENT OF SUCH PARAMETERS IN CRITICAL EXPERIMENTS CAN BE USEFUL IN TESTING CROSS-SECTION DATA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

CROSS SECTION + REACTIVITY COEFFICIENT + REACTOR, SPACE + THEORETICAL INVESTIGATION

6-27707 ALSO IN CATEGORY 5
MOORE KV + RETTIG WH
RELAP2--A DIGITAL PROGRAM FOR REACTOR BLOWDOWN AND POWER EXCURSION ANALYSIS
PHILLIPS PETROLEUM COMPANY
100-17263 +. 75 PAGES, 4 FIGURES, 4 TABLES, 8 REFERENCES, MARCH 1968

RELAP2 IS A FORTRAN-IV DIGITAL PROGRAM WHICH CALCULATED FLOW, MASS INVENTORIES, TEMPERATURES, PRESSURES, REACTIVITIES, AND TRANSIENT POWER FOR THE PRIMARY SYSTEM OF A WATER REACTOR DURING A REACTIVITY OR A LOSS-OF-COOLANT ACCIDENT. ALTHOUGH RETAINING THE SIMPLIFIED GEOMETRY (THREE VOLUMES PLUS A CORE REGION) OF THE FLASH AND RELAPSE PROGRAMS, MANY IMPROVEMENTS AND EXTENSIONS HAVE BEEN MADE. THE GEOMETRY CAN BE MADE TO APPROXIMATE EITHER A PRESSURIZED OR A BOILING WATER REACTOR SYSTEM. THE CORE IS TREATED AS A TWO-POINT MODEL FOR POWER GENERATION, HEAT TRANSFER, AND REACTIVITY FEEDBACKS AND AS A ONE-POINT MODEL FOR THE REACTOR KINETICS, PRESSURE BALANCES, AND FLOW BALANCES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT, LOSS OF COOLANT + *COMPUTER PROGRAM + BLOWDOWN + REACTOR DYNAMICS + REACTOR KINETICS + REACTOR, BWR + REACTOR, PWR

6-27743
BRAESS D + KUSTERS H + THURNAY K
IMPROVEMENT IN SECOND EXCURSION CALCULATIONS
INSTITUT FUR NEUTRONENPHYSIK AND REAKTORTECHNIK KERFORSCHUNGSZENTRUM KARLSRUHE
47 PAGES, 8 FIGURES, 2 TABLES, 25 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST REACTORS, SEPTEMBER 1967

THE DESCRIPTION OF LARGE POWER EXCURSIONS IN A FAST REACTOR WITH A FOLLOWING DISASSEMBLY OF CORE MATERIAL BY THE METHOD OF BETHE-TAIT WAS IMPROVED AND EXTENDED TO CYLINDRICAL GEOMETRY. THE EFFECTS OF DELAYED NEUTRONS AND OF DOPPLER FEEDBACK WERE INCLUDED. KINETIC THEORY CALCULATIONS WERE MADE ABOUT THE LIQUID STATE OF URANIUM OXIDE. DIFFERENCES BETWEEN CYLINDRICAL AND SPHERICAL MODEL CALCULATIONS ARE GIVEN.

AVAILABILITY - D. BRAESS, INSTITUT FUR NEUTRONENPHYSIK AND REAKTORTECHNIK KERNFORSCHUNGSZENTRUM KARLSRUHE

*EXCURSION, LARGE + DOPPLER EFFECT + EQUATION OF STATE + REACTOR, FAST + THEORETICAL INVESTIGATION + URANIUM DIOXIDE

6-27744
CARPENTER SG + MOUTNFORD LA + TUTTLE RJ
SMALL-SAMPLE SURFACE-TO-MASS AND HOMOGENEITY EFFECTS IN FAST NEUTRON SPECTRA
ATOMICS INTERNATIONAL
15 PAGES, 11 FIGURES, 2 TABLES, 5 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NEUTRON REACTORS, SEPTEMBER 1967

MEASUREMENTS OF THE REACTIVITY EFFECTS OF THE SURFACE-TO-MASS RATIOS OF VARIOUS NUCLEAR FUEL SAMPLES WERE PERFORMED IN ORDER TO SEPARATE THE REACTIVITY EFFECTS OF THE TEMPERATURE COEFFICIENT AND THE DOPPLER COEFFICIENT IN FAST NEUTRON SPECTRA. TEMPERATURE AND DOPPLER COEFFICIENTS OF REACTIVITY ARE GIVEN FOR A NUMBER OF FUEL MATERIALS.

AVAILABILITY - S.G. CARPENTER, P.O. BOX 309, CANOGA PARK, CALIFORNIA

DOPPLER COEFFICIENT + FUEL COEFFICIENT + FUEL EXPANSION COEFFICIENT + MEASUREMENT, GENERAL + REACTIVITY COEFFICIENT + TEMPERATURE COEFFICIENT

6-27842 ALSO IN CATEGORIES 17 AND 9
LEAD PLATE SHIFT TO CORE ADDS 0.168% REACTIVITY
PENNSYLVANIA STATE UNIVERSITY
3 PAGES, ATOMIC ENERGY CLEARINGHOUSE, 14(35), PAGES 12-14 (AUGUST 26, 1968)

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-27842 *CONTINUED*

(LETTER TO DRL, AUG. 9) ON JULY 24, THE REACTOR OPERATOR WAS OBSERVING XENON BEHAVIOR AND PLOTTING ROD POSITION VS TIME. HE NOTED A 37 UNIT REG ROD WITHDRAWAL IN A FEW SECONDS, A SLIGHT LOG INCREASE, AND A 10 C FUEL TEMP. DECREASE. REACTOR WAS SHUT DOWN. CAUSE WAS A THICK LEAD PLATE (MOUNTED BETWEEN CORE AND THERMAL COLUMN) WHICH HAD SWUNG TOWARD THE CORE AS NYLON-ROPE SAGGED. LEAD ADDED 0.084% AND REFLECTED MORE NEUTRONS TOWARD THE SERVOCHAMBER, CAUSING A 40 KW POWER DECREASE, WITH THIS FUEL COOLING ADDING 0.084%.

*INSTRUMENTATION, ABNORMAL INDICATION + *OPERATOR ACTION + BEAM HOLE + CONTROLLER + INCIDENT, EQUIPMENT + INSTRUMENTATION, POWER RANGE + LEAD + POWER COEFFICIENT + REACTIVITY EFFECT + REACTIVITY EFFECT, ANOMALOUS + REACTOR POWER + REACTOR, RESEARCH + REFLECTOR + TRIGA (RR)

6-28002 ALSO IN CATEGORY 17

NUCLEAR PHYSICS MADE VERY, VERY EASY
USAEC + NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NTO-T-0026 +. 81 PAGES, 27 FIGURES, 6 TABLES, JULY 1968

INTENDED TO INTRODUCE BASIC REACTOR PRINCIPLES TO VARIOUS GROUPS OF NONNUCLEAR NERVA TEST OPERATIONS PERSONNEL. SECTIONS ARE ATOMIC PHYSICS (19 PAGES), NUCLEAR PHYSICS (25 PAGES), AND REACTOR PHYSICS (33 PAGES). ***TREATMENT IS QUITE BASIC AND READABLE. COVERS USUAL GROUNDS. NOT RESTRICTED TO A PARTICULAR TYPE, EXCEPT REACTOR EQUATIONS IMPLY MODERATION.

*REACTOR PHYSICS + *STAFFING, TRAINING, QUALIFICATION + NERVA PROGRAM +, REACTOR, POWER + REACTOR, SPACE

6-28010 ALSO IN CATEGORY 17

THE STARTUP TEST PROGRAM FOR THE CONNECTICUT YANKEE YANKEE REACTOR
CONNECTICUT YANKEE ATOMIC POWER COMPANY, HADDAM
NYO-3250-11 +. 37 PAGES, FIGURES, TABLES, DOCKET 50-213. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

REPORTS WORK DURING MONTH OF JULY 1967. FUEL LOADED WITH WATER AT 2650 PPM BORON, THEN BORON DILUTED SLOWLY TO GO CRITICAL. ZERO POWER MEASUREMENTS WERE MADE AT 10 MWTH. AGREEMENT ON COLD TOTAL EXCESS REACTIVITY AND WORTHS OF GROUPS AB WAS EXCELLENT WITH PREDICTION, BUT THE HOT WORTH OF CD WAS LOW BY 0.035 REACTIVITY %. MEASUREMENTS MADE OF SINGLE ROD WORTHS (FOR STUCK AND EJECTED RODS) AGREED WELL WITH PREDICTIONS. DIFFERENTIAL BORON WORTH CURVE IS STEEPER THAN EXPECTED, PERHAPS BECAUSE RODS ARE IN CORE. TEMPERATURE COEFFICIENTS TAKEN BY USING BORON CHANGES IS ALSO STEEPER THAN PREDICTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 CPY, \$0.65 MICROFICHE

*CONTROL ROD WORTH + *REACTOR STARTUP TESTING + COMPARISON, THEORY AND EXPERIENCE + HADDAM NECK (PWR) + REACTIVITY, EXCESS + REACTOR, PWR

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-25944 ALSO IN CATEGORIES 5 AND 6
MORRISON DL + CARBIENER WA + RITZMAN RL + BLUTREICH JN + CLARK WE + DENNING RS + GIESEKE JA + WOOTON RO
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR
ACCIDENT, QUARTERLY PROGRESS REPORT FOR JANUARY THROUGH MARCH, 1968
BATTTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO
BMT-1835 +. 30 PAGES, 4 FIGURES, 8 TABLES, 30 REFERENCES, APRIL 1, 1968

PROGRESS REPORT ON THE FOLLOWING AREAS - ECCSA COMPUTER CODE DEVELOPMENT, CALCULATIONS OF
ACCIDENT HEAT TRANSFER, EVALUATION OF REACTOR KINETICS PROBLEMS, REACTIVITY-ACCIDENT
INITIATION OF A LOSS-OF-COOLANT ACCIDENT, FISSION PRODUCT RELEASE FROM UO₂, AEROSOL-PARTICLE
CHARGING, PARTICLE COLLECTION IN PRESSURE-SUSPENSION POOLS, FISSION-PRODUCT TRANSPORT AND
DEPOSITION MODELS, AND CONDITIONS AND CRITERIA FOR PAINT PERFORMANCE IN REACTOR CONTAINMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + *FISSION PRODUCT TRANSPORT + *REACTOR KINETICS +
ACCIDENT, REACTIVITY + AEROSOL + COMPUTER PROGRAM + CONTAINMENT PAINT + FISSION PRODUCT RELEASE, GENERAL +
FISSION PRODUCT RETENTION + HEAT TRANSFER + SPACE DEPENDENT DYNAMICS

7-26413 ALSO IN CATEGORIES 1 AND 11
COTTRELL WB
NUCLEAR SAFETY PROGRAM ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1967
OAK RIDGE NATIONAL LABORATORY
ORNL-4228 +. 443 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1968

THE ORNL NUCLEAR SAFETY PROGRAM INVOLVES TASKS IN SEVERAL LABORATORY DIVISIONS AND IS CLOSELY
RELATED TO PROGRAMS AT OTHER LABORATORIES. THIS REPORT IS ONE OF A CONTINUING SERIES
STARTING WITH ORNL-3319 IN 1962. IT CONTAINS PROGRESS REPORTS ON VARIOUS ASPECTS OF
CHARACTERIZATION AND BEHAVIOR OF ACCIDENT-RELEASES, FISSION PRODUCTS, FILTRATION AND
ADSORPTION TECHNOLOGY, SPRAY AND ADSORPTION TECHNOLOGY, SAFETY STUDIES FOR HIGH-TEMPERATURE
GAS-COOLED REACTORS, SAFETY STUDIES FOR MSBR, PRESSURE VESSEL AND PIPING TECHNOLOGY, GENERAL
NUCLEAR SAFETY STUDIES, AND NUCLEAR SAFETY INFORMATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ADSORPTION + *FILTRATION + *FISSION PRODUCT RELEASE, GENERAL + *INFORMATION RETRIEVAL + *NSIC + *PIPING +
*PRESSURE VESSEL + *REACTOR, BREEDER + *REACTOR, HTGR + *REACTOR, MOLTEN SALT + *SAFETY PROGRAM +
*SPRAY, GENERAL

7-26558 ALSO IN CATEGORIES 11 AND 1
COTTRELL WB
ORNL NUCLEAR SAFETY RESEARCH AND DEVELOPMENT PROGRAM BIMONTHLY REPORT FOR MARCH-APRIL 1968
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-IM-2230 +. 164 PAGES, FIGURES, TABLES, MAY 30, 1968

INCLUDED IN THIS PROGRESS REPORT IS 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. ALTHOUGH MOST OF THE WORK HAS BEEN AND CONTINUES TO BE IN GENERAL
SUPPORT OF WATER POWER-REACTOR TECHNOLOGY, INCLUDING SOME IN DIRECT SUPPORT OF THE LOFT AND
CSE PROGRAMS, SEVERAL PROJECTS WERE STARTED THE FIRST OF THE CALENDAR YEAR IN SUPPORT OF THE
HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGR) PROGRAM. THESE PROJECTS INCLUDE BOTH IN-PILE AND
OUT-PILE STUDIES OF REACTION RATES AND FISSION PRODUCT RELEASE AND TRANSPORT PHENOMENA
RELEVANT TO POTENTIAL HTGR ACCIDENT SITUATIONS. OTHER MAJOR PROJECTS INCLUDE FUEL TRANSPORT
SAFETY INVESTIGATIONS, A SERIES OF DISCUSSION PAPERS ON VARIOUS ASPECTS OF SAFETY
INVESTIGATIONS, A SERIES OF DISCUSSION PAPERS ON VARIOUS ASPECTS OF WATER REACTOR TECHNOLOGY,
AND THE STUDIES ON PRESSURE VESSEL TECHNOLOGY. EXPERIMENTAL WORK RELATIVE TO PRESSURE VESSEL
TECHNOLOGY INCLUDES INVESTIGATIONS OF THE ATTACHMENT OF NOZZLES TO SHELLS AND THE VARIABILITY
OF IMPACT DATA ON LOW-ALLOY STEELS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151 \$3.00 COPY, \$0.65 MICROFICHE

*CHEMICAL KINETICS + *CONTAINMENT, GENERAL + *CSE + *FISSION PRODUCT RETENTION +
*FISSION PRODUCT TRANSPORT + *FISSION PRODUCT, AIRBORNE + *IMPACT PROPERTY + *IN PILE EXPERIMENT +
*LOFT (S-RR) + *NOZZLE + *OUT OF PILE LOOPS AND EXPERIMENTS + *STEEL + CONTAINMENT SPRAY +
FISSION PRODUCT RELEASE, GENERAL + PRESSURE VESSEL + REACTOR, HTGR

7-27028 ALSO IN CATEGORY 4
EICHELBURGER RL + MCKISSON RL
SOLUBILITY OF COPPER IN SODIUM
ATOMICS INTERNATIONAL
AI-AEC-12671 +. 22 PAGES, 8 FIGURES, 3 TABLES, 4 REFERENCES, MAY, 1968

THE SOLUBILITY OF COPPER IN SODIUM HAS BEEN STUDIED IN THE TEMPERATURE RANGE OF 250 TO 726 C,

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27028 *CONTINUED*

USING A VERY HIGH PURITY SODIUM AND OXYGEN FREE HIGH CONDUCTIVITY COPPER. A CAPSULE WAS USED, WITH THE SODIUM EXPOSED ONLY TO HIGH VACUUM. CHEMICAL ANALYSIS WAS PERFORMED USING COLORIMETRY AND ATOMIC ABSORPTION SPECTROMETRY. RESULTS OF THE 21 EXPERIMENTS REPORTED BETWEEN 350 AND 726 C WERE COMBINED WITH THOSE FROM TWO OTHER STUDIES TO GIVE AN EXPRESSION BASED ON 39 DATA POINTS AND COVERING THE TEMPERATURE RANGE OF 245 TO 726 C.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22515
\$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL TECHNIQUE, CALIBRATION + *COPPER + *METAL, LIQUID + *SODIUM + PROPERTY, PHYSICAL + REACTOR, LMCR

7-27029 ALSO IN CATEGORY 4

MOREWITZ HA + KOONTZ RL + NELSON CT + GREENFIELD MA + HAUSKNECHT DF
SODIUM BURNING, AEROSOL GENERATION, AND CONTROL OF FISSION PRODUCT RELEASE DURING AN ACCIDENT PART II.
AEROSOL GENERATION AND CONTROL OF FISSION PRODUCT RELEASE
ATOMICS INTERNATIONAL +
29 PAGES, 16 FIGURES, TABLE, 4 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

RESULTS ARE PRESENTED FOR WORK IN PROGRESS AT ATOMICS INTERNATIONAL TO DEVELOP EXPERIMENTAL INFORMATION AND ANALYTICAL METHODS WHICH CHARACTERIZE THE RELEASE AND TRANSPORT OF EFFLUENTS GENERATED DURING A SODIUM FIRE IN AN LMFR. DATA ARE PRESENTED FROM EXPERIMENTS WHICH DESCRIBE THE TIME-HISTORY OF PARTICLE SIZE AND MASS DISTRIBUTION OF AEROSOLS GENERATED DURING SODIUM FIRES. EXPERIMENTAL OBSERVATIONS ARE MADE TO STUDY AEROSOL DEPLETION RESULTING FROM AGGLOMERATION, FALLOUT, AND WALL PLATING MECHANISMS. PREDICTION OF SODIUM OXIDE AEROSOL BEHAVIOR USING A THEORETICAL MODEL IS IN AGREEMENT WITH EXPERIMENTAL OBSERVATIONS IN THE LABORATORY. THE INTERACTION OF THE DOMINANT AEROSOL SPECIES, SODIUM OXIDE, WITH FUEL AND FISSION PRODUCT AEROSOLS IS ALSO DESCRIBED.

AVAILABILITY - H.A. MOREWITZ, P.O. BOX 309, CANOGA PARK, CALIFORNIA

*AEROSOL PRODUCTION + *AEROSOL PROPERTIES + *ANALYTICAL MODEL + *FIRE + *METAL, LIQUID + *OXIDE + *REACTOR, LMCR + *SODIUM + AGGLOMERATE + DEPOSITION + FALLOUT + FISSION PRODUCT TRANSPORT

7-27030 ALSO IN CATEGORY 4

MACPHERSON RE
SODIUM BURNING AND AEROSOL RELEASE - AN EVALUATION OF THE STATE OF THE ART
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1937 +. 33 PAGES, 26 REFERENCES, MAY 6, 1968

IN A SODIUM-COOLED REACTOR, THE POSSIBILITY OF SODIUM FIRES AND THE RESULTANT RELEASE OF AEROSOLS STRONGLY INFLUENCE CONTAINMENT VESSEL DESIGN AND OPERATING SAFETY. QUALITATIVE INVESTIGATIONS OF SODIUM POOL FIRES AND SPRAY FIRES HAVE BEEN CARRIED OUT IN CONJUNCTION WITH EACH MAJOR SODIUM-COOLED REACTOR PROJECT. RECENTLY, MORE QUANTITATIVE STUDIES WERE UNDERTAKEN IN THESE AREAS, AND THE PROBLEM OF EXPLOSIVE INJECTION OF SODIUM SPRAYS INTO CONTAINMENT VOLUMES WAS INVESTIGATED. WORK IS ALSO UNDER WAY TO CHARACTERIZE AEROSOLS RELEASED FROM SODIUM FIRES AND TO DEFINE THEIR PERFORMANCE IN THE CONTAINMENT VOLUME. THIS DOCUMENT BRIEFLY SUMMARIZES THE WORK TO DATE ON SODIUM FIRES AND AEROSOL RELEASE, REVIEWS THE SCOPE OF CURRENT PROGRAMS, AND THEN PROPOSES ADDITIONAL EFFORT TO PROVIDE SAFETY CRITERIA FOR LIQUID-METAL-COOLED FAST-REACTOR DESIGN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FIRE + *METAL, LIQUID + *REACTOR, LMCR + AEROSOL PRODUCTION + AEROSOL PROPERTIES + OXIDE + SAFETY REVIEW + SODIUM

7-27031 ALSO IN CATEGORY 4

GORLAND S + BILSKI R
CONTROL OF CONTAMINANTS IN LIQUID-METAL SYSTEMS
NASA, LEWIS RESEARCH CENTER
NASA-TM-X-1432 +. 9 PAGES, 7 FIGURES, TABLE, 10 REFERENCES, DECEMBER, 1967

THE CONTAMINANT CONTROLS AND CLEANING PROCEDURES USED IN THE SNAP-8 SIMULATION LOOP, CONSISTING OF TWO SODIUM-POTASSIUM (NAK) LOOPS AND ONE MERCURY LOOP, MINIMIZED BOTH STARTUP AND OPERATIONAL PROBLEMS. MERCURY WETTING WAS INDUCED IN THE BOILER AND CONDENSER AS DETERMINED BY PROGRESSIVE IMPROVEMENT IN THE HEAT-TRANSFER PERFORMANCE. THE DEGREE OF WETTING IS AN INDICATION OF THE SYSTEM CLEANLINESS. THE BOILER WAS CONDITIONED IN APPROXIMATELY 250 HOURS OF OPERATION WITHOUT WETTING ADDITIVES. AFTER 384 HOURS OF OPERATION, ANALYSIS OF A HG SAMPLE BY A DISTILLATION METHOD INDICATED NO CONTAMINATION. OXIDE PLUGGING IN THE NAK LOOPS WAS MINIMIZED USING THE LOOP-ENTRY PROCEDURES DEVELOPED IN THE INVESTIGATION. NO PLUGS OCCURRED BECAUSE OF CHANGED OR OF REPAIRS THAT REQUIRED SYSTEM ENTRY, AND ONLY MINOR PARTIAL PLUGS OCCURRED IN OVER 1500 HOURS OF OPERATION OF THE NAK LOOPS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*MERCURY + *METAL, LIQUID + *OPERATING EXPERIENCE + *OUT OF PILE LOOPS AND EXPERIMENTS + *OXIDE + *SODIUM + DECONTAMINATION + NAK + PIPING + REACTOR, LMCR + REACTOR, SPACE + SNAP 8 (SR)

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27032

PARKER GW + LORENZ RA + RITTENHOUSE PL + OSBORNE MF + CREEK GE
CHARACTERIZATION AND BEHAVIOR OF ACCIDENT-RELEASED FISSION PRODUCTS (PART I)
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4228 +. 70 PAGES, 38 FIGURES, 10 TABLES, PAGES 3-72 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - PROMPT RELEASE OF FISSION PRODUCTS FROM ZIRCALOY-CLAS UO2 FUELS
- OUT-OF-PILE EXPERIMENTS WITH FUELS IRRADIATED AT HIGH HEAT-GENERATION RATES, PROMPT
FISSION-PRODUCT RELEASE STUDIES IN TREAT, CALCULATION OF AMOUNT OF VOLATILE RADIOACTIVITY IN
FUEL ROD VOID SPACES, STUDIES OF ZIRCALOY TUBE-BURST PHENOMENA. CHARACTERIZATION OF
SIMULATED ACCIDENT AEROSOLS - PORTABLE SAMPLER FOR CHARACTERIZATION OF SIMULATED AEROSOLS.
OUT-OF-PILE TESTS OF CSE SIMULANT, IN-PILE TESTS OF CSE SIMULANT. IN-PILE RELEASE OF FISSION
PRODUCTS IN SIMULATED REACTOR ACCIDENTS - SIMULATED LOSS-OF-COOLANT ACCIDENTS IN ORR,
SIMULATED TRANSIENT ACCIDENTS IN TREAT. LOFT ASSISTANCE PROGRAM - EXPERIMENTAL FACILITIES,
EXPERIMENTAL PROGRAM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*AEROSOL PROPERTIES + *ALLOY + *FISSION PRODUCT RELEASE, GENERAL + *IN PILE EXPERIMENT +
*OUT OF PILE LOOPS AND EXPERIMENTS + *SAMPLING + *SIMULATION + *ZIRCONIUM + AEROSOL PRODUCTION + CSE +
FILTER, CASCADE IMPACTOR + FISSION GAS RELEASE + FISSION PRODUCT TRANSPORT + FISSION PRODUCT, VOLATILE +
LOFT (S-RR) + NSPP + ORR (RR) + PARTICLE SIZE + TREAT (PRR)

7-27033

FONTANA MH
CHARACTERIZATION AND BEHAVIOR OF ACCIDENT RELEASED FISSION PRODUCTS (PART II)
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4228 +. 28 PAGES, 47 FIGURES, 37 REFERENCES, PAGES 72-99 FROM THE NSP ANNUAL PROGRESS REPORT, APRIL,
1968

PROGRESS REPORT DEALING WITH - CHEMICAL EQUILIBRIA OF FISSION-PRODUCT FUEL MIXTURES - THE
URANIUM-OXYGEN AND URANIUM-OXYGEN-STRONTIUM SYSTEMS, ESTIMATION OF THERMODYNAMIC PROPERTIES.
FISSION-PRODUCT TRANSPORT BEHAVIOR IN CONTAINMENT VESSELS DUE TO NATURAL PHENOMENA -
TRANSPORT STUDIES IN THE NUCLEAR SAFETY PILOT PLANT, STUDIES OF CONVECTION IN CONTAINMENT
VESSELS, BOUNDARY-LAYER ANALYSIS OF THE EFFECT OF CONDENSATION ON FISSION-PRODUCT DEPOSITION.

*CHEMICAL EQUILIBRIUM + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT TRANSPORT +
*THERMAL PROPERTY + *THERMODYNAMICS + CONDENSATION + DEPOSITION + FISSION PRODUCT RETENTION +
FUEL MELTDOWN + NSPP + URANIUM DIOXIDE + VAPOR, VAPOR PRESSURE

7-27034

ADAMS RE + ACKLEY RD + CGMBS Z
FILTRATION AND ADSORPTION TECHNOLOGY (PART I)
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4228 +. 48 PAGES, 15 FIGURES, 16 TABLES, PAGES 99-148 FROM THE NSP ANNUAL PROGRESS REPORT, APRIL,
1968

PROGRESS REPORT DEALING WITH - TRAPPING OF RADIOACTIVE IODINE AND METHYL IODIDE BY IODIZED
CHARCOAL - REMOVAL OF METHYL IODIDE FROM MOIST AIR SYSTEMS, REMOVAL OF ELEMENTAL IODINE FROM
MOIST AIR SYSTEMS, LOSS OF IMPREGNANT FROM IODIZED CHARCOAL AT ELEVATED TEMPERATURES, EFFECT
OF WEATHERING ON METHYL IODIDE REMOVAL EFFICIENCY OF IODIZED CHARCOAL. REACTIONS OF IODINE
VAPOR UNDER ACCIDENT CONDITIONS - REACTIONS OF IODINE IN CONTAINMENT SYSTEMS, ANALYTICAL
STUDIES OF METHYL IODIDE FORMATION, MECHANISM OF SORPTION OF MOLECULAR IODINE. DEVELOPMENT
OF IODINE-CHARACTERIZATION SAMPLERS - TESTING OF IODINE-CHARACTERIZATION PACK (MAY PACK),
DEVELOPMENT AND TESTING OF HONEYCOMB IODINE SAMPLER. FILTRATION OF STAINLESS STEEL-UO2
AEROSOLS - FILTRATION OF AEROSOLS BY HIGH EFFICIENCY FILTER MEDIA, BEHAVIOR OF AEROSOLS IN
HUMID ATMOSPHERES.

*AEROSOL PROPERTIES + *CHARCOAL ADSORBER + *FILTER EFFICIENCY + *FISSION PRODUCT, IODINE +
*ORGANIC IODIDE + *SAMPLING + AIR CLEANING + FILTER CHARACTERISTICS + FILTER SYSTEM +
FILTER, CASCADE IMPACTOR + HUMIDITY + IODINE + OUT OF PILE LOOPS AND EXPERIMENTS +
PARTICLE SIZE DISTRIBUTION + SIMULATION + STEAM

7-27035

ADAMS RW + DAVIS RJ + GILL JS + TRUITT J + BUCHHOLZ H
FILTRATION AND ADSORPTION TECHNOLOGY (PART II)
ORNL-4228 +. 46 PAGES, 34 FIGURES, 18 TABLES, 51 REFERENCES, PAGES 148-193 FROM THE NSP ANNUAL PROGRESS
REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - CHARACTERIZATION OF RADIOACTIVE PARTICULATE AEROSOLS -
AGGLOMERATION OF AEROSOLS, CHARACTERIZATION OF AEROSOLS BY THE FIBROUS-FILTER ANALYZER,
DEVELOPMENT OF A MULTISTAGE INERTIAL IMPACTOR FOR CHARACTERIZING SOLID AEROSOLS, DEVELOPMENT
OF A LOW-PRESSURE IMPACTOR FOR THE CLASSIFICATION OF SUBMICRON PARTICLES. IGNITION OF
CHARCOAL ADSORBERS BY FISSION-PRODUCT DECAY HEAT - IN-PILE CHARCOAL IGNITION EXPERIMENTS,
LABORATORY CHARCOAL IGNITION EXPERIMENTS, ANALYTICAL CORRELATION OF IGNITION DATA.
SEPARATION OF NOBLE GASES FROM AIR BY PERMELECTIVE MEMBRANES - CRITERIA FOR REACTOR ACCIDENT

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27035 *CONTINUED*

NUCLEAR SAFETY STUDIES, DEVELOPMENT OF IMPROVED SEPARATIONS MEMBRANES AND A MULTIMEMBRANE PACKAGE, PERMEABILITY OF NITROGEN, OXYGEN, ARGON, KRYPTON, AND XENON THROUGH A DIMETHYL SILICONE RUBBER MEMBRANE. ENGINEERING MANUAL FOR DESIGN AND CONSTRUCTION OF HIGH-EFFICIENCY FILTER SYSTEMS.

*AEROSOL PROPERTIES + *FILTER EFFICIENCY + *FILTER, CASCADE IMPACTOR + *IGNITION + *NOBLE GAS + *SAMPLING + AIR CLEANING + CHARCOAL + FILTER SYSTEM + IN PILE EXPERIMENT + OUT OF PILE LOOPS AND EXPERIMENTS + PARTICLE SIZE DISTRIBUTION + SIMULATION

7-27036

PATTERSON CS + HUMPHRIES WT

SPRAY AND ABSORPTION TECHNOLOGY (PART I)

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-4228 +. 23 PAGES, 12 FIGURES, PAGES 193-215 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - EQUILIBRIUM DISTRIBUTION OF I2 BETWEEN NITROGEN STREAMS AND AQUEOUS SOLUTIONS AT 25 C - EXPERIMENTAL EQUIPMENT AND PROCEDURE, EXPERIMENTAL RESULTS, ANALYSIS OF DATA. UPTAKE OF CH3I BY A SUSPENDED DROP OF WATER SOLUTION - EXPERIMENTAL SYSTEM, TREATMENT OF DATA, ROLE OF ADDITIVES, EFFECT OF RADIATION ON THE MASS TRANSPORT OF CH3I INTO A WATER DROP, EFFECT OF RELATIVE HUMIDITY ON MASS TRANSFER OF CH3I.

*ANALYTICAL TECHNIQUE, CALIBRATION + *CHEMICAL EQUILIBRIUM + *DECONTAMINATION FACTOR + *ORGANIC IODIDE + *SPRAY, GENERAL + DIFFUSION + FISSION PRODUCT, IODINE + IODINE + MASS TRANSFER + WATER VAPOR

7-27037

PARKER GW + CREEK GE + HORTON NR

SPRAY AND ABSORPTION TECHNOLOGY (PART II)

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-4228 +. 29 PAGES, 17 FIGURES, 10 TABLES, 13 REFERENCES, PAGES 215-243 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - DISSOLUTION AND HYDROLYSIS OF METHYL IODIDE IN MISTING SPRAY SOLUTIONS - EXPERIMENTAL EQUIPMENT, EXPERIMENTAL PROCEDURE. SPRAY TESTS IN THE NUCLEAR SAFETY PILOT PLANT - EQUIPMENT AND EXPERIMENTAL PROCEDURE, FIRST SERIES OF EXPERIMENTS, SECOND SERIES OF EXPERIMENTS, THEORETICAL STUDIES, CONTINUATION OF PROGRAM. RADIATION STABILITY OF SPRAY SOLUTIONS - EFFECT OF RADIATION ON PH, I2 EQUIVALENCE, AND SOLIDS FORMATION, RADIOLYTIC H2 PRODUCTION. SCAVENGING OF FISSION PRODUCTS BY SUPPRESSION POOLS.

*CONTAINMENT, PRESSURE SUPPRESSION + *HYDROGEN + *NSPP + *ORGANIC IODIDE + *RADIATION EFFECT + DECONTAMINATION FACTOR + DECONTAMINATION SPRAY + IODINE + MIST + RADIATION DAMAGE + SPRAY, GENERAL

7-27038

BAKER JE + BLOOD CM + HEBERT GM + OVERHOLSER LG

SAFETY STUDIES FOR HIGH-TEMPERATURE GAS-COOLED REACTORS

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-4228 +. 41 PAGES, 13 FIGURES, 6 TABLES, 15 REFERENCES, PAGES 243-289 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - STEAM-CARBON REACTION AND FISSION-PRODUCT RELEASE AND TRANSPORT STUDIES - OXIDATION OF BONDED COATED-PARTICLE FUEL COMPACTS, OXIDATION OF PYROLYTIC-CARBON-COATED FUEL PARTICLES BY WATER VAPOR, STEAM-GRAPHITE REACTION, TRANSPORT OF BARIUM BY HELIUM, IN-PILE BEHAVIOR OF HTGR FUEL ELEMENTS IN MIXTURES OF STEAM AND HELIUM ENGINEERING-SCALE STEAM-GRAPHITE REACTION STUDIES - ENGINEERING-SCALE TEST FACILITY, ANALYTICAL STUDIES OF STEAM-GRAPHITE REACTION. HTGR FUEL TESTS IN THE ORR POOLSIDE CAPSULE FACILITY - TEST DESCRIPTION, POSTIRRADIATION EVALUATION. THERMODYNAMIC AND TRANSPORT PROPERTIES OF FISSION PRODUCTS - EFFECT OF WATER VAPOR ON THE VOLATILITY OF FISSION-PRODUCT OXIDES, FISSION-PRODUCT DEPOSITION CHARACTERISTICS IN THERMAL GRADIENTS.

*CARBON + *CHEMICAL REACTION + *COATED PARTICLE + *FISSION PRODUCT RETENTION + *GRAPHITE + *IN PILE EXPERIMENT + *OXIDATION + *STEAM + ANALYTICAL TECHNIQUE, CALIBRATION + DEPOSITION + DIFFUSION + FISSION PRODUCT TRANSPORT + FISSION RECOIL + IRRADIATION TESTING + THERMAL PROPERTY + THERMODYNAMICS + WATER VAPOR

7-27039

ALSO IN CATEGORY 6

SAFETY STUDIES FOR MSBR

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-4228 +. 23 PAGES, 8 FIGURES, TABLE, 8 REFERENCES, PAGES 289-311 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - MSBR DYNAMIC STUDIES - REACTOR SYSTEM RESPONSE TO REACTIVITY CHANGES, REACTOR SYSTEM STABILITY STUDIES. MSBR TEMPERATURE COEFFICIENTS OF REACTIVITY. FISSION-PRODUCT BEHAVIOR IN MOLTEN-SALT REACTORS - FISSION-PRODUCT CONCENTRATIONS IN THE MSRE, STABILITY OF MOLYBDENUM FLUORIDES IN LiF-BE2F2 MELTS. MOLTEN-SALT COMPATIBILITY STUDIES. AFTERHEAT GENERATION IN AN MSBR SYSTEM - AFTERHEAT GENERATION IN AN MSBR FUEL-LOOP HEAT EXCHANGER, AFTERHEAT GENERATION IN GRAPHITE DUE TO FISSION-PRODUCT GASES AND THEIR DECAY PRODUCTS. CALCULATION OF FISSION-PRODUCT BUILDUP IN AN MSBR.

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27039 *CONTINUED*

*COMPUTER, ANALOG + *DECAY HEAT + *FISSION PRODUCT TRANSPORT + *MOLTEN FUEL + *REACTIVITY EFFECT +
*REACTOR STABILITY + ANALYTICAL MODEL + COMPUTER CONTROL + COMPUTER PROGRAM + EQUATION OF STATE +
FISSION PRODUCT ACTIVITY, GROSS + MSRE (IRE) + REACTOR, MOLTEN SALT

7-27056 ALSO IN CATEGORY 5

FONTANA MH

THE CHEMICAL EQUILIBRIA OF FISSION PRODUCT NUCLEAR FUEL MIXTURES -- THE URANIUM OXYGEN AND THE URANIUM OXYGEN STRONTIUM SYSTEM

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-TM-2105 +. 272 PAGES, 31 FIGURES, 28 TABLES, 74 REFERENCES, SUBMITTED TO THE FACULTY OF PURDUE UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY, JULY 1968

THE TRANSPORT OF FISSION PRODUCTS RELEASED DURING A REACTOR ACCIDENT DEPENDS IN PART UPON THE CHEMICAL STATE IN WHICH THEY EXIST. COMPUTATION OF CHEMICAL EQUILIBRIA IN THE GAS PHASE AROUND A MELTED FUEL ELEMENT IS DIFFICULT BECAUSE THE FUEL MAY ACT AS A SOLVENT FOR FISSION PRODUCTS. ALSO, FUELS SUCH AS URANIUM OXIDE FORM A NONSTOICHIOMETRIC CONDENSED PHASE. METHODS OF USING MULTICOMPONENT CHEMICAL-EQUILIBRIUM COMPUTER TECHNIQUES HAVE BEEN DEVELOPED FOR TREATING THIS PROBLEM, AND THEY HAVE BEEN TESTED AGAINST PUBLISHED KNUDSEN CELL-MASS SPECTROMETER DATA FOR THE U-O SYSTEM. THIS SERVED AS A BASE POINT FROM WHICH THE U-SR-O SYSTEM WAS EXTENDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CHEMICAL EQUILIBRIUM + *FISSION PRODUCT RELEASE, GENERAL + *FISSION PRODUCT TRANSPORT + OXYGEN +
STRONTIUM + URANIUM DIOXIDE + URANIUM, NATURAL

7-27065

LUDWIG FL

BEHAVIOR OF A NUMERICAL ANALOG TO A CASCADE IMPACTOR

STANFORD RESEARCH INSTITUTE, MENLO PARK, CALIFORNIA

4 PAGES, 4 FIGURES, 6 REFERENCES, ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 2(7), PAGES 547-550 (JULY, 1968)

A SIMPLE NUMERICAL ANALOG TO CASCADE IMPACTORS AND THE RESULTS OF ITS APPLICATION TO THE ANDERSEN SAMPLER ARE DESCRIBED. COMMONLY USED DATA REDUCTION TECHNIQUES OVERESTIMATE THE GEOMETRIC STANDARD DEVIATION OF SAMPLED SIZE DISTRIBUTIONS. THE OVERESTIMATE IS SMALL FOR GEOMETRIC STANDARD DEVIATIONS GREATER THAN ABOUT 4 BUT BECOMES SIGNIFICANT FOR VALUES LESS THAN 2. THE EFFECTS OF THIS ARTIFACT ON THE ESTIMATE OF MEDIAN DIAMETER ARE SMALL. THE MAGNITUDES OF THE ERRORS ARE RELATED TO THE SHAPE OF THE PARTICLE-SIZE SPECTRUM OVER THE DIAMETER RANGE SAMPLED BY THE IMPACTOR.

*ANALOG SIMULATION + *FILTER, CASCADE IMPACTOR + *PARTICLE SIZE DISTRIBUTION + *THEORETICAL INVESTIGATION +
AEROSOL + COMPUTER, ANALOG + SAMPLING

7-27066

GENCO JM + ROSENBERG HS + MORRISON DL

IODINE DEPOSITION AND ITS ENHANCEMENT UNDER REACTOR ACCIDENT CONDITIONS

BATTELLE MEMORIAL INSTITUTE

13 PAGES, 12 FIGURES, 4 TABLES, 16 REFERENCES, NUCLEAR SAFETY, 9(3), PAGES 226-238 (MAY-JUNE, 1968)

THE CURRENT STATUS OF FUNDAMENTAL IODINE DEPOSITION STUDIES AT THE COLUMBUS LABORATORIES OF BATTELLE MEMORIAL INSTITUTE IS SUMMARIZED. DEPOSITION EXPERIMENTS WERE CONDUCTED ON PRIMARY- AND CONTAINMENT-SYSTEM SURFACES, AND IT WAS FOUND THAT HI EXHIBITS CONSIDERABLY GREATER DEPOSITION THAN I2 ON PRIMARY SURFACES, ESPECIALLY AT ELEVATED TEMPERATURES. THERMODYNAMIC AND KINETIC DATA ON SEVERAL TYPICAL CONTAINMENT-VESSEL PAINTS INDICATED CONSIDERABLE IODINE PENETRATION INTO THE INTERIOR OF THE COATINGS. A DIFFUSION WITH CHEMICAL-REACTION MECHANISM CAN ADEQUATELY EXPLAIN THE DATA. EFFORT HAS BEEN DIRECTED TO THE DEVELOPMENT OF A REACTIVE COATING SYSTEM CAPABLE OF ENHANCING IODINE DEPOSITION UNDER SERIOUS REACTOR ACCIDENT CONDITIONS.

*CHEMICAL KINETICS + *COATING, SURFACE + *DEPOSITION + *FISSION PRODUCT, IODINE + *SURFACE, PAINTED +
*THERMODYNAMICS + CHEMICAL REACTION + DECONTAMINATION + DIFFUSION + FISSION PRODUCT TRANSPORT + IODINE +
THEORETICAL INVESTIGATION

7-27067

GENCO JM + ROSENBERG HS + BERRY DA + BERRY WE + CREMEANS GE + RITZMAN RL + DRAUGLIS EJ + MORRISON DL

FISSION-PRODUCT DEPOSITION AND ITS ENHANCEMENT UNDER REACTOR ACCIDENT CONDITIONS

BATTELLE MEMORIAL INSTITUTE

BMI-X-10229 +. 62 PAGES, 16 FIGURES, 22 TABLES, 22 REFERENCES, APRIL, 1968

PROGRESS REPORT DEALING WITH END EFFECTS AND ANOMALOUS IODINE-DEPOSITION BEHAVIOR, LIQUID-PHASE DEPOSITION OF HI ON CONTAINMENT-SYSTEMS COATINGS, TELLURIUM AND CESIUM DEPOSITION, VAPOR-PHASE DEPOSITION OF IODINE ON PAINTED SURFACES, REACTIVE COATINGS AS A PASSIVE SAFETY SYSTEM, EVALUATION OF COATING CANDIDATES FOR THE REMOVAL OF ELEMENTAL IODINE AIR-STREAM MIXTURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27067 *CONTINUED*
22151 \$3.00 COPY, \$0.65 MICROFICHE

*CESIUM + *COATING, SURFACE + *IODINE + *ORGANIC IODIDE + *SURFACE, PAINTED + *TELLURIUM +
DECONTAMINATION + DEPOSITION

7-27068
PARKER GW + BUCHHOLZ H
SIZE CLASSIFICATION OF SUBMICRON PARTICLES BY A LOW-PRESSURE CASCADE IMPACTOR
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4226 +. 64 PAGES, 22 FIGURES, 10 TABLES, 19 REFERENCES, CONTRACT NO. W-7405-ENG-26, JUNE, 1968

1. THE PRINCIPLE OF THE CASCADE IMPACTOR IS SIMPLE. A GAS WHICH IS CARRYING PARTICLES, IS ACCELERATED THROUGH A NOZZLE AND IMPINGED ON A PLATE. PARTICLES HAVING SUFFICIENT INERTIA (I.E., THE LARGE PARTICLES) LEAVE THE JET STREAM LINES AND SETTLE ON THE PLATE. SUCCESSIVE STAGES WITH JETS OF INCREASING VELOCITY REMOVE SUCCESSIVELY SMALLER PARTICLES. OPERATION AT LOW PRESSURE INCREASES THE MEAN FREE PATH OF THE GAS MOLECULES AND THE CUNNINGHAM CORRECTION (FOR THE SLIP OF SMALL PARTICLES BETWEEN GAS MOLECULES). THIS ENABLES ONE TO DESIGN A CASCADE IMPACTOR OF REASONABLE JET SIZE WHICH WILL SEPARATE SUBMICRON PARTICLES. 2. IN THIS WORK A COMMERCIAL (ANDERSEN) IMPACTOR, MODIFIED FOR LOW PRESSURE OPERATION, AND AN IMPACTOR OR ORIGINAL DESIGN WERE BUILT, TESTED AND CALIBRATED. DESIGN DATA AND CALIBRATION CURVES ARE REPORTED. THE PARTICLE SIZE CALIBRATION CURVES ARE REPORTED. THE PARTICLE SIZE RANGE SEPARATED IS FROM ABOUT 0.01 MICRON TO SEVERAL MICRONS DIAMETER. THE ORIGINAL DESIGN IMPACTOR IS ASSEMBLED AND DISASSEMBLED VERY SIMPLY AND EMPLOYS THROW-AWAY IMPACTOR PLATES TO FACILITATE DECONTAMINATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*AEROSOL + *FILTER, CASCADE IMPACTOR + *PARTICLE SIZE DISTRIBUTION + *SAMPLING + AIR CLEANING +
ANALYTICAL TECHNIQUE, CALIBRATION + INSTRUMENTATION, AIR SAMPLING + PARTICLE SIZE

7-27069
BENZEL M + BREMEN F + BRAUN F
AN ARRANGEMENT FOR INSERTING, HOLDING AND SEALING EXCHANGEABLE FILTERS INTO DISCHARGE DUCTS FOR POLLUTED AIR
BRITISH PATENT 1,089,730 +. 4 PAGES, 4 FIGURES, NOVEMBER 8, 1967

THE EQUIPMENT IS DESCRIBED AND IS PARTICULARLY SUITED FOR AIR DUCTS CARRYING RADIOACTIVE DUST. THE FILTER ELEMENT, WHICH HAS A RIGID RECTANGULAR FRAME WITH A SEALING GASKET BONDED TO THE FRAME, IS INSERTED THROUGH A CLOSEABLE OPENING IN THE DUCT BY TOGGLE LEVERS, AND THE SEALING GASKET IS PRESSED TO A SEALING FLANGE LOCATED INSIDE THE DUCT.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*FILTER MAINTENANCE + *FILTER SYSTEM + *PATENT + FILTER + FILTER INSTALLATION + FILTER OPERATION

7-27070
PIEKAR HW + CLARENBURG LA
AEROSOL FILTERS - THE TORTUOSITY FACTOR IN FIBROUS FILTERS
CHEMICAL LABORATORY OF THE NATIONAL DEFENCE RESEARCH ORGANIZATION T.N.O., TIJSWIJK Z.H., THE NETHERLANDS
11 PAGES, 6 FIGURES, TABLE, 27 REFERENCES, CHEMICAL ENGINEERING SCIENCE, 22(12), PAGES 1817-1827 (1967)

A THEORETICAL DERIVATION IS GIVEN OF THE TORTUOSITY FACTOR FOR A FLOW THROUGH FIBROUS FILTERS, BASED ON PURELY GEOMETRICAL CONSIDERATIONS. THE RESULTING EXPRESSION FOR THE TORTUOSITY APPEARS TO BE A FUNCTION OF FILTER AND FIBRE PROPERTIES. FOR LAMINAR AIR FLOW THE TORTUOSITY FACTOR IS CALCULATED AS A FUNCTION OF POROSITY AND OF FILTER COMPOSITION. ALTHOUGH THE RESULTING CURVES ARE IN QUANTITATIVE AGREEMENT WITH THE EXPERIMENTAL WORK OF SULLIVAN, FREQUENTLY REFERRED TO, THERE IS MUCH EVIDENCE THAT SULLIVAN DID NOT MEASURE TORTUOSITY ALONE. FINALLY THE TORTUOSITY FACTOR IS CALCULATED FOR ELECTRICAL FLOW THROUGH FIBROUS FILTERS SATURATED WITH A CONDUCTING LIQUID. THEORETICAL AND EXPERIMENTAL RESULTS ARE IN EXCELLENT AGREEMENT. THEREFORE, IT MAY BE CONCLUDED THAT IT IS NOT JUSTIFIED TO TAKE THE CONSTANT VALUE (SQUARE ROOT OF 2) DERIVED FROM ELECTRICAL MEASUREMENTS FOR THE TORTUOSITY FACTOR OF LAMINAR AIR FLOW THROUGH FIBROUS FILTERS.

*FILTER, FIBER + *THEORETICAL INVESTIGATION + AIR + FILTER THEORY, DIFFUSION + FILTER THEORY, IMPACTION +
FILTER THEORY, INTERCEPTION + FLOW, GENERAL

7-27071
FIRST MW + VILES JF + REIST PC + BULBA EA + OBRIEN MJ + WEKER RA + GOLDIN AS + MOELLER DW
SEMIANNUAL PROGRESS REPORT. HARVARD AIR CLEANING LABORATORY. SEPTEMBER 1, 1967 -- MARCH 1, 1968
HARVARD UNIVERSITY, AIR CLEANING LABORATORY, SCHOOL OF PUBLIC HEALTH, BOSTON, MASS.
NYO-841-12 +. 76 PAGES, 25 FIGURES, 10 TABLES, 14 REFERENCES, APRIL, 1968

(PART ONE) WALL DEPOSITION OF SODIUM PARTICLES. (PART TWO) FOAM ENCAPSULATION FOR REMOVAL OF AIRBORNE IODINE AND METHYL IODIDE. (PART THREE) IN-PLACE FILTER TEST. (PART FOUR) KRYPTON SEPARATION BY ELECTROSTATIC DIFFUSION. (PART FIVE) FALLING DROP CONTAINMENT VESSEL CLEAN-UP SYSTEMS. (PART SIX) INTERNATIONAL SYMPOSIUM AND TENTH AEC AIR CLEANING CONFERENCE.

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27071 *CONTINUED*
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*AEROSOL + *AIR CLEANING + *FOAM + *KRYPTON + *ORGANIC IODIDE + *SODIUM + *SPRAY, GENERAL +
DECONTAMINATION + DEPOSITION + ELECTROSTATIC PRECIPITATION + FILTER + IODINE + TEST, FILTER + TESTING

7-27072
STEVENS DC

RADIOACTIVE AEROSOLS IN SOME SELECTED AREAS AT A.E.R.E. PARTICLE SIZE DISTRIBUTIONS AND LONG TERM MEAN
CONCENTRATIONS MEASURED BY PERSONAL AND STATIC AIR SAMPLERS.
UKAEA, BERKS HARWELL
AERE-R-5688 +. 18 PAGES, 4 FIGURES, 4 TABLES, 13 REFERENCES, JANUARY, 1968

CENTRIPETERS AND PERSONAL AIR SAMPLERS WERE USED FOR ONE YEAR TO MEASURE THE PARTICLE SIZE OF
RADIOACTIVE AEROSOLS IN VARIOUS BUILDINGS AT A.E.R.E., AND TO EXAMINE THE RELATIONSHIP
BETWEEN PERSONAL EXPOSURE AND EXPOSURE MEASURED BY AN ENVIRONMENTAL (STATIC) SAMPLER. THE
ACTIVITY MEDIAN AERODYNAMIC PARTICLE DIAMETER ASSOCIATED WITH THE AIRBORNE ACTIVITY IN THE
INCINERATOR BUILDING AND FILTER HOUSE WAS 5 TO 6 MICRONS FOR BOTH ALPHA AND BETA ACTIVITY,
WITH A GEOMETRIC STANDARD DEVIATION OF 2.5 TO 3.0. SIMILAR SIZE DISTRIBUTIONS WERE OBTAINED
FOR BETA ACTIVITY IN THE HIGH-ACTIVITY-HANDLING BUILDING AND THE WET DECONTAMINATION AREA,
BUT AIRBORNE ALPHA ACTIVITY IN THE LATTER HAD A MEDIAN DIAMETER OF 3.5 MICRONS, WITH A
GEOMETRIC STANDARD DEVIATION OF 4.3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*AEROSOL + *MONITORING PROGRAM, ENVIRONMENTAL + *PARTICLE SIZE + *PARTICLE, RADIOACTIVE + *SAMPLING +
AIR CLEANING + ATMOSPHERIC POLLUTION + ENVIRONMENTAL CONDITION

7-27092 ALSO IN CATEGORY 8
SYMPOSIUM ON METAL-GAS REACTIONS IN ATMOSPHERES CONTAINING CO2
6 PAGES, BRITISH CORROSION JOURNAL, 2(6), PAGES 229-234 (1967)

THE PROGRAMME FOR THIS SYMPOSIUM WAS PREFACED BY THE FOLLOWING OUTLINE OF THE OBJECTIVES OF
THE MEETING - IN THE LAST FEW YEARS MUCH WORK HAS BEEN CARRIED OUT ON THE OXIDATION OF BOILER
AND FUEL CLADDING MATERIALS IN CARBON DIOXIDE ENVIRONMENTS IN THE TEMPERATURE RANGE 350-850 C
IN CONNECTION WITH THE BRITISH GAS-COOLED NUCLEAR REACTOR PROGRAMME. THIS COVERS RIMMING,
SEMI-KILLED AND LOW ALLOY STEELS AND ALSO 9 PER CENT AND 12 PER CENT CHROMIUM AND AUSTENITIC
STEELS. WORK HAS ALSO BEEN DONE IN THE U.K. AND IN EUROPE IN HELIUM ENVIRONMENTS CONTAINING
SMALL AMOUNTS OF CO/CO2, RELATING TO MORE ADVANCED NUCLEAR REACTOR CONCEPTS. THE DISCUSSION
AT THIS SYMPOSIUM WILL COVER REPORTS OF THIS WORK, AND IN ADDITION CORROSION PROBLEMS
ENCOUNTERED IN REFORMERS USED IN THE GAS INDUSTRY AND ALLIED PLANT, ARISING FROM COMBINED
CARBURISING/OXIDISING REACTIONS ON AUSTENITIC STEELS AND HIGH NICKEL ALLOYS.

*ALLOY + *CARBON + *CARBON DIOXIDE + *CARBON MONOXIDE + *OXIDATION + *STEEL + CARBIDE + CHEMICAL KINETICS +
CHROMIUM + CLADDING + CORROSION + DRAGON (HTGR) + REACTOR, GCR + REACTOR, HTGR + STEEL, STAINLESS

7-27093

JAYE S + GOEDDEL WV
HIGH-TEMPERATURE GAS-COOLED REACTOR FUEL AND FUEL CYCLES - THEIR PROGRESS AND PROMISE
GULF GENERAL ATOMIC INCORPORATED, SAN DIEGO, CALIFORNIA
14 PAGES, 11 FIGURES, 7 TABLES, 22 REFERENCES, NUCLEAR ENGINEERING AND DESIGN, 7(4), PAGES 283-296 (APRIL,
1968)

DISCUSSES FUEL AND FUEL CYCLES FOR THE HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGR). A SURVEY
OF DESIGN FEATURES, ANALYTICAL MODELS, AND IRRADIATION TESTING RESULTS OF PYROLYTIC CARBON
COATED FUEL PARTICLES IS PRESENTED. SEVERAL POTENTIALLY ATTRACTIVE FUEL CYCLE POSSIBILITIES
ARE DISCUSSED, AND ALSO TRENDS IN FUEL AND FUEL-CYCLE COSTS FOR LARGE HTGRS.

*CARBON + *COATED PARTICLE + *FUEL INTEGRITY + *PYROLYTIC + *REACTOR, GCR + ANALYTICAL MODEL +
DESIGN CRITERIA + DIFFUSION + HIGH TEMPERATURE + IRRADIATION TESTING

7-27095

KASS S
THE CORROSION AND HYDROGEN ABSORPTION CHARACTERISTICS OF ZIRCONIUM ALLOYS
BETTIS ATOMIC POWER LAB, PITTSBURGH
WAPD-TM-517 +. 61 PAGES, 31 FIGURES, 10 TABLES, 3 REFERENCES, FEBRUARY, 1968

THE CORROSION AND HYDROGEN ABSORPTION PROPERTIES OF ZIRCONIUM-BASE ALLOYS CONTAINING 0.5 OR
1.0% IRON, 0.5 OR 1% CHROMIUM, AND 0 OR 0.5% TIN IN HIGH-TEMPERATURE WATER AND STEAM HAVE
BEEN STUDIED. THE ALLOY CONTAINING 0.5% IRON AND 1.0% CHROMIUM WITH OR WITHOUT 0.5% TIN
EXHIBITS A VERY LOW CORROSION RATE AND AT THE SAME TIME VERY LOW HYDROGEN PICKUP TENDENCIES.
FOR APPLICATIONS AT 680 F AND BELOW, THE CORROSION PROPERTIES OF THE TIN-BEARING ALLOY ARE
SUPERIOR. FOR APPLICATIONS ABOVE 60 F, THE TIN-FREE ALLOY IS SUPERIOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27095 *CONTINUED*

*ADSORPTION + *ALLOY + *CORROSION + *HYDROGEN + *ZIRCONIUM + CHROMIUM + HIGH TEMPERATURE + IRON + STEAM + TIN + WATER, GENERAL

7-27096

BEZELLA WA

ANALYSES OF THE FISSION GASES RELEASED WITHIN SPENT YANKEE FUEL RODS
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PENNSYLVANIA, ATOMIC POWER DIVISION
WCAP-6087 +. 90 PAGES, 33 FIGURES, 10 TABLES, 25 REFERENCES, FEBRUARY, 1968

1. AN ANALYSIS WAS CONDUCTED OF THE GASES FOUND WITHIN 32 UO₂ FUEL RODS REMOVED FROM THE YANKEE REACTOR. THESE RODS SELECTED FOR GAS ANALYSIS EXPERIENCED AVERAGE FUEL BURNUPS FROM 3000 MWD/MTU UP TO 36,000 MWK/MTU. IRRADIATION WAS AT RATHER LOW FUEL HEAT RATINGS WHICH RANGED FROM 0.94 KW/FT TO 4.1 KW/FT WITH FUEL AVERAGE PELLET TEMPERATURES DURING IRRADIATION ESTIMATED TO RANGE FROM 785 F TO 1450 F. 2. THE COMPOSITION OF THE TOTAL GAS COLLECTED FROM THE FUEL RODS WAS DETERMINED SPECTROGRAPHICALLY WITH THE AMOUNT OF THE GAS CONSTITUENTS EVALUATED VOLUMETRICALLY. THE EVOLVED FISSION GASES (KRYPTON AND XENON) FOUND WITHIN THE FUEL RODS VARIED BETWEEN 0.05 PERCENT AND 8.5 PERCENT OF THE AMOUNT WHICH WAS THEORETICALLY PRODUCED. HELIUM GAS FOUND WITHIN THE FUEL RODS RANGED FROM 1.5 PERCENT TO APPROXIMATELY 100 PERCENT OF THAT GENERATED AND WAS ATTRIBUTED TO TERNARY FISSIONS. 3. AN ATTEMPT TO CORRELATE THE HELIUM AND THE FISSION GAS (KR AND XE) RELEASE DATA FROM 20 OF THESE FUEL RODS USING A MODIFIED DIFFUSION MODEL MET WITH LIMITED SUCCESS. THE RATHER LOW TEMPERATURE EXPERIENCED BY THE UO₂ FUEL, THE RELATIVELY LARGE AMOUNTS OF H₂ AND HE GAS PRESENT WITHIN THE FUEL RODS, THE UNCERTAINTIES ASSOCIATED WITH THE PREDICTION OF FUEL ROD THERMAL HISTORIES, AND THE BASIC DIFFUSION MODEL ITSELF PRECLUDED THE ESTABLISHMENT OF A UNIQUE SET OF CORRELATING DIFFUSION PARAMETERS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*FISSION GAS RELEASE + *FUEL BURNUP + *FUEL ELEMENT + *NOBLE GAS + *OPERATING EXPERIENCE + *RELEASE RATE + ANALYTICAL MODEL + DIFFUSION + FUEL INTEGRITY + HELIUM + HYDROGEN + KRYPTON + REACTOR, PWR + XENON + YANKEE (PWR)

7-27284

ALSO IN CATEGORY 13

ADDISON RA + POTTER JE + SMITH SE + WHITE PAF

INSTALLATION OF HIGH-EFFICIENCY FILTERS

UKAEA, ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON, ENGLAND

AWRE-0-81/65 +. 19 PAGES, 6 FIGURES, OCTOBER, 1965

SUMMARIZES THE PRINCIPLES EVOLVED OVER SEVERAL YEARS AT AWRE FOR THE INSTALLATION OF HIGH EFFICIENCY AIR FILTERS IN RADIOACTIVE AND TOXIC PROCESS BUILDINGS PARTICULARLY WITH RESPECT TO THE SAFETY ASPECTS OF THE INSTALLATION. IT IS BASED ON A MORE DETAILED REPORT, AWRE REPORT NO. 0-24/65, WHICH CONTAINS DETAILS OF EXPERIMENTAL WORK ETC. CARRIED OUT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*FABRICATION + *FILTER + *FILTER INSTALLATION + *FUEL CONVERSION + *FUEL ELEMENT + *FUEL REPROCESSING + *ORE CONVERSION + *RADIOISOTOPE + *REACTOR, GENERAL + TESTING

7-27449

INCE G + WALMSLEY R

MECHANICAL COUPLING DEVICES AND NUCLEAR REACTOR FUEL ELEMENTS INCORPORATING THE SAME

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

BRITISH PATENT 1,068,631 +. 5 PAGES, 8 FIGURES, MAY 10, 1967

DESCRIBES A MECHANICAL DEVICE FOR COUPLING GENERALLY CYLINDRICAL TUBULAR MEMBERS TO ROD-LIKE MEMBERS FITTING INSIDE THE TUBULAR MEMBER. THE MEMBERS ARE NOT DISENGAGED BY ACTIONS REVERSE TO THOSE USED FOR ENGAGEMENT. THE DEVICE IS INTENDED TO BE INCORPORATED IN FUEL ELEMENTS.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*EQUIPMENT DESIGN + *FUEL ELEMENT + *PATENT + FUEL ELEMENT CLUSTER + FUEL HANDLING MACHINE + UNITED KINGDOM

7-27471

SCOTT JL

FUEL-ELEMENT PERFORMANCE

9 PAGES, 4 FIGURES, 3 TABLES, 42 REFERENCES, NUCLEAR SAFETY, 8(4), PAGES 331-339 (SUMMER 1967)

FUEL-ELEMENT DEVELOPMENT WORK IS NOW BEING DIRECTED PRIMARILY TOWARD ADVANCED CONVERTERS AND FAST BREEDER REACTORS. WITH THE TECHNICAL FEASIBILITY OF THE COATED-PARTICLE FUELS FOR HIGH-TEMPERATURE GAS-COOLED REACTORS ASSURED, EMPHASIS IS CURRENTLY PLACED ON INNOVATIONS THAT WILL REDUCE FUEL-CYCLE COSTS. RECENT HIGH-BURNUP DATA ON MIXED-OXIDE FUEL PINS FOR BOTH ADVANCED CONVERTER AND FAST-BREEDER REACTORS HAVE DELINEATED BETTER THE FORMIDABLE SWELLING AND FISSION-GAS-RELEASE PROBLEMS AT THE HIGH BURNUPS REQUIRED FOR ECONOMICAL FUEL CYCLES. WE CAN EXPECT MANY NEW DEVELOPMENTS IN OXIDE AND CARBIDE FUELS AT HIGH BURNUPS IN THE NEAR FUTURE.

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27471 *CONTINUED*
*ACCIDENT ANALYSIS + *FISSION GAS RELEASE + *FUEL BURNUP + FUEL ELEMENT + OXIDE

7-27472 ALSO IN CATEGORY 5
PITTS SH
FACTORS INFLUENCING THE IGNITION OF METALLIC PLUTONIUM
DOW CHEMICAL COMPANY
8 PAGES, 14 FIGURES, 1 TABLE, 17 REFERENCES, NUCLEAR SAFETY, 9(2), PAGES 112-120 (MARCH-APRIL 1968)

THE FACTORS THAT INFLUENCE THE IGNITION OF PLUTONIUM WERE INVESTIGATED EXPERIMENTALLY AND FOUND TO BE RELATED TO SAMPLE SIZE AND GEOMETRY OR TO THE SURFACE COMPOSITION. THE IGNITION TEMPERATURE DECREASED AS THE SAMPLE SURFACE AREA WAS INCREASED, AS THE WEIGHT OF PLUTONIUM FILINGS WAS INCREASED, AND AS SLOWER HEATING RATES WERE USED. SAMPLES HEATED AT CONSTANT, ELEVATED TEMPERATURES IGNITED AT LOWER TEMPERATURES THAN THOSE HEATED AT A CONSTANTLY INCREASING TEMPERATURE. THIN FOIL COUPONS IGNITED AT LOWER TEMPERATURES WHEN THEY CONTAINED INDUCED INTERNAL STRESSES. LOWER IGNITION TEMPERATURES WERE OBTAINED BY FORMING PUO ON THE SAMPLE SURFACE.

*ACCIDENT ANALYSIS + *CHEMICAL REACTION + *PLUTONIUM + EXPERIMENT, GENERAL + FIRE + IGNITION + IGNITION TEMPERATURE

7-27816
FILTER UNIT INSPECTION AND TESTING SERVICE FISCAL YEAR 1969
U.S. ATOMIC ENERGY COMMISSION
HEALTH AND SAFETY INFORMATION NO. 268 +. 4 PAGES, JULY 1, 1968

INSPECTION AND TESTING OF HIGH-EFFICIENCY FILTER UNITS WILL CONTINUE IN THE FISCAL YEAR BEGINNING JULY 1, 1968. THE SERVICE WILL BE PROVIDED WITHOUT CHARGE TO AEC OFFICES AND COST-TYPE CONTRACTORS. SERVICE TO LUMP-SUM AND UNIT-PRICE CONTRACTORS, AEC LICENSEES, AND OTHERS WILL BE SUPPLIED ACCORDING TO THE SCHEDULE OF CHARGES APPENDED. A SEPARATE SCHEDULE OF CHARGES APPLICABLE TO SERVICE FOR FEDERAL AGENCIES OTHER THAN AEC IS AVAILABLE UPON AGENCY REQUEST. INSPECTION AND TESTING WILL CONTINUE TO BE RENDERED AT OAK RIDGE, TENN. AND AT RICHLAND, WASH. TO EXPEDITE SERVICE AT THE PROPER FACILITY, ORGANIZATIONS ARE URGED TO FOLLOW THE PROCEDURE APPENDED.

*FILTER INSPECTION + *FILTER QUALITY ASSURANCE STATION + *FILTER TEST REQUIREMENT + FILTER EFFICIENCY + FILTER SAFETY EVALUATION + FILTER, ABSOLUTE + FILTER, HIGH EFFICIENCY

7-27817
TANG IN + CASTLEMAN AW
RADIATION-INDUCED DECOMPOSITION OF METHYL IODIDE IN AIR
BROOKHAVEN NATIONAL LABORATORY
2 PAGES, 1 FIGURES, 6 REFERENCES, ANS TRANS. 11(1), PAGES 76-77, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, JUNE 10-13, 1968, TORONTO, CANADA

THE PHOTOCHEMICAL OXIDATION OF CH₃I IN A PURE OXYGEN ATMOSPHERE HAS BEEN STUDIED EXTENSIVELY. HOWEVER, NO DATA ON THE STABILITY OF CH₃I IN A COMBINED RADIATION AND OXIDIZING ENVIRONMENT ARE AVAILABLE IN THE LITERATURE. THIS PAPER PRESENTS THE RESULTS OF A STUDY ON THE CO-60 GAMMA-RAY-INDUCED DECOMPOSITION OF CH₃I IN AIR. THE INFORMATION IS OF BOTH FUNDAMENTAL AND PRACTICAL INTEREST SINCE CH₃I HAS BEEN SHOWN TO FORM WHEN CARRIER-FREE AMOUNTS OF IODINE ARE RELEASED UNDER CONDITIONS LIKELY TO EXIST IN A REACTOR ACCIDENT. THE TOTAL ABSORBED DOSE AT 50% DECOMPOSITION IS 7.3×10^{18} EV/G OF AIR. METHYL NITRATE AND ETHYL NITRATE ARE THE MAJOR RADIOLYSIS PRODUCTS OBSERVED IN THESE EXPERIMENTS.

*CHEMICAL KINETICS + *GAMMA + *ORGANIC IODIDE + *OXIDATION + *RADIATION DAMAGE + FISSION PRODUCT, IODINE + IODINE + RADIATION EFFECT

7-27818 ALSO IN CATEGORY 4
POUCHER FW + KOHL AL
CLEANING TECHNIQUES FOR SODIUM SYSTEM COMPONENTS
ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA
2 PAGES, 2 REFERENCES, ANS TRANS. 11(1), PAGES 114-115, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

SPECIALIZED TECHNIQUES ARE REQUIRED FOR CLEANING SURFACES THAT HAVE BEEN IN CONTACT WITH LIQUID SODIUM. ALTHOUGH A GREAT MANY PROCESSES HAVE BEEN INVESTIGATED, ONLY TWO HAVE PROVED GENERALLY USEFUL FOR A WIDE VARIETY OF APPLICATIONS AT ATOMICS INTERNATIONAL. THESE ARE REACTION WITH STEAM (WITH OR WITHOUT AN INERT GAS DILUENT) FOR MAJOR SYSTEMS AND COMPONENTS, AND REACTION WITH LIQUID 2-BUTOXYETHENOL (ETHYLENE GLYCOL MONOBUTYL ETHER, BUTYL CELLOSOLVE, DOWANOL E.B.) FOR SMALLER ITEMS AND HOT-CELL APPLICATIONS. IN ADDITION, DIPPING COMPONENTS IN HOT OIL HAS PROVED HELPFUL AS AN INITIAL STEP TO REDUCE THE QUANTITY OF SODIUM REQUIRING REACTION. LIQUID AMMONIA WASHING HAS BEEN SHOWN TO BE APPLICABLE FOR SPECIAL CASES WHERE HYDROGEN EVOLUTION MUST BE MINIMIZED.

*COOLANT CHEMISTRY + *DECONTAMINATION + *SODIUM + *STEAM + METAL, ALKALI + METAL, LIQUID + REACTOR, LMC + REACTOR, LMFBR

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27819 ALSO IN CATEGORY 4

MCPHEETERS CC + BIERY JC

THE DYNAMIC CHARACTERISTICS OF A SODIUM OXIDE PLUGGING INDICATOR

LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

2 PAGES, 6 REFERENCES, ANS TRANS. 11(1), PAGES 115-116, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

WORK AT LOS ALAMOS SCIENTIFIC LABORATORY HAS INDICATED THAT THE PLUGGING INDICATOR CAN BE A USEFUL ANALYTICAL INSTRUMENT FOR INDICATING OXYGEN CONCENTRATIONS IN SODIUM. AS COMPARED TO THE DISTILLATION SAMPLER OF EMF CELLS, THE PLUGGING INDICATOR DATA HAD A MUCH LOWER STATISTICAL STANDARD DEVIATION. HOWEVER, THE METER REQUIRED CALIBRATION. THE PLUGGING TEMPERATURE WAS CORRELATED WITH FLOW RATE, COOLING RATE, AND OXYGEN CONCENTRATION.

*ANALYTICAL TECHNIQUE, CALIBRATION + *COOLANT CHEMISTRY + *FLOW ORIFICE + *OXIDE + *SODIUM + METAL, ALKALI + METAL, LIQUID + REACTOR, LMCR + REACTOR, LMFBR

7-27820 ALSO IN CATEGORY 4

MCPHEETERS CC

MASS TRANSFER OF OXYGEN IN SODIUM COLD TRAPS

LOS ALAMOS SCIENTIFIC LABORATORY

2 PAGES, 5 REFERENCES, ANS TRANS. 11(1), PAGES 116-117, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

COLD TRAPS HAVE BEEN USED EXTENSIVELY FOR CONTROLLING OXYGEN CONCENTRATION IN SODIUM SYSTEMS. COLD TRAPS UTILIZE THE POSITIVE TEMPERATURE DEPENDENCE OF THE SOLUBILITY OF SODIUM MONOXIDE IN SODIUM AND THE RESULTANT PRECIPITATION OF SODIUM MONOXIDE AT LOW SODIUM TEMPERATURES. SODIUM MONOXIDE PRECIPITATION IS HERE ASSUMED TO BE HETEROGENEOUS BECAUSE OF THE STRONG EFFECT OF SURFACE AREA ON THE PRECIPITATION RATE SHOWN IN PREVIOUS PACKLESS COLD TRAP EXPERIMENTS. A PACKLESS COLD TRAP OF SIMPLE GEOMETRY AND OPERATING WITH A TEMPERATURE GRADIENT WAS USED IN THIS STUDY. IN THE PRESENCE OF THE TEMPERATURE GRADIENT, THE EFFECTIVE PRECIPITATION SURFACE AREA WAS A FUNCTION OF THE OXYGEN CONCENTRATION IN THE SODIUM ENTERING THE COLD TRAP.

*ANALYTICAL TECHNIQUE, CALIBRATION + *COOLANT CHEMISTRY + *FLOW ORIFICE + *OXIDE + *SODIUM + FILTER, TRAP + METAL, ALKALI + METAL, LIQUID + REACTOR, LMCR + REACTOR, LMFBR

7-27824

PARSLY LF + FRANZREB JK

STUDIES OF THE REMOVAL OF IODINE VAPOR FROM CONTAINMENT BUILDING ATMOSPHERES AT THE NUCLEAR SAFETY PILOT PLANT

OAK RIDGE NATIONAL LABORATORY

2 PAGES, 1 TABLE, 5 REFERENCES, ANS TRANS. 11(1), PAGES 372-73, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

CONTAINMENT SPRAYS HAVE BEEN PROPOSED AS PART OF THE ENGINEERED SAFETY SYSTEMS FOR A NUMBER OF LARGE POWER REACTORS NOW BEING DESIGNED AND BUILT. IN THE UNLIKELY EVENT OF A LOSS-OF-COOLANT ACCIDENT, SPRAYS CAN PERFORM THE DUAL FUNCTION OF REMOVING HEAT AND REMOVING AIRBORNE FISSION PRODUCTS, PARTICULARLY IODINE. TO SUBSTANTIATE DESIGN CALCULATIONS FOR IODINE REMOVAL BY SPRAYS, THE NUCLEAR SAFETY PILOT PLANT AT OAK RIDGE HAS BEEN USED TO CARRY OUT ENGINEERING-SCALE TESTS OF IODINE VAPOR REMOVAL FROM SIMULATED LOSS-OF-COOLANT-ACCIDENT ATMOSPHERES.

*ANALYTICAL MODEL + *CONTAINMENT SPRAY + *IODINE + *NOZZLE + *NSPP + FILTER SPRAY + FISSION PRODUCT, IODINE + OUT OF PILE LOOPS AND EXPERIMENTS + SPRAY, GENERAL

7-27825

PATTERSON CS + HUMPHRIES WT

DISTRIBUTION OF IODINE BETWEEN AIR AND AQUEOUS SOLUTIONS

FURMAN UNIVERSITY

1 PAGE, 2 TABLES, 3 REFERENCES, ANS TRANS. 11(1), PAGE 374, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE PROGRAM IS CONCERNED WITH THE SEARCH FOR SUITABLE SPRAY SOLUTIONS THROUGH THE LABORATORY EVALUATION OF ADDITIVES HAVING A HIGH AFFINITY FOR IODINE. A GAS TITRATION METHOD HAS BEEN DEVELOPED TO DETERMINE THE CAPACITIES OF VARIOUS SOLUTIONS TO REMOVE IODINE FROM AIR STREAMS. A METHOD OF TREATMENT OF THE DATA IS GIVEN WHICH ELIMINATES KINETIC EFFECTS AND YIELDS STRICTLY SATURATION COMPOSITIONS. THE RESULTS FOR WATER AGREE REASONABLY WELL WITH THE LOWEST PUBLISHED DATA. ADDITION OF BORIC ACID DECREASES THE SOLUBILITY OF IODINE IN WATER. IODINE CAPACITIES FOR THIOSULFATE AND BASE SOLUTIONS ARE LINEAR IN ADDITIVE CONCENTRATION AND ARE CONSISTENT WITH A MODEL WHICH ASSUMES QUANTITATIVE REACTION WITH THE PRIMARY ADDITIVE.

*ANALYTICAL MODEL + *ANALYTICAL TECHNIQUE, CALIBRATION + *CONTAINMENT SPRAY + *IODINE + *SPRAY, GENERAL + CHEMICAL EQUILIBRIUM + FILTER SPRAY + FISSION PRODUCT, IODINE

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-27826

SOLDANO BA + WARD WT
UPTAKE OF METHYL IODIDE FROM WIND TUNNEL GASES BY A SUSPENDED DROP OF WATER, PART II
OAK RIDGE NATIONAL LABORATORY
2 PAGES, 1 TABLE, 3 REFERENCES, ANS TRANS. 11(1), PAGES 374-75, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

STUDIES CONDUCTED ON A DROP OF WATER SUSPENDED IN A WIND TUNNEL INDICATE THAT THE RATE OF PICKUP OF METHYL IODIDE CAN BE DESCRIBED BY AN EQUATION PROVIDED BY THE AUTHOR.

*ANALYTICAL MODEL + *CHEMICAL KINETICS + *CONTAINMENT SPRAY + *ORGANIC IODIDE + *SPRAY, GENERAL + CHEMICAL EQUILIBRIUM + FILTER SPRAY + FISSION PRODUCT, IODINE

7-27999

ALSO IN CATEGORY 8

HENZEL N + KLEINE-TEBBE A
STUDY ON CHEMICAL REACTIONS BETWEEN URANIUM DIOXIDE, THE MOST ABUNDANT FISSION PRODUCTS, WATER AND SODIUM
BATTELLE-INSTITUT FRANKFURT AM MAIN
104 PAGES, 23 FIGURES, 8 TABLES, 70 REFERENCES, APRIL 25, 1968

DEALS WITH CHEMICAL REACTIONS BETWEEN URANIUM DIOXIDE, THE MOST IMPORTANT FISSION PRODUCTS WITH REGARD TO QUANTITY AND RADIOACTIVITY, AND THE COOLANTS WATER (VAPOR) AND SODIUM. BY MEANS OF A NEW SIMPLE METHOD, THE EQUILIBRIUM OF SUCH SYSTEMS CAN BE CALCULATED AND GRAPHICALLY EXTRAPOLATED TO HIGH TEMPERATURES EVEN BEYOND THE REGION OF KNOWN THERMODYNAMIC DATA. FROM THE REACTION POTENTIALS OBTAINED IN THIS WAY AND THE INITIAL MOLE CONCENTRATIONS OF THE REACTANTS ESTIMATED AS REALISTICALLY AS POSSIBLE, THE AMOUNTS OF THERMODYNAMICALLY STABLE REACTION PRODUCTS ARE DETERMINED, AT LEAST IN THEIR ORDER OF MAGNITUDE, AS A FUNCTION OF TEMPERATURE.

AVAILABILITY - N. HENZEL, FRANKFURT AM MAIN

*CHEMICAL REACTION + *FISSION PRODUCT RETENTION + *SODIUM + *THERMODYNAMICS + *URANIUM DIOXIDE + *WATER VAPOR + *WATER, GENERAL + CHEMICAL EQUILIBRIUM + METAL, ALKALI + REACTOR COOLANT + THEORETICAL INVESTIGATION

7-28049

ALSO IN CATEGORIES 17 AND 13

FILTER FAILURE AT WEST VALLEY PLANT
NUCLEAR FUEL SERVICES, INC., WEST VALLEY, N. Y.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(38), PAGE 29 AND 30, (SEPT. 16, 1968), DOCKET NO. 50-201

(TWX TO COMPLIANCE) CN SEPT. 4, 1968, ONE FILTER OF 30 IN THE MAIN VENTILATION FILTER BANK FAILED. 1-2% OF THE FILTER WAS DISCHARGED FROM THE STACK AND FELL ON TO ROOF. PROBABLE CAUSE WAS FILTER PRESSURE DROP, AT UPPER OPERATING LIMIT. HIGH PRESSURE DROP ALARM IS BEING REDUCED 18%, AND LOW PRESSURE DROP ALARM IS ADJUSTED TO INCREASE SENSITIVITY TO SINGLE FILTER FAILURE. NOT A REPORTABLE INCIDENT BECAUSE ANALYSIS OF ADJACENT FILTER AND STACK SAMPLER INDICATE 11% OF MONTHLY ALLOWANCE DISCHARGED. SURVEY OF SITE PERIMETER DID NOT SHOW RADIATION INCREASE ABOVE BACKGROUND.

*FILTER, DAMAGED + *PRESSURE DROP + AIRBORNE RELEASE + FUEL REPROCESSING + INCIDENT, EQUIPMENT + NFS + STACK + VENTILATION SYSTEM

7-28050

ALSO IN CATEGORIES 17 AND 13

NFS SHUTDOWN TO EVALUATE FILTER FAILURE
NUCLEAR FUEL SERVICES, INC., WEST VALLEY, N. Y.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(38), PAGE 30, (SEPT. 16, 1968), DOCKET NO. 50-201

(LETTER TO NFS, SEPT. 6, 1968) CONFIRMS SEPT. 6 PHONE CALL THAT WEST VALLEY PLANT OPERATION WILL NOT BE RESUMED UNTIL THE FOLLOWING IS REVIEWED BY AEC - (1) AMOUNT OF RADIOACTIVITY RELEASED FROM STACK SEPT. 4, 1968, (2) NFS EVALUATION, INCLUDING PROBABLE CAUSE AND CORRECTIVE ACTION, (3) INFORMATION REQUESTED IN APRIL 2, 1968, LETTER, INCLUDING IMMEDIATE WARNING OF ABNORMAL CONDITIONS IN VENTILATION AND OFFGAS SYSTEMS. ITEMS 1 AND 2 ARE NECESSARY TO CONFIRM TECH.-SPEC. REQUIREMENTS MET (PARAGRAPHS 4.1.1, 7.1.2.2 AND 7.1.7.3).

*AIRBORNE RELEASE + *FILTER, DAMAGED + FUEL REPROCESSING + INCIDENT, EQUIPMENT + INSPECTION AND COMPLIANCE + NFS + OFF GAS + STACK + VENTILATION SYSTEM

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-25160 ALSO IN CATEGORY 5
MORRISON DL + WILSON TR
CURRENT RESEARCH ON COOLANT BLOWDOWN IN THE USA
BATELLE MEMORIAL INSTITUTE + PHILLIPS PETROLEUM COMPANY, IDAHO FALLS, IDAHO
34 PAGES, 17 FIGURES, 18 REFERENCES, FROM THE RECORD OF THE THIRD CREST MEETING, PARIS, NOVEMBER, 1967

THE COURSE AND CONSEQUENCES OF A LOSS-OF-COOLANT ACCIDENT ARE DIRECTLY RELATED TO THE BLOWDOWN AFTER RUPTURE, AND CURRENT RESEARCH IS CARRIED OUT TO CHARACTERIZE THIS OCCURRENCE. AREAS OF INTEREST ARE - DECOMPRESSION, TWO-PHASE FLOW, MECHANICAL EFFECTS, ETC. THE EFFORT IS BEING PURSUED AT LOFT, CSE, AND IIT. THE DEVELOPMENT OF ANALYTICAL MODELS AND COMPUTER CODES IS ALSO DISCUSSED, AND COMPARISON BETWEEN CALCULATIONS AND EXPERIMENTS IS MADE.

AVAILABILITY - D.L. MORRISON, BATELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES

*ACCIDENT, LOSS OF COOLANT + *BLOWDOWN + *CREST + *CSE + *LOFT (S-RR) + ANALYTICAL MODEL + COMPUTER PROGRAM + REACTOR, SAFETY RESEARCH

8-27092 ALSO IN CATEGORY 7
SYMPOSIUM ON METAL-GAS REACTIONS IN ATMOSPHERES CONTAINING CO₂
6 PAGES, BRITISH CORROSION JOURNAL, 2(6), PAGES 229-234 (1967)

THE PROGRAMME FOR THIS SYMPOSIUM WAS PREFACED BY THE FOLLOWING OUTLINE OF THE OBJECTIVES OF THE MEETING - IN THE LAST FEW YEARS MUCH WORK HAS BEEN CARRIED OUT ON THE OXIDATION OF BOILER AND FUEL CLADDING MATERIALS IN CARBON DIOXIDE ENVIRONMENTS IN THE TEMPERATURE RANGE 350-850 C IN CONNECTION WITH THE BRITISH GAS-COOLED NUCLEAR REACTOR PROGRAMME. THIS COVERS RIMMING, SEMI-KILLED AND LOW ALLOY STEELS AND ALSO 9 PER CENT AND 12 PER CENT CHROMIUM AND AUSTENITIC STEELS. WORK HAS ALSO BEEN DONE IN THE U.K. AND IN EUROPE IN HELIUM ENVIRONMENTS CONTAINING SMALL AMOUNTS OF CO/CO₂, RELATING TO MORE ADVANCED NUCLEAR REACTOR CONCEPTS. THE DISCUSSION AT THIS SYMPOSIUM WILL COVER REPORTS OF THIS WORK, AND IN ADDITION CORROSION PROBLEMS ENCOUNTERED IN REFORMERS USED IN THE GAS INDUSTRY AND ALLIED PLANT, ARISING FROM COMBINED CARBURISING/OXIDISING REACTIONS ON AUSTENITIC STEELS AND HIGH NICKEL ALLOYS.

*ALLOY + *CARBON + *CARBON DIOXIDE + *CARBON MONOXIDE + *OXIDATION + *STEEL + CARBIDE + CHEMICAL KINETICS + CHROMIUM + CLADDING + CORROSION + DRAGON (HTGR) + REACTOR, SCR + REACTOR, HTGR + STEEL, STAINLESS

8-27651 ALSO IN CATEGORY 5
WHITE JF
PHYSICO-CHEMICAL STUDIES OF CLAD UO₂ IN POTENTIAL MELTDOWN ENVIRONMENT (TASK NO. 1175)
GENERAL ELECTRIC COMPANY, CINCINNATI, OHIO
GEMP-1104 +. 35 PAGES, FIGURES, TABLES, EXTRACTED FROM SEVENTH ANNUAL REPORT - AEC FUELS AND MATERIALS DEVELOPMENT PROGRAM, MARCH 29, 1968

SUMMARY OF EXPERIMENTAL WORK BY GE-NMPO DURING CY-67 TOWARDS DETERMINING THE FUEL PIN BEHAVIOR DURING A LOSS-OF-COOLANT ACCIDENT. WORK INCLUDED (1) DYNAMIC DEFORMATION AND FAILURE STUDIES OF ZIRCALOY-4 TUBES WITH HIGH INTERNAL PRESSURES AT HIGH TEMPERATURES IN ARGON OF STEAM ENVIRONMENTS, (2) CHEMICAL KINETIC STUDIES OF THE OXIDATION OF TYPE 304 STAINLESS STEEL BY STEAM OR AIR, (4) CHEMICAL KINETIC STUDIES OF THE OXIDATION OF UO₂ BY STEAM, (5) MEASUREMENTS OF THE TENSILE STRENGTH AND THE THERMAL CONDUCTIVITY OF TYPE 304 STAINLESS STEEL, AND (6) MEASUREMENTS OF THE TOTAL EMITTANCE OF UNOXIDIZED AND OXIDIZED AIRCALOY-4.

*AIR + *BURST PRESSURE + *CHEMICAL KINETICS + *CHEMICAL REACTION + *DEFORMATION + *FUEL ELEMENT + *METAL WATER REACTION + *STEAM + *STEEL, STAINLESS + *THERMAL PROPERTY + *URANIUM DIOXIDE + *ZIRCALOY + ACCIDENT, LOSS OF COOLANT + CREEP BEHAVIOR + OXIDATION + STRUCTURAL ANALYSIS, DYNAMIC + THERMAL EXPERIMENT

8-27998
HENZEL N + KLEINE-TEBBE A
EXPERIMENTAL INVESTIGATION OF REACTIONS BETWEEN URANIUM DIOXIDE AND WATER IN NONISOTHERMAL QUASI-ISOBARIC CONDITIONS
BATELLE-INSTITUT FRANKFURT AM MAIN
46 PAGES, 21 FIGURES, 2 TABLES, 14 REFERENCES, APRIL 29, 1968

THE CHEMICAL AND PHYSICAL BEHAVIOR OF HOT SOLID UO₂ IN LIQUID WATER WAS EXAMINED UNDER NONISOTHERMAL, QUASI-ISOBARIC CONDITIONS. VARIOUS SIZE PELLETS WERE HEATED BY INDUCTION AND THEN DUMPED INTO THE WATER. THE AMOUNT OF STEAM GENERATED DEPENDED STRONGLY ON THE SPECIFIC SURFACE OF THE SAMPLE AND THE WATER TEMPERATURE. IT APPEARED THAT LOW-TEMPERATURE WATER IS A PREREQUISITE FOR STEAM EXPLOSIONS. OXIDATION OF THE SAMPLES INCREASED WITH DECREASING SAMPLE SURFACE. FOR 800-MICRON PARTICLES, THE OXYGEN-TO-URANIUM RATIO INCREASED BY ABOUT 0.0125.

AVAILABILITY - N. HENZEL, BATELLE-INSTITUT FRANKFURT AM MAIN

*CHEMICAL REACTION + *HEAT TRANSFER, BOILING + *PRESSURE PULSE + *URANIUM DIOXIDE + *WATER, GENERAL + HEAT TRANSFER, CONVECTION + TEST, BENCH

8-27999 ALSO IN CATEGORY 7

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-27999 *CONTINUED*
HENZEL N + KLEINE-TEBBE A
STUDY ON CHEMICAL REACTIONS BETWEEN URANIUM DIOXIDE, THE MOST ABUNDANT FISSION PRODUCTS, WATER AND SODIUM
BATTELLE-INSTITUT FRANKFURT AM MAIN
104 PAGES, 23 FIGURES, 8 TABLES, 70 REFERENCES, APRIL 25, 1968

DEALS WITH CHEMICAL REACTIONS BETWEEN URANIUM DIOXIDE, THE MOST IMPORTANT FISSION PRODUCTS WITH REGARD TO QUANTITY AND RADIOACTIVITY, AND THE COOLANTS WATER (VAPOR) AND SODIUM. BY MEANS OF A NEW SIMPLE METHOD, THE EQUILIBRIUM OF SUCH SYSTEMS CAN BE CALCULATED AND GRAPHICALLY EXTRAPOLATED TO HIGH TEMPERATURES EVEN BEYOND THE REGION OF KNOWN THERMODYNAMIC DATA. FROM THE REACTION POTENTIALS OBTAINED IN THIS WAY AND THE INITIAL MOLE CONCENTRATIONS OF THE REACTANTS ESTIMATED AS REALISTICALLY AS POSSIBLE, THE AMOUNTS OF THERMODYNAMICALLY STABLE REACTION PRODUCTS ARE DETERMINED, AT LEAST IN THEIR ORDER OF MAGNITUDE, AS A FUNCTION OF TEMPERATURE.

AVAILABILITY - N. HENZEL, FRANKFURT AM MAIN

*CHEMICAL REACTION + *FISSION PRODUCT RETENTION + *SODIUM + *THERMODYNAMICS + *URANIUM DIOXIDE +
*WATER VAPOR + *WATER, GENERAL + CHEMICAL EQUILIBRIUM + METAL, ALKALI + REACTOR COOLANT +
THEORETICAL INVESTIGATION

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-25699

KURT-UMEROV VO

A MATHEMATICAL MODEL FOR PREDICTING GRADUAL FAILURES IN SYSTEM ELEMENTS

1 PAGE, ENGLISH ABSTRACT IN AUTOMATION EXPRESS 8(2), PAGE 47 (1966) TRANSLATED FROM AVTOMATIKA I TELEMEXHANIKA NO. 2, PAGES 142-46 (FEBRUARY 1966)

A MATHEMATICAL MODEL IS PROPOSED FOR THE VARIATION IN SYSTEM-ELEMENT PARAMETERS. THE AUTHOR DETERMINES THE PARAMETERS OF THE STATISTICAL MODEL CONSTRUCTED ON THE BASIS OF THE HISTORICAL VARIATION IN THE PARAMETERS OF EACH OF THE MONITORED ELEMENTS UNDER OPERATING CONDITIONS. A METHOD IS GIVEN FOR DETERMINING THE FUNCTIONAL RELIABILITY OF ACTUAL ELEMENTS OVER A GIVEN TIME.

*RELIABILITY, COMPONENT + ANALYTICAL MODEL + INSTRUMENTATION, COMPONENT + MATHEMATICAL TREATMENT + USSR

9-26139

KOZLOV BA

RELIABILITY OF ISOLATED SUBSYSTEMS IN A REDUNDANT SYSTEM WITH RESTORATION

5 PAGES, IZVESTIA AKAD. NAUK, TEKHNICHESKAIA KIBERNETIKA NO. 7, PAGES 23-27 (NOVEMBER-DECEMBER 1965), ABSTRACT IN AUTOMATION EXPRESS ISSUE 4, VOL. 8(1), PAGE 26 (1966)

A RESTORABLE SYSTEM OF N+M ELEMENTS IS CONSIDERED (M OF THE ELEMENTS ARE USED AS A SLIDING RESERVE). THE MEAN OPERATING TIME TILL FAILURE IS ESTIMATED FOR A SINGLE ISOLATED OPERATING ELEMENT.

*RELIABILITY ANALYSIS + MATHEMATICAL TREATMENT + REDUNDANCE + USSR

9-26303

ALSO IN CATEGORY 12

SHAW MK

LIQUID SHUTDOWN SYSTEM FOR WINFRITH SGHWR

3 PAGES, FIGURES, NUCLEAR ENGINEERING, 13(144), PAGES 418-420 (MAY 1968)

SYSTEM CONSISTS OF BUILT-IN SHUTDOWN TUBES IN THE CALANDRIA WHICH PERMIT RECOVERY OF THE POISON. LOOP CONSISTS OF A U-TUBE, SHUTDOWN VALVE, HIGH PRESSURE HEAD TANK AND A BUFFER TANK. FLUID INLET VELOCITY IS 80 FT/SEC, WHICH IS ARRESTED BY COMPRESSING HELIUM IN THE TUBE WHILE DISCHARGING A FRACTION TO A BUFFER TANK. THE ABSORBER FLUID CAN BE DRAINED FROM THE TUBES FOR REUSE. VALVE DESIGN IS SUCH THAT OPENING TIME IS 0.1 SEC AND CONSISTS OF A 2-WAY BODY AND SPOOL WITH A 1.5-IN. STROKE BETWEEN SEALS. SIX COIL SPRINGS PUSH SPOOL TOWARD ITS SEAT WHEN A SPLIT ELECTROMAGNET IS ACTIVATED.

*SHUTDOWN SYSTEM, SECONDARY + *SYSTEM DESCRIPTION + *VALVE + DESIGN CRITERIA + REACTOR CONTROL + REACTOR, HWR + REACTOR, PRESSURE TUBE + UNITED KINGDOM

9-26412

ALSO IN CATEGORY 17

PASHOS TJ

CONTROL MATERIALS SYMPOSIUM

4 PAGES, 2 TABLES, 8 REFERENCES, NUCLEAR APPLICATIONS, 4(6), PAGES 394-437 (JUNE 1968)

SUMMARIZES FIVE PAPERS PRESENTED AT THE JUNE 1966 ANS MEETING. TOPICS ARE - (1) MATERIALS FOR CONTROL OF WATER-COOLED POWER REACTORS, (2) USE OF LANTHANID OXIDE ABSORBERS IN PWR, (3) CONTROL BLADES PER HFBR, (4) PERFORMANCE OF BORON-CONTAINING RODS IN WATER-COOLED POWER REACTORS, AND (5) PERFORMANCE OF AG-IN-CD IN PWR.

*MATERIAL + *REACTOR CONTROL + BORON + CADMIUM + CONTROL ROD + DYSPROSIUM + EUROPIUM + INDIUM + LANTHANUM + OPERATING EXPERIENCE + REACTOR, BWR + REACTOR, PWR + SILVER

9-26437

BATES AEG + EPLER EP + OAKES LC

FEATURES OF, AND OPERATING EXPERIENCE WITH, THE HFIR PROTECTION SYSTEM

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

8 PAGES, 5 FIGURES, 1 TABLE, 7 REFERENCES, NUCLEAR APPLICATIONS, 4(5), PAGES 289-296 (MAY, 1968)

THE ORNL SECOND GENERATION OF REACTOR-PROTECTION SYSTEMS HAS BEEN APPLIED SUCCESSFULLY TO THE HFIR. TESTING FOR UNSAFE COMPONENT FAILURES, ROUTINE MAINTENANCE, AND MOST REPAIR WORK ARE DONE ROUTINELY WHILE THE REACTOR IS AT POWER. TWO-OF-THREE COINCIDENCE LOGIC IS USED FOR ON-LINE MAINTENANCE AND TESTING AND NOT FOR THE USUAL OBJECTIVE OF AVOIDING FALSE SCRAMS. THE PROTECTION SYSTEM, ON-LINE TESTING METHODS, AND THE FIRST 13 MONTHS OF REACTOR OPERATION ARE REVIEWED.

*OPERATING EXPERIENCE + *REACTOR SAFETY SYSTEM + HFIR (FTR) + INSTRUMENTATION, COINCIDENT + INSTRUMENTATION, PROTECTIVE + INSTRUMENTATION, TESTING + ORNL + REACTOR, AEC OWNED + REACTOR, FLUX TRAP + REACTOR, RESEARCH + TEST, ON LINE + TEST, SYSTEM OPERABILITY

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26470

LONG E

NUCLEAR REACTOR REACTIVITY CONTROL ARRANGEMENTS

ENGLISH ELECTRIC CO.

BRITISH PATENT 1,089,343 +. 3 PAGES, 3 FIGURES, NOVEMBER 1, 1967

THE DESIGN OF A CONTROL ROD PLACEMENT AND DRIVE MECHANISM FOR REACTOR CORES WITH A PLURALITY OF FUEL CHANNELS IS PRESENTED. THE MECHANISM MANOVES THE CONTROL RODS BY MEANS OF WINDING MECHANISMS WITH FIXED POSITION IN THE REACTOR CORE, A COMMON DRIVE UNIT LOCATED OUTSIDE THE PRESSURE VESSEL, AND A MOVEABLE WINDING MECHANISM WHICH CONNECTS THE FIXED ROD CHANNELS WITH THE DRIVE UNIT.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*CONTROL ROD DRIVE + PATENT + UNITED KINGDOM

9-26471

CHALLENGER RS

NUCLEAR REACTOR CONTROL MECHANISMS

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

BRITISH PATENT 1,087,493 +. 5 PAGES, 5 FIGURES, OCTOBER 18, 1967

A CONTROL ROD DRIVE MECHANISM WHICH UTILIZES BOTH NORMAL OPERATIONAL CONTROL MOVEMENT AND EMERGENCY SHUTDOWN MOVEMENT FOR THE SAME CONTROL ROD IS DESCRIBED.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*CONTROL ROD DRIVE + CONTROL ROD SCRAM MECHANISM + DAMPING + PATENT + UNITED KINGDOM

9-26472

BOOTHROYD AD + CUNDILL BR

BURST-CARTRIDGE DETECTION UNITS

ENGLISH ELECTRIC CO.

BRITISH PATENT 1,093,142 +. 7-PAGES, 3 FIGURES, NOVEMBER 29, 1967.

THE DESCRIPTION OF A BURST-CARTRIDGE-DETECTION UNIT FOR DETECTING FISSION PRODUCTS RELEASED FROM BURST OR DAMAGED FUEL ELEMENT CARTRIDGES IN GAS-COOLED REACTORS IS PRESENTED. THE DETECTION UNIT COMPRISES A SAMPLING PIPE FROM EACH FUEL ELEMENT LEADING TO AN ELECTROSTATIC PRECIPITATOR CHAMBER. AFTER THE SAMPLED GAS REACHES THE PRECIPITATOR CHAMBER, A FLEXIBLE ELECTRODE COLLECTS THE FISSION PRODUCTS AND PASSES THEM TO A RADIATION DETECTOR.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + PATENT + REACTOR, GCR + UNITED KINGDOM

9-26473

IMPROVEMENTS RELATING TO CONTROL DEVICES FOR PARALLEL TUBULAR NUCLEAR REACTOR ELEMENTS

COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE

FRENCH PATENT 1,448,295 +. 4 PAGES 2 FIGURES, JUNE 27, 1966, IN FRENCH

THE REACTOR PRESSURE TUBES ARE ARRANGED IN A CLUSTER IN A REGULAR LATTICE. THE DEVICE CONSISTS OF RETRACTABLE PROBES COMING INTO CONTACT WITH THE TUBES. THE PROBES ARE CONVEYED BY A MOVABLE CARRIAGE FITTED WITH ROLLERS BEARING ON TWO ADJACENT TUBULAR ELEMENTS. THE CARRIAGE INCLUDES A SELF-CONTAINED CONTROL MECHANISM WHICH CONTROLS THE PHYSICAL CHARACTERISTICS OF THE TUBULAR ELEMENTS AND NOTABLY THEIR THERMAL INSULATION. THE OBJECT IS TO REDUCE THE OVERALL DIMENSIONS OF SUCH CONTROL DEVICES, TO IMPROVE THEIR MOVEMENT BETWEEN THE PARALLEL TUBES. THE CONTROL DEVICE CAN BE INSERTED OR WITHDRAWN FROM THE REACTOR DURING OPERATION OR SHUTDOWN.

AVAILABILITY - IT IS OUT UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*IN CORE MEASUREMENT + *SERVOMECHANISM + FRANCE + INSTRUMENTATION, GENERAL + INSTRUMENTATION, IN CORE + PATENT

9-26474

SAFETY DEVICE FOR A NUCLEAR REACTOR

COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE

FRENCH PATENT 1,451,407 +. 6 PAGES, 2 FIGURES, JULY 25, 1966, IN FRENCH

THE REACTOR IS COOLED BY A LIQUID WHICH ALSO SERVES AS MODERATOR AND COMPRISES A VERTICAL, DETACHABLE CHANNEL TUBE OF WHICH AT LEAST THE LOWER PART CONTAINS LIQUID WHEN IN PLACE IN THE REACTOR. A MOVABLE ABSORBER ROD IS DISPOSED IN THE CHANNEL TUBE WHILE A CONTROL MECHANISM TAKES PLACE IN THE UPPER PART OF THE CHANNEL TUBE AND SUPPORTS THE ROD VIA A DETACHABLE

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26474 *CONTINUED*

COUPLING. A DAMPING DEVICE IS INTEGRAL WITH THE LOWER PART OF THE CHANNEL IN ORDER TO ABSORB THE KINETIC ENERGY OF THE ROD WHEN IT FALLS IN THE CHANNEL. THE DAMPING DEVICE COMPRISES A HYDRAULIC BRAKING COMPONENT AS WELL AS AN ELASTIC MECHANICAL STOPPING DEVICE.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*CONTROL ROD SCRAM MECHANISM + CONTROL ROD + DAMPING + FRANCE + HYDRAULIC EFFECT + PATENT

9-26475

HANDLING DEVICE FOR A NUCLEAR REACTOR
COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE
FRENCH PATENT 1,455,218 +. 4 PAGES, 3 FIGURES, SEPTEMBER 5, 1966, IN FRENCH

A NUCLEAR REACTOR LOADING DEVICE IS PROVIDED WITH A ROTATABLE CYLINDER CONTAINING DUCTS IN A LEAK-PROOF HOOD. THE HOOD HAS A VERTICAL CHANNEL AND CAN BE TIGHTLY COUPLED WITH THE BIOLOGICAL SHIELD OF THE REACTOR. MEANS ARE PROVIDED TO BRING EACH OF THE DUCTS OF THE CYLINDER INTO ALIGNMENT WITH THE CHANNEL WHEREIN A GRIPPING UNIT IS DISPOSED IN ORDER TO EXCHANGE THE FUEL ELEMENTS.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*FUEL HANDLING MACHINE + FRANCE + PATENT

9-26476

ARTAMKIN VN + VORONKOV AV
COMPENSATION OF THE REACTIVITY OF NUCLEAR REACTORS BY LAMINATED BURNABLE POISONS
4 PAGES, 4 FIGURES, 4 REFERENCES, ATOMNAYA ENERGIYA, 22(3), PAGES 215-218 (MARCH 1967)

THE POSSIBILITY OF USING LAMINATED BURNABLE POISONS TO COMPENSATE THE REACTIVITY OF NUCLEAR REACTORS IS DISCUSSED. A METHOD IS PROPOSED FOR COMPUTING THE NEUTRON DISTRIBUTION OUTSIDE THE POISON IN THE P-SUB-1 APPROXIMATION. THE SPACE AND TIME DISTRIBUTION OF ABSORBING MATERIAL IN A SLAB OF BURNABLE POISON CONSISTING OF SEVERAL LAYERS OF HETEROGENEOUS MATERIALS IS CALCULATED ON THE ASSUMPTION THAT SCATTERING MAY BE NEGLECTED.

*POISON, BURNABLE + MATHEMATICAL TREATMENT + POISON, FIXED + THEORETICAL INVESTIGATION + USSR

9-26512

ALSO IN CATEGORY 10

VERBER F
ELECTRICAL PENETRATIONS OF REACTOR CONTAINMENT BUILDINGS
14 PAGES, 31 FIGURES, 1 TABLE, 24 REFERENCES, POWER REACTOR TECHNOLOGY AND REACTOR FUEL PROCESSING 10(2), PAGES 122-135 (SPRING 1967)

THIS ARTICLE GATHERS THE ESSENTIAL FEATURES AND WORKINGS OF ELECTRICAL PENETRATIONS OF 11 REPRESENTATIVE NUCLEAR POWER PLANTS AND CONSIDERS SOURCES OF LEAKAGE, REMEDIES, AND BASIC SEALING PRINCIPLES. PRESENT PENETRATION DESIGNS ARE DESCRIBED, AS ARE SOME IFAK-RATE-TEST PRACTICES. A LIST OF RECOMMENDATIONS FOR ELECTRICAL-PENETRATION-SYSTEM DESIGN IS INCLUDED.

*CONTAINMENT PENETRATION, ELECTRICAL + DESIGN CRITERIA + ELECTRICAL CONDUCTION + EQUIPMENT DESIGN + INSTRUMENTATION, COMPONENT + OPERATING EXPERIENCE + SEAL + TEST, LEAK RATE

9-26559

CHAUVET G + TOUMIER E + VILLAIN P
REACTIMETER - ITS UTILIZATION
CENTRE D ETUDES NUCLEAIRES DE GRENOBLE, FRANCE + CENTRE D ETUDES NUCLEAIRES DE CADARACHE, FRANCE
11 PAGES, 5 FIGURES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

THE REACTIMETER WHICH MEASURES REACTIVITY CONTINUOUSLY AND INSTANTANEOUSLY IS A VERY CONVENIENT TOOL TO ANALYZE RAPIDLY AND ACCURATELY THE DIFFERENT PARAMETERS GOVERNING THE REACTIVITY OF A REACTOR EVEN IF SEVERAL OF THESE PARAMETERS DEVELOP NEARLY SIMULTANEOUSLY (FUEL, CONTROL RODS, POISON DILUTION, TEMPERATURE, XENON, ETC.).

AVAILABILITY - G. CHAUVET, CEA-CEN/GRENOBLE- METHODES NOUVELLES DE MESURES DES RAYONNEMENTS

*INSTRUMENTATION, NUCLEAR + *REACTIVITY EFFECT + COMPARISON, THEORY AND EXPERIENCE + EQUIPMENT DESIGN + FRANCE + INSTRUMENTATION, PERIOD + OPERATING EXPERIENCE + SOLID STATE DEVICE

9-26560

ERNST H + KILIAN P + KISON H
CONTROL ROD CONSIDERATIONS FOR STEAM COOLED FAST BREEDER REACTORS
16 PAGES, 5 FIGURES, 2 TABLES, FROM THE CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, IV-8/6, SEPTEMBER, 1967

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26560 *CONTINUED*

A PARAMETRIC STUDY OF REACTOR SHUTDOWN AT LOSS OF STEAM SHOWS THAT THE REACTOR CAN BE SHUT DOWN SAFELY WITH 50-MSEC DELAY TIME, 2-G ACCELERATION, ASSUMING 10/SEC AS THE REACTIVITY RAMP. VARIOUS POSSIBILITIES OF MECHANICAL ARRANGEMENT OF THE CONTROL ROD DRIVES, REACTOR CORE AND STEAM OUTLET PLENUM ARE DISCUSSED. A NEW CONTROL ROD DRIVE IS PROPOSED WHICH IS A REVERSED VERSION OF AN EXISTING DRIVE FOR BOILING WATER REACTORS. MECHANIC-HYDRAULICAL AND MECHANICAL SYSTEMS ARE DISCUSSED.

*CONTROL ROD + *DESIGN CRITERIA + REACTOR, BREEDER + REACTOR, FAST + REACTOR, GCR + STEAM

9-26561 ALSO IN CATEGORY 6

ROUX DP + FRY DN + ROBINSON JC
APPLICATION OF GAMMA-RAY DETECTION FOR REACTOR DIAGNOSIS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2144 +. 17 PAGES, 3 FIGURES, 3 TABLES, MARCH 20, 1968

POWER SPECTRAL DENSITY (PSD) MEASUREMENTS OF THE FLUCTUATING CURRENT FROM A GAMMA-SENSITIVE AND A NEUTRON-SENSITIVE IONIZATION CHAMBER ARE COMPARED AS A REACTOR DIAGNOSTIC TOOL IN THE HFIR OPERATING AT POWER. AN ANALYTICAL MODEL IS PRESENTED TO DEMONSTRATE THAT WHEN BOTH OBSERVED GAMMA AND NEUTRON PSD ARE NORMALIZED BY THE SQUARE OF THE PROMPT MEAN-CURRENT OF THE CHAMBERS, THEY YIELD THE SAME ABSOLUTE PSD. THE ANALYTICAL RESULT IS VERIFIED EXPERIMENTALLY WITH A MULTISECTION IONIZATION CHAMBER COMPOSED OF ELECTRICALLY INDEPENDENT CLOSELY LOCATED NEUTRON-SENSITIVE AND GAMMA-SENSITIVE CHAMBERS. IN THE CASE OF THE GAMMA CHAMBER, AN ESTIMATE OF THE CURRENT COMPONENT CAUSED BY THE DELAYED PHOTONS EMITTED BY THE RADIOACTIVE FISSION PRODUCTS IS NECESSARY TO MEASURE THE ABSOLUTE PSD. IN THIS EXPERIMENT THE DELAYED CURRENT COMPONENT HAS BEEN ESTIMATED TO BE 13 PER CENT OF THE TOTAL GAMMA CURRENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*NOISE CROSS CORRELATION + *REACTOR DYNAMICS + ANALYTICAL MODEL + CHAMBER, ION + COMPARISON, THEORY AND EXPERIENCE + GAMMA + HFIR (FTR) + INSTRUMENTATION, NUCLEAR + NEUTRON + NOISE ANALYSIS + ORNL + REACTOR, AEC OWNED + REACTOR, FLUX TRAP + REACTOR, RESEARCH

9-26562

HSU C
CONTROL AND STABILITY ANALYSIS OF SPATIALLY DEPENDENT NUCLEAR REACTOR SYSTEMS
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
ANL-7322 +. 81 PAGES, 6 FIGURES, TABLE, 47 REFERENCES, JULY, 1967

AFUNDAMENTAL APPROACH TO THE STUDY OF THE DYNAMICS OF SPATIALLY DEPENDENT NUCLEAR REACTOR SYSTEMS IS DEVELOPED. THIS APPROACH TREATS REACTOR DYNAMICS PROBLEMS FROM THE SYSTEMS PARTIAL-DIFFERENTIAL EQUATIONS WITHOUT FINDING THE SOLUTION OR ENGAGING ANY APPROXIMATION TO A LUMPED-PARAMETER MODEL. A DYNAMICAL MODEL OF A SPATIALLY DEPENDENT PROCESS IN NUCLEAR REACTORS IS FORMULATED. THE MODEL IS GENERAL AND MAY INCLUDE THE SPATIAL EFFECTS OF DETERMINISTIC PROCESSES SUCH AS CONTROL DEVICES AND TEMPERATURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*REACTOR CONTROL + CONTROL SYSTEM + MATHEMATICAL TREATMENT + PONTRYAGINS PRINCIPLE + THEORETICAL INVESTIGATION

9-26570 ALSO IN CATEGORY 17

CLARK RH + CARSON JF
EQUIPMENT MALFUNCTIONS AND MODIFICATIONS
COMBUSTION ENGINEERING, INC.
RAW-337 +. 2 PAGES, FROM THE BABCOCK + WILCOX TEST REACTOR LICENSE TR-4 EIGHTH REPORT TO THE ATOMIC ENERGY COMMISSION DIVISION OF REACTOR LICENSING, MAY, 1968, DUCKFORD NO. 50-30

SMALL PLASTIC TUBES SUPPLYING N₂-HE TO A DETECTOR EXPERIMENT CAME IN CONTACT WITH HEATER WIRES OF ANOTHER EXPERIMENT. THE GAS-SUPPLY VALVES WERE CLOSED BEFORE INCIDENT, SO ONLY GAS IN TUBES ESCAPED. SOME INCREASE IN CONTAINMENT PARTICULATE MONITOR WAS NOTED. ***NUMEROUS SCRAMS HAVE BEEN CAUSED BY SHORT-TERM POWER INTERRUPTIONS OF FLUCTUATIONS INITIATED BY A QUICK-ACTING SCRAM RELAY. IN THE PRIMARY PUMP CIRCUIT THERE IS A SECOND RELAY WHICH SERVES SAME PURPOSE BUT IS SLOWER ACTING. THE QUICK-ACTING RELAY IS LESS SAFE SINCE IT CREATES NEED FOR MORE STARTUPS AND WAS PROVIDED WITH DELAY OF 1 TO 2 SEC.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST. WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*FAILURE, DESIGN ERROR + ACCIDENT, LOSS OF POWER + ELECTRIC POWER, NORMAL + EXPERIMENT, GENERAL + INCIDENT, EQUIPMENT + INSTRUMENTATION, RELAY + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR SAFETY SYSTEM + REACTOR, RESEARCH + REPORT, OPERATIONS SUMMARY + SCRAM, SPURIOUS

9-26703

RUUX D
PARALLEL-PLATE MULTISECTION IONIZATION CHAMBERS FOR HIGH-PERFORMANCE REACTORS
OAK RIDGE NATIONAL LABORATORY

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26703 *CONTINUED*

STI/PUB/115 + CN-22/53 +. 15 PAGES, 8 FIGURES, 4 TABLES, 2 REFERENCES PAGES 3-17 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

A NEW MODEL FOR REACTOR CONTROL WAS DEVELOPED. THE ELECTRODES MAY BE COATED WITH BORON-10 FOR USE AS NEUTRON-SENSITIVE CHAMBERS, WITH URANIUM-235 FOR USE AS FISSION CHAMBERS, OR LEFT UNCOATED FOR USE AS GAMMA-SENSITIVE CHAMBERS. ALSO, THE USE OF BORON-COATED AND UNCOATED ELECTRODES APPROPRIATELY CONNECTED WILL GIVE A GAMMA-COMPENSATED NEUTRON-SENSITIVE CHAMBER. ACTIVE SECTIONS MAY BE COMBINED TO ASSEMBLE MULTIPURPOSE DETECTORS FOR DIFFERENT REACTOR CONTROL APPLICATIONS. TO DATE, TWO ORNL REACTORS HAVE BEEN FULLY EQUIPPED WITH THIS CHAMBER MODEL. OVER A PERIOD OF 20 MONTHS, NO FAILURE HAS OCCURRED.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*CHAMBER, ION + CHAMBER, FISSION + CHAMBER, GAMMA + CHAMBER, NEUTRON + EQUIPMENT DESIGN + INSTRUMENTATION, NUCLEAR

9-26704

ALLEMAND R + DELCROIX V

NEW POSSIBILITIES OFFERED BY BORON AND URANIUM DETECTORS

CENTRE D ETUDES NUCLEAIRES DE GRENOBLE, FRANCE

STI/PUB/115 + CN-22/20 +. 11 PAGES, 8 FIGURES, 1 TABLE, 8 REFERENCES, PAGES 45-55 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

THE IDEA OF COVERING THE TOTAL POWER RANGE BY MEANS OF A SINGLE FISSION CHAMBER OPERATING FIRST AS A PULSE CHAMBER AND THEN AS A CONTINUOUS CURRENT CHAMBER IS JUSTIFIED BY THE DEVELOPMENT OF PULSE SYSTEMS POSSESSING A LARGE RANGE AND ENABLING THE PROBLEM OF GAMMA FLUX COMPENSATION TO BE SOLVED BY MEANS OF A FIXED COMPENSATION. IN THE SAME WAY, THE REPLACEMENT OF THE FISSION CHAMBER BY A NONPROPORTIONAL BORON COUNTER HAVING THE ADVANTAGE OF GREATER SENSITIVITY WOULD REPRESENT A FURTHER STEP FORWARD.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*CHAMBER, ION + DESIGN STUDY + INSTRUMENTATION, NUCLEAR

9-26705

COX RJ + HARRISON D + GOODINGS A

USING NEUTRON FLUX DETECTORS IN-PILE

ATOMIC ENERGY ESTABLISHMENT, WINFRITH, DORCHESTER, DORSET

STI/PUB/114 + CN-22/26 +. 15 PAGES, 5 FIGURES, 13 REFERENCES, PAGES 57-71 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

NEUTRON FLUX DETECTORS HAVE DEVELOPED TO THE STAGE WHERE THEY CAN BE USED WITH CONFIDENCE IN-PILE IN MOST TYPES OF POWER REACTORS. THE USE OF SUCH DETECTORS CAN RESULT IN A REDUCTION IN COST OF MEASURING POWER LEVEL FOR CONTROL PURPOSES OR CAN BE USED FOR LOCALIZED FLUX MEASUREMENTS TO IMPROVE THE POWER DISTRIBUTION THROUGHOUT THE REACTOR. INFORMATION IS GIVEN ON THE TYPES OF DETECTORS THAT HAVE RECENTLY BEEN DEVELOPED IN THE UNITED KINGDOM, INCLUDING PERFORMANCE DATA AND SOME INDICATION OF THE USES FOR WHICH THEY ARE SUITABLE.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, IN CORE + *INSTRUMENTATION, RADIATION MONITORING + COUNTER + ELECTRICAL CONDUCTION + HIGH TEMPERATURE + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, NUCLEAR + NEUTRON + UNITED KINGDOM

9-26706

BROWN DP

MICROWAVE DETERMINATION OF NEUTRON FLUXES IN REACTORS

BATTELLE MEMORIAL INSTITUTE, RICHLAND, WASH.

STI/PUB/115 + CN-22/54 +. 15 PAGES, 8 FIGURES, 8 REFERENCES, PAGES 73-97 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

A TECHNIQUE WAS INVESTIGATED FOR DETERMINING IN-CORE NEUTRON FLUX DENSITIES THROUGH THE USE OF MICROWAVES. THIS TECHNIQUE IS BASED ON THE CHANGE IN RESONANT FREQUENCY OF A MICROWAVE CAVITY THAT CONTAINS A PLASMA PRODUCED BY THE IMPINGING NEUTRONS. EXPERIMENTS CONDUCTED IN A HANFORD PRODUCTION REACTOR DEMONSTRATED GOOD CORRELATION BETWEEN THE MEASURED FREQUENCY SHIFT AND THE ACTUAL FLUX DENSITY IN THE REACTOR. RESPONSE OF THE MICROWAVE DETECTOR IS ESSENTIALLY IMMEDIATE, AND TRANSIENT FLUX CHANGES WERE READILY APPARENT.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, NUCLEAR + COMPARISON, THEORY AND EXPERIENCE + FLUX, INTEGRATED + IN CORE MEASUREMENT + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, IN CORE + NEUTRON

9-26707

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26707 *CONTINUED*
JAIN RD + VENKATESWARLU U
THE NEUTRON FLUX MONITORING SYSTEM AND FLUX DISTRIBUTION IN THE TARAPUR REACTORS
TARAPUR ATOMIC POWER PROJECT, BOMBAY, INDIA
STI/PUB/115 + CN-22/37 +. 7 PAGES, 1 FIGURE, 2 TABLES, 8 REFERENCES, PAGES 99-105 OF NUCLEAR ELECTRONICS
CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

BECAUSE OF EXCESSIVE THICKNESS OF WATER REFLECTORS IN THE TARAPUR REACTORS, THE FEASIBILITY OF
THE USE OF OUT-OF-CORE NEUTRON FLUX DETECTING SYSTEM WAS IN DOUBT. A SCHEME PROPOSING
COMPLETE IN-CORE DETECTING SYSTEM WAS FOUND QUITE INADEQUATE FROM THE POINT OF VIEW OF SAFE
OPERATION OF THE STATION. A NEW SCHEME UTILIZING A MIXED IN-CORE AND OUT-OF-CORE DETECTING
SYSTEM BASED ON THE CALCULATIONS OF NEUTRON AND GAMMA-RAY FLUX DISTRIBUTIONS HAS BEEN
EVOLVED. THIS PAPER CONTAINS THE CALCULATIONS OF THE NEUTRON AND GAMMA-RAY DISTRIBUTIONS AND
THE DESCRIPTION OF THE LATEST SCHEME OF NEUTRON DETECTING SYSTEM TO BE INSTALLED IN THE
TARAPUR REACTORS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATION, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, RADIATION MONITORING + FLUX, INTEGRATED + GAMMA + INDIA + NEUTRON + THERMAL NEUTRON

9-26708
FURET J + WEILL J
PRESENT STATE OF DEVELOPMENT IN REACTOR CONTROL INSTRUMENTATION DESIGN IN FRANCE
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE
STI/PUB/115 + CN-22/16 +. 14 PAGES, 7 FIGURES, 3 TABLES, 9 REFERENCES, PAGES 107-120 OF NUCLEAR
ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

ONLY NEUTRON DETECTORS ARE DISCUSSED, AND DEVELOPMENT IS CONCENTRATED ON THE FOLLOWING - (A)
INCREASING THE DISTANCE BETWEEN ELECTRONIC INSTRUMENTATION AND THE DETECTORS TO PERMIT
OPERATION UNDER ENVIRONMENTAL CONDITIONS, (B) INCREASING THE MEASURING RANGE OF THE PULSE
ASSEMBLIES, WITH IMPROVEMENT IN NEUTRON/GAMMA DISCRIMINATION, (C) USING THE SAME DETECTOR
BOTH FOR DIGITAL AND CURRENT TECHNIQUES, AND (D) DEVELOPING DIGITAL MEASURING TECHNIQUES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, CONTROL + DESIGN STUDY + FRANCE + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, NUCLEAR +
NEUTRON + SURVEY, GENERAL

9-26709
VENKATESWARLU U + VISWANATHAN L + PANSARE MG + NAGLE AK
SOME DESIGN ASPECTS OF THE CONTROL AND SAFETY INSTRUMENTATION OF THE ZERO-ENERGY REACTOR ZERLINA
ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA
STI/PUB/115 + CN-22/36 +. 12 PAGES, 8 FIGURES, REFERENCES, PAGES 121-32 OF NUCLEAR ELECTRONICS CONFERENCE
PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

SOME OF THE SPECIAL CONDITIONS ARE DISCUSSED THAT EXIST IN ZERLINA (ZERO-ENERGY REACTOR FOR
LATTICE INVESTIGATIONS AND STUDY OF NEW ASSEMBLIES) AND HOW THEY INFLUENCE THE DESIGN OF
NEUTRON FLUX INSTRUMENTATION USED FOR MEASUREMENT, CONTROL, AND OVERALL SAFETY OF THE
REACTOR. IN VIEW OF THE POTENTIAL DANGERS INVOLVED IN RESEARCH REACTOR AND THE TYPE OF
EXPERIMENTS CONDUCTED, ALL HIGH-LEVEL FLUX MEASURING INSTRUMENTATION SUCH AS LINEAR,
LOG-PERIOD, AND ERROR CHANNELS IN ADDITION TO A NUMBER OF SAFETY CIRCUITS, ARE CONNECTED INTO
THE REACTOR TRIP LINE.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, NUCLEAR + *NEUTRON + DESIGN STUDY + FLUX, INTEGRATED + INDIA + INSTRUMENTATION, CONTROL +
REACTOR SAFETY SYSTEM + REACTOR, RESEARCH

9-26710
HARRISON D + WILSON I + COX RJ
REDUCING THE EFFECTS OF ELECTRICAL INTERFERENCE ON NUCLEAR INSTRUMENTS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH
STI/PUB/115 + CN-22/27 +. 13 PAGES, 5 FIGURES, 6 REFERENCES, PAGES 157-69 OF NUCLEAR ELECTRONICS
CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

A SPECIAL STUDY WAS MADE OF THE CAUSES OF INTERFERENCE IN NUCLEONIC REACTOR CONTROL
INSTRUMENTS WITH THE FOLLOWING OBJECTIVES - (1) TO IDENTIFY AND UNDERSTAND THE WAY IN WHICH
INTERFERENCE IS CAUSED, (2) TO DEVELOP TECHNIQUES AND RULES FOR INTERFERENCE REDUCTION, (3)
TO DEVELOP MEANS OF DIAGNOSING THE SOURCES AND CAUSES OF INTERFERENCE AND TO TEST THE
GOODNESS OF A GIVEN INSTALLATION. RECENT TEST METHODS ARE DESCRIBED, THE RESULTS OF WHICH
CAN BE USED TO DECIDE WHERE TO MAKE CHANGES TO THE INSTALLATION TO EFFECT IMPROVEMENTS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, ABNORMAL INDICATION + *INSTRUMENTATION, NUCLEAR + ELECTRICAL CONDUCTION +
FAILURE, DESIGN ERROR + FAILURE, INSTALLATION ERROR + INSTABILITY + INSTRUMENTATION, TESTING + INTEGRITY +
QUALITY CONTROL

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26711
DELCROIX V + HENRY M + LACOUR J + PINON Y + ROCHET A + TATTEGRAIN A
FAST PERIOD METER WITH INTEGRATED CIRCUITS
CENTRE D ETUDES NUCLEAIRES DE GRENOBLE + CENTRE D ETUDES NUCLEAIRES DE CADARACHE
STI/PUB/115 + CN-22/24 +. 16 PAGES, 10 FIGURES, 5 REFERENCES, PAGES 185-200 OF NUCLEAR ELECTRONICS
CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE EQUIPMENT DESCRIBED WAS DESIGNED FOR MEASURING THE POWER DOUBLING TIME OF THE CABRI REACTOR AT CADARACHE DURING THE EXPONENTIAL PHASE OF THE TRANSIENT STATE PRODUCED BY A STEPWISE CHANGE IN REACTIVITY. THE AMPLIFIER, THE THRESHOLDS, THE LOGICAL CIRCUITS, AND MOST OF THE CONTROL CIRCUITS OF THE THIN-STRIP MEMORY ARE MADE WITH INTEGRATED CIRCUITS. SWITCHING IS CARRIED OUT BY MEANS OF FIELD-EFFECT TRANSISTORS. EMPHASIS IS PLACED ON THE PROBLEMS POSED BY THE USE OF INTEGRATED CIRCUITS AND FERROMAGNETIC STRIP MEMORIES, AND THE ADVANTAGES DERIVED FROM USING THEM.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, PERIOD + *PERIOD METER + FRANCE + SOLID STATE DEVICE

9-26712
DA COSTA VIEIRA D + FRIEDLING G + MERITE B + TATTEGRAIN A
APPARATUS FOR MEASURING FAST DOUBLING TIMES OF THE CABRI REACTOR
CENTRE D ETUDES NUCLEAIRES DE CADARACHE
STI/PUB/115 + CN-22/8 +. 23 PAGES, 14 FIGURES, PAGES 201-23 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE APPARATUS FOR MEASURING DOUBLING TIMES AS SHORT AS 1 MS INCLUDES A CONSTANT-SENSITIVITY AMPLIFIER AND SEVERAL TRIGGERING CIRCUITS IN PARALLEL. THE OUTPUT SIGNALS OF THE TRIGGERING CIRCUITS ARE SERIALIZED ON A SINGLE WIRE, GIVING A TRAIN OF SIX PULSES, THE INTERVALS BETWEEN WHICH DEFINE THE FIVE DOUBLING TIMES. AT THE RECEPTION END, A REGISTER DISTRIBUTES THE STOP-GO COMMANDS OF SEVERAL SEALERS. THE APPARATUS DISPLAYS THE RESULTS INSTANTANEOUSLY ON NIXIE TUBES AND ALSO PROVIDES FOR AN AUTOMATIC PRINT-OUT ON AN IBM MACHINE.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, NUCLEAR + DATA PROCESSING + FRANCE + INSTRUMENTATION, PERIOD

9-26713
LAUNOIS M
THE USE OF MODULATED GAIN DETECTORS AND A DIGITAL DATA STORAGE UNIT TO RECORD PULSED REACTOR EXCURSIONS
COMMISSARIAT A L ENERGIE ATOMIQUE, PARIS, FRANCE
STI/PUB/115 + CN-22/14 +. 14 PAGES, 12 FIGURES, PAGES 231-44 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

TO ENSURE ACCURATE RECORDING OF PULSED REACTOR EXCURSIONS, A METHOD WAS DEVELOPED IN WHICH USE IS MADE OF A CURRENT DETECTOR FOLLOWED BY A SAMPLING CIRCUIT, A CODER, AND A DIGITAL STORAGE UNIT CONSISTING AT PRESENT OF AN ANALYZER OPERATING AS A MULTISCALE. THE PAPER DISCUSSES POSSIBLE AND PLANNED APPLICATIONS OF THIS SYSTEM TO THE CABRI REACTOR.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, NUCLEAR + DATA PROCESSING + FRANCE + INSTRUMENTATION, RECORDER + REACTOR, PULSED

9-26714
SAKURAI Y + MORI K + ISOZUMI K + KAKIZAWA K
CAPACITANCE-TYPE VOID METER
OSAKA UNIVERSITY, JAPAN
STI/PUB/115 + CN-22/6 +. 14 PAGES, 14 FIGURES, 5 REFERENCES, PAGES 247-60 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

A METHOD IS REPORTED FOR VOID-FRACTION MEASUREMENT WHICH IS BASED ON CHANGES OF THE EQUIVALENT DIELECTRIC CONSTANT OF THE TWO-PHASE FLOW. BOTH THE INSTANTANEOUS AND THE LOCAL VOID FRACTION CAN BE MEASURED WITH A FAST RESPONSE BY THIS METHOD. THE LINEARITY OF THE DEVICE IS GOOD. EXPERIMENTAL RESULTS SHOW THAT A PROBE-TYPE ELECTRODE HAS THE BEST CHARACTERISTICS FOR BWR DOSE APPLICATIONS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, FLOW + COMPARISON, THEORY AND EXPERIENCE + FLOW, TWO PHASE + REACTOR, BWR

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26715

LIPSETT JJ

RUPTURED FUEL LOCATION WITH HIGH-RESOLUTION GAMMA-RAY SPECTROMETERS

ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONT.

STI/PUB/115 + CN-22/31 +. 23 PAGES, 9 FIGURES, 3 TABLES, 17 REFERENCES, PAGES 299-321 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

THE GAMMA SPECTRA OF MIXED FISSION PRODUCTS WERE MEASURED IN NRX LOOP EXPERIMENTS USING INTENTIONALLY PUNCTURED UO₂ FUEL. THE PAPER REPORTS TEST DATA ON (A) PHASE DISTRIBUTION OF FISSION PRODUCTS IN TWO-PHASE COOLANT FLOW WITH A 0.25-MM DRILLED PUNCTURE, (B) FISSION PRODUCTS APPEARING IN ORGANIC COOLANT AFTER A SUDDEN PUNCTURE AND IMMEDIATE REACTOR SHUTDOWN, AND (C) RELEASE OF FISSION PRODUCTS (HALF-LIFE LESS THAN 17 MIN) THROUGH A 0.25-MM DRILLED PUNCTURE IN HIGHLY RATED FUEL IN PRESSURIZED WATER.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATION, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + CANADA + CANDU (HWR) + REACTOR, HWR + SPECTROMETRY, GAMMA + TEST, INSTRUMENT RESPONSE

9-26716

GRAFTIEAUX J + ROGUIN A

DEVELOPMENT OF FISSION-PRODUCT DETECTORS FOR THE DETECTION OF BURST FUEL ELEMENT CANS

CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE

STI/PUB/115 + CN-22/13 +. 10 PAGES, 4 FIGURES, 10 REFERENCES, PAGES 323-32 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

THE MEASUREMENT OF FISSION GASES BY ELECTRIC COLLECTION IS USED FOR DETECTING BURST CANS, PRINCIPALLY IN GRAPHITE/GAS-REACTOR SYSTEMS. THE METHOD OF ELECTRIC COLLECTION AFTER EXTRACTION OF THE FISSION GASES DISSOLVED IN THE WATER IS ALSO USED FOR MAINTAINING A CHECK ON THE FUEL OF WATER-COOLED REACTORS. HOWEVER, ALTHOUGH IT IS LESS SENSITIVE, THE METHOD OF MEASURING DELAYED NEUTRONS EMITTED BY THE FISSION PRODUCTS ESCAPING INTO THE WATER IS WIDELY USED BECAUSE OF THE SIMPLICITY OF THE EQUIPMENT. THE METHOD IS USED IN THE EL.3, PEGASE, AND OSIRIS REACTORS. SYSTEMS USED IN THE EDF POWER REACTOR AND IN THE EL.4 REACTOR COOLED BY CARBON DIOXIDE ARE ALSO PRESENT.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + FISSION PRODUCT RELEASE, GENERAL + FRANCE + INSTRUMENTATION, COMPONENT + SURVEY, GENERAL

9-26717

RAGUPATHY S + VOHRA KG

A MULTICHANNEL ANALYSIS SYSTEM FOR LOW LEVELS OF FISSION PRODUCTS IN REACTOR COOLANTS

ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA

STI/PUB/115 + CN-22/42 +. 7 PAGES, 6 FIGURES, PAGES 333-39 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

DESCRIBES THE SYSTEM CONSISTING OF A SODIUM IODIDE CRYSTAL AND A 256-CHANNEL PULSE-HEIGHT ANALYZER INCORPORATING FERRITE-CORE MEMORY STORAGE. THIS SYSTEM HAS BEEN ADOPTED FOR THE MEASUREMENT OF VERY LOW LEVELS OF FISSION PRODUCTS IN REACTOR COOLANTS BY GAMMA SPECTROMETRY. THE SYSTEM CAN BE USED FOR A VERY LARGE RANGE OF FISSION-PRODUCT ACTIVITY, FROM VERY LOW LEVELS OF ACTIVITY ENCOUNTERED IN NORMAL OPERATIONS TO FAIRLY HIGH LEVELS ENCOUNTERED IN THE CASE OF A SPLIT ROD. USING THIS SYSTEM, PRELIMINARY STUDIES HAVE BEEN MADE ON INDUCED RADIOACTIVITY AND FISSION-PRODUCT ACTIVITIES IN THE REACTOR COOLING WATER SAMPLES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + COMPARISON, THEORY AND EXPERIENCE + FISSION PRODUCT RELEASE, GENERAL + INDIA + SPECTROMETRY, GAMMA + TEST, INSTRUMENT RESPONSE

9-26718

PATWARDHAN PK + INDURKAR VS

A NEW DESIGN OF RATIO CIRCUIT FOR FISSION-FRAGMENT STUDIES

ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA

STI/PUB/115 + CN-22/32 +. 10 PAGES, 8 FIGURES, 6 REFERENCES, PAGES 341-50 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

DESCRIBES A PULSE-VOLTAGE DIVIDING CIRCUIT FOR STUDYING THE MASS DISTRIBUTION OF FISSION-FRAGMENTS IN A MULTI-PARAMETER EXPERIMENTAL SET-UP. IN THE PRESENT METHOD, TEMPERATURE-COMPENSATED AMPLIFIERS AND ZERO-TRIGGER TECHNIQUES ARE USED TO IMPROVE UPON THE OVERALL SENSITIVITY. THE SPECIAL FEATURE OF THE CIRCUIT IS THAT THE OUTPUT IS PRESENTED IN DIGITAL FORM, IMPROVING CONSIDERABLY THE OVERALL CIRCUIT PERFORMANCE IN TERMS OF FLUCTUATIONS AND LINEARITY.

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26718 *CONTINUED*

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT + FISSION PRODUCT RELEASE, GENERAL +
INSTRUMENTATION, COMPONENT

9-26719

CHAUVEY G + GARIOD R + TOURNIER E
REACTIMETER

CENTRE D ETUDES NUCLEAIRES DE GRENOBLE, FRANCE

STI/PUB/115 + CN-22/22 +. 14 PAGES, 16 FIGURES, 2 TABLES, 7 REFERENCES, PAGES 365-78 OF NUCLEAR
ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

THE REACTIMETER IS AN APPARATUS BY WHICH THE REACTIVITY IN A REACTOR, PARTICULARLY DURING REACTIVITY TRANSIENTS, CAN BE MEASURED DIRECTLY AND INSTANTANEOUSLY. COMPARATIVE STUDIES WERE CARRIED OUT ON THE BASIS OF CONVENTIONAL MEASUREMENTS AND AN ACCURACY OF THE ORDER OF $\pm 1\%$ WAS OBTAINED ON THE FOLLOWING REACTORS - ALIZE, AZUR, AND SILOETTE. WHEN THE PERIOD OF THE REACTOR IS POSITIVE NO PRECAUTIONS NEED TO BE TAKEN WITH REGARD TO THE POSITIONING OF THE CHAMBER. WHEN THE PERIOD IS STRONGLY NEGATIVE IT IS SUFFICIENT TO ARRANGE THE CHAMBER IN SUCH A WAY THAT PART OF THE CORE IS BETWEEN THE ROD BEING STUDIED AND THE CHAMBER. IN THIS WAY ROD ANTI-REACTIVITY CAN BE MEASURED WITH AN ACCURACY OF $\pm 1\%$.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, NUCLEAR + *REACTIVITY EFFECT + COMPARISON, THEORY AND EXPERIENCE + FRANCE +
INSTRUMENTATION, PERIOD + OPERATING EXPERIENCE

9-26720

CAILLET C + DEAT M + FURET J + WEILL J

PROCEDURE FOR RAPID START-UP-ANALYSIS ON AN ANALOG COMPUTER AND COMPARISON WITH RESULTS OF REACTOR TRIALS
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE

STI/PUB/115 + CN-22/21 +. 14 PAGES, 3 FIGURES, 4 TABLES, 3 REFERENCES, PAGES 379-93 OF NUCLEAR
ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

WITH THE AUTOMATIC STARTUP PROCEDURE A REACTOR CAN PASS FROM ANY UNKNOWN SUBCRITICAL STATE TO A SUBCRITICAL STATE VERY CLOSE TO CRITICALITY UNDER SATISFACTORY CONDITIONS OF SPEED AND SAFETY. RESULTS OBTAINED ON THE ANALOG COMPUTER WERE COMPARED WITH TRIAL VALUES ON THE CABRI REACTOR.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*CONTROL SYSTEM + *INSTRUMENTATION, STARTUP + *REACTOR CONTROL + COMPARISON, THEORY AND EXPERIENCE +
COMPUTER, ANALOG + FRANCE + SIMULATION

9-26721

ALSO IN CATEGORY 6

CHERNICK J

NEUTRON DYNAMICS OF BROOKHAVEN(S) HIGH FLUX BEAM REACTOR
BROOKHAVEN NATIONAL LABORATORY, UPTON, N.Y.

STI/PUB/115 + CN-22/52 +. 17 PAGES, 13 FIGURES, 7 REFERENCES, PAGES 395-411 OF NUCLEAR ELECTRONICS
CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

BROOKHAVEN(S) HIGH FLUX BEAM REACTOR (HFBR) IS A HIGH-POWER-DENSITY RESEARCH REACTOR WITH MANY NOVEL FEATURES. THESE INCLUDE A COMPACT UNDERMODERATED CORE, COOLED, MODERATED, AND REFLECTED BY HIGH-VELOCITY D₂O. THE LARGE D₂O REFLECTOR PLAYS THE DOMINANT ROLE IN NEUTRON MODERATION AND IN CONTROLLING THE REACTOR. RESULTING SAFETY FEATURES INCLUDE A LONG NEUTRON GENERATION TIME, PLUS NEGATIVE TEMPERATURE AND VOID COEFFICIENTS THROUGHOUT THE CORE AND REFLECTOR. DYNAMIC CHARACTERISTICS OF THE REACTOR HAVE BEEN EXPLORED BOTH BY ANALOG AND DIGITAL COMPUTING MACHINES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*REACTOR CONTROL + *REACTOR DYNAMICS + HEAVY WATER + HFBR (RR) + REACTOR, AEC OWNED + REACTOR, RESEARCH +
REACTOR, RESEARCH + REACTOR, WATER

9-26722

BERTRAND J + DESANDRE NAVARRE D + FRIEDLING G + MOURCHOU R

AUTOMATIC CONTROL SYSTEM OF THE PEGGY REACTOR

CENTRE D ETUDES NUCLEAIRES DE CADARACHE, FRANCE

STI/PUB/115 + CN-22/23 +. 15 PAGES, 11 FIGURES, PAGES 413-27 OF NUCLEAR ELECTRONICS CONFERENCE
PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE PAPER DESCRIBES THE AUTOMATIC CONTROL SYSTEM DESIGNED TO REPLACE THE PREVIOUS SYSTEM OF THE PEGGY REACTOR. THE MAIN CHARACTERISTICS OF THE SYSTEM ARE THAT IT PERMITS (A) CHANGE-OVER AT A CONSTANT PERIOD OF 20 SEC FROM AN INITIAL TO A FINAL POWER DIFFERING BY A

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26722 *CONTINUED*

FACTOR OF AS MUCH AS 1 MILLION, (B) ACCURATE STABILIZATION OF THE POWER, THE CHANGE FROM A TRANSIENT TO A STABILIZED STATE BEING MADE AUTOMATICALLY. PRINCIPLES UNDERLYING THE DESIGN OF THE EQUIPMENT ARE DISCUSSED.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*CONTROL SYSTEM + *REACTOR CONTROL + EQUIPMENT DESIGN + FRANCE

9-26723

KOVANIC P

P. KOVANIC--SPECIAL CONTRIBUTION TO NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY

NUCLEAR RESEARCH INSTITUTE OF THE CZECHOSLOVAK ACADEMY OF SCIENCES IN REZ

STI/PUB/115 +. 5 PAGES, FIGURES, PAGES 429-33 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

DIGITAL EQUIPMENT WAS BUILT TO HANDLE THE IMPULSES OF A FIXED-POSITION PULSED NEUTRON DETECTOR BUT WHICH HAS THE ADVANTAGES USUALLY FOUND WITH MOVABLE DETECTORS. THE FACILITY IS DESIGNED FOR OPERATION AS A FIXED DETECTOR SYSTEM IN THE LOWER REACTOR-POWER REGION. THIS WORK WAS CARRIED OUT IN THE NUCLEAR RESEARCH INSTITUTE OF THE CZECHOSLOVAK ACADEMY OF SCIENCE IN REZ.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*INSTRUMENTATION, NUCLEAR + CONTROL SYSTEM + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, CONTROL + REACTOR, RESEARCH

9-26724

JOVER P + UBERSCHLAG J + FURET J

CONTROL AND SAFETY ASSEMBLY FOR REACTORS OF VERY HIGH FLUX

CENTRE D ETUDES NUCLEAIRES DE SACLAY

STI/PUB/115 + CN-22/15 +. 7 PAGES, 5 FIGURES, 2 REFERENCES, PAGES 435-41 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE DISPLACEMENT OF THE AUTONOMOUS LOOPS BEING TESTED IN THE PEGASE HIGH-FLUX REACTOR HAS BEEN THE CAUSE OF DISTURBANCES IN THE CONTROL AND SAFETY ASSEMBLIES BASED ON NUCLEAR DETECTION. CONSEQUENTLY A SYSTEM HAS BEEN DESIGNED FOR AUTOMATIC CORRECTION OF THE AMPLIFIER GAIN. EACH ASSEMBLY HAS ITS OWN AUTOMATIC SYSTEM FOR CORRECTING DISTURBANCES IN THE DETECTOR TO WHICH IT IS COUPLED. PROVISION HAS BEEN MADE FOR DISCONNECTING THE CONNECTION SYSTEM IF IT SHOULD FAIL, WHILE ENSURING CONTINUITY OF OPERATION IN CASES WHERE A FAULT OCCURS IN ONE OF THE ELEMENTS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR CONTROL + *REACTOR SAFETY SYSTEM + CONTROL SYSTEM + INSTRUMENTATION, AMPLIFIER + INSTRUMENTATION, NUCLEAR + SERVOMECHANISM

9-26725

KLIGER I

SYNTHESIS OF AN OPTIMAL CONTROL SYSTEM FOR NUCLEAR REACTORS WITH GENERALIZED TEMPERATURE FEEDBACK

ARGONNE NATIONAL LABORATORY

STI/PUB/115 + CN-22/55 +. 18 PAGES, FIGURES, 4 REFERENCES, PAGES 443-60 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE SYNTHESIS PROBLEM OF A GENERALIZED REACTOR CONTROL SYSTEM IS DISCUSSED. THE PROBLEM IS FORMULATED SUCH THAT IT IS APPLICABLE TO A LARGE CLASS OF OPTIMIZATION PROBLEMS IN THE NUCLEAR REACTOR FIELD. THE CONTROL SYSTEM IS COMPOSED OF TWO PARTS. THE FIRST CONTROLS THE REACTOR HEAT TRANSFER SYSTEM THROUGH THE COOLANT FLOW AND THE NEUTRON DENSITY. THE SECOND CONTROLLER FORCES THE REACTOR TO GENERATE THE DESIRED NEUTRON FLUX AS DETERMINED BY THE FIRST CONTROLLER.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR CONTROL + CONTROL SYSTEM + CONTROLLER + INSTRUMENTATION, CONTROL + MATHEMATICAL TREATMENT + SIMULATION + THEORETICAL INVESTIGATION

9-26726

WEISS H

POWER MEASUREMENT AND AUTOMATIC REACTOR CONTROL BY GAMMA- OR CERENKOV-RADIATION

ATOMINSTITUT DER OSTERREICHISCHEN HOCHSCHULEN, VIENNA, AUSTRIA

STI/PUB/115 + CN-22/2 +. 14 PAGES, 12 FIGURES, 10 REFERENCES, PAGES 461-74 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE POWER-MEASURING SYSTEM WAS INSTALLED IN THE TRIGA-REACTOR FOR TESTING AND AUTOMATIC REACTOR CONTROL. WITH THIS METHOD IT IS POSSIBLE TO MOUNT THE DETECTOR AT A DISTANCE FROM

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26726 *CONTINUED*

THE CORE WITH THE RESULT THAT THE MEASUREMENT IS NOT SO DEPENDENT ON LOCAL FLUX VARIATIONS DUE TO IRRADIATION SAMPLES IN THE CORE, CHANGES OF CONTROL ROD POSITIONS, AND BURNUP OF FUEL AS IF THE NEUTRON DETECTOR WERE MOUNTED AT THE REFLECTOR. THE DETECTORS ARE FREE FROM NEUTRON ACTIVATION, RADIATION DAMAGE, AND SENSITIVITY CHANGES DUE TO NUCLEAR REACTIONS IN THE DETECTOR MATERIAL. FURTHERMORE, THERE ARE NO INSULATION PROBLEMS CAUSED BY IRRADIATION OF INSULATORS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR CONTROL + GAMMA EMITTER + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, CONTROL + OPERATING EXPERIENCE + REACTOR POWER + REACTOR, RESEARCH + TRANSFER FUNCTION + TRIGA (RR)

9-26727

MEIFFREN J + DECOOL F
SAFETY SYSTEMS AND THE MEASUREMENT OF NEUTRON FLUX IN THE G-2 AND G-3 REACTORS
CENTRE DE PRODUCTION DU PLUTONIUM, MARCOULE, FRANCE
STI/PUB/115 + CN-22/19 +. 19 PAGES, 7 FIGURES, PAGES 475-93 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

BRIEFLY DISCUSSED ARE THE ORIGINAL FLUX-MEASUREMENT SYSTEM AND SAFETY DEVICES. THE NEW EQUIPMENT IS DESCRIBED, GIVING REASONS FOR THE CHOICE MADE. RESULTS ARE PRESENTED FROM THE TESTING OF THE EQUIPMENT, AN ACCOUNT OF ITS INSTALLATION AND INITIAL OPERATION, AND THE OPERATING RESULTS OBTAINED OVER SEVERAL MONTHS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016 \$13.50 COPY/BOOK

*REACTOR SAFETY SYSTEM + FLUX, INTEGRATED + FRANCE + MEASUREMENT, GENERAL + NEUTRON + OPERATING EXPERIENCE + TEST, INSTRUMENT RESPONSE

9-26728

WILSON I + WHYARD RE + KEATS AB
PULSE CODING TECHNIQUES FOR REACTOR SAFETY LOGIC SYSTEMS
UNITED KINGDOM ATOMIC ENERGY ESTABLISHMENT, WINFRITH
STI/PUB/115 + CN-22/28 +. 8 PAGES, 3 FIGURES, 3 REFERENCES, PAGES 497-504 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

REACTOR SAFETY LOGIC SYSTEMS FOR USE ON LARGE NUCLEAR POWER STATIONS MUST PROVIDE AN EXTREMELY HIGH RELIABILITY FOR SHUTTING DOWN THE PLANT FOR GENUINE FAULT CONDITIONS COMBINED WITH THE CONFLICTING REQUIREMENT OF RELATIVE FREEDOM FROM UNNECESSARY SHUTDOWNS DUE TO MINOR FAULTS. MOST SYSTEMS EMPLOY REDUNDANCY TOGETHER WITH A MAJORITY-VOTE TECHNIQUE. THE USE OF SOLID-STATE LOGIC ELEMENTS HAS GIVEN RISE TO A RAPID ADVANCEMENT OF TECHNIQUES. THE PAPER DEALS WITH THE MAJORITY-VOTE PART OF SUCH A SYSTEM AND THE PROBLEM OF BEING ABLE TO TEST THAT THIS PART OF THE SYSTEM IS FUNCTIONING CORRECTLY.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR SAFETY SYSTEM + INSTRUMENTATION, COMPONENT + SOLID STATE DEVICE + TEST, INSTRUMENT RESPONSE

9-26729

FURET J
EVOLUTION OF SAFETY SYSTEMS FOR THE CONTROL OF CEA REACTORS
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE
STI/PUB/115 + CN-22/17 +. 12 PAGES, 10 FIGURES, 13 REFERENCES, PAGES 505-16 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

THE EVOLUTION OF SAFETY SYSTEMS IS THE RESULT OF MANY YEARS OF EXPERIENCE IN REACTOR OPERATION, IMPROVED KNOWLEDGE OF REACTOR DYNAMICS, CONSIDERABLE PROGRESS IN SAFETY STUDIES, NEW CONTROL TECHNIQUES, THE IMPROVED PERFORMANCE OF MEASURING EQUIPMENT, AND WITH ADVANCES IN ELECTRONIC TECHNOLOGY. IN DESCRIBING THE EVOLUTION OF SAFETY SYSTEMS FOR REACTOR CONTROL THE AUTHOR ANALYSES EACH OF THESE POINTS, TAKING INTO ACCOUNT PAST EXPERIENCE, CURRENT PROJECTS, OPERATIONAL NEEDS AND PRESENT SAFETY REQUIREMENTS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATION, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR SAFETY SYSTEM + DESIGN CRITERIA + FRANCE + OPERATING EXPERIENCE + SAFETY REVIEW

9-26730

KASARGOD SV
SOLID-STATE LOGIC FOR REACTOR SAFETY SYSTEMS
ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA
STI/PUB/115 + CN-22/40 +. 9 PAGES, FIGURES, 3 REFERENCES, PAGES 517-25 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26730 *CONTINUED*

THIS PAPER DESCRIBES A TRANSISTOR-DIODE LOGIC SYSTEM FOR REACTOR SAFETY AND INTERLOCK FUNCTIONS. FACTORS TO BE CONSIDERED IN THE DESIGN OF SYSTEMS ARE DISCUSSED BY TAKING THE EXAMPLE OF A TYPICAL REACTOR SCRAM LINE. SOUND DESIGN CALLS FOR PROPER GROUPING OF INPUTS TO THE SYSTEMS, AND A JUDICIOUS USE OF THE PRINCIPLE OF REDUNDANCY.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR SAFETY SYSTEM + DESIGN CRITERIA + INSTRUMENTATION, COMPONENT + SOLID STATE DEVICE

9-26732

DI GIACOMO G

DESIGN FOR EXPERIMENTAL REACTOR SAFETY CIRCUITS INVOLVING NUMERICAL DATA PROCESSING

GROUPEMENT ATOMIQUE ALSACIENNE ATLANTIQUE

STI/PUB/115 + CN-22/10 +. 12 PAGES, 3 FIGURES, PAGES 545-56 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOVEMBER 22-26, 1965

PROBLEMS OF REDUNDANCY OF MEASUREMENTS AND OF INTERSIGNAL COINCIDENCES IS DISCUSSED IN THE DESIGN OF SAFETY CIRCUITS. THE ROLE OF THE DATA-PROCESSING COMPUTER IN THE SAFETY CIRCUITS IS DEFINED, TOGETHER WITH THE EXTENT OF ITS PARTICIPATION IN THE TRIGGERING OF CORRECTIVE ACTION. A BRIEF DESCRIPTION IS GIVEN OF THE GENERAL STRUCTURE OF THE SAFETY CIRCUITS, SHOWING THE APPLICATION OF THE ABOVE PRINCIPLES AND THE STRUCTURE OF THE NUMERICAL DATA PROCESSING WITH THE ESSENTIAL FEATURES ASSOCIATED WITH SAFETY. THESE INCLUDE IN PARTICULAR THE DUPLICATION OF CERTAIN UNITS AND THE SEPARATION OF MEASUREMENT CHANNELS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*REACTOR SAFETY SYSTEM + DATA PROCESSING + INSTRUMENTATION, COMPONENT + REDUNDANCE + TEST, ON LINE

9-26733

PATWARDHAN PK

THE NEED FOR A SOPHISTICATION IN MULTIPARAMETER ANALYSIS AND REAL-TIME DATA PROCESSING

ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA

STI/PUB/115 + CN-22/33 +. 19 PAGES, 3 FIGURES, 9 TABLES, 20 REFERENCES, PAGES 575-93 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

DISCUSSES THE GENERAL REQUIREMENTS OF MULTI-PARAMETER ANALYSERS FOR NUCLEAR RESEARCH. THE USE OF WIRED-PROGRAMME COMPUTERS AND THE CONCEPT OF SYSTEM ORGANIZATION USING AN ON-LINE SPECIAL-PURPOSE COMPUTER FOR DATA TAKING AND CLOSED-LOOP CONTROL IS DISCUSSED. A PICTURE OF THE PRESENT STATE OF THE ART AND POSSIBLE TRENDS FOR FUTURE DEVELOPMENT ARE PRESENTED. IMPLEMENTATION OF COMPUTER-BASED CONVENTIONAL AND NUCLEAR REACTOR POWER PLANT CONTROL AND OF IN-PILE LOOP EXPERIMENTS IS ALSO EXPLAINED.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*DATA PROCESSING + COMPUTER CONTROL + INSTRUMENTATION, CONTROL + REACTOR CONTROL

9-26734

ALSO IN CATEGORY 16

JOSHI CW + INGLE NA + JATHAR NB

AN AUTOMATIC DATA-LOGGING SYSTEM FOR METEOROLOGICAL STUDIES IN REACTOR ENVIRONMENTS

ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA

STI/PUB/115 + CN-22/43 +. 8 PAGES, 7 FIGURES, 2 REFERENCES, PAGES 595-602 IN NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

AN AUTOMATIC DATA-LOGGING SYSTEM WAS DESIGNED FOR METEOROLOGICAL STUDIES FOR THE TARAPUR POWER REACTOR. THESE STUDIES REQUIRE THE MEASUREMENT OF WIND SPEED, WIND DIRECTION, ATMOSPHERIC PRESSURE, TEMPERATURE, ETC., AVERAGED OVER A CERTAIN FIXED PERIOD, AT VARIOUS HEIGHTS ON A TOWER. THE SYSTEM IS DESIGNED TO LOG DATA FROM 256 SENSORS. THE DATA ARE FED TO A DIGITAL COMPUTER FOR ANALYSIS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*DATA PROCESSING + INSTRUMENTATION, METEOROLOGICAL + METEOROLOGY

9-26735

BLOMBERG PE

P. E. BLOMBERG--SPECIAL CONTRIBUTION TO NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY

1 PAGE, PAGE 603 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

A COMPUTER WILL BE INSTALLED IN SWEDENS SECOND POWER REACTOR, MARVIKEN, A BOILING HEAVY-WATER REACTOR, WITH THE PRIMARY OBJECT OF INCREASING THE SPEED OF STARTUP. EXPERIENCE HAS BEEN GAINED FROM THE AGESTA REACTOR. IN THE MARVIKEN REACTOR, IN-CORE DETECTORS WILL ALSO BE USED FOR INCREASING THE POWER.

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26735 *CONTINUED*
AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*COMPUTER CONTROL + INSTRUMENTATION, STARTUP + REACTOR CONTROL + REACTOR, BWR + SWEDEN

9-26736
KING ESF
STEPPING MOTORS AND ASSOCIATED ELECTRONIC CIRCUITS FOR REACTOR CONTROL
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
10 PAGES, 10 FIGURES, 1 TABLE, 7 REFERENCES, PAGES 613-22 OF NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS,
BOMBAY, NOVEMBER 22-26, 1968

ELECTRICAL STEPPING MOTORS ARE NOW AVAILABLE WHICH ARE VERY SUITABLE FOR USE WITH REACTOR
CONTROL RODS. THE MOTORS MAY HAVE THREE OR FOUR WINDINGS AND ARE DRIVEN BY D.C.
PULSE-GENERATORS SPECIALLY DESIGNED FOR THE PARTICULAR REACTOR APPLICATION. SIX VERTICALLY
ACTING CONTROL RODS WITH STEPPING MOTORS WILL BE INSTALLED IN THE HIGH-FLUX RESEARCH REACTOR
PLUTO.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 327 EAST 34TH STREET, NEW YORK, N.Y.
10016, \$13.50 COPY/BOOK

*CONTROL ROD DRIVE + DESIGN STUDY + EQUIPMENT DESIGN + INSTRUMENTATION, COMPONENT + UNITED KINGDOM

9-26739 ALSO IN CATEGORY 17
CONTROL ROD STARTERS WITHDRAWN
UNIVERSITY OF CALIFORNIA, LOS ANGELES
1 PAGE, LETTER TO D. J. SKOVHOLT. LETTER TO D. J. SKOVHOLT FROM CRAIG B. SMITH. JUNE 26, 1968. DOCKET
50-142.

DURING THE 19 JUNE 1968 PRESTART CHECKOUT, CONTROL BLADE NO. 1 DID NOT RETURN TO THE DOWN
POSITION WHEN DROPPED. WHATEVER IS INHIBITING MOTION IS NOT IN THE DRIVE. WE HAVE REMOVED
THE FUEL AND ARE UNSTACKING THE GRAPHITE CENTER ISLAND TO LOCATE THE DIFFICULTY.

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

ARGONAUT (TNG) + FAILURE, SCRAM MECHANISM + REACTOR, RESEARCH

9-26740 ALSO IN CATEGORY 17
MARK F TRIGA CONTROL ROD STICKS
GENERAL DYNAMICS, GENERAL ATOMIC DIVISION
2 PAGES, LETTER TO D. J. SKOVHOLT, DRL. FROM LETTER TO D. J. SKOVHOLT FROM E. CREUTZ. JUNE 28, 1968.
DOCKET 50-163.

ON MAY 29, DURING A ROUTINE PULSE AT THE MARK F, THE SHIM ROD STOPPED 3 IN. SHORT OF FULL
INSERTION FOLLOWING THE ROUTINE SCRAM. SHUTDOWN MARGIN WAS \$1.27 WITH THIS ROD FULL OUT.
50% OF THE SUBSEQUENT TEST DROPS SHOWED ROD STOPPED 3 IN. SHORT, IN 50% ROD FELL FULLY DOWN.
AFTER ADJACENT ELEMENTS WERE CHECKED FOR INTERFERENCE, ROD DROPPED FREELY. REACTOR RETURNED
TO SERVICE JUNE 7 AFTER DISCUSSION WITH COMPLIANCE. EXACT CAUSE NOT RESOLVED, BUT MOST
PROBABLE CAUSE WAS IMPROPERLY SEATED ELEMENT OR TEMPORARY FOREIGN OBJECT IN THE DASH POT.

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

*FAILURE, SCRAM MECHANISM + FUEL ELEMENT + FUEL HANDLING + OBSTRUCTION + REACTOR, PULSED +
REACTOR, RESEARCH + SAFETY REVIEW + TEST, SYSTEM OPERABILITY + TRIGA (RR)

9-26741 ALSO IN CATEGORY 17
SIX MONTHS OPERATIONS SUMMARY JAN TO JUN 19, 1968
UNIVERSITY OF TEXAS
3 PAGES, LETTER TO P. A. MORRIS, DRL. FROM LETTER TO P. A. MORRIS FROM S. J. GAGE. JUNE 20, 1968, DOCKET
50-192.

TWO FUEL ELEMENTS WERE ADDED AND POWER LEVEL INCREASED TO 250 KW ON APRIL 2. AN 8400-CURIE
CO-60 SOURCE WAS INSTALLED IN THE REACTOR-POOL IRRADIATOR. A 4-IN.-DIA. PORTABLE, VERTICAL
BEAM TUBE WAS INSTALLED AFTER REACTOR COMMITTEE DETERMINED IT DID NOT INVOLVE A TECH.-SPEC.
CHANGE OR AN UNREVIEWED SAFETY QUESTION. THE LOWER END RESTS ON THE GRAPHITE REFLECTOR, AND
THE UPPER END EMERGES NEAR THE BRIDGE, WITH A BEAM CATCHER REDUCING BRIDGE RADIATION TO LESS
THAN 50 MR/HR AT 250 KW. FOLLOWING COMPLIANCE SUGGESTIONS, AN ELECTRONIC TEST CIRCUIT WAS
ADDED TO THE POWER CHANNEL, WHICH ALLOWS CHECKOUT OF ALL COMPONENTS EXCEPT UCIC. JUNE 11
LETTER SENT DESCRIBING SMALL RADIOCHEMISTRY LABORATORY.

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

*BEAM HOLE + *TEST, SYSTEM OPERABILITY + COBALT + INSPECTION AND COMPLIANCE +
INSTRUMENTATION, POWER RANGE + NEUTRON + POWER UPRATING + RADIATION SAFETY AND CONTROL + RADIOGRAPHY +
REACTOR, RESEARCH + REPORT, OPERATIONS SUMMARY + SAFETY REVIEW + SHIELDING + SOURCE, RADIATION +
TRIGA (RR)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26747

GROSE VL

RELIABILITY AND HOW IT GREW

3 PAGES, EVALUATION ENGINEERING, VOL. 7, PAGES 46-48 (JAN-FEB 1968), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 83 (JUNE 1968)

A HISTORICAL APPROACH TO THE GROWTH OF INDUSTRIAL RELIABILITY PROGRAMS IS PRESENTED, AND THE IMPORTANCE OF MANAGEMENT PLANNING BY LARGE-SCALE PRODUCTION FACILITIES IS NOTED. THE FACT THAT RELIABILITY PROGRAMS GREW BECAUSE OF THE COMPLEXITY AND UNRELIABILITY OF EQUIPMENT FOLLOWING WORLD WAR II IS NOTED, AS ARE SO-CALLED RELIABILITY GROWING PAINS. MENTION IS MADE OF THE ROLE OF THE STATISTICIAN, THE GENERATION OF GOVERNMENT SPECIFICATIONS, AND THE IMPETUS OF INCENTIVE CONTRACTING AND SPACE-RELATED RESEARCH PROGRAMS IN FOSTERING CONCERNED RELIABILITY PROGRAMS.

RELIABILITY ANALYSIS + SURVEY, GENERAL

9-26748

TIGER B

DOES RELIABILITY PREDICTION HELP MAKE THE SYSTEM GO

RADIO CORP. OF AMERICA, BURLINGTON, MASS

3 PAGES, 3 REFERENCES, PAGES 573-75 OF ANNALS OF RELIABILITY AND MAINTAINABILITY- ANNUAL RELIABILITY AND MAINTAINABILITY CONFERENCE, 6TH, COCOA BEACH, FLA., JULY 17-19, 1967, PROCEEDINGS, VOLUME 6, NEW YORK SOCIETY OF AUTOMOTIVE ENGINEERS, INC., ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 86 (JUNE 1968)

UTILITY, PRACTICALITY, AND VALIDITY OF RELIABILITY PREDICTION TOOLS ARE DISCUSSED. THE UNDERSTANDING OF DESIGN, PRODUCTION, USAGE, AND MANAGEMENT PROBLEMS IS CONSIDERED A MUST BEFORE THE APPLICATION OF MATHEMATICAL TECHNIQUES CAN BE SUCCESSFULLY APPLIED TO IDENTIFY THE BEST POSSIBLE SYSTEMS AT THE LOWEST POSSIBLE COSTS. IT IS NOTED THAT THE USE OF RELIABILITY PREDICTION HAS BEEN HANDICAPPED BY OVEREMPHASIZING THE SIMPLICITY OF PREDICTION TECHNIQUES. EMPHASIS ON BETTER COMMUNICATION AND GREATER ASSISTANCE IN DECISION MAKING DURING DESIGN AND PRODUCTION IS STRESSED. THOSE WHO HAVE BEEN HEAVILY INVOLVED IN RELIABILITY PREDICTIONS WILL RECOGNIZE THE FRUSTRATIONS BEING TOUCHED ON IN THIS PAPER.

*RELIABILITY ANALYSIS

9-26749

ASHENDORF G

PITFALLS IN RELIABILITY PREDICTIONS

RADIO CORP. OF AMERICA, NEW YORK

6 PAGES, PAGES 576-581 OF ANNALS OF RELIABILITY AND MAINTAINABILITY. ANNUAL RELIABILITY AND MAINTAINABILITY CONFERENCE, 6TH, COCOA BEACH, FLA., JULY 17-19, 1967, PROCEEDINGS. VOL. 6, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 86 (JUNE 1968)

PROBLEMS THAT REQUIRE RELIABILITY PREDICTION AS THE BASIS OR ONE OF THE BASES FOR DECISION MAKING ARE DISCUSSED, WITH THE NOTE THAT RELIABILITY PREDICTION CAPABILITY VARIES WITH EACH SITUATION. FACTORS WHICH CONTRIBUTE TO INACCURACIES IN FINAL PREDICTIONS ARE IDENTIFIED, AND THE PLACES AT WHICH DECISIONS ARE MADE ARE POINTED OUT. DECISION MAKING PROCESSES ARE REVIEWED IN THE CHRONOLOGICAL ORDER IN WHICH THEY APPEAR IN THE VARIOUS FUNCTIONAL PHASES OF A DEVELOPMENT PROGRAM FROM THE PROGRAM DEFINITION, PRELIMINARY DESIGN AND SYSTEMS PLANNING, DETAILED DESIGN, TO THE ACTUAL RELIABILITY DEMONSTRATION. TABLES DETAIL THE RELIABILITY PREDICTION PITFALLS AT EACH OF THESE PHASES. PRACTICALITY AND VALIDITY OF PREDICTIONS ARE DISCUSSED.

*RELIABILITY ANALYSIS

9-26750

PATTERSON RL

RELIABILITY MODELS FOR DEPENDENT ELEMENTS USING A METHOD OF CORRELATIONS

UNIVERSITY OF FLORIDA, GAINESVILLE

5 PAGES, 1 REFERENCE, PAGES 364-386 OF ANNALS OF RELIABILITY AND MAINTAINABILITY. ANNUAL RELIABILITY AND MAINTAINABILITY CONFERENCE, 6TH, COCOA BEACH, FLA., JULY 17-19, 1967, PROCEEDINGS, VOLUME 6. NEW YORK SOCIETY OF AUTOMOTIVE ENGINEERS, INC., ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 91 (JUNE 1968)

MODELS ARE GENERATED BASED ON THE ASSUMPTION THAT THE INTERACTION OF COMPONENTS GENERATES LINEAR STATISTICAL CORRELATIONS AMONG THE CONDITIONS OF GROUPS OF COMPONENTS. THESE INTERACTION EFFECTS MAY BE DUE TO ACTIVE PHYSICAL MECHANISMS OR MAY BE PRESENT EVEN THOUGH THE ELEMENTS OF THE SYSTEM ARE PHYSICALLY INDEPENDENT. FORMULAS ARE DEVELOPED FOR SYSTEMS IN WHICH THE ELEMENTS ARE IN SERIES. THE CASE OF TWO PHYSICALLY SEPARATED FIBERS, EACH SUBJECTED TO A RANDOM LOAD, IS CONSIDERED. IT SHOWS THAT THE RESULTING EQUATION CAN BE APPROXIMATED WHEN THE CORRELATION COEFFICIENT IS LARGE. THIS APPROXIMATION CAN BE GENERALIZED AND RELATED TO THE HAZARD RATES THAT DEFINE FAILURE OF A STAGE. A RELIABILITY MODEL IS ALSO OBTAINED FOR A SYSTEM COMPOSED OF INTERACTING STAGES IN PARALLEL.

*RELIABILITY ANALYSIS + ANALYTICAL MODEL + STATISTICAL CORRELATION

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26751

GERTSBAKH IB

OPTIMAL CONTROL OF SWITCHING ON RESERVE ELEMENTS

8 PAGES, REFERENCES, TECH. CYBERNETICS, NO. 5, PAGES 106-113 (JAN. 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 93 (JUNE 1968)

A RESERVED SYSTEM IS INVESTIGATED, THE TESTING OF WHICH MAY TAKE PLACE ONLY AT DETERMINATE POINTS IN TIME. THE NUMBER OF ELEMENTS INCLUDED IN THE HOT RESERVE AFTER THE NEXT CHECK IS SELECTED WITH THE INTENTION OF MINIMIZING THE PROBABILITY OF SYSTEM FAILURE DURING THE COURSE OF THE GIVEN OPERATING TIME. THE ALGORITHM IS PRESENTED FOR FINDING THE OPTIMAL POLICY FOR SWITCHING ON THE RESERVE ELEMENTS, AND SOME OF ITS PROPERTIES ARE INVESTIGATED.

*RELIABILITY, SYSTEM + REDUNDANCE + TEST, SYSTEM OPERABILITY

9-26752

EL MAWAZINY AH + BUEHLER RJ

CONFIDENCE LIMITS FOR THE RELIABILITY OF SERIES SYSTEMS

IOWA STATE UNIVERSITY, AMES + UNIVERSITY OF MINNESOTA, MINN.

7 PAGES, 8 REFERENCES, JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, VOL 62, PAGES 1452-1459 (DECEMBER 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 93 (JUNE 1968)

CONFIDENCE LIMITS ARE ESTABLISHED FOR THE PROBABILITY OF SUCCESSFUL OPERATION OF SERIES SYSTEMS THAT OPERATE ONLY WHEN EACH OF THEIR DISSIMILAR COMPONENTS OPERATES UNTIL A CERTAIN TIME. THE FAILURE LAW IS ASSUMED TO BE EXPONENTIAL, AND DATA ARE ASSUMED AVAILABLE FOR EACH TYPE OF COMPONENT IN ORDER TO PROVIDE A LARGE-SAMPLE APPROXIMATION TO THE EXACT CONFIDENCE LIMITS. MAXIMUM LIKELIHOOD THEORY AND BAYESIAN SOLUTIONS ARE CONSIDERED, AND THESE ARE FOUND TO AGREE WITH THOSE OBTAINED BY THE LARGE-SAMPLE APPROXIMATION METHOD. AN EXAMPLE OF THE LARGE-SAMPLE APPROXIMATION METHOD IS ILLUSTRATED BY MAKING USE OF A TABLE OF RANDOM NUMBERS AND CALCULATING FAILURE TIMES FROM AN EXPONENTIAL POPULATION. THE LARGE SAMPLING APPROXIMATION IS, HOWEVER, NOT CONSIDERED APPLICABLE TO MORE GENERAL SYSTEMS, ALTHOUGH APPROXIMATIONS COULD BE DEVELOPED BY MAXIMUM LIKELIHOOD OR OTHER METHODS.

*RELIABILITY ANALYSIS + MATHEMATICAL TREATMENT + RELIABILITY, SYSTEM + THEORETICAL INVESTIGATION

9-26753

SEDYAKIN NM

A PHYSICAL RELIABILITY THEORY

9 PAGES, 5 REFERENCES, ENGINEERING CYBERNETICS, NO. 3, PAGES 295-303 (MAY-JUN 1966), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 93 (JUNE 1968)

HAZARD RATE AND CUMULATIVE HAZARD FUNCTION ARE DEVELOPED DURING THE FORMULATION OF A PHYSICAL LAW THAT GOVERNS THE RELIABILITY OF MATERIALS AND SYSTEMS, AND MATHEMATICAL MODELS ARE CONSTRUCTED TO GIVE A QUANTITATIVE DESCRIPTION OF THE PROCESSES THAT INFLUENCE THE RELIABILITY OF A BROAD CLASS OF SYSTEMS. A SOLUTION IS OFFERED FOR THE CASE OF A SYSTEM THAT CONSISTS OF TWO DEVICES, ONE FUNCTIONALLY NECESSARY AND THE OTHER A RESERVE, AND DETAILS ARE INCLUDED FOR VARIOUS BREAKDOWN SITUATIONS THAT COULD ARISE FOR SUCH A SYSTEM.

*RELIABILITY ANALYSIS + FAILURE, COMPONENT + MATHEMATICAL TREATMENT + RELIABILITY, COMPONENT

9-26754

NATHAN I

SYSTEMS AVAILABILITY MODELING, CONSIDERING COMPLEX AND IMPERFECT SPARING

ANATHON, INC., NEW YORK

11 PAGES, 6 REFERENCES, IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SUPPL., VOL. AES-2, PAGES 183-193 (1966), NEW YORK, IEEE, INC., ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 93 (JUNE 1968)

THE IMPORTANCE OF REALISTIC SYSTEMS AVAILABILITY (READINESS) MODELS FOR USEFUL SYSTEMS AND COST EFFECTIVENESS ANALYSIS AND EVALUATION IS DISCUSSED. A METHOD IS PRESENTED WHICH CONSIDERS (1) DIFFERENT TYPES OF IMPERFECT FAILURE DETECTION, (2) VARIOUS REPLACEMENT STRATEGIES, WITH IMPERFECT REPLACEMENTS AND LIMITED SPARES, (3) DIFFERENT TYPES OF SCHEDULED INSPECTIONS, AND (4) NONINSTANTANEOUS REPLACEMENT RATES AND SOME TYPES OF NONINSTANTANEOUS FAILURE DETECTION.

*RELIABILITY ANALYSIS + ANALYTICAL MODEL + ECONOMICS + THEORETICAL INVESTIGATION

9-26755

BRAY TA + CRAWFORD GB + PROSCHAN F

MAXIMUM LIKELIHOOD ESTIMATION OF A U-SHAPED FAILURE RATE FUNCTION

44 PAGES, REFERENCES, MATHEMATICAL NOTE NO. 534, OCTOBER 1967. ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 95 (JUNE 1968)

A MAXIMUM LIKELIHOOD ESTIMATE (MLE) IS DERIVED FOR THE FAILURE RATES AS A FUNCTION OF AGE BASED ON INCOMPLETE DATA, ASSUMING THE FAILURE RATE FUNCTION IS INITIALLY DECREASING AND

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26755 *CONTINUED*

SUBSEQUENTLY INCREASING, WITH THE TURNING POINT UNKNOWN. AN ALGORITHM FOR COMPUTATION OF THE MLE IS DEVELOPED. A SMALL WORKED EXAMPLE IS INCLUDED TO SHOW IN DETAIL THE STEPS OF THE ALGORITHM. A PROGRAM FOR MACHINE COMPUTATION IS PRESENTED. THE MLE IS SHOWN TO BE A CONSISTENT ESTIMATOR. NO FURTHER ASSUMPTION IS REQUIRED AS TO THE MATHEMATICAL FORM OF THE LIFE-LENGTH DISTRIBUTION (SUCH AS EXPONENTIAL, WEIBULL, NORMAL, ETC.). THUS THE MODEL MAY BE REALISTICALLY APPLIED IN A VARIETY OF RELIABILITY SITUATIONS, WHERE THE SO-CALLED BATHTUB SHAPED FAILURE RATE IS APPROPRIATE.

*RELIABILITY ANALYSIS + COMPUTER PROGRAM + FAILURE, COMPONENT + MATHEMATICAL TREATMENT + STATISTICAL ANALYSIS + THEORETICAL INVESTIGATION

9-26756

FEDUCCIA AJ + KLION J

HOW ACCURATE ARE RELIABILITY PREDICTIONS

U.S. AIRFORCE

8 PAGES, 8 REFERENCES, PAGES 280-287 OF ANNALS OF ASSURANCE SCIENCES. PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN. 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 96 (JUNE 1968)

EVALUATION OF ACCURACY OF STRESS-ANALYSIS RELIABILITY PREDICTION TECHNIQUES. METHODS ARE DESCRIBED WHICH CAN BE USED (1) TO COMPUTE CONFIDENCE INTERVALS ABOUT A PREDICTED VALUE AND (2) TO ADVANTAGEOUSLY DERIVE RELIABILITY DEMONSTRATION PLANS THAT CAN REDUCE TEST TIME. (REVIEW) THE APPROACH IS THAT OF TRYING TO FIND THE FREQUENCY DISTRIBUTION OF THE RATIO OF PREDICTED TO OBSERVED MEAN TIME BETWEEN FAILURES, THEN USING THAT INFORMATION AS AN A PRIORI DISTRIBUTION FOR A BAYES ESTIMATE.

*RELIABILITY ANALYSIS + FAILURE, COMPONENT + STATISTICAL ANALYSIS

9-26757

SCHICK GJ

BAYESIAN CONCEPTS FOR RELIABILITY AND CONFIDENCE

9 PAGES, 20 REFERENCES, PAGES 297-405 OF ANNALS OF ASSURANCE SCIENCES. PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 97 (JUNE 1968)

COMPARISON OF THE CLASSICAL AND BAYESIAN APPROACHES TO RELIABILITY ESTIMATION OF COMPLEX SYSTEMS AT A SPECIFIED CONFIDENCE LEVEL. WHILE THE BASIC ASSUMPTIONS ARE CLEARLY STATED FOR EITHER OF THE TWO APPROACHES, AND WHILE THE TWO METHODS DIFFER CONSIDERABLY, THE PHILOSOPHICAL QUESTIONS UNDERLYING THE ASSUMPTIONS ARE NOT DISCUSSED. SOME OF THE MISUSES OF THE LAPLACE RULE OF SUCCESSION ARE GIVEN THROUGH PRACTICAL EXAMPLES, AND WAYS OF AVOIDING THESE PITFALLS ARE INDICATED. THE BAYESIAN METHOD AND ITS APPROPRIATE COMPUTER PROGRAM FOR FINDING EXACT CONFIDENCE LIMITS FOR THE SYSTEM RELIABILITY OF COMPLEX MISSILE SYSTEMS IS DISCUSSED IN DETAIL.

*RELIABILITY ANALYSIS + COMPUTER PROGRAM + MATHEMATICAL TREATMENT + RELIABILITY, SYSTEM + STATISTICAL ANALYSIS

9-26758

AMSTADTER RB

PREDICTION OF SYSTEM RELIABILITY BY METHOD OF BOUNDS

AEROJET-GENERAL CORP., CALIF.

8 PAGES, PAGES 423-430 IN ANNALS OF ASSURANCE SCIENCES. PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 98 (JUNE 1968)

DEFINITION OF THE REFINEMENT OF A NEW METHOD OF RELIABILITY PREDICTION FOR COMPLEX SYSTEMS. THE METHOD INVOLVES THE CALCULATION OF BOTH UPPER AND LOWER BOUNDS AND PROCEDURE FOR COMBINING THE TWO TO YIELD A REALISTICALLY PRECISE ESTIMATE OF THE TRUE VALUE. THE REFINEMENT INCLUDES THE CONSIDERATION AND USE OF FAILURE MODES AND THEN PROBABILITIES OF OCCURRENCE. THE METHOD CAN BE USED BOTH AS AN EXCELLENT SUBSTITUTE FOR MORE TIME-CONSUMING QUASI-EXACT PROCEDURES, AND ALSO FOR THOSE SYSTEMS FOR WHICH EXACT PROCEDURES CANNOT BE DEVELOPED AND FOR WHICH MONTE CARLO TECHNIQUE ARE EXCESSIVELY COSTLY.

*RELIABILITY ANALYSIS + PROBABILITY + RELIABILITY, SYSTEM + STATISTICAL ANALYSIS

9-26759

DOYON LR + BERSSENBRUGGE MM

SOLVING COMPLEX RELIABILITY MODELS BY COMPUTER

NORTHEASTERN UNIVERSITY + RAYTHEON COMPANY, BEDFORD, MASS.

18 PAGES, 11 REFERENCES, PAGES 431-448 IN ANNALS OF ASSURANCE SCIENCE. PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN. 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 98 (JUNE 1968)

DISCUSSION OF THE USE OF DIGITAL COMPUTERS TO SOLVE RELIABILITY AVAILABILITY/MTBF (MEAN-TIME-BETWEEN-FAILURE) MODELS OF COMPLEX SYSTEMS. ACTUAL-CASE PROBLEMS WITH SOLUTIONS ARE PRESENTED FOR SOLVING MISSION-RELIABILITY, INSTANTANEOUS-AVAILABILITY, AND INTERVAL-AVAILABILITY PROBLEMS. USE IS MADE OF A METHOD OF TRANSLATING EACH

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26759 *CONTINUED*

ELECTRONIC-SYSTEM OPERATIONAL STATE DEPICTED IN THE FLOW GRAPHS AS DIFFERENTIAL EQUATIONS IN THE TIME DOMAIN. BY AN ITERATIVE COMPUTER PROCEDURE, SOLUTIONS IN THE TIME DOMAIN ARE OBTAINED WITHOUT HAVING TO TRANSFORM THE EXPRESSIONS TO AND FROM THE COMPLEX DOMAIN. THE COMPUTER PROGRAM IS A DOUBLE-PRECISION DIGITAL PROGRAM CALLED DIFF, FOR SOLVING SETS OF DIFFERENTIAL EQUATIONS WITH AS MANY AS 99 UNKNOWNNS.

*RELIABILITY ANALYSIS + ANALYTICAL MODEL + COMPUTER PROGRAM

9-26760

COWAN JD

RELIABLE COMPUTATION WITH UNRELIABLE ELEMENTS

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY, LONDON

17 PAGES REFERENCES OF AD-646625 AND N67-26806, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 100 (JUNE 1968)

DISCUSSES COMPUTER SYSTEM DESIGNS FOR OPERATION AT ANY REQUIRED LEVEL OF RELIABILITY, GIVEN UNRELIABLE ELEMENTS. METHODS DISCUSSED ARE - CONTROL OF STATIONARY ERRORS AND FAULT-MAKING OF TRANSIENT ERRORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*RELIABILITY ANALYSIS + RELIABILITY, COMPONENT

9-26761

GILMORE DB

APPLICATION OF A MONTE CARLO METHOD TO THE DETERMINATION OF MEAN TIME TO FAILURE OF COMPLEX SYSTEMS

JOHNS HOPKINS UNIVERSITY

6 PAGES, PAGES 391-396 IN ANNALS OF ASSURANCE SCIENCES. PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN. 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 100 (JUNE 1968)

A MONTE CARLO SIMULATION IS DESCRIBED FOR DETERMINING THE MEAN TIME TO FAILURE OF COMPLEX ELECTRONIC EQUIPMENT WITH ONE OR MORE ACTIVE OR STANDBY REDUNDANT ELEMENTS. A RELIABILITY BLOCK IS BASED ON THIS DIAGRAM. BOTH BLOCK DIAGRAM AND MATHEMATICAL MODEL ARE PRESENTED FOR A TYPICAL SYSTEM THAT IS THEN ANALYZED BY THE MONTE CARLO STATISTICAL TECHNIQUE THAT REQUIRED LITTLE MATHEMATICAL KNOW-HOW.

*RELIABILITY ANALYSIS + ANALYTICAL MODEL + FAILURE, COMPONENT + MONTE CARLO + REDUNDANCE + RELIABILITY, SYSTEM + STATISTICAL ANALYSIS

9-26762

PLYER CH + WOOD WP

BUILDING IN RELIABILITY

MARTIN MARIETTA CORPORATION, MD.

5 PAGES, 8 REFERENCES, PAGES 369-373 IN ANNALS OF RELIABILITY AND MAINTAINABILITY, ANNUAL RELIABILITY AND MAINTAINABILITY CONFERENCE, 6TH, COCOA BEACH, FLA. JULY 17-19 1967, PROCEEDINGS. VOLUME 6 - ALL SYSTEMS GO. ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 101 (JUNE 1968)

DISCUSSION OF THE FAILURE MODE AND EFFECTS ANALYSIS, CRITICAL CHARACTERISTICS DETERMINATION, SAFETY FEATURES, AND TEST EQUIPMENT COMPLEXITY AS THE COMPONENTS OF AN IN-HOUSE PROCESS CONTROL PROGRAM HAVING SPECIAL SIGNIFICANCE IN THEIR HIGH PAYOFF IN PRODUCT INTEGRITY FOR AEROSPACE MISSIONS. RELIABILITY REQUIREMENTS ARE USED TO DEVELOP QUALITY REQUIREMENTS FOR PROCESS CONTROL AND A SIMPLE METHOD FOR IN-PROCESS DATA ANALYSIS IS DESCRIBED. THIS REJECT PATTERN ANALYSIS RELATES THE COST OF FAILURE TO THE COST OF REPAIR. DATA ARE ALSO GIVEN TO PROVE THE NEED FOR PRODUCT BURN-IN AND SCREENING.

*RELIABILITY, COMPONENT + DESIGN CRITERIA + EQUIPMENT DESIGN + TESTING

9-26763

COTTIFRIED P + WEISS DW

RELIABILITY PREDICTION WITH INADEQUATE DATA

DOOZ-ALLEN APPLIED RESEARCH, INC., BETHESDA MD.

8 PAGES, 13 REFERENCES, PAGES 600-607 IN ANNALS OF RELIABILITY AND MAINTAINABILITY, ANNUAL RELIABILITY AND MAINTAINABILITY CONFERENCE, 6TH COCOA BEACH, FLA., JULY 17-19, 1967, PROCEEDINGS. VOL 6--ALL SYSTEMS GO, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 102 (JUNE 1968)

DESCRIPTION OF AN APPROACH TO NONELECTRONIC RELIABILITY PREDICTION WITH INADEQUATE DATA. THE LACK OF SUFFICIENT DATA CREATES THE NEED TO IMPROVE PREDICTION ACCURACY AND TO QUANTIFY THE UNCERTAINTY ASSOCIATED WITH THE PREDICTIONS. THE PROPOSED APPROACH WAS DEVELOPED FOR RELIABILITY PREDICTION IN FLIGHT CONTROL SYSTEMS, BUT ITS TECHNIQUES ARE BELIEVED TO BE BROADLY APPLICABLE.

*RELIABILITY ANALYSIS

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26764

JORDAN JR + BUCHANAN RL
SYSTEM SAFETY--A QUANTITATIVE FALLOUT FROM RELIABILITY ANALYSIS
MCDONNELL DOUGLAS CORP., CALIF.
8 PAGES, 5 REFERENCES, PAGES 653-660 IN ANNALS OF RELIABILITY AND MAINTAINABILITY, ANNUAL RELIABILITY AND MAINTAINABILITY CONFERENCE, 6TH COCOA BEACH, FLA., JULY 17-19, 1967, PROCEEDINGS. VOL. 6--ALL SYSTEMS GO. ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 102 (JUNE 1968)

DESCRIPTION OF A METHOD FOR QUANTITATIVELY EVALUATING THE SAFETY OF A SYSTEM BY UTILIZING EXISTING RELIABILITY TECHNIQUES AND DATA. THE PREMISE DEVELOPED IS THAT CREW SAFETY IS A SPECIAL CASE OF SYSTEM SAFETY. THEREFORE, THE RELIABILITY ANALYSIS AND MATHEMATICAL MODELS DEVELOPED TO EVALUATE CREW SAFETY ARE CONSIDERED APPLICABLE TO A SYSTEM-SAFETY ANALYSIS. SYSTEM SAFETY IS DEVELOPED AS THE PROBABILITY OF SUCCESSFULLY COMPLETING OR SAFELY ABORTING A GIVEN OPERATION OR TEST.

*RELIABILITY, SYSTEM + SAFETY EVALUATION + SAFETY REVIEW

9-26765

TROXEL DI + TIGER B
PREDICTING INTEGRATED CIRCUIT RELIABILITY VIA FAILURE MECHANISMS
RADIO CORP. OF AMERICA, N. J.
9 PAGES, 4 REFERENCES, PAGES 217-225 IN ANNALS OF ASSURANCE SCIENCES, PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS. JAN 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 104 (JUNE 1968)

A STRESS SURVIVAL MATRIX TEST AND A PHYSICAL EFFECTS ANALYSIS PROGRAM WERE CONDUCTED ON MONOLITHIC SILICON INTEGRATED CIRCUITS TO DETERMINE RELIABILITY AS A FUNCTION OF FAILURE MECHANISMS. RESULTS INDICATED THAT RELIABILITY OF A PROPERLY USED CIRCUIT WAS NOT PRIMARILY A FUNCTION OF TEMPERATURE, POWER, OR SHOCK DURING USAGE BUT RATHER DIRECTLY DEPENDENT UPON SCREENING EFFECTIVENESS DURING PRODUCTION, PRODUCTION ABERRATIONS THAT CAN LEAD TO FAILURE IN THE FIELD, AND LIFE DISTRIBUTIONS AND ENVIRONMENTAL SUSCEPTIBILITIES OF UNITS UNDERGOING THESE FAILURE MECHANISMS.

*RELIABILITY, COMPONENT + FAILURE, COMPONENT + INSTRUMENTATION, COMPONENT + SOLID STATE DEVICE

9-26766

SEBENY RL
A MONTE CARLO APPROACH TO SPARES PROVISIONING
COLLINS RADIO COMPANY, CEDAR RAPIDS, IOWA
4 PAGES, PAGES 350-353 IN ANNALS OF ASSURANCE SCIENCES, PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN. 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(6), PAGE 105 (JUNE 1968)

A COMPUTER PROGRAM USING A MONTE CARLO APPROACH IS DESCRIBED FOR PROVISIONING SPARES FOR A COMPLEX SYSTEM ON THE BASIS OF THEIR IMPACT ON SYSTEM AVAILABILITY AND COST. THE MONTE CARLO TECHNIQUE PERMITS SIMULATION AND ANALYSIS OF A VARIETY OF SYSTEM CONFIGURATIONS AND MAINTENANCE PRACTICES, AND THE INPUT DATA REQUIRED TO USE THE PROGRAM IS GREATLY SIMPLIFIED BY USING A COMPUTER GENERATED TABLE DESCRIBING SYSTEM SUCCESS AS A FUNCTION OF ASSEMBLY STATES. THE INPUT DATA IS USER ORIENTED IN THAT IT REQUIRES ONLY THE KNOWLEDGE OF SYSTEM OPERATION AND MAINTENANCE PRACTICES. THIS APPROACH TO SELECTING SPARES IS DESCRIBED FOR A SYSTEM THAT CONTAINS REDUNDANCY IN PARALLEL UNITS OR SUBSYSTEMS AS WELL AS SIMILAR UNITS THAT CAN BE INTERCHANGED OR CANNIBALIZED.

*RELIABILITY, SYSTEM + COMPUTER PROGRAM + MONTE CARLO + REDUNDANCE

9-26930

ALSO IN CATEGORY 17
MODIFICATION OF ROD DRIVE CONTROL CIRCUITS
UNIVERSITY OF MISSOURI
2 PAGES, 1 FIGURE, LETTER TO E M HOWARD, DRL, TAKEN FROM A LETTER TO E. M. HOWARD, DRL FROM D. RAY. MAY 27, 1968. DOCKET 50-123.

PROPOSED MODIFICATION PLACES AUXILIARY CONTACTS OF THE WITHDRAW SWITCH IN THE ROD-DRIVE CONTROL CIRCUITS SO THAT BOTH THE RELAY K9 MUST BE ENERGIZED AND EITHER GANG OR INDIVIDUAL WITHDRAW SWITCH CLOSED FOR THE ROD TO WITHDRAW. WE AWAIT YOUR COMMENTS BEFORE MAKING THE MODIFICATIONS.

AVAILABILITY - PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C.

*CONTROL, ROD DRIVE + *INSTRUMENTATION, SWITCH + ACCIDENT, CONTROL ROD WITHDRAWAL + CONTROL SYSTEM + FAILURE, DESIGN ERROR + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR, RESEARCH

9-26967

ALSO IN CATEGORY 10
TALBOT JE
INSTRUMENTATION(S) JOB IN NUCLEAR POWER GENERATION--INSURE PLANT RELIABILITY, AVAILABILITY, AND SAFETY

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-26967 *CONTINUED*
3 PAGES, INSTRUMENTATION TECHNOLOGY 15(7), PAGES 10-12 (JULY 1968)

THE 11TH ANNUAL ISA POWER INSTRUMENTATION SYMPOSIUM IN CHICAGO, MAY 1968, HAD AS ITS THEME RELIABILITY, AVAILABILITY, AND SAFETY. FOUR PAPERS TOOK UP THE TOPIC OF NUCLEAR GENERATION. ECONOMICS OF NUCLEAR INSTRUMENTATION WAS ALSO DISCUSSED. A TRAINING SIMULATOR OF A BWR TO SIMULATE A COMPLETE HOT OR COLD STARTUP WAS PRESENTED BY GENERAL ELECTRIC. INSTRUMENTATION PROBLEMS ASSOCIATED WITH THE EXTREME OPERATING CONDITIONS OF FAST BREEDER REACTORS WERE DISCUSSED.

*ELECTRIC POWER, GENERAL + *INSTRUMENTATION, GENERAL + CONTROL SYSTEM + ECONOMICS + INSTRUMENTATION, CONTROL + INSTRUMENTATION, INDICATOR + INSTRUMENTATION, PROTECTIVE + REACTOR, BREEDER + REACTOR, FAST + SIMULATION

9-26968
SIBLEY FS + SPOONER NF + HALL BF
AGING IN TYPE K COUPLES
HOSKINS MFG. COMPANY
3 PAGES, 4 FIGURES, INSTRUMENTATION TECHNOLOGY 15(7), PAGES 53-55 (JULY 1968)

CHROMEL-ALUMEL THERMOCOUPLES EXPERIENCE A RELATIVELY UNKNOWN EFFECT CALLED AGING, IN THE TEMPERATURE RANGE FROM 700 TO 1000 F. AGING TENDS TO RAISE THE LEVEL OF THERMOCOUPLE OUTPUT. RATHER THAN DISCUSS THE THEORY BEHIND AGING, THE AUTHORS STICK TO OBSERVABLE EFFECTS IN COMMON PRACTICE AND SUGGEST WAYS TO MAINTAIN CALIBRATION ACCURACY.

HIGH TEMPERATURE + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, TEMPERATURE + MEASUREMENT, TEMPERATURE + TEST, ON LINE

9-27343 ALSO IN CATEGORY 17
REPORT ON SLOW RELEASE TIME OF SHIM ARM NO. 4
NATIONAL BUREAU OF STANDARDS
5 PAGES, LETTER TO P.A. MORRIS, DRL FROM R.S. CARTER, JULY 19, 1968, DOCKET NO. 50-184

ON JULY 11, THIS CLUTCH WAS FOUND SLIPPING DURING SPECIAL ROD DROP TESTS AND HAD A 230 MSEC RELEASE TIME INSTEAD OF 150-160. THE CLUTCH PLATE HUB HAD BEEN ASSEMBLED WITH MINIMAL CLEARANCE FROM ITS SUPPORT BRACKET. NEAR FULL OUT, THE COMPRESSED SCRAM SPRING REDUCED THIS CLEARANCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FAILURE, SCRAM MECHANISM + CONTROL ROD DRIVE + NBS + OPERATING EXPERIENCE + REACTOR, RESEARCH + RESPONSE TIME

9-27344 ALSO IN CATEGORY 17
SELECTED SAN ONOFRE OPERATING EXPERIENCE
SOUTHERN CALIFORNIA Edison
13 PAGES, SEMI-ANNUAL OPERATING REPORT NO. 2, JULY 22, 1968, DOCKET NO. 50-206, TYPE--PWR, MFG--WEST., AE--BECHTEL

FIVE SHUTDOWNS WERE MADE (LEAKING PRIMARY COOLANT, TWO ELECTRICAL CABLE FAILURES, CONTROL ROD CYCLE MALFUNCTION, CONTROL ROD F-10 FOUND BOTTOMED BY REVERSED POLARITY OF THE MOVABLE GRIPPER COIL). RADWASTE RELEASE LINE CHECK VALVE FAILED, SPILLING WATER. ***TESTS SHOWED FLOW STRATIFICATION IN REACTOR COOLANT COLD LEG GIVES A HIGH DELTA T OF 5.3 F (FULL POWER). PH REACTIVITY EFFECT IS ABOUT 0.35 PERCENT/PH UNIT AT PH 6.4. POWER COEFF. VS ROD POSITION DATA TAKEN. BORON DILUTION HAS BEEN 2.1 PPM/FULL POWER DAY, VS 2.9 PREDICTED. 65 SPECIFIC DESIGN CHANGES LISTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FAILURE, EQUIPMENT + *FLOW DISTRIBUTION + *PH REACTIVITY EFFECT + *POWER COEFFICIENT + ACCIDENT, CONTROL ROD WITHDRAWAL + FAILURE, SCRAM MECHANISM + FUEL BURNUP + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, TEMPERATURE + REACTOR, PWR + REPORT, OPERATIONS SUMMARY + SAN ONOFRE (PWR) + VALVE + WASTE DISPOSAL, LIQUID

9-27494 ALSO IN CATEGORIES 5 AND 17
WYLIE RD
TENSILE AND IMPACT PROPERTIES OF ELK RIVER REACTOR CONTROL ROD MATERIAL. FINAL REPORT
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
SWRI-1228-55 +. 21 PAGES, FIGURES, 5 REFERENCES, FEB. 19, 1965

THE BORON STAINLESS STEEL SPECIMENS WHICH WERE REMOVED FROM THE ELK RIVER REACTOR DURING THE SHUT DOWN IN EARLY NOVEMBER 1964 WERE TESTED AT SOUTHWEST RESEARCH INSTITUTE. BOTH SUBSIZE TENSILE AND IMPACT SPECIMENS WERE INCLUDED IN THE SURVEILLANCE PROGRAM. AN ESTIMATE OF THE FLUX LEVEL WAS MADE BY ALLIS CHALMERS AS 1.3 X 10¹² (20TH) NVT THERMAL AS OF AUGUST 31, 1964. THIS CORRESPONDS TO APPROXIMATELY 0.22 ATOM PERCENT BURN-UP. THE DUCTILITY OF THE SPECIMENS WAS MEASURED AS 1-2% ELONGATION WHICH WAS BELOW THE 3.4% REQUIRED BY THE TECHNICAL

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27494 *CONTINUED*

SPECIFICATIONS. A LITERATURE REVIEW INDICATED THAT THE MEASURED DUCTILITY WAS IN THE RANGE OF THE OTHER TEST DATA AVAILABLE ON BORON STAINLESS STEELS WITH APPROXIMATELY 2% B.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151

*CONTROL ROD + *IMPACT PROPERTY + *TENSILE PROPERTY + ELK RIVER (BWR) + EXPERIMENT, GENERAL + MATERIAL + REACTOR, BWR + SURVEILLANCE PROGRAM

9-27499

MOTOMIYA K

METHOD FOR DRIVING A REACTOR CONTROL ROD

HITACHI LTD.

JAPANESE PATENT 1967-5959 +. 2 PAGES, 1 FIGURE, MARCH 10, 1967

THE TIME LAG AT THE REACTOR SCRAM CAN BE REDUCED PARTICULARLY IN SUCH REACTORS AS MTR, COMPARED WITH THE CONVENTIONAL HYDRAULIC TECHNIQUE. A SURGE TANK, HAVING AN (GAS) EXHAUST VALVE WHICH OPENS EARLIER THAN THE SCRAM DRAIN VALVE, IS INSTALLED IN THE PATH OF WATER DRAINAGE. THIS SURGE TANK IS NORMALLY FILLED WITH HIGH-PRESSURE GAS. BY RELEASING THIS GAS FROM THE TANK, THE PRESSURE UNDER THE PISTON (IN THE CYLINDER) FOR A CONTROL ROD IS REMOVED. IN THIS WAY, THE CONTROL ROD IS IN THE STATE OF ENTERING THE SCRAM BEFORE THE SCRAM DRAIN-VALVE IS OPENED.

AVAILABILITY - U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D. C. \$0.30 PER PAGE

*CONTROL ROD DRIVE + JAPAN + PATENT

9-27500

AMAMIYA S

MECHANISM FOR DECELERATING THE DROPPING OF A REACTOR CONTROL ROD

HITACHI LTD.

JAPANESE PATENT 1966-22160 +. 5 PAGES, 1 FIGURE, 1 TABLE, NOVEMBER 2, 1966

USING THE PROPOSED MECHANISM, THE SHOCK AND RECOIL OF A REACTOR CONTROL ROD IN A REACTOR SCRAM CAN BE ELIMINATED BY DECELERATING THE MOTION OF DROPPING NEAR THE END OF SCRAM ACTION WHERE THE VERTICAL MOTION IS CONVERTED INTO A ROTATIONAL MOTION.

AVAILABILITY - U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D. C. \$0.30 PER PAGE

*CONTROL ROD SCRAM MECHANISM + CONTROL ROD + INSTRUMENTATION, CONTROL + JAPAN + PATENT

9-27501

AKIMOTO S + SATO Y

DRIVE MECHANISM FOR A REACTOR CONTROL ROD

HITACHI LTD.

JAPANESE PATENT 1967-5960 +. 5 PAGES, 5 FIGURES, MARCH 30, 1967

A CONTROL ROD HAS A SCREW CUT INTO ONE END AND A CYLINDER AT THE OTHER. IN THE CYLINDER IS A LINK MECHANISM WHICH HOLDS THE ROD AND ENABLES VERTICAL MOTION. A REACTANCE MOTOR IS INSTALLED AT THE SCREWED END TO DRIVE THE ROD UP OR DOWN. A GEAR, ATTACHED TO THE ROTOR, CONNECTS WITH A SEALED SYNCHRO-OSCILLATOR. AN ELECTROMAGNET IS INSTALLED, JUST OUTSIDE THE CYLINDER AT ABOUT THE POSITION OF THE LEVER, SO AS TO MOVE TOGETHER WITH THE DRIVE ROD BY MEANS OF A SIGNAL FROM THE SYNCHRO-OSCILLATOR.

AVAILABILITY - FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (\$0.30 CENTS/PAGE)

*CONTROL ROD DRIVE + JAPAN + PATENT

9-27519

HOPKINSON A + LEVELL RW

ANALOGUE AND DIGITAL COMPUTING TECHNIQUES IN PLANT MODELLING, REDUCTION AND CONTROL STUDIES

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH

8 PAGES, 2 FIGURES, 7 REFERENCES, FROM SECOND U.K.A.C. CONTROL CONVENTION ON ADVANCES IN COMPUTER CONTROL, THE UNIVERSITY OF BRISTOL, APRIL 11-14, 1967

DESCRIBES THE TECHNIQUES USED AND EXPERIENCE GAINED DURING DYNAMIC STUDIES OF A PROPOSED PROTOTYPE FAST REACTOR POWER PLANT. THE STUDIES INCLUDED DEVELOPMENT OF DYNAMIC MODELS FOR INVESTIGATING THE UNCONTROLLED PLANT UNDER NORMAL CONDITIONS AND FOLLOWING VARIOUS PLANT FAULTS AND FOR STUDYING PLANT CONTROL OVER A FAIRLY WIDE RANGE OF POWER LEVELS.

AVAILABILITY - C. BALDWIN LTD., TUNBRIDGE WELLS, KENT, ENGLAND

*REACTOR CONTROL + *THEORETICAL INVESTIGATION + ANALYTICAL MODEL + COMPUTER PROGRAM + COMPUTER, ANALOG + COMPUTER, DIGITAL + CONTROL SYSTEM + REACTOR, FAST + REACTOR, LMCR + SODIUM + TRANSFER FUNCTION

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27536

DICK RS

ON THE FALLACY OF AN AVAILABILITY MEASURE
ITT DEFENSE COMMUNICATION

2 PAGES, 2 REFERENCES, IEEE TRANS. ON RELIABILITY, VOL. R-16, PAGES 137-38 (DECEMBER 1967)

A WELL-KNOWN AVAILABILITY MEASURE WHICH HAS APPEARED IN RECENT TEXTS IS ONLY AN APPROXIMATION TO THE PROBLEM WHERE THE PRODUCT OF FAILURE RATE AND DURATION OF OPERATION IS SMALL ENOUGH THAT THE OCCURRENCE OF MORE THAN ONE FAILURE DURING THE DURATION OF OPERATION IS MINUTE. FOR LARGER VALUES OF THIS PRODUCT, THE NUMBER OF REPAIRS THAT CAN BE PERMITTED DURING THE PERIOD OF OPERATION MUST BE KNOWN.

*RELIABILITY ANALYSIS + ERROR ANALYSIS + MATHEMATICAL TREATMENT

9-27579

ALSO IN CATEGORIES 4 AND 6

FRIEDMAN ST + RANKIN WD

INDIRECT MEASUREMENT OF NUCLEAR HEATING RATES IN POISON CONTROL VANES

LOS ALAMOS SCIENTIFIC LABORATORY

1 PAGE, ANS TRANSACTIONS 11(1), PAGE 25, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE ACCURATE PREDICTION OF NUCLEAR HEATING RATES IN HIGH CAPTURE CROSS-SECTION CONTROL MATERIALS IS A MAJOR RADIATION ANALYSIS PROBLEM. THE PROBLEM IS PARTICULARLY ACUTE IN NUCLEAR ROCKET REACTOR SYSTEMS SUCH AS NERVA WHERE THE RELATIVELY THIN CONTROL VANES ARE LOCATED IN HIGHLY MODERATING BERYLLIUM REFLECTOR REGION IMMEDIATELY ADJACENT TO A HIGH-POWER DENSITY CORE. OPERATIONAL CONSIDERATIONS, INCLUDING EFFECTS ON REACTOR SAFETY AND RELIABILITY, REQUIRE ACCURATE PREDICTIONS OF VANE HEATING RATES AND AN ADEQUATE FLOW OF LIQUID HYDROGEN TO THE VANES, DRUMS, REFLECTOR, AND PRESSURE VESSEL, BUT ESPECIALLY TO THE VANES SINCE THESE INVOLVE THE CONTROL SYSTEM.

*MEASUREMENT, TEMPERATURE + *NUCLEAR ROCKET + HEAT TRANSFER + INSTRUMENTATION, CONTROL + NERVA PROGRAM

9-27580

DELLA VILLA LA

RADIATION-HARDENED NERVA PRESSURE TRANSDUCER

AEROJET, SACRAMENTO, CALIFORNIA

1 PAGE, ANS TRANSACTIONS 11(1), PAGE 26, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO CANADA, JUNE 10-13, 1968

THE NERVA ENGINE CONTROL SYSTEM REQUIRES A NOZZLE CHAMBER MEASUREMENT. TO MEET THE FREQUENCY-RESPONSE REQUIREMENTS, THE TRANSDUCER MUST BE MOUNTED AT THE NOZZLE PASS-THROUGH BOSS WHICH IS DOWNSTREAM OF THE REACTOR CORE EXIT. THE TRANSDUCER MUST BE NOT ONLY RADIATION RESISTANT BUT MUST OPERATE WHILE BEING SUBJECTED TO INTERNAL TEMPERATURE GRADIENTS CREATED BY THE GAMMA FIELD, AND TO TEMPERATURES FROM -200 TO 600 F CREATED BY LIQUID HYDROGEN COOLING. SEVERAL DESIGNS WERE TESTED.

*INSTRUMENTATION, PRESSURE + *TEST, INSTRUMENT RESPONSE + ENVIRONMENTAL CONDITION + HIGH TEMPERATURE + INSTRUMENTATION, COMPONENT + NERVA PROGRAM + NUCLEAR ROCKET

9-27581

OZAIR V + ANDREWS DG

DEVELOPMENT OF A SENSITIVE GAMMA COUNTER DIRECT-READING IN FLUX AND DOSE RATE

UNIVERSITY OF TORONTO, ONTARIO, CANADA

2 PAGES, 1 FIGURE, ANS TRANSACTIONS 11(1), PAGES 66-67, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

PARTIAL SUCCESS HAS BEEN ACHIEVED TOWARD THE DEVELOPMENT OF A SENSITIVE GAMMA COUNTER TUBE THAT CAN BE USED ALTERNATIVELY IN THE ISOFLUX (SAME COUNTS READING, SAME FLUX) AND THE ISODOSE (SAME COUNTS READING, SAME DOSE RATE) MODE OVER A USEFUL RANGE OF PHOTON ENERGIES, IN THIS INSTANCE, 0.15 TO 1.5 MEV.

*INSTRUMENTATION, NUCLEAR + *SPECTROMETRY, GAMMA + COUNTER + DOSIMETRY, GENERAL + GAMMA

9-27582

RILEY DR + FLECK J

REACTOR AVAILABILITY DRIVER FUEL INSTRUMENTATION

GENERAL ELECTRIC, SCHENECTADY + GENERAL ELECTRIC, SUNNYVALE, CALIF.

1 PAGE, 1 FIGURE, 1 TABLE, ANS TRANSACTIONS 11(1), PAGE 330, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO CANADA, JUNE 10-13, 1968

DURING THE EVOLUTION OF THE CONCEPTUAL DESIGN OF THE FFTF BACKUP DESIGN, SPECIAL EMPHASIS WAS PLACED ON MAXIMIZING REACTOR PLANT AVAILABILITY. SEVEN SCHEMES FOR CORE TEMPERATURE SENSING WERE CONCEIVED, RANGING FROM A SCHEME WITH NO REDUNDANCY WHATEVER TO AN ELABORATE SCHEME USING FOUR THERMOCOUPLES PER CHANNEL AND EXTENSIVE FAILURE-DETECTING CIRCUITRY. THE

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27582 *CONTINUED*

UNAVAILABILITY OF EACH SCHEME HAS BEEN PREDICTED, AND THE ARRANGEMENT RECOMMENDED USES FOUR THERMOCOUPLES PER CHANNEL, WITH THREE OF THEM ACTIVELY CONNECTED AND ONE AS A SPARE. ONE THERMOCOUPLE FROM EACH CHANNEL IS CONNECTED TO EACH OF THREE OR CIRCUITS, AND THEN THE THREE ORS ARE CONNECTED TO TWO-OUT-OF-THREE MAJORITY LOGIC TO PROVIDE THE SCRAM SIGNAL.

FFTF (TR) + INSTRUMENTATION, IN CORE + INSTRUMENTATION, TEMPERATURE + REACTOR, FAST + REACTOR, LMCR

9-27583

JACKSON CN

RECENT ADVANCES IN REGENERATIVE IN-CORE NEUTRON FLUX MONITORS
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON

1 PAGE, 1 FIGURE, 1 TABLE, 2 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 336, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO CANADA, JUNE 10-13, 1968

THIS PAPER FOCUSES ON RECENT INVESTIGATIONS IN THE DEVELOPMENT OF REGENERATING FLUX MONITORS-A NOVEL DETECTOR CONCEPT THAT EMPLOYS A MIXTURE OF FERTILE AND FISSIONABLE URANIUM ISOTOPES (90% U-234/10% U-235). IN THIS COATING MATERIAL, U-234 TRANSMUTES BY THERMAL-NEUTRON ABSORPTION TO U-235, REPLACING SIMILAR ATOMS LOST DUE TO BURNOUT, THEREBY ACCOMPLISHING THE REGENERATING FUNCTION AND EXTENDING THE USEFUL LIFE OF THE NEUTRON SENSOR.

*INSTRUMENTATION, IN CORE + *INSTRUMENTATION, NUCLEAR + EQUIPMENT DESIGN + FLUX, INTEGRATED + TEST, INSTRUMENT RESPONSE

9-27584

ALSO IN CATEGORY 17

KINZER JE + PARK TA + CHANDLER EM

OPERATING EXPERIENCE WITH A MINIATURIZED NEUTRON FLUX SENSOR.

ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA

1 PAGE, 2 FIGURES, 1 REFERENCE, ANS TRANSACTION 11(1), PAGE 336, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE ADIT NEUTRON FLUX SENSOR, WAS DESIGNED TO MEET THE CONTINUING NEED FOR VERY SMALL DYNAMIC SENSORS. THE BASIC APPROACH MEASUREMENT OF FISSION-PRODUCED TEMPERATURE, HAS BEEN MODIFIED TO INCREASE OUTPUT SIGNAL AND DECREASE PHYSICAL SIZE WHILE MAINTAINING SIMPLICITY. PROTOTYPE MODELS HAVE BEEN 0.083 IN. IN DIAMETER. SINCE THE TYPE OF FISSIONABLE MATERIAL USED MAY BE CHOSEN TO MATCH THE NEUTRON FLUX ENVIRONMENT OF INTEREST, THIS TYPE OF FLUX SENSOR IS APPLICABLE TO BOTH FAST AND THERMAL FLUX MEASUREMENTS. ADDITIONALLY, THE RELIABILITY AND RELATIVELY LONG LIFE OF THERMOCOUPLES AND THE FACT THAT THE ONLY INSTRUMENTATION REQUIRED IS THE STANDARD THERMOCOUPLE RECORDER, MAKE THE ADIT FLUX SENSORS ATTRACTIVE FOR IN-CORE DATA ACQUISITION.

*INSTRUMENTATION, IN CORE + *INSTRUMENTATION, NUCLEAR + FLUX, INTEGRATED + OPERATING EXPERIENCE

9-27585

ALSO IN CATEGORY 17

KINZER JE + BABBE EL

OPERATING EXPERIENCE WITH A MINIATURIZED PRESSURE SENSOR

ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA

1 PAGE, 3 FIGURES, 2 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 337, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13 1968

THE ADIT (ADVANCED DEVELOPMENT IRRADIATION TECHNIQUES) PRESSURE SENSOR OPERATES MUCH LIKE A DIAPHRAGM ACTUATED PRESSURE SWITCH. TWO SYMMETRICAL BELLWS JOINED BY A COUPLING DISK FORM A FORCE BALANCE SYSTEM PLUS A DOUBLE SEAL AGAINST FISSION GAS. AN ON-OFF ELECTRICAL CONTACT, MADE BY A PLATINUM-TIPPED THERMOCOUPLE, INDICATES WHEN THE BALANCING GAS IS IN EQUILIBRIUM WITH THE PRESSURE BEING MEASURED. THIS THERMOCOUPLE MAKES THE DEVICE A COMBINATION PRESSURE-TEMPERATURE SENSOR AND CAN BE USED TO CORRECT FOR TEMPERATURE CHARACTERISTICS OF THE BELLWS SYSTEM.

*INSTRUMENTATION, PRESSURE + CHALK RIVER + INSTRUMENTATION, TEMPERATURE + OPERATING EXPERIENCE + TEST, INSTRUMENT RESPONSE

9-27586

AGAZZI A + BROGGI A + DE PARATESI SG + GHIURGI L

A LIQUID-ROD SHUTDOWN SYSTEM

EUROPEAN ATOMIC ENERGY COMMUNITY, ITALY

2 PAGES, 2 FIGURES, ANS TRANSACTIONS 11(1), PAGES 338-9, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

RESEARCH IN THE FIELD OF LIQUID-ROD SHUTDOWN EMERGENCY SYSTEMS IS JUSTIFIED BY THE DESIRABILITY OF AVOIDING THE DIFFICULTIES THAT THE INSTALLATION OF NORMAL SOLID RODS WOULD RAISE IN SOME REACTORS. SINCE 1966 RESEARCH ACTIVITY ON THE SUBJECT HAS BEEN UNDERWAY AT THE CCR-EURATOM-ISPRA, UNDER THE O2O-MODERATED REACTOR ORGEL PROGRAM. DIFFERENT SYSTEMS HAVE BEEN CONSIDERED AND ONE HAS BEEN COMPLETELY DESIGNED AND A THREE-ROD MOCKUP ERECTED. TESTS ON THIS MOCKUP DEMONSTRATED THE FEASIBILITY OF THE SYSTEM AND ITS VERY GOOD DYNAMIC PERFORMANCE. STUDIES OF RELIABILITY HAVE ALSO BEEN CARRIED OUT.

*CONTROL ROD PROGRAM + *LIQUID + BORON + CONTROL ROD + CONTROL SYSTEM + EQUIPMENT DESIGN + EURATOM + INSTRUMENTATION, CONTROL + SYSTEM DESCRIPTION

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27587

CLARK RG

OPERATION OF REACTOR SYSTEMS WITH A DIGITAL COMPUTER
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON

2 PAGES, 1 REFERENCE, ANS TRANSACTIONS 11(1), PAGES 339-40, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

A DIGITAL INSTRUMENT SYSTEM UTILIZING A HIGH-SPEED COMPUTER CONTROLS THE PROCESS SYSTEMS FOR THE HIGH TEMPERATURE LATTICE TEST REACTOR (HTLTR), WHICH WENT CRITICAL IN NOVEMBER 1967. ON-LINE COMPUTATIONS ARE MADE CONTINUOUSLY AND THE INFORMATION ON THE CRT IS UPDATED AT SHORT INTERVALS OF TIME FOR OPERATOR ACTION OR AUTOMATIC RESPONSE OF THE SYSTEM UNDER PROGRAM DIRECTION. OPERATION OF THE SYSTEM THROUGH THE COMMAND TYPEWRITER IS RAPID ENOUGH FOR ROUTINE OPERATION, BUT FUNCTIONS THAT REQUIRE IMMEDIATE OPERATOR RESPONSE HAVE INDIVIDUAL CONVENTIONAL CONTROLS SUCH AS THE SCRAM BUTTON.

*COMPUTER CONTROL + *REACTOR CONTROL + BATTELLE NORTHWEST + COMPUTER, DIGITAL + INSTRUMENTATION, CONTROL + INSTRUMENTATION, PROCESS + REACTOR, RESEARCH

9-27588

KAUFMAN NC

CALIBRATION OF THE ATR LOBE POWER MONITORING SYSTEM
IDAHO NUCLEAR CORPORATION

1 PAGE, ANS TRANSACTION 11(1), PAGE 340, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE SERPENTINE FUEL ANNULUS OF THE ADVANCED TEST REACTOR FORMS FIVE POWER-GENERATING LOBES. A KNOWLEDGE OF THE DIVISION OF THE TOTAL REACTOR POWER AMONG THESE LOBES IS IMPORTANT TO REACTOR OPERATION, BOTH IN CONSIDERATIONS OF REACTOR SAFETY AND IN THE ACHIEVEMENT OF DESIRED TEST IRRADIATIONS. THE SYSTEM IS UNDERGOING TESTS TO VERIFY THE ACCURACY OF CALCULATION, PARTICULARLY UNDER THE INFLUENCE OF EXTREME CHANGES IN EXPERIMENT LOADING, SHIM POSITIONS, AND POWER DIVISION. MEASUREMENTS IN ATRC AND CALCULATIONS FROM A COMPUTER MODEL OF THE SYSTEM INDICATE THAT IN NO CASE SHOULD THE DIFFERENCE BETWEEN CALCULATED AND INDEPENDENTLY MEASURED LOBE POWERS EXCEED $\pm 4\%$.

ATR (TR) + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, POWER RANGE + REACTOR, AEC OWNED + REACTOR, TEST

9-27589

LEONARD JH

RADIATION-INDUCED TEMPORARY DECALIBRATION OF THERMOCOUPLES
UNIVERSITY OF CINCINNATI

1 PAGE, 1 FIGURE, 4 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 340, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

GIVES RESULTS OF FURTHER EXPERIMENTS SHOWING DIRECT RADIATION EFFECTS ON THERMOCOUPLE CALIBRATION AT TEMPERATURES COMMON IN CURRENT REACTORS. A MECHANISM WHICH CAN ACCOUNT FOR SUCH PHENOMENA INVOLVES DIFFERENT DEGREES OF TIME-DEPENDENT CHANGE IN ELECTRON MOBILITY IN THE TWO THERMOELECTRIC MATERIALS DUE TO APPEARANCE OF RADIATION-PRODUCED SCATTERING CENTERS FOLLOWED BY SELF ANNEALING. AN IMPORTANT FACTOR APPEARS TO BE THE LOCATION OF THE TEMPERATURE GRADIENT ALONG THE THERMOCOUPLE WIRES RELATIVE TO THE LOCATION OF NEUTRON FLUX GRADIENT.

*INSTRUMENTATION, ABNORMAL INDICATION + *INSTRUMENTATION, TEMPERATURE + INSTABILITY + INSTRUMENTATION CALIBRATION + IRRADIATION TESTING + RADIATION EFFECT

9-27590

DAU GJ + BOURASSA RR

RESULTS OF THERMOCOUPLE CALIBRATION IN A PULSED REACTOR
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON

1 PAGE, 3 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 341, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

A MECHANISM WAS POSTULATED TO INDICATE HOW RADIATION CAN AFFECT THERMOCOUPLE CALIBRATION, BUT BECAUSE SOME OF THE CONSTANTS CANNOT BE OBTAINED ACCURATELY, IT WAS NECESSARY TO EXPERIMENTALLY EVALUATE THE INSTANTANEOUS EFFECTS ON THERMOCOUPLE CALIBRATION. AN EXPERIMENT WAS DESIGNED AND CONDUCTED IN A PULSED TRIGA REACTOR USING CHROMEL-GHANNEL THERMOCOUPLES. RESULTS OF THE PULSED DATA ON FOUR THERMOCOUPLES. RESULTS OF THE PULSED DATA ON FOUR THERMOCOUPLES INDICATED AN APPARENT TEMPERATURE INCREASE OF LESS THAN 2.5 C. IT WAS CONCLUDED THAT THERE ARE NO SIGNIFICANT DOSE RATE RADIATION EFFECTS ON THERMOCOUPLES OTHER THAN LOCALIZED GAMMA HEATING AT TEMPERATURES UP TO 230 C AND IN FLUXES OF APPROXIMATELY 10^{16} (16TH) WITH A FAST-TO-THERMAL RATIO OF ONE AND A GAMMA PHOTON FLUX OF GREATER THAN 10^{10} (10TH) R/H.

*INSTRUMENTATION, TEMPERATURE + *IRRADIATION TESTING + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, ABNORMAL INDICATION + RADIATION EFFECT + REACTOR, RESEARCH + TEST, INSTRUMENT RESPONSE + TRIGA (RR)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27591

ELLIS JF

AN INSTRUMENT FOR MEASURING MECHANICAL VIBRATIONS IN FAST-PULSE REACTOR CORES
OAK RIDGE NATIONAL LABORATORY

1 PAGE, 1 FIGURE, ANS TRANSACTIONS 11(1), PAGE 342, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-12, 1968

PROXIMITY GAGES ARE ADVANTAGEOUS FOR MEASURING MECHANICAL DISPLACEMENTS AND VIBRATIONS IN PULSE REACTOR CORES BECAUSE THEY REQUIRE NO PHYSICAL ATTACHMENT TO THE CORE MATERIAL. DURING INITIAL TESTS OF THE ARMY PULSE RADIATION FACILITY REACTOR CONDUCTED AT THE OAK RIDGE CRITICAL EXPERIMENTS FACILITY, A NEWLY DEVELOPED PROXIMITY GAGE WAS TESTED. IT COMPRISED A 30-MHZ OSCILLATOR DRIVING A DIFFERENTIAL PROBE WHOSE INPUT AND DUAL OUTPUTS MATCHED THE CONNECTING COAXIAL LINES. THE UNIT WAS OPERATED WITHIN 0.10 IN. OF THE REACTOR CORE SURFACE. THE DIFFERENTIAL NATURE OF THE INSTRUMENT VIRTUALLY CANCELED THE EFFECTS OF RADIATION AND HEATING.

*INSTRUMENTATION, POSITION + *VIBRATION + INSTRUMENTATION, COMPONENT + TEST, INSTRUMENT RESPONSE

9-27592

POSEY LD + WALKER JV

THE FISSION-COUPLE DETECTOR - A LOW-RESOLUTION NEUTRON SPECTROMETER FOR PULSED-NEUTRON ENVIRONMENTS
SANDIA CORPORATION, ALBUQUERQUE, NEW MEXICO

2 PAGES, 1 FIGURE, 4 REFERENCES, ANS TRANSACTIONS 11(1), PAGES 342-3, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-12, 1968

A NEW TECHNIQUE IS PRESENTED FOR OBTAINING LOW-RESOLUTION SPECTRA OF PULSED-NEUTRON ENVIRONMENTS. THIS TECHNIQUE IS BASED ON THE INTRINSIC THERMOCOUPLE CONCEPT USED PREVIOUSLY, IN THE FORM OF URANIUM FUEL MATERIAL, TO MAKE RELATIVE NEUTRON FLUX MEASUREMENTS OR POWER DENSITY MEASUREMENTS ACROSS A NUCLEAR ASSEMBLY. THROUGH THE USE OF DIFFERENT FISSILE MATERIALS, POSSESSING CROSS SECTIONS OF DIFFERING ENERGY DEPENDENCE, DETECTORS HAVE BEEN DESIGNED TO OBTAIN CERTAIN DIFFERENTIAL AND INTEGRAL SPECTRAL INFORMATION.

*SPECTROMETRY, NEUTRON + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, NUCLEAR + NEUTRON

9-27593

CLAYTON JR

VIBRATION INSTRUMENTATION DURING THE ADVANCED TEST REACTOR STARTUP

PHILLIPS PETROLEUM COMPANY, AEC, IDAHO FALLS, IDAHO

1 PAGE, ANS TRANSACTIONS 11(1), PAGE 351, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-12, 1968

DURING STARTUP OPERATIONS OF ATR, COOLANT FLOW VIBRATED THE IN-PILE TUBE AND SAFETY ROD. THE ORIENTATION AND MAGNITUDE OF THE DISPLACEMENTS BETWEEN THE IN-PILE TUBE AND THE SURROUNDING SAFETY ROD WERE REQUIRED TO DETERMINE THE EFFECT OF THE VIBRATION. DISPLACEMENT MEASUREMENTS WERE NECESSARY AT DIFFERENT ELEVATIONS WHILE THE REACTOR SYSTEM OPERATED AT VARIOUS FLOW AND PRESSURE CONDITIONS. ALSO, DYNAMIC PRESSURE TRANSDUCERS WERE USED TO DETERMINE THE CAUSE OF THE VIBRATION. A VIBRATION TRANSFER FUNCTION WAS DETERMINED FOR THE IN-PILE TUBE BEFORE AND AFTER THE FIX WAS MADE.

*INSTRUMENTATION, POSITION + *VIBRATION + ATR (TR) + REACTOR, AEC OWNED + REACTOR, TEST + TRANSFER FUNCTION

9-27594

TERNEY WB + FENECH H

CONTROL-ROD PROGRAMMING OPTIMIZATION USING DYNAMIC PROGRAMMING

KNOLLS ATOMIC POWER LABORATORY + MASS. INSTITUTE OF TECHNOLOGY

1 PAGE, 5 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 354, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-12, 1968

A TWO-RADIAL-ZONE PWR SIMILAR TO YANKEE WAS USED FOR THE STUDY. THE STATE OF THE REACTOR WAS REPRESENTED BY THE BURNUPS IN THE RADIAL ZONES BELOW THE RODS, AND THE LOCATION OF THE CONTROL-ROD BANKS. ALL NUCLEAR PARAMETERS WERE FITTED TO THE ZONAL BURNUPS AS IN THE CELL-MOVE SYSTEM. THE OPTIMAL ROD PROGRAM WAS A COMBINATION OF ZONAL AND BANK WITHDRAWALS INDICATING THAT THE INNER ZONE SHOULD BE DEPLETED SOMEWHAT BEFORE ALLOWING THE POWER TO SHIFT INTO IT. IT WAS FOUND THAT DYNAMIC PROGRAMMING SIGNIFICANTLY REDUCES THE NECESSARY CALCULATIONS BY VIRTUE OF ALLOWING NONOPTIMAL PATHS TO BE DISCARDED WHENEVER THERE IS A BETTER ROD PROGRAM TO A GIVEN STATE.

*CONTROL ROD PROGRAM + COMPUTER PROGRAM + CONTROL ROD INTERACTION

9-27595

ALSO IN CATEGORIES 5 AND 17

HARRIGAN PM + MATTEL J + TOTH WL

OPTICAL, LIGHTING, AND PHOTOGRAPHIC EQUIPMENT FOR THE ENRICO FERMI ATOMIC POWER PLANT REPAIR PROGRAM
POWER REACTOR DEVELOPMENT COMPANY + ATOMIC POWER DEVELOPMENT ASSOCIATES

1 PAGE, 1 FIGURE, ANS TRANSACTIONS 11(1), PAGE 358, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27595 *CONTINUED*
AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

A MELTDOWN OF TWO CORE SUBASSEMBLIES REQUIRED THE USE OF VERY LONG OPTICAL INSTRUMENTS AND LIGHTING EQUIPMENT FOR THE PURPOSE OF INSPECTION OF THE CORE AND REACTOR COMPONENTS. BECAUSE LITTLE INFORMATION WAS AVAILABLE ON THE DESIGN OF SUITABLE VIEWING AND LIGHTING EQUIPMENT FOR USE IN SODIUM REACTOR ENVIRONMENTS, MUCH DEVELOPMENTAL WORK AND TESTING HAD TO BE DONE TO PROVIDE SUITABLE EQUIPMENT. MUCH DEVELOPMENT WAS REQUIRED TO PROVIDE LIGHTING EQUIPMENT WITH ADEQUATE LAMP LIFE AND MANEUVERABILITY. THE USE OF PHOTOGRAPHY THROUGH THE VIEWING INSTRUMENTS WAS NOT SUCCESSFUL INITIALLY, BUT IMPROVEMENTS BOTH IN TECHNIQUE AND EQUIPMENT LED TO REMARKABLY GOOD RESULTS IN THE LATTER PART OF THE PROGRAM.

*INSTRUMENTATION, IN CORE + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT DESIGN + FERMI (LMFBR) + INSTRUMENTATION, SURVEILLANCE + MAINTENANCE AND REPAIR + MAINTENANCE, REMOTE + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR

9-27596 ALSO IN CATEGORIES 5 AND 17
DUFFY JG + MATTE J + RYAN JD + WARBERG HS
OBJECT RETRIEVAL TOOLS FOR THE ENRICO FERMI ATOMIC POWER PLANT REPAIR PROGRAM
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT, MICHIGAN
3 PAGES, 2 FIGURES, ANS TRANSACTIONS 11(1), PAGES 358-360, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE METHOD OF RETRIEVING FROM THE BOTTOM OF THE FERMI REACTOR AN OBJECT THAT CAUSED A MELTDOWN INVOLVED PROCEDURES AND TOOLS WHICH ARE UNIQUE AND COULD HAVE APPLICATION IN FUTURE PROBLEMS. TOOLS WERE DEVELOPED TO CUT THE OBJECT INTO PIECES SMALL ENOUGH TO BE REMOVED UPWARD THROUGH THE SUPPORT PLATE. SEVERAL GRIPPERS FOR THIS PURPOSE WERE ALSO DEVELOPED. SIMULTANEOUSLY, SPECIAL TOOLS WERE DEVELOPED TO REMOVE THE OBJECT INTACT VIA THE SODIUM INLET PIPE.

*INSTRUMENTATION, IN CORE + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT DESIGN + FERMI (LMFBR) + MAINTENANCE AND REPAIR + MAINTENANCE, REMOTE + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR

9-27597 ALSO IN CATEGORY 13
HARDTKE FC
TWO METHODS FOR EVALUATING THE SUSCEPTIBILITY OF IRRADIATED GLASS TO FRACTURE BY ELECTRICAL DISCHARGE
UNIVERSITY OF MO., ROLLA, ROLLA, MISSOURI
1 PAGE, 3 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 360, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

USING 200- TO 300-KV ELECTRONS, TWO METHODS HAVE BEEN DEVELOPED FOR TESTING SHIELDING GLASS FORMULATIONS FOR THEIR SUSCEPTIBILITY TO DISCHARGE AND FRACTURE UPON RADIATION EXPOSURE. THESE TESTS ARE INTENDED TO SUPERSEDE THOSE THAT HAVE FEATURED LARGE SAMPLES EXPOSED TO INTENSE GAMMA SOURCES AS WELL AS THOSE THAT MEASURE DIRECTLY THE INTRINSIC RESISTIVITY AND DIELECTRIC CONSTANT OF THE GLASS.

*GLASS + *RADIOISOTOPE + *SHIELDING + ELECTRICAL CONDUCTION + FAILURE, COMPONENT + IRRADIATION TESTING + RADIATION EFFECT + TEST, COMPONENT

9-27598
COLLINS RM
UNDERWATER CHARGING MACHINE FOR NUCLEAR IRRADIATION SAMPLE INSERTION
WESTINGHOUSE ASTRONUCLEAR LABORATORY
1 PAGE, 1 FIGURE, ANS TRANSACTIONS 11(1), PAGE 360, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

DISCUSSES DESIGN AND CONSTRUCTION OF A SPECIAL UNDERWATER MACHINE FOR INSERTION OF NUCLEAR IRRADIATION SAMPLES INTO THE NASA TEST REACTOR AT THEIR PLUM BROOK STATION, SANDUSKY, OHIO. SOME OF THE MAJOR PROBLEMS IN DESIGN AND THEIR RESULTANT SOLUTION ARE DESCRIBED IN BRIEF. OPERATING PARAMETERS AND CONSTRUCTION MATERIALS RESTRAINTS POSED UNIQUE PROBLEMS REQUIRING SPECIAL SOLUTIONS. A QUITE SOPHISTICATED SOLID-STATE CONTROL SYSTEM WAS PROVIDED FOR CARRIAGE POSITION INDICATION, HIGH THRUST MONITORING, AND CLUTCH SLIP SENSING. EXPERIENCE GATHERED TO DATE INDICATES A SUCCESSFUL APPROACH TO, AND EXECUTION OF, A DIFFICULT OPERATIONAL AND ENVIRONMENTAL DESIGN PROBLEM.

*EQUIPMENT DESIGN + *IRRADIATION TESTING + *REMOTE MANIPULATING AND VIEWING + CONTROL SYSTEM + DESIGN STUDY + REACTOR, TEST

9-27599
THOMPSON WM + VACROUX AG
FORCE-REFLECTING SERVOMECHANISMS WITH SIGNAL DELAY
ARGONNE NATIONAL LABORATORY
2 PAGES, 2 FIGURES, 6 REFERENCES, ANS TRANSACTIONS 11(1), PAGES 361-362, 1968 MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

FORCE-REFLECTING SERVOMECHANISMS ARE THE CONNECTING LINKS IN ELECTRICALLY CONNECTED MASTER-SLAVE MANIPULATORS. IF A LARGE DISTANCE SEPARATES THE MASTER AND SLAVE ARMS, OR IF OTHER SIGNAL-DELAYING MEDIA ARE INVOLVED, THE RESULTING SIGNAL DELAY SIGNIFICANTLY AFFECTS SYSTEM STABILITY. AN ANALYSIS OF THIS EFFECT HAS BEEN MADE. IT ALSO CONSIDERS UNBALANCED

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27599 *CONTINUED*

GAINS OF THE TRANSMISSION CHANNELS. THE RESULTS INDICATE THAT THE APPLICATION OF FORCE-REFLECTING SERVOMECHANISMS WHEN TIME DELAY IS INVOLVED IS RESTRICTED BECAUSE OF STABILITY CONSIDERATIONS. IN THE SYSTEM INVESTIGATED, ACCEPTABLE RELATIVE STABILITY WAS POSSIBLE ONLY UP TO A CERTAIN MAXIMUM TIME DELAY. BEYOND THIS DELAY, ONE MAY HAVE TO EMPLOY OTHER SYSTEMS SUCH AS THOSE WITHOUT FORCE REFLECTION.

*REMOTE MANIPULATING AND VIEWING + *SERVOMECHANISM + INSTABILITY + PONTRYAGINS PRINCIPLE

9-27600

WASHBURN LA

MAINTENANCE REPLICATION RATE PREDICTION AND MEASUREMENT

TEXAS INSTRUMENTS INCORPORATED, DALLAS, TEXAS

4 PAGES, 4 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(1), PAGES 49-52 (MAY 1967)

DETERMINATION OF MAINTENANCE REPLICATION RATE AND SPARES PROVISIONING IS DESCRIBED MATHEMATICALLY. BECAUSE OF ITS GREAT REPRESENTATIONAL FLEXIBILITY, THE QUADPARAMETRIC GENERALIZED GAMMA FUNCTION IS ASSUMED AS THE DISTRIBUTION OF LIFE LENGTH. FROM THE LAPLACE TRANSFORM OF THE REPLACEMENT RATE AN INVERSE TRANSFORM IS DEVELOPED WHICH OBTAINS THE DISTRIBUTIONAL FORM FOR THE GENERAL TERM OF THE SERIES. THIS IS A GENERALIZED GAMMA FUNCTION, HENCE THE REPLACEMENT RATE HAS THIS FORM OF PROBABILITY DENSITY. INTEGRATION YIELDS THE EXPECTED NUMBER OF REPLACEMENTS IN A GENERAL PERIOD OF TIME.

*MAINTENANCE AND REPAIR + *RELIABILITY ANALYSIS + MATHEMATICAL TREATMENT + TRANSFER FUNCTION

9-27601

LEVY LL + MOORE AH

A MONTE CARLO TECHNIQUE FOR OBTAINING SYSTEM RELIABILITY CONFIDENCE LIMITS FROM COMPONENT TEST DATA U.S. AIR FORCE

4 PAGES, 1 FIGURE, 1 TABLE, 14 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(2), PAGES 69-72 (SEPTEMBER 1967)

A DIGITAL COMPUTER TECHNIQUE IS DEVELOPED, USING A MONTE CARLO SIMULATION BASED ON COMMON PROBABILITY MODELS, WITH WHICH COMPONENT TEST DATA MAY BE TRANSLATED INTO APPROXIMATE SYSTEM RELIABILITY LIMITS AT ANY CONFIDENCE LEVEL. THE PROBABILITY DISTRIBUTIONS FROM WHICH THE COMPONENT FAILURES ARE ASSUMED TO COME ARE THE EXPONENTIAL, WEIBULL (SHAPE PARAMETER K KNOWN), GAMMA (SHAPE PARAMETER ALPHA KNOWN), NORMAL, AND LOGNORMAL. THE COMPONENTS CAN BE ARRANGED IN ANY SYSTEM CONFIGURATION, SERIES, PARALLEL, OR BOTH. SINCE RELIABILITY PREDICTION IS MEANINGFUL ONLY WHEN EXPRESSED WITH AN ASSOCIATED CONFIDENCE LEVEL, THIS METHOD PROVIDES A VALUABLE AND ECONOMICAL TOOL FOR THE RELIABILITY ANALYST.

*DATA PROCESSING + *MONTE CARLO + *RELIABILITY ANALYSIS + PROBABILITY + RELIABILITY, COMPONENT + RELIABILITY, SYSTEM + SIMULATION

9-27602

BRENDER DM

THE UNCERTAINTY OF SYSTEM FAILURE-RATE PREDICTIONS

7 PAGES, 5 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(2), PAGES 75-81 (SEPTEMBER 1967)

THE RELATIVE UNCERTAINTY INVOLVED IN THE PREDICTION OF THE FAILURE RATE OF A SYSTEM IS OFTEN CONSIDERABLY LESS THAN THE UNCERTAINTY ASSOCIATED WITH THE FAILURE RATE OF THE AVERAGE COMPONENT. THE RELATIVE UNCERTAINTY ASSOCIATED WITH THE PREDICTION OF THE NUMBER OF FUTURE SYSTEM FAILURES IS ALWAYS GREATER THAN THAT ASSOCIATED WITH SYSTEM FAILURE RATE. THE PURPOSE OF THIS PAPER IS TO RELATE (1) THE UNCERTAINTY IN THE NUMBER OF PREDICTED SYSTEM FAILURES TO THE UNCERTAINTY IN THE SYSTEM FAILURE RATE, AND (2) THE UNCERTAINTY OF THE SYSTEM FAILURE RATE TO THE UNCERTAINTY IN THE FAILURE RATES OF THE COMPONENTS.

*RELIABILITY ANALYSIS + PROBABILITY + RELIABILITY, SYSTEM

9-27603

FAN LY + WANG CS + TILLMAN FA + HWANG CL

OPTIMIZATION OF SYSTEMS RELIABILITY

KANSAS STATE UNIVERSITY, MANHATTAN

6 PAGES, 5 FIGURES, 2 TABLES, 11 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(2), PAGES 81-86 (SEPTEMBER 1967)

THE PURPOSE OF THIS PAPER IS TO OBTAIN AN OPTIMUM REDUNDANCY OF THE PARALLEL SYSTEM BY A VARIATIONAL TECHNIQUE. THE OBJECTIVE FUNCTION IS TO MAXIMIZE THE SYSTEM PROFIT. A SIMPLE COMPUTATIONAL PROCEDURE IS OBTAINED FOR THE OPTIMUM DESIGN OF THE MULTISTAGE PARALLEL SYSTEMS BY THIS METHOD. TWO NUMERICAL EXAMPLES ARE GIVEN IN DETAIL.

*RELIABILITY, SYSTEM + ECONOMICS + REDUNDANCE

9-27604

SPRINGER MD + THOMPSON WE

BAYESIAN CONFIDENCE LIMITS FOR THE RELIABILITY OF CASCADE EXPONENTIAL SUBSYSTEMS

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27604 *CONTINUED*
GENERAL MOTORS, INC.

4 PAGES, 1 FIGURE, 7 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(2), PAGES 86-89 (SEPTEMBER 1967)

THE PROBLEM TREATED HERE IS THAT OF DERIVING EXACT BAYESIAN CONFIDENCE INTERVALS FOR THE RELIABILITY OF A CASCADE SYSTEM CONSISTING OF N INDEPENDENT SUBSYSTEMS EACH HAVING AN EXPONENTIAL DISTRIBUTION OF LIFE WITH A FAILURE RATE WHICH IS ESTIMATED FROM LIFE TEST DATA. THE POSTERIOR PROBABILITY DENSITY FUNCTION OF THE SYSTEM RELIABILITY IS DERIVED IN CLOSED FORM, USING THE METHOD OF THE MELLIN INTEGRAL TRANSFORM. THE POSTERIOR DISTRIBUTION FUNCTION IS OBTAINED, YIELDING BAYESIAN CONFIDENCE LIMITS ON THE TOTAL SYSTEM RELIABILITY. THESE RESULTS, WHICH ARE BELIEVED TO BE NEW FOR N GREATER THAN 3, HAVE AN IMMEDIATE APPLICATION TO PROBLEMS OF RELIABILITY EVALUATION AND TEST PLANNING.

MATHEMATICAL TREATMENT + RELIABILITY, SYSTEM + STATISTICAL ANALYSIS

9-27605
KOOI CF

RELATION OF A PHYSICAL PROCESS TO THE RELIABILITY OF ELECTRONIC COMPONENTS

4 PAGES, 5 FIGURES, 6 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(3), PAGES 113-116 (DECEMBER 1967)

AN ENSEMBLE OF ELECTRONIC COMPONENTS HAVING A RANDOM VARIATION OF SOME PARAMETER, SUCH AS SURFACE CONTAMINATION, IS CONSIDERED. A PHYSICAL PROCESS IS POSTULATED WHICH LEADS TO A CHANGE IN ONE OF THE OPERATING CHARACTERISTICS OF THE DEVICE. WHEN THIS OPERATING CHARACTERISTIC ATTAINS A VALUE OUTSIDE AN ACCEPTABLE RANGE, THE DEVICE IS CONSIDERED TO HAVE FAILED. THE FAILURE RATE IS CALCULATED DIRECTLY FROM THE TIME BEHAVIOR OF THE PHYSICAL PROCESS AND COMPARED, FOR ILLUSTRATION, TO THE WEIBULL FAILURE LAW. THE PARAMETERS OF THE WEIBULL LAW ARE THEN RELATED TO THE PARAMETERS OF THE PHYSICAL PROCESS AND THE DISTRIBUTION OF STARTING PARAMETERS.

*RELIABILITY, COMPONENT + FAILURE, COMPONENT + INSTRUMENTATION, COMPONENT + PROBABILITY + STATISTICAL ANALYSIS

9-27606
LOTT JE

RELIABILITY PREDICTIONS AND SYSTEM SUPPORT COSTS

MARTIN MARIETTA CORPORATION, ORLANDO, FLA.

8 PAGES, FIGURES, 4 REFERENCES, IEEE TRANS. ON RELIABILITY R-16(3), PAGES 126-133 (DECEMBER 1967)

A CASE STUDY DEMONSTRATES THAT SPARES REQUIREMENTS BASED ON OPERATIONAL RELIABILITY PREDICTIONS RESULT IN THE SYSTEM BEING UNDERSUPPORTED DURING ITS BURN-IN AND USEFUL-LIFE PHASES BY AVERAGE FACTORS OF 42.2 AND 4.22, RESPECTIVELY. HOWEVER, SYSTEMS SPARES REQUIREMENTS BASED ON LOGISTICS ESTIMATES RESULT IN THE SYSTEM BEING OVERSUPPORTED DURING ITS BURN-IN PHASE BY AN AVERAGE FACTOR OF 4.26 WITH THIS FACTOR PROBABLY INCREASING AS THE SYSTEM ENTERS THE USEFUL-LIFE PHASE OF ITS LIFE CYCLE. ADEQUATE SYSTEM SUPPORT WITHIN PREDETERMINED COST ESTIMATES WILL BE ACHIEVED ONLY WHEN RELIABILITY PREDICTIONS ARE ACCURATE AND WHEN SYSTEMS SPARES REQUIREMENTS ARE COMPUTED SEPARATELY FOR THE EQUIPMENT BURN-IN PHASE AND USEFUL-LIFE PHASE.

*COMPARISON, THEORY AND EXPERIENCE + *ECONOMICS + *RELIABILITY, SYSTEM + FAILURE, COMPONENT + PERFORMANCE LIMIT + TEST, PREOPERATIONAL

9-27607

RUBINSTEIN D

STATISTICAL EXPOSITION OF GUID MANUAL FOR RELIABILITY MEASUREMENT PROGRAM

GENERAL ELECTRIC COMPANY, SYRACUSE, NEW YORK

R68-13862 +. 55 PAGES, REFERENCES, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 111 (JULY 1968)

MATHEMATICAL MODELS AND DERIVATIONS AND STATISTICAL THEORY ARE DISCUSSED. COMPONENTS AND SYSTEMS, FAILURE AND RELIABILITY, AND LIFE TESTING ARE CONSIDERED, INCLUDING THE JUSTIFICATION OF TRUNCATED LIFE TESTING. STATISTICAL INFERENCE OF SYSTEM RELIABILITY OF A SERIES SYSTEM IS DEVELOPED IN TERMS OF ESTIMATES RELATING TO COMPONENT FAILURE RATES, INFERENCE BASED ON NORMAL DISTRIBUTION, AND EXTENSIONS TO SYSTEMS WITH REDUNDANCY. TAYLORS EXPANSION FOR GUIDE MANUAL ESTIMATES, MOMENTS OF THE NUMBER OF FAILURES AND TEST TERMINATION TIMES, EXPECTED VALUES OF GUIDE MANUAL ESTIMATES, AND THE TERMWISE EXPANSION OF ONE OF THE VALUES ARE DETAILED. A COMPARISON WITH OTHER METHODS IS INCLUDED, AS IN THE DISTRIBUTION OF UPPER CONFIDENCE LIMITS FOR SYSTEM FAILURE RATES.

*RELIABILITY ANALYSIS + CODES AND STANDARDS + RELIABILITY, COMPONENT + RELIABILITY, SYSTEM + STATISTICAL ANALYSIS

9-27609

WEITZENFELD AS + HAPP WW

COMBINATORIAL TECHNIQUES FOR FAULT IDENTIFICATION IN MULTI-TERMINAL NETWORKS

NASA

7 PAGES, 22 REFERENCES, IEEE TRANSACTIONS ON RELIABILITY VOL. R-16, PAGES 93-99 (DECEMBER 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 114 (JULY 1968)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27609 *CONTINUED*

A PROCEDURE IS PROPOSED FOR IDENTIFICATION AND DIAGNOSIS OF FAULTS IN MULTITERMINAL DEVICES. A COMBINATORIAL TECHNIQUE DETERMINED THE NUMBER OF X-TERMINAL Y-PORT NONREDUNDANT SUBNETWORKS WHICH CAN BE GENERATED FROM A Z-TERMINAL PARENT NETWORK. THIS INFORMATION IS INTENDED TO IDENTIFY AND ISOLATE INTERNAL FAULTS OF THE SYSTEM THROUGH AN OPTIMAL SET OF EXTERNAL MEASUREMENTS. FOUR- AND FIVE-TERMINAL DEVICES ARE EXAMINED. THE RESULTS ARE SO FORMULATED AS TO YIELD ALGORITHMS FOR COMPUTER-ORIENTED PROCEDURES TO IDENTIFY THE COMPLETE SET OF NONREDUNDANT CONFIGURATIONS OF A MULTITERMINAL NETWORK. THE FLOW CHART OF OPERATIONS SUITABLE FOR A COMPUTER PROGRAM IS PRESENTED.

*RELIABILITY ANALYSIS + COMPUTER PROGRAM

9-27610

BRENDER DM

THE EFFECT OF K-FACTORS ON THE UNCERTAINTY OF FAILURE-RATE PREDICTIONS

2 PAGES, 1 REFERENCE, IEEE TRANSACTIONS ON RELIABILITY, VOL. R-16, PAGES 135 AND 136, (DECEMBER 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 116 (JULY 1968)

DETERMINATION OF THE UNCERTAINTY INVOLVED WHEN MULTIPLYING A FAILURE RATE BY A K-FACTOR (STRESS FACTOR) TO ACCOUNT FOR THE EFFECT OF A MORE SEVERE ENVIRONMENT. PRACTICAL EVIDENCE OF THIS UNCERTAINTY IS SUPPLIED BY THE LARGE DEVIATIONS FREQUENTLY ENCOUNTERED BETWEEN PREDICTED AND MEASURED RESULTS. THE USE OF BAYESIAN IDEAS TO MEASURE THIS UNCERTAINTY IS DEMONSTRATED.

*RELIABILITY ANALYSIS + ENVIRONMENTAL CONDITION

9-27611

ANSLEY WG

DEVICE FAILURES DURING EQUIPMENT LIFE FOR LOGNORMAL DISTRIBUTIONS

HEWLETT-PACKARD CO., PALO ALTO, CALIF.

2 PAGES, 1 REFERENCE, IEEE TRANSACTIONS ON RELIABILITY VOL. R-16, PAGES 139-40 (DEC. 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 116 (JULY 1968)

PRESENTATION OF A SIMPLE GRAPH SHOWING THE TOTAL FRACTION OF DEVICES WHICH WILL FAIL OVER ANY GIVEN TIME FOR LOGNORMAL FAILURE DISTRIBUTIONS. THE RESULT IS A FUNCTION OF THE MEDIAN LIFE AND THE GEOMETRIC DISPERSION.

*RELIABILITY ANALYSIS + FAILURE, COMPONENT + RELIABILITY, COMPONENT

9-27612

CODIER EO

RELIABILITY GROWTH IN REAL LIFE

GENERAL ELECTRIC COMPANY, UTICA, NEW YORK

12 PAGES, IN ANNALS OF ASSURANCE SCIENCES, PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., JAN. 16-18, 1968, PAGES 458-469. ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 122 (JULY 1968)

DISCUSSION OF MONITORING, FORECASTING, AND PRESENTATION METHODS OF RELIABILITY PREDICTION THAT WORK AND ARE BELIEVABLE. IT IS SHOWN THAT THE DUANE CHART APPEARS TO BE A POWERFUL ANALYTICAL TOOL FOR CONSTRUCTING RELIABLE ESTIMATES OF THE CURRENT STATUS AND RATE OF RELIABILITY GROWTH. IT IS POINTED OUT THAT THE AMOUNT OF EVIDENCE WHICH HAS BEEN ACCUMULATED AND INTERPRETED IN THE DUANE MODEL IS AT THIS POINT COMPLETELY CONVINCING THAT THIS PARTICULAR MODEL IS AN EFFECTIVE REPRESENTATION OF THE REAL WORLD.

*RELIABILITY ANALYSIS + ANALYTICAL MODEL

9-27613

REYNOLDS JO

EFFECTS OF SUSTAINED TEMPERATURE CYCLING ON PARTS

COLLINS RADIO COMPANY, CEDAR RAPIDS, IOWA

8 PAGES, IN ANNALS OF ASSURANCE SCIENCES, PROCEEDINGS OF THE ANNUAL SYMPOSIUM ON RELIABILITY, BOSTON, MASS., PAGES 486-493, JANUARY 16-18, 1968, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 125 (JULY 1968)

REPORTS A STUDY OF THE EFFECT OF SUSTAINED TEMPERATURE CYCLING ON ELECTRONIC-PART FAILURE RATES. THE TYPICAL MIL-STD-781A THERMAL ENVIRONMENT IS DESCRIBED, AND THE TYPE OF PARTS AND COMPONENTS FOUND MOST SUSCEPTIBLE TO DEGRADATION OR FAILURE IS DISCUSSED. AN EVALUATION OF EXTENSIVE PART-LEVEL SUSTAINED TEMPERATURE CYCLING IS MADE. CORRECTIVE ACTION TAKEN ON CERTAIN PART TYPES IS REVIEWED, AND RECOMMENDATIONS FOR INDUSTRY AND GOVERNMENT ACTION ARE MADE.

*INSTRUMENTATION, COMPONENT + *RELIABILITY, COMPONENT + FAILURE, COMPONENT + TEMPERATURE TRANSIENT + TEST, COMPONENT + THERMAL MECHANICAL EFFECT

9-27614 ALSO IN CATEGORIES 18 AND 10

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27614 *CONTINUED*

DRL QUESTIONS EMERGENCY SIGNALS AND POWER

U.S. ATOMIC ENERGY COMMISSION

3 PAGES, LETTER TO M. H. PRATT FROM P. A. MORRIS, JULY 31, 1968, DOCKET 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

DRL ASKS 7 SPECIFIC QUESTIONS. (1) ABILITY OF OFFSITE POWER, WITH A FAULT IN OUTSIDE SYSTEM, TO SAFELY SHUTDOWN PLANT. (2) ABILITY OF OFFSITE POWER TO SATISFY CRITERION 39 DESPITE 2 MIN DISCONNECT DELAY. (3) DC POWER FOR SWITCHYARD. (4) DESIGN AGAINST ELECTRICAL CABLE FIRE. (5) CONSEQUENCES OF LOSS OF STATION AIR OR INSTRUMENT AIR. (6) DIESEL START FROM SIGNALS OTHER THAN LOW VOLTAGE, E.G., UPON COOLANT INJECTION. (7) DISCUSS ADEQUACY OF CORE SPRAY ACTUATION SIGNALS. DISCUSS LACK OF DIVERSITY FOR ISOLATION VALVE ACTUATION.

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

*PLANT PROTECTIVE SYSTEM + ACCIDENT, LOSS OF POWER + AEC QUESTION + ELECTRICAL CONDUCTION + FIRE + NINE MILE POINT (BWR) + PNEUMATIC SYSTEM + REACTOR, BWR

9-27616 ALSO IN CATEGORIES 17 AND 6

SELECTED SHIPPINGPORT OPERATING EXPERIENCE

BETTIS ATOMIC POWER LABORATORY

WAPD-MRP-122 +. 14 PAGES, PAGES 6, 20-41 AND 43 OF PRESSURIZED WATER REACTOR (PWR) PROJECT. TECHNICAL PROGRESS REPORT, JULY 22, OCTOBER 20, 1967

(PAGE 6) NH₄OH ADDITION AND DEGASIFICATION RATES INCREASE DRASTICALLY WITH COOLANT PH ABOVE 10.3. (PAGE 20-41) POWER LIMITS FOR VARIOUS CONTROL ROD PROGRAMS PAST 10,000 EFPH WERE CALCULATED. FOR VARIOUS LOAD SWINGS, XENON BURNOUT RATES AND AXIAL PEAK/AV NEUTRON FLUXES WERE MEASURED AND COMPARED WITH TURBO-ZIP CALCULATIONS. ON THE RETURN TO 100 MWE ON AUGUST 21, XENON OSCILLATION SET IN, GIVING +9 IN. CONTROL ROD MOTION. OPERATIONAL DETECTORS LOCATED AT CORE MIDHEIGHT WERE IN PHASE WITH ROD BANK MOTION, WHILE TEST CHAMBERS ABOVE THE CORE WERE OUT OF PHASE. OPERATING LIMITS FOR PEAK SINGLE CHANNEL NUCLEAR INSTRUMENT READINGS WERE CALCULATED, AS WAS A CONTROL ROD PROGRAM. (PAGE 43) COMPUTER PROGRAM MO 795 WAS PLACED INTO PRODUCTION. MO 795 PERFORMS ALL FUEL ELEMENT PERFORMANCE LIMITS CALCULATIONS FOR CORE 2, INCLUDING MAXIMUM PERMISSIBLE SINGLE CHANNEL, NUCLEAR INSTRUMENT READINGS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONTROL ROD PROGRAM + *FUEL ELEMENT + *INSTRUMENTATION, ABNORMAL INDICATION + *PERFORMANCE LIMIT + *XENON OSCILLATION + COMPUTER PROGRAM + COOLANT CHEMISTRY + POWER DISTRIBUTION + REACTOR, PWR + REPORT, OPERATIONS ANALYSIS + SHIPPINGPORT (PWR)

9-27621 ALSO IN CATEGORY 17

LACROSSE OPERATIONS OCT 1967

ALLIS-CHALMERS, BETHESDA, MARYLAND

ACNP-67534 +. 20 PAGES, FIGURES, TABLES, OCTOBER 1967, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

NO REACTOR OPERATION BECAUSE TESTS AND MODIFICATIONS WERE COMPLETED FOR POWER OPERATION. A ROD FAILED TO WITHDRAW AFTER A SCRAM DUE TO A PIECE OF A PHENOLIC BACKUP RING PLUGGING THE HYDRAULIC OIL DISCHARGE ORIFICE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, SCRAM MECHANISM + LACROSSE (BWR) + REACTOR, BWR + REPORT, OPERATIONS

9-27650

MAJIMA K

AN INTRODUCTION OF RANDOM DRIFT PARAMETERS IN RELIABILITY

IBM JAPAN LTD., KOBE, JAPAN

10 PAGES, ELECTRONICS AND COMMUNICATIONS IN JAPAN, VOL. 38, PAGES 74-83 (1965), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEW 8(7), PAGE 112 (JULY 1968)

A RANDOM-WALK MODEL IS USED TO DERIVE RANDOM DRIFT PARAMETERS, WITH THE MEAN VALUE OF THE FLUCTUATING PARAMETER BEING PROPORTIONAL TO TIME AND THE PROBABILITY DISTRIBUTION REPRESENTED BY A THEORETICAL DISTRIBUTION. WHEN THE COEFFICIENTS OF THESE DRIFT PARAMETERS ARE SUBSEQUENTLY CHOSEN AS THE PARAMETERS OF LIFE OF RESISTORS, TEMPERATURE CHARACTERISTICS OF CAPACITORS, AND DEGRADATION OF TUBE TRANSCONDUCTANCE, GOOD RESULTS ARE OBTAINED THAT CAN BE EXPRESSED NUMERICALLY AND BE APPLIED TO THE DETERMINATION OF RELIABILITY. RELIABILITY PREDICTION WITH RESPECT TO TIME IS DISCUSSED AS IS A METHOD FOR DETECTING VARIATIONS OF CIRCUIT, PARAMETERS WITH THE DRIFT PARAMETERS FOR VARIOUS COMPONENTS.

*RELIABILITY ANALYSIS + ANALYTICAL MODEL + FAILURE, GENERAL + INSTRUMENTATION, COMPONENT

9-27842 ALSO IN CATEGORIES 17 AND 6

LEAD PLATE SHIFT TO CORE ADDS 0.168% REACTIVITY

PENNSYLVANIA STATE UNIVERSITY

3 PAGES, ATOMIC ENERGY CLEARINGHOUSE, 14(35), PAGES 12-14 (AUGUST 26, 1968)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27842 *CONTINUED*

(LETTER TO DRL, AUG. 9) ON JULY 24, THE REACTOR OPERATOR WAS OBSERVING XENON BEHAVIOR AND PLOTTING ROD POSITION VS TIME. HE NOTED A 37 UNIT REG ROD WITHDRAWAL IN A FEW SECONDS, A SLIGHT LOG INCREASE, AND A 10 C FUEL TEMP. DECREASE. REACTOR WAS SHUT DOWN. CAUSE WAS A THICK LEAD PLATE (MOUNTED BETWEEN CORE AND THERMAL COLUMN) WHICH HAD SWUNG TOWARD THE CORE AS NYLON ROPES SAGGED. LEAD ADDED 0.084% AND REFLECTED MORE NEUTRONS TOWARD THE SERVOCHAMBER, CAUSING A 40 KW POWER DECREASE, WITH THIS FUEL COOLING ADDING 0.084%.

*INSTRUMENTATION, ABNORMAL INDICATION + *OPERATOR ACTION + BEAM HOLE + CONTROLLER + INCIDENT, EQUIPMENT + INSTRUMENTATION, POWER RANGE + LEAD + POWER COEFFICIENT + REACTIVITY EFFECT + REACTIVITY EFFECT, ANOMALOUS + REACTOR POWER + REACTOR, RESEARCH + REFLECTOR + TRIGA (RR)

9-27845 ALSO IN CATEGORIES 17 AND 18
DRL QUESTIONS ON NINE MILE POINT CONTROL RODS
U.S. ATOMIC ENERGY COMMISSION

2 PAGES, LETTER TO M.H. PRATT FROM P.A. MORRIS, AUGUST 13, 1968, DOCKET 50-220, TYPE--BWR, MFG--G.F., AE--NIAGARA MOHAWK

COMPLIANCE SAYS DESIGN MODIFICATIONS HAVE BEEN MADE TO CONTROL ROD DRIVE HYDRAULIC LINE PENETRATION IN CONTAINMENT. THIS SHOULD BE REPORTED WITH BASES AND SAFETY EVALUATION. ASKS FOR SPECIFIC INFORMATION ON WELD REPAIR BETWEEN STUB TUBES AND ROD DRIVE HOUSINGS, (1) BASES FOR CONTOURING SHOP WELDS, (2) FIELD WELDS DEPOSIT OF METAL ON SIDE OF TUBES, AND (3) PLANS FOR CLEANING AND HYDROTESTING VESSEL, PLUS DETAILED RECORDS OF DYE CHECKS PRIOR TO HYDROTEST.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CONTAINMENT PENETRATION, PIPE + *WELDING + CONTROL ROD DRIVE + INSPECTION AND COMPLIANCE + NINE MILE POINT (BWR) + PRESSURE VESSEL + REACTOR, BWR + TEST, NONDESTRUCTIVE

9-27879 ALSO IN CATEGORY 10

SYLIACCO TE

THE ADAPTIVE RELIABILITY CONTROL SYSTEM

CLEVELAND ELECTRIC ILLUMINATING COMPANY, CLEVELAND, OHIO

15 PAGES, 2 FIGURES, 3 TABLES, 5 REFERENCES, IEEE TRANS. ON POWER APPARATUS AND SYSTEMS, PAS-86(5), PAGES 517-531 (MAY 1967)

CONSIDERATIONS NECESSARY FOR THE DESIGN OF A TOTAL CONTROL SYSTEM FOR THE IMPROVEMENT OF THE RELIABILITY OF THE GENERATION-TRANSMISSION SYSTEM ARE DISCUSSED. THE CONTROL SYSTEM IS MADE OF AUTOMATIC FUNCTIONS, HUMAN PARTICIPATION, AND AN INFORMATION SYSTEM. IN THE FIRST PART OF THE PAPER, THE FRAMEWORK OF THE DESIGN IS ESTABLISHED AND THE BASIC OVERALL STRATEGY FOR MAINTAINING RELIABILITY IS DESCRIBED. THE SECOND PART DESCRIBES THE THINKING AND THE WORK BEING DONE AT CLEVELAND ELECTRIC ILLUMINATING COMPANY FOR THE PRACTICAL IMPLEMENTATION OF THE DESIGN CONCEPTS ON THIS SYSTEM.

CONTROL SYSTEM + DESIGN STUDY + ECONOMICS + ELECTRIC POWER, GENERAL + EMERGENCY SYSTEM + INSTABILITY + RELIABILITY, SYSTEM

9-27885 ALSO IN CATEGORY 5

KARTLUKE H + WICHNER RP + HOFFMAN HW

AN ACOUSTIC INSTRUMENT FOR MEASURING SUBCOOLING IN BOILING SYSTEMS

OAK RIDGE NATIONAL LABORATORY

ORNL-P-1678 + CONF-650946-3 +. 8 PAGES, 1 REFERENCES, FROM 4TH HIGH TEMPERATURE LIQUID-METAL HEAT TRANSFER TECHNOLOGY CONFERENCE, ARGONNE, ILLINOIS, SEPTEMBER 28-29, 1965

DESCRIBES AN ACOUSTIC INSTRUMENT CAPABLE OF INDICATING THE DEGREE OF UNDERSATURATION IN A KNOWN FLUID AT UNKNOWN LOCAL TEMPERATURE AND PRESSURE CONDITIONS. THIS INCIPIENT-BOILING DETECTOR HAS BEEN TESTED WITH WATER AND SHOWN TO BE EFFECTIVE IN MONITORING THE FLOW IN PRESSURIZED WATER REACTORS, WHERE BOILING IS UNDESIRABLE AND DANGEROUS. THE CURRENT STUDY IS DIRECTED TO EVALUATING THIS DEVICE FOR POSSIBLE SIMILAR APPLICATION IN LIQUID-METAL COOLED-FAST REACTORS. PRELIMINARY TESTS IN LIQUID POTASSIUM ARE DISCUSSED. THE RESULTS WERE INCONCLUSIVE, AND EXPERIMENTS WITH A HIGHER POWER OSCILLATOR ARE PLANNED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*INSTRUMENTATION, COOLANT QUALITY + *NOISE + *SUBCOOLING + BOILING + INSTRUMENTATION, GENERAL + NOISE ANALYSIS

9-27931

SHOUMAN ML

RELIABILITY PHYSICS MODELS

BROOKLYN POLYTECHNIC INSTITUTE

7 PAGES, IEEE TRANSACTIONS ON RELIABILITY, VOL. R-17, PAGES 14-20 (MARCH 1968), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS, 8(8), PAGE 128 (AUGUST 1968)

DESCRIPTION OF RELIABILITY FAILURE MODELS BASED ON LOGICAL HYPOTHESES AS TO HOW OBJECTS FAIL. IT IS NOTED THAT THE GENERALIZED STRESS-STRENGTH MODEL PREVALENT IN CURRENT LITERATURE IS PERHAPS THE CLOSEST THAT ANALYSTS HAVE COME TO A GENERAL PHYSICAL MODEL. IF A NORMAL

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27931 *CONTINUED*

STRENGTH DISTRIBUTION AND POISSON DISTRIBUTED-STRESS-OCCURRENCE TIMES WITH NORMALLY DISTRIBUTED AMPLITUDES ARE ASSUMED, THEN THIS LEADS TO AN EXPONENTIAL FAILURE-DENSITY FUNCTION AND A CONSTANT HAZARD. SUCH A MODEL IS PROBABLY BEST SUITED FOR SITUATIONS IN WHICH THE PART GENERALLY LASTS A LONG TIME AND ONLY SEEMS TO FAIL WHEN, ON OCCASION, A LARGE STRESS OCCURS.

*ANALYTICAL MODEL + *RELIABILITY ANALYSIS + FAILURE, GENERAL + PROBABILITY + STRESS ANALYSIS

9-27932

AILOR RH

ESTIMATING RELIABILITY OF COMPLEX SYSTEMS

NASA

NASA-TM-X-53592 +. 78 PAGES, REFERENCES, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 129 (AUGUST 1968)

THE ANALYSIS OF SIMPLE SYSTEMS IS DISCUSSED WHEREBY THE SYSTEM RELIABILITY EQUATION CAN BE DETERMINED BY A RELATIVELY EASY APPLICATION OF THE FUNDAMENTAL PROBABILITY THEOREMS. FOR COMPLEX SYSTEMS, TWO METHODS ARE PRESENTED. THE RELIABILITY FUNCTIONS FOR THE COMPONENTS THAT MAKE UP A SYSTEM ARE DISCUSSED, AND, FINALLY, A LIMITED DISCUSSION IS PROVIDED ON IMPLEMENTING, CONTROLLING, AND TESTING THE SOLUTION IN REGARD TO RELIABILITY.

*RELIABILITY, SYSTEM + PROBABILITY + RELIABILITY, COMPONENT

9-27933

ARMSTRONG DB

ON FINDING A NEARLY MINIMAL SET OF FAULT DETECTION TESTS FOR COMBINATIONAL LOGIC NETS

BELL TELEPHONE LABORATORIES, INC., MURRAY HILL, N. J.

6 PAGES, 6 REFERENCES, IEEE TRANSACTIONS ON ELECTRONIC COMPUTERS, VOL. EC-15, PAGES 66-73 (FEBRUARY 1966), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 129 (AUGUST 1968)

A PROCEDURE IS DESCRIBED FOR FINDING, BY SHORTCUT METHODS, A NEAR-MINIMAL SET OF TESTS FOR DETECTING ALL SINGLE FAULTS IN A COMBINATIONAL LOGIC NET. THE BASES OF THE PROCEDURE ARE THE PATH SENSITIZING CONCEPT, AND REDUCTION OF A NET TO ITS EQUIVALENT NORMAL FORM. THE ENF ALSO PROVIDES A VEHICLE FOR SYSTEMATICALLY FINDING THE MOST DESIRABLE TESTS, NAMELY THOSE WHICH EACH DETECT MANY FAULTS IN THE NET. THE PROCEDURE IS ILLUSTRATED IN DETAIL BY AN EXAMPLE.

*RELIABILITY ANALYSIS + *TEST, SYSTEM OPERABILITY + RELIABILITY, SYSTEM + TESTING

9-27934

COZZOLINO JM

THE OPTIMAL BURN-IN TESTING IN REPAIRABLE EQUIPMENT

MASS. INSTITUTE OF TECH.

TR-23 + AD-642105 + N67-17158 +. 134 PAGES, REFERENCES, OCTOBER 1966, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 130 (AUGUST 1968)

THE INFANT MORTALITY EFFECT OBSERVED IN THE STATISTICAL TREATMENT OF RELIABILITY DENOTES A DECREASING WITH TIME OF THE CONDITIONAL PROBABILITY OF FAILURE OF A DEVICE WHICH EXHIBITS IT. THIS WIDELY PRESENT EFFECT MAY BE UTILIZED TO IMPROVE THE RELIABILITY BY MEANS OF BURN-IN TESTING WHICH SEEKS TO DISCRIMINATE BETWEEN HIGH AND LOW QUALITY UNITS BY ACCUMULATING OPERATING EXPERIENCE UPON ALL UNITS. A GENERAL BURN-IN TEST PROBLEM FOR REPAIRABLE DEVICES IS FORMULATED BASED UPON THE EXPLICIT MODELING OF THE REPAIR PROCESS. THE CASE OF UNREPAIRABLE DEVICES IS TREATED AS A SPECIAL CASE.

*RELIABILITY, COMPONENT + INSTRUMENTATION, COMPONENT + QUALITY CONTROL + TEST, PREOPERATIONAL

9-27935

BRIGGS WG

RELIABILITY STATEMENTS UNDER UNCERTAINTY

HARBIDGE HOUSE, INC., BOSTON, MASS.

9 PAGES, 12 REFERENCES, THE LOGISTICS REVIEW, VOL 3, PAGES 11-19 (FEBRUARY 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 131 (AUGUST 1968)

COMPONENT RELIABILITY IS DEFINED, AND THE UNCERTAINTY OF THE FAILURE RATE IS CONSIDERED IN TERMS OF SUBJECTIVE DISTRIBUTIONS AND BAYESIAN ANALYSIS. IT IS SHOWN THAT IF THE FAILURE RATE OF A CONDITIONAL POISSON DISTRIBUTION HAS A GAMMA DISTRIBUTION, THE RESULTING UNCONDITIONAL DISTRIBUTION OF FAILURES IS NEGATIVE BINOMIAL. A COMPUTATION FORM FOR THIS UNCONDITIONAL DISTRIBUTION OF FAILURES IS GIVEN AND SOME NUMERICAL EXAMPLES ARE INCLUDED. ILLUSTRATIVE VALUES OF NEGATIVE BINOMIAL PROBABILITIES ARE TABULATED.

*RELIABILITY ANALYSIS + *RELIABILITY, COMPONENT

9-27936

JAIN HC

RELIABILITY OF A COMPLEX SYSTEM WITH TWO TYPES OF SUBSYSTEMS

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27936 *CONTINUED*

DEFENSE SCIENCE LABORATORY, DELHI, INDIA
17 PAGES, 5 REFERENCES, THE LOGISTICS REVIEW, VOL 3, PAGES 21-37 (JAN-FEB. 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 132 (AUGUST 1968)

COMPLEX SYSTEM BEHAVIOR IS CONSIDERED THAT OPERATES AT REDUCED EFFICIENCY UPON FAILURE OF ONE COMPONENT (L-SUB-2) AND COMPLETELY BREAKS DOWN UPON THE FAILURE OF ANOTHER COMPONENT (L-SUB-1). FAILURE AND REPAIR TIMES FOR BOTH THESE COMPONENTS FOLLOW EXPONENTIAL DISTRIBUTIONS. IF L-SUB-1 FAILS WHILE L-SUB-2 IS BEING REPAIRED, THEN THE REPAIR OF L-SUB-1 TAKES PRECEDENCE. THE REPAIR OF L-SUB-2 IS RESUMED LATER AT THE POINT WHERE IT WAS PREEMPTED. BOTH TYPES OF REPAIRS ARE CONSIDERED, AND EXPLICIT SOLUTIONS ARE DERIVED USING K-ERLANG AND EXPONENTIAL REPAIR TIME DISTRIBUTIONS. STEADY STATE SOLUTIONS ARE DERIVED BY A COROLLARY OF ABELS THEOREM, AND NUMERICAL EXAMPLES ARE INCLUDED.

*RELIABILITY, SYSTEM + INSTRUMENTATION, COMPONENT + MAINTENANCE AND REPAIR + RELIABILITY, COMPONENT

9-27937

PRINGLE RS + GRESHO PM
A COMPREHENSIVE RELIABILITY ANALYSIS OF REDUNDANT SYSTEMS
DOUGLAS AIRCRAFT CO., INC., SANTA MONICA, CALIF. + NORTH AMERICAN AVIATION, INC., CALIF.
8 PAGES, 8 REFERENCES, JOURNAL OF SPACECRAFT AND ROCKETS, VOL. 4, PAGES 631-639 (MAY 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 133 (AUGUST 1968)

ANALYSIS AND DISCUSSION OF THE GENERAL EFFECT OF REDUNDANCY ON SYSTEM RELIABILITY. THREE TYPES OF REDUNDANCY ARE DESCRIBED--ACTIVE REDUNDANCY, STANDBY REDUNDANCY, AND ACTIVE-STANDBY REDUNDANCY--AND EQUATIONS ARE DEVELOPED FOR EACH TYPE. A RAPID AND ACCURATE APPROXIMATION TECHNIQUE FOR ANALYZING ACTIVE-STANDBY REDUNDANCY IS ALSO PRESENTED.

*REDUNDANCE + *RELIABILITY ANALYSIS + *RELIABILITY, SYSTEM

9-27938

CORNELL CE
MINIMIZING HUMAN ERRORS
10 PAGES, SPACE/AERONAUTICS, VOL. 49, PAGES 72-81 (MARCH 1968), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 134 (AUGUST 1968)

ANALYSIS OF THE CAUSES AND REMEDIES OF HUMAN ERRORS WITH RESPECT TO WORK INVOLVING SPACECRAFT MANUFACTURING. THE FOUR MAJOR CAUSES OF HUMAN ERROR WHICH ARE DISCUSSED INCLUDE FAILURE TO FOLLOW PROCEDURES, INCORRECT DIAGNOSIS OF PARTICULAR SITUATIONS, MISINTERPRETATION OF COMMUNICATIONS, AND INSUFFICIENT ATTENTION OR CAUTION. THE PROBLEM ASSOCIATED WITH QUANTIFYING HUMAN ERROR IS ALSO DISCUSSED.

*ERROR ANALYSIS + *FAILURE, ADMINISTRATIVE CONTROL + *RELIABILITY ANALYSIS + QUALITY CONTROL

9-27939

MEISTER D + FARR DE
THE UTILIZATION OF HUMAN FACTORS INFORMATION BY DESIGNERS
BUNKER-RAMO CORP., CANOGA PARK, CALIF.
AD-642057 + N67-15359 +. 105 PAGES, REFERENCES, SEPTEMBER 16, 1966, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 135 (AUGUST 1968)

THREE DESIGN TESTS WERE DEVELOPED TO DETERMINE HOW HUMAN FACTORS CRITERIA AND INFORMATION ARE APPLIED TO DESIGN PROBLEMS. TEST RESULTS INDICATE THAT DESIGNERS HAVE LITTLE OR NO INTEREST IN HUMAN FACTORS AND USUALLY FAIL TO APPLY HUMAN FACTORS CRITERIA TO DESIGN. THE MOST IMPORTANT SOURCE OF INFORMATION FOR THE DESIGNER IS THE DESIGN SPECIFICATION. WHERE A DESIGNER DOES NOT HAVE FORMALLY ASSIGNED RESPONSIBILITY FOR A DESIGN PARAMETER, HIS ANALYSIS WILL NOT REFLECT THIS FACTOR. IT IS RECOMMENDED THAT DESIGN SPECIFICATIONS EMPHASIZE HUMAN FACTORS TO THE SAME EXTENT THAT OTHER FUNCTIONAL REQUIREMENTS ARE EMPHASIZED.

*FAILURE, ADMINISTRATIVE CONTROL + *RELIABILITY ANALYSIS + DESIGN CRITERIA + DESIGN STUDY + QUALITY CONTROL

9-27940

MEISTER D
APPLICATIONS OF HUMAN RELIABILITY TO THE PRODUCTION PROCESS
BUNKER-RAMO CORP., CANOGA PARK, CALIF.
13 PAGES, REFERENCES, PAGES 33-45 IN AFSC SYMPOSIUM ON RELIABILITY OF HUMAN PERFORMANCE IN WORK, MAY 1967, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 135 (AUGUST 1968)

PRODUCTION WORKER ERRORS ARE RELATED TO SYSTEM RELIABILITY, AND CHARACTERISTICS THAT DIFFERENTIATE PRODUCTION ERROR FROM OPERATING ERROR ARE CONSIDERED. FACTORS THAT PREDISPOSE TO WORKER ERROR ARE ANALYZED IN THE CONTEXT OF THE PRODUCTION PROCESS AS A MAN-MACHINE SYSTEM. THE IMPORTANCE OF WORKMANSHIP AS A PROBLEM AREA THAT REQUIRES BEHAVIORAL INVESTIGATION IS STRESSED, AND MEANS OF DETECTING ERRORS AND THEIR CAUSES ARE PRESENTED. THE EFFECT OF PRODUCTION ERROR ON RELIABILITY IS TREATED, AND A TABULATION IS PRESENTED TO INDICATE UNRELIABILITY RESULTING FROM SIGNIFICANT HUMAN-INITIATED FAILURES.

*FAILURE, ADMINISTRATIVE CONTROL + *RELIABILITY, SYSTEM + INSPECTION AND COMPLIANCE + QUALITY CONTROL

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-27941

BARZILOVICH YY

THE PROBLEM OF SERVICING COMPLEX TECHNICAL SYSTEMS

24 PAGES, REFERENCES, TECHNICAL CYBERNETICS NO. 6, PAGES 102-125 (FEBRUARY 14, 1967), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 136 (AUGUST 1968)

A BRIEF REVIEW IS OFFERED OF BASIC WORKS IN THE AREA OF CONTROL OF RELIABILITY OF COMPLEX TECHNICAL SYSTEMS DURING OPERATION AND DESIGN. THIS IS A QUALITATIVE REVIEW OF VARIOUS METHODS FOR SERVICING EQUIPMENT. IT CONSIDERS BOTH SCHEDULED AND UNSCHEDULED MAINTENANCE AND VARIOUS STRATEGIES FOR CONSUMING REDUNDANT ELEMENTS.

*RELIABILITY, SYSTEM + DESIGN STUDY + INSTRUMENTATION, GENERAL + MAINTENANCE AND REPAIR

9-27942

WRIGHT LW

AN OVERVIEW OF ELECTRONIC PART FAILURE ANALYSIS EXPERIENCE

JET PROPULSION LAB., PASADENA, CALIF.

5 PAGES, IEEE TRANSACTIONS ON RELIABILITY, VOL R-17, PAGES 5-9 (MARCH 1968), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 138 (AUGUST 1968)

THE ROLE OF PART (OR COMPONENT) FAILURE ANALYSIS IN SYSTEMS DEVELOPMENT IS DISCUSSED, ALONG WITH THE MAJOR CAUSES OF PARTS FAILURES AND CASE HISTORIES FOR ELECTRONIC DEVICES. THE MAJOR PORTION OF PARTS FAILURES THAT HAVE RESULTED IN EQUIPMENT MALFUNCTIONING ARE ATTRIBUTED TO GROSS QUALITY DEFECTS AND MISUSE. TIME/ENVIRONMENT DEPENDENT FAILURE MECHANISMS ARE GENERALLY MORE INSIDIOUS, MORE DIFFICULT TO PINPOINT, AND RESULT IN FEWER EQUIPMENT MALFUNCTIONS. THERE ARE NUMEROUS TIME/ENVIRONMENT DEPENDENT FAILURE MECHANISMS WHICH ARE NOT UNDERSTOOD SUFFICIENTLY TO PERMIT HIGHLY EFFECTIVE FAILURE ANALYSIS IN RELATION TO CURRENT PROJECTS.

*FAILURE, COMPONENT + *RELIABILITY, COMPONENT + ENVIRONMENTAL CONDITION + INSTRUMENTATION, COMPONENT + QUALITY CONTROL

9-27943

RELIABILITY AND MAINTAINABILITY DATA-SOURCE GUIDE

NAVAL APPLIED SCIENCE LAB., BROOKLYN, N. Y.

AD-659195 + N68-10849 +. 254 PAGES, JANUARY 1967, ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 139 (AUGUST 1968)

THIS DATA-SOURCE GUIDE IDENTIFIES 23 GOVERNMENT RELIABILITY AND MAINTAINABILITY DATA SOURCES AND OVER 95 SOURCES OF TECHNICAL AND SCIENTIFIC INFORMATION FOR RELATED ENGINEERING DATA. THE TECHNICAL COVERAGE, MISSION, STATUS, AND THE ADDRESS OF CONTACTS ASSOCIATED WITH EACH DATA SOURCE ARE SUMMARIZED IN THE GUIDE. THE GUIDE TABULATES RESPONSES RECEIVED FROM 118 CONTRACTORS IN REPLY TO A QUESTIONNAIRE PREPARED BY ARINC RESEARCH. A MATRIX SHOWS THAT 94 OF THE 118 HAD ESTABLISHED RELIABILITY AND MAINTAINABILITY DATA COLLECTION ACTIVITIES. ALSO PRESENTED IS A REVIEW OF THE COLLECTED DATA, AS TO ITS UTILITY, OPTIMISM, CURRENCY, AND APPLICABILITY TO MULTICONTRACTOR USE.

*INSTRUMENTATION, GENERAL + *RELIABILITY ANALYSIS + INFORMATION RETRIEVAL + STATISTICAL CORRELATION

9-27944

BUSSOLINI JJ

THE APPLICATION OF OVERSTRESS TESTING-TO-FAILURE TO AIRBORNE ELECTRONICS--A STATUS REPORT

GRUMMAN AIRCRAFT ENGINEERING CORP.

7 PAGES, IEEE TRANSACTIONS OF AEROSPACE AND ELECTRONIC SYSTEMS, VOL AES-4, PAGES 142-148 (MARCH 1968), ABSTRACT IN RELIABILITY ABSTRACTS AND TECHNICAL REVIEWS 8(8), PAGE 143 (AUGUST 1968)

APPLICATION OF THE CONCEPT OF SAFETY-MARGIN DESIGN AND OVERSTRESS TESTING TO THE DESIGN OF ELECTRONIC EQUIPMENT. TEST RESULTS ARE PRESENTED WHICH INDICATE THE VALUE OF THE OVERSTRESS TEST-TO-FAILURE TECHNIQUE AS A DESIGN TOOL AND METHOD OF SOURCE SELECTION, RELIABILITY IMPROVEMENT, AND EVALUATION. IT IS SHOWN THAT 65% OF THE FAILURE OCCURRING UNDER OVERSTRESS ENVIRONMENTS ARE DUPLICATES OF EXPERIENCED OPERATIONAL FAILURES. IMPROVEMENTS OF 5 TO 1 IN RELIABILITY LEVELS HAVE RESULTED FROM APPLICATION OF RESULTS OF OVERSTRESS TESTS WHICH CONSUMED LESS THAN 200 HR OF ACTUAL TEST TIME. THE FIRST IN A REQUIRED SERIES OF INDICES WHICH MAY ASSIST IN THE EVENTUAL USE OF OVERSTRESS TESTING FOR RELIABILITY INDEX MEASUREMENT ARE DISCUSSED.

*INSTRUMENTATION, COMPONENT + *RELIABILITY, COMPONENT + FAILURE, COMPONENT + TEST, DESTRUCTIVE

9-28012

DEVICE FOR MONITORING SHUT-DOWN NUCLEAR REACTORS

BELGIAN PATENT NO. 686,624 +. 13 PAGES, 3 FIGURES, SEPTEMBER 8, 1966

A METHOD OF PREPARING A SAFING WIRE FOR USE IN SAFE-GUARDING A NUCLEAR REACTOR TO DETECT SURREPTITIOUS USE THEREOF, COMPRISING PROVIDING A TUBE OF A HIGH MELTING METAL, PULLING ONE

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-28012 *CONTINUED*

OR MORE STRANDS OF A RELATIVELY LOW MELTING METAL, ONE OR MORE STRANDS OF A TARGET METAL WHICH WILL BECOME RADIOACTIVE IN THE EVENT OF A NEUTRON CHAIN REACTION, AND ONE OR MORE STRANDS OF A DIFFERENCE METAL THROUGH SAID TUBE, WHILE ALLOWING SAID LAST-MENTIONED STRANDS TO KINK WITHIN THE TUBE, AND ROTARY SWAGING IN THE TUBE TO COMPACT THE ASSEMBLY.

AVAILABILITY - U. S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D. C. 20545

*DECOMMISSIONING + *EXAMINATION + *INSPECTION AND COMPLIANCE + ACTIVATION + ADMINISTRATIVE CONTROL + BELGIUM + EQUIPMENT DESIGN + MEASUREMENT, REACTIVITY + PATENT + SURVEILLANCE PROGRAM

9-28013

FOTI, G

BEHAVIOR OF FISSION CHAMBER SYSTEM INSIDE THE REACTOR CORE OF THE GARIGLIANO NUCLEAR STATION DURING THE FIRST PERIOD OF OPERATION AT FULL CAPACITY

6 PAGES, 3 FIGURES, ENERGIA ELETTRICA, 42, PAGES 345-50 (1965)

BOILING WATER REACTORS HAVE A NEUTRON FLUX DISTRIBUTION INSIDE THE CORE THAT IS RIGIDLY DEPENDENT ON THE OPERATIONAL CONDITIONS OF THE INSTALLATION. THIS MAKES IT NECESSARY THAT THE OPERATOR HAVE AT HIS DISPOSAL CONTINUOUSLY ALL INFORMATION OBTAINABLE ON THE FLUX DISTRIBUTION. THE MEASUREMENT SYSTEM IN THE GARIGLIANO NUCLEAR POWER PLANT IS BRIEFLY DESCRIBED. THE OPERATIONAL EXPERIENCE OBTAINED UP TO JUNE 1964 IS SUMMARIZED. THE BEHAVIOR OF THE SYSTEM DURING THE PERIOD FROM JUNE 1964 TO APRIL 1965 AT FULL POWER WAS REPORTED TO AN APPENDIX.

*CHAMBER, FISSION + *INSTRUMENTATION, NUCLEAR + *OPERATING EXPERIENCE + FLUX DISTRIBUTION + GARIGLIANO (BWR) + IN CORE MEASUREMENT + INSTRUMENTATION, IN CORE + ITALY + REACTOR, BWR

9-28014

SWINTH KL + PHILIPP LD + HOITINK NC

COMPTON SUPPRESSION USING PULSE-SHAPE DISCRIMINATION AND ANTICOINCIDENCE TECHNIQUES

BATTELLE-NORTHWEST, RICHLAND, WASHINGTON

BNWL-SA-1515 + CONF-680207-3 +. 17 PAGES, MARCH 4, 1958, FROM 11TH SCINTILLATION AND SEMICONDUCTOR COUNTER SYMPOSIUM, WASHINGTON, D. C.

THE USE OF PULSE-SHAPE DISCRIMINATION AND ANTICOINCIDENCE TECHNIQUES IS DESCRIBED IN REDUCING THE CONTINUUM OF THE ENERGY SPECTRUM FROM GAMMA RAYS IN THE ENERGY REGION FROM 100 KEV TO 1.5 MEV. THE SYSTEM IS INTENDED GENERALLY FOR LOW LEVEL COUNTING AND THE DATA PRESENTED PERTAINS TO COUNTING IN THIS MODE. STUDIES WERE PERFORMED WITH BOTH CS-137 AND FE-59 SOURCES. FOR THE FE-59 SOURCE, AN AVERAGE REDUCTION OF 85% IN THE CONTINUUM RESULTED USING A PLANAR DIODE SQ. 110 SQ. MM BY 2.4 MM DEEP IN AN ANTICOINCIDENCE ANNULUS OF NAI(TI). BOTH THE DISTRIBUTION AND NUMBER OF EVENTS REJECTED VARIES, WITH THE AMPLIFIER SHAPING TIME CONSTANTS. RESULTS ARE COMPARED WITH THOSE OBTAINED BY OTHER INVESTIGATORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*INSTRUMENTATION, PULSE + COUNTER + GAMMA + INSTRUMENTATION, COINCIDENT + INSTRUMENTATION, COMPONENT + INSTRUMENTATION, NUCLEAR + SOLID STATE DEVICE

9-28015

TODT WH

AN IN-CORE RADIATION DETECTOR FOR MONITORING PULSED REACTOR EXCURSIONS

WESTINGHOUSE ELECTRIC CORPORATION

6 PAGES, 2 FIGURES, 2 REFERENCES, NUCLEAR APPLICATIONS 5(3), PAGES 173-178 (SEPTEMBER 1968)

AN IN-CORE RADIATION DETECTOR WAS DEVELOPED TO MEASURE INTENSE RADIATION LEVELS PRESENT IN PULSING REACTOR CORES. TEST RESULTS ARE SHOWN FOR TRIGA AND PULSTAR EXCURSIONS WITH PEAK POWER LEVELS OF 150 AND 1000 MW, RESPECTIVELY. LIFE DATA INDICATE NO DETERIORATION IN DETECTOR CHARACTERISTICS AFTER MORE THAN 800 TRIGA PULSES.

*INSTRUMENTATION, IN CORE + *INSTRUMENTATION, RADIATION MONITORING + BORON + CHAMBER, ION + COMPARISON, THEORY AND EXPERIENCE + EQUIPMENT DESIGN + OPERATING EXPERIENCE + REACTOR, PULSED + REACTOR, RESEARCH + TEST, INSTRUMENT RESPONSE + TRIGA (IRR)

9-28016

MUELLER RE + BRANYAN CE

CALIBRATION MEASUREMENTS OF CONTROL AND SAFETY RODS IN THE ENRICO FERMI REACTOR

ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT

APDA-NTS-18 +. 59 PAGES, 12 FIGURES, 4 TABLES, 13 REFERENCES, APRIL 1968

DURING THE LOW-POWER TESTING OF THE ENRICO FERMI REACTOR, DETAILED CALIBRATION MEASUREMENTS OF THE CONTROL AND SAFETY RODS WERE MADE TO CONFIRM THE ROD DESIGN AND ALSO TO INVESTIGATE THE ADAPTABILITY OF DIFFERENT CALIBRATION TECHNIQUES. WORTHS OF INDIVIDUAL UNSHADOWED AND SHADOWED RODS WERE OBTAINED AS WELL AS GAUGED ROD WORTH. THE MEASURED ROD WORTH WERE ABOUT 6 TO 15 PER CENT LESS THAN HAD BEEN PREDICTED FROM CRITICAL EXPERIMENT DATA. HOWEVER, THIS AGREEMENT IS CONSIDERED SATISFACTORY IN VIEW OF DESIGN CHANGES MADE SINCE THE EXPERIMENT. MEANS BY WHICH THE CALIBRATION PROCEDURE COULD BE IMPROVED ARE DISCUSSED.

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-28016 *CONTINUED*
AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*CONTROL ROD CALIBRATION + *CONTROL ROD INTERACTION + *CONTROL ROD WORTH +
COMPARISON, THEORY AND EXPERIENCE + FERMI (LMFBR) + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMR +
TESTING

9-28017
PAGE 6
REACTOR HIFAR THE CONTROL REVERSAL CIRCUITS
AUSTRALIAN ATOMIC ENERGY COMMISSION RESEARCH ESTABLISHMENT, LUCAS HEIGHTS
AAEC/M4 +. 19 PAGES, 2 FIGURES, OCTOBER 1967

THIS MANUAL DESCRIBES IN DETAIL THE OPERATION OF THE CONTROL REVERSAL CIRCUITS IN HIFAR AND
THEIR RELATION TO OTHER PARTS OF THE SAFETY CIRCUITS. THIS MANUAL MUST BE READ IN
CONJUNCTION WITH MANUAL M1 (INTRODUCTION TO HIFAR GUARD AND SAFETY CIRCUITS). IT IS PART OF
A SERIES OF MANUALS ON THE INSTRUMENTATION OF THE REACTOR HIFAR.

*INSTRUMENTATION, CONTROL + *REACTOR CONTROL + AUSTRALIA + CONTROL SYSTEM + PROCEDURES AND MANUALS +
REACTOR SAFETY SYSTEM

9-28018
SHIBATA T + KAWAKUBO T + NANJYO T + HAYASHI S + ET. AL.
INITIAL CALIBRATION OF THE KYOTO UNIVERSITY REACTOR
KYOTO UNIVERSITY, JAPAN
158 PAGES, FIGURES, 1965

THE KYOTO UNIVERSITY REACTOR, KUR, BELONGS TO THE RESEARCH REACTOR INSTITUTE, KYOTO
UNIVERSITY, OSAKA, JAPAN. TO OBTAIN VARIOUS IMPORTANT CHARACTERISTICS, TEST OPERATIONS WERE
FREQUENTLY DONE AFTER THE INITIAL CRITICAL EXPERIMENT, IN PARALLEL WITH SOME TEST IRRADIATION
AND TEST EXPERIMENTS WITH NEUTRON BEAM. THE PART OF THE RESULTS OF THOSE INITIAL TESTS AND
CALIBRATION IS REPORTED HERE.

*REACTOR DESCRIPTION + CONTROL ROD CALIBRATION + CONTROL ROD WORTH + CRITICALITY EXPERIMENT +
FLUX DISTRIBUTION + INSTRUMENTATION CALIBRATION + JAPAN + REACTIVITY EFFECT + REACTOR POWER +
REACTOR, RESEARCH + TEST, PLANT RESPONSE

9-28041
DETECTOR HANDBOOK
CALIFORNIA UNIVERSITY, LIVERMORE. LAWRENCE RADIATION LAB.
UCRL-50176 +. 150 PAGES, AUGUST 1967

THIS REPORT EXAMINES LIGHT SENSORS, THEIR CHARACTERISTICS, OPERATION, AND CALIBRATION. THE
DETECTORS ARE - PHOTODIODES, FLUORS AND RADIATORS, TEST LIGHT SYSTEMS, LOG DETECTORS, COMPTON
DETECTORS, PHOTOMULTIPLIERS, AND SOME SOLID-STATE DETECTORS. FATIGUE, THE CERENKOV RESPONSE
TO GAMMA AND FAST-NEUTRON RADIATION, PULSE RESPONSE, AND LIGHT COLLECTING EFFICIENCY FOR
SCINTILLATION COUNTERS ARE EXAMINED FOR VARIOUS DETECTORS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*INSTRUMENTATION, COMPONENT + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, LOGARITHMIC +
SOLID STATE DEVICE + TEST, INSTRUMENT RESPONSE

9-28067 ALSO IN CATEGORIES 11 AND 12
PEDERSEN HN + SPANNER JC
DETECTION, LOCATION, AND CHARACTERIZATION OF FLAW GROWTH IN METALS USING ACOUSTIC EMISSION METHODS
BATTELLE-NORTHWEST
CONF-671011 +. 2 PAGES, 4 REFERENCES, OCTOBER 1966

BATTELLE-NORTHWEST IN FEBRUARY OF 1966 BEGAN A PROGRAM TO NONDESTRUCTIVELY DETECT INCIPENT
FAILURE OF REACTOR PRESSURE PIPING, USING THE ACOUSTIC EMISSION GENERATED BY FRACTURE,
CLEAVAGE, DISLOCATION UNPINNING, TWINNING, ETC., OF SINGLE OR MULTIPLE GRAINS OF THE PIPING
MATERIAL. THE PURPOSE OF THE PROGRAM IS - (1) THE DETECTION OF ACOUSTIC EMISSION AGAINST THE
NOISE BACKGROUND OF THE OPERATING REACTOR, (2) THE LOCATION OF THE POINT OF ORIGIN OF THE
ACOUSTIC EMISSION, (3) THE CHARACTERIZATION OF THE ACOUSTIC EMISSION BY THE TYPE OF FAILURE
OR FLAW-GROWTH MECHANISM IN THE METAL, AND (4) PREDICTION OF THE TIME OF FAILURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ANALYTICAL TECHNIQUE, CALIBRATION + FLAW + INSTRUMENTATION, SURVEILLANCE + INTEGRITY + METAL + PIPING +
TEST, NONDESTRUCTIVE

9-28068 ALSO IN CATEGORIES 11 AND 12

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-28068 *CONTINUED*

HUTTON PH

ACOUSTIC EMISSION IN METALS AS A NDT TOOL

BATTELLE MEMORIAL INSTITUTE, PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON

BNWL-SA-1262 + CONF-671002-4 +. 8 PAGES, 3 REFERENCES, FOR PRESENTATION AT THE 27TH NATIONAL CONFERENCE OF THE SOCIETY FOR NONDESTRUCTIVE TESTING AT CLEVELAND, OHIO, OCTOBER 18, 1967, SEPTEMBER 1967

SOME OF THE MORE EVIDENT APPLICATIONS OF ACOUSTIC EMISSION, IN ADDITION TO MONITORING FLAW GROWTH IN REACTOR PRESSURE SYSTEMS, ARE - (1) REMOTE AND CONTINUOUS SURVEILLANCE OF OPERATIONAL SYSTEMS SUCH AS NATURAL-GAS PIPE LINES AND AIRCRAFT STRUCTURES TO DETECT FORMATION AND/OR GROWTH OF FLAWS, (2) MONITORING WELDS, PARTICULARLY IN HEAVY SECTIONS, AS THEY COOL TO DETECT INTERNAL CRACKING, (3) USE AS A STUDY TOOL FOR FRACTURE MECHANICS RESEARCH IN BOTH METALLICS AND NONMETALLICS, (4) MONITORING SPACE VEHICLES FOR MICROMETEORITE PENETRATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ANALYTICAL TECHNIQUE, CALIBRATION + FLAW + INSTRUMENTATION, SURVEILLANCE + INTEGRITY + METAL + PIPING +
PRESSURE VESSEL + TEST, NONDESTRUCTIVE

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-25909 ALSO IN CATEGORIES 12 AND 18
TESTS OF DIESEL GENERATOR PERFORMANCE
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 3 PAGES, PAGES 7-1 THROUGH 7-3 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL
PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL 1968

ACRS RECOMMENDED TESTING GENERATORS UNDER SIMULATED EMERGENCY CONDITIONS. GE RESPONDED THAT TESTS WILL BE CONDUCTED AT THE MANUFACTURERS PLANT TO CONFIRM ADEQUACY WITH RESPECT TO START TIMES, SYNCHRONIZATION, AND SIMULATED LOADING. TESTS (FOR SINGLE DIESEL) ON STARTING RELIABILITY, START TIMES, AND SIMULATED LOAD-CARRYING CAPABILITY WERE ALMOST COMPLETE. TESTS OF STARTING AND SYNCHRONIZING TWO OR MORE DIESELS ARE BEING PLANNED FOR 1968. SITE TESTS WILL BE CONDUCTED AND INTEGRATED WITH SPECIFIC PROJECTS.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*GENERATOR, ENGINE + *RELIABILITY, COMPONENT + *SYSTEM CAPABILITY + *TEST, SYSTEM OPERABILITY + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + ELECTRIC POWER, SHUTDOWN + EMERGENCY POWER, ELECTRIC + REACTOR, BWR + SYSTEM OPERABILITY IN ACCIDENT

10-26512 ALSO IN CATEGORY 9
VERBER F
ELECTRICAL PENETRATIONS OF REACTOR CONTAINMENT BUILDINGS
14 PAGES, 31 FIGURES, 1 TABLE, 24 REFERENCES, POWER REACTOR TECHNOLOGY AND REACTOR FUEL PROCESSING 10(2), PAGES 122-135 (SPRING 1967)

THIS ARTICLE GATHERS THE ESSENTIAL FEATURES AND WORKINGS OF ELECTRICAL PENETRATIONS OF 11 REPRESENTATIVE NUCLEAR POWER PLANTS AND CONSIDERS SOURCES OF LEAKAGE, REMEDIES, AND BASIC SEALING PRINCIPLES. PRESENT PENETRATION DESIGNS ARE DESCRIBED, AS ARE SOME LEAK-RATE-TEST PRACTICES. A LIST OF RECOMMENDATIONS FOR ELECTRICAL-PENETRATION-SYSTEM DESIGN IS INCLUDED.

*CONTAINMENT PENETRATION, ELECTRICAL + DESIGN CRITERIA + ELECTRICAL CONDUCTION + EQUIPMENT DESIGN + INSTRUMENTATION, COMPONENT + OPERATING EXPERIENCE + SEAL + TEST, LEAK RATE

10-26967 ALSO IN CATEGORY 9
TALBOT JE
INSTRUMENTATION(S) JOB IN NUCLEAR POWER GENERATION--INSURE PLANT RELIABILITY, AVAILABILITY, AND SAFETY
3 PAGES, INSTRUMENTATION TECHNOLOGY 15(7), PAGES 10-12 (JULY 1968)

THE 11TH ANNUAL ISA POWER INSTRUMENTATION SYMPOSIUM IN CHICAGO, MAY 1968, HAD AS ITS THEME RELIABILITY, AVAILABILITY, AND SAFETY. FOUR PAPERS TOOK UP THE TOPIC OF NUCLEAR GENERATION. ECONOMICS OF NUCLEAR INSTRUMENTATION WAS ALSO DISCUSSED. A TRAINING SIMULATOR OF A BWR TO SIMULATE A COMPLETE HOT OR COLD STARTUP WAS PRESENTED BY GENERAL ELECTRIC. INSTRUMENTATION PROBLEMS ASSOCIATED WITH THE EXTREME OPERATING CONDITIONS OF FAST BREEDER REACTORS WERE DISCUSSED.

*ELECTRIC POWER, GENERAL + *INSTRUMENTATION, GENERAL + CONTROL SYSTEM + ECONOMICS + INSTRUMENTATION, CONTROL + INSTRUMENTATION, INDICATOR + INSTRUMENTATION, PROTECTIVE + REACTOR, BREEDER + REACTOR, FAST + SIMULATION

10-27286 ALSO IN CATEGORY 17
PHILLIPS JL
MINIMIZING THE HAZARDS ASSOCIATED WITH THE USE OF THE DOUNREAY FAST REACTOR AS AN IRRADIATION FACILITY
UKAEA, DOUNREAY WORKS
23 PAGES, 7 FIGURES, 3 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

REVIEWS EXPERIENCE WITH OPERATION AND EXPERIMENTS. POWER-COEFFICIENT MEASUREMENTS BRIEFLY CONSIDERED. COOLANT IMPURITIES DURING INITIAL OPERATION INTERFERED WITH CONTROL ROD-DRIVE MECHANISM. A HEAT-EXCHANGER-TUBE LEAK, DUE TO DEFECTIVE MANUFACTURING, RESULTED IN ADDITIONAL TUBE CORROSION AND OXIDATION DEPOSITS. MORE-SENSITIVE METHODS ARE NEEDED TO DETECT VERY SMALL LEAK RATES. AN AIRLOCK IN FUEL SUPPLY TO ONE DIESEL, AND AN ELECTRICAL FAULT IN ALTERNATOR OF ANOTHER, RESULTED IN SCRAM. WHEN A DIESEL FAILED WITH AN OPEN CIRCUIT FUSE TO SETBACK RELAY, SCRAM OCCURRED. ALSO DISCUSSES FUEL BURNUP AND ELEMENT DESIGN, PLUS EXPERIENCE AND REVIEW TECHNIQUE FOR IRRADIATION EXPERIMENTS.

AVAILABILITY - J.L. PHILLIPS, DOUNREAY EXPERIMENTAL REACTOR ESTABLISHMENT

*OPERATING EXPERIENCE SUMMARY + COMPARISON, THEORY AND EXPERIENCE + CONTROL ROD DRIVE + COOLANT QUALITY + CORROSION + DOUNREAY (TR) + FAILURE, SEQUENTIAL + FAILURE, SIMULTANEOUS + FAILURE, TUBING + FUEL BURNUP + GENERATOR, ENGINE + HEAT EXCHANGER + IRRADIATION TESTING + LEAK RATE + OBSTRUCTION + POWER COEFFICIENT + REACTOR, TEST + SAFETY REVIEW + SCRAM, REAL

10-27474 ALSO IN CATEGORIES 17 AND 11
SAFETY EVALUATION FOR PROPOSED 115 MWTB PEACH BOTTOM OPERATION

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-27474 *CONTINUED*
PHILADELPHIA ELECTRIC COMPANY
19 PAGES, NOVEMBER 14, 1966, DOCKET 50-171, TYPE--HTGR, MFG--G.A., AE--BECHTEL

EXCESS REACTIVITY (0.20 INSTEAD OF 0.15 DUE TO CARBON DENSITY AND THORIUM ABSORPTION CROSS SECTION OVERESTIMATE) WAS ADJUSTED WITH LUMPED BURNABLE POISON TO GIVE AN 0.06 SHUTDOWN MARGIN. LIMITS ON REACTIVITY AND FLUX ANOMALIES WILL BE SET. AFTER 1965 CABLE FIRE (WELDING SLAG INITIATION, CHIMNEY EFFECT), CO2 SYSTEM EXTENDED TO CABLE AREAS, REROUTED TO INCREASE INDEPENDENCE, SMOKE DETECTORS INSTALLED, AND FIREPROOF COVERS AND FIRE STOPS INSTALLED. HELIUM LEAKAGE IS 10-20 TIMES DESIRED 0.2 LB/DAY. CONTROL ROD DRIVE BALLS ARE NOW 100 PERCENT TESTED AFTER FAILURES FROM INTERNAL DEFECTS. A LARGER CONTAINMENT VACUUM RELIEF IS PROVIDED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*OPERATING EXPERIENCE SUMMARY + *SAFETY EVALUATION + CONTAINMENT PENETRATION, ELECTRICAL + CONTAINMENT VACUUM BREAKER + CROSS SECTION + ELECTRICAL CONDUCTION + EXAMINATION + FAILURE, SCRAM MECHANISM + FIRE + INDEPENDENCE + PEACH BOTTOM 1 (HTGR) + POWER UPGRATING + REACTIVITY EFFECT, ANOMALOUS + REACTOR, HTGR + SHUTDOWN MARGIN + THORIUM

10-27475 ALSO IN CATEGORY 18
ACRS REPORT ON MAINE YANKEE
AEC, DIVISION OF REACTOR LICENSING
4 PAGES, LETTER TO G.T. SEABORG, USAEC, JULY 19, 1968, DOCKET 50-309, TYPE--PWR, MFG--C.E., AE--STONE + WEBSTER

ACRS APPROVES CONSTRUCTION, CALLING ATTENTION TO PREVIOUS STATEMENTS ON LARGE WATER COOLED POWER REACTORS. ACRS BELIEVES OFF-SITE ELECTRICAL POWER SUPPLY TO ENGINEERED, SAFEGUARDS SHOULD BE MODIFIED SO NO SINGLE FAILURE WILL PREVENT POWER AVAILABILITY. SUGGESTS REGULATORY STAFF REVIEW CONTROL ROD DRIVE POWER SUPPLY SINCE DESIGN NOT COMPLETED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*ACRS + *ELECTRIC POWER, ALTERNATE + *EMERGENCY POWER, ELECTRIC + MAINE YANKEE (PWR) + REACTOR, PWR + REPORT, PSAR + REVIEW

10-27502 ALSO IN CATEGORIES 18 AND 11
ACRS REPORT ON RANCHO SECO
UNITED STATES ATOMIC ENERGY COMMISSION
3 PAGES, LETTER TO G.T. SEABORG, USAEC, JULY 19, 1968, DOCKET 50-312, TYPE--PWR, MFG--B.W., AE--BECHTEL

ACRS APPROVES CONSTRUCTION, CALLING ATTENTION TO PREVIOUS STATEMENTS ON LARGE WATER COOLED POWER REACTORS. SUGGESTS FURTHER ANALYSIS OF FAST FLUX DAMAGE TO REACTOR VESSEL, AND ADEQUACY OF VESSEL SURVEILLANCE PROGRAM. ACRS REITERATES BELIEF CONTROL AND PROTECTION INSTRUMENTATION SHOULD BE INDEPENDENT OF COMMON FAILURE MODES. APPLICANT AND REG. STAFF SHOULD REVIEW FOR SYSTEMATIC, NONRANDOM CONCURRENT FAILURES OF REDUNDANT DEVICES NOT CONSIDERED IN THE SINGLE FAILURE CRITERION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C., 20545 (\$0.25 CENTS/COPY)

*ACRS + *FAILURE, SIMULTANEOUS + *PLANT PROTECTIVE SYSTEM + *PRESSURE VESSEL + *REVIEW + BRITTLE FRACTURE + RANCHO SECO (PWR) + REACTOR, PWR + REPORT, PSAR + SINGLE FAILURE CRITERION + SURVEILLANCE PROGRAM

10-27578
ELSTON KC
RELIABILITY OF NUCLEAR GENERATING UNITS
CANADA HYDROELECTRIC POWER COMMISSION
2 PAGES, ANS. TRANSACTIONS 11(1), PAGES 6-7, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE PERFORMANCE OF LARGE NUCLEAR GENERATING UNITS IS OF MAJOR CONCERN WITH REGARD TO SYSTEMS STABILITY AND SYSTEM RESERVE. NUCLEAR PERFORMANCE EXPERIENCE IS VERY LIMITED AND ASSESSMENT OF SUCH EXPERIENCE IS MADE DIFFICULT BY THE NUMBER OF CONCEPTS, IMMATUREITY OF THE UNITS, AND THE RAPID INCREASE IN UNIT SIZE. THEREFORE, EXPERIENCE DATA ARE BEING COLLECTED AND ANALYZED ON NPD AND DOUGLAS POINT ON OUTAGES AND OPERATIONS OF THE UNIT AND COMPARED WITH TARGETS. THIS DATA PERMITS A VARIETY OF RELIABILITY ANALYSIS ON A TIME OR ENERGY BASIS.

*ELECTRIC POWER, GENERAL + *RELIABILITY, SYSTEM + CANADA + NPD 2 (HWR) + OPERATING EXPERIENCE + REACTOR POWER + REACTOR, HWR + REACTOR, PRESSURE TUBE + STATISTICAL CORRELATION

10-27614 ALSO IN CATEGORIES 18 AND 9
DRL QUESTIONS EMERGENCY SIGNALS AND POWER
U.S. ATOMIC ENERGY COMMISSION
3 PAGES, LETTER TO M. H. PRATT FROM P. A. MORRIS, JULY 31, 1968, DOCKET 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

DRL ASKS 7 SPECIFIC QUESTIONS. (1) ABILITY OF OFFSITE POWER, WITH A FAULT IN OUTSIDE SYSTEM, TO SAFELY SHUTDOWN PLANT. (2) ABILITY OF OFFSITE POWER TO SATISFY CRITERION 39 DESPITE 2 MIN

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-27614 *CONTINUED*

DISCONNECT DELAY. (3) DC POWER FOR SWITCHYARD. (4) DESIGN AGAINST ELECTRICAL CABLE FIRE. (5) CONSEQUENCES OF LOSS OF STATION AIR OR INSTRUMENT AIR. (6) DIESEL START FROM SIGNALS OTHER THAN LOW VOLTAGE, E.G., UPON COOLANT INJECTION. (7) DISCUSS ADEQUACY OF CORE SPRAY ACTUATION SIGNALS. DISCUSS LACK OF DIVERSITY FOR ISOLATION VALVE ACTUATION.

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

*PLANT PROTECTIVE SYSTEM + ACCIDENT, LOSS OF POWER + AEC QUESTION + ELECTRICAL CONDUCTION + FIRE + NINE MILE POINT (BWR) + PNEUMATIC SYSTEM + REACTOR, BWR

10-27879 ALSO IN CATEGORY 9

SYLIACCO TE

THE ADAPTIVE RELIABILITY CONTROL SYSTEM

CLEVELAND ELECTRIC ILLUMINATING COMPANY, CLEVELAND, OHIO

15 PAGES, 2 FIGURES, 3 TABLES, 5 REFERENCES, IEEE TRANS. ON POWER APPARATUS AND SYSTEMS, PAS-86(5), PAGES 517-531 (MAY 1967)

CONSIDERATIONS NECESSARY FOR THE DESIGN OF A TOTAL CONTROL SYSTEM FOR THE IMPROVEMENT OF THE RELIABILITY OF THE GENERATION-TRANSMISSION SYSTEM ARE DISCUSSED. THE CONTROL SYSTEM IS MADE OF AUTOMATIC FUNCTIONS, HUMAN PARTICIPATION, AND AN INFORMATION SYSTEM. IN THE FIRST PART OF THE PAPER, THE FRAMEWORK OF THE DESIGN IS ESTABLISHED AND THE BASIC OVERALL STRATEGY FOR MAINTAINING RELIABILITY IS DESCRIBED. THE SECOND PART DESCRIBES THE THINKING AND THE WORK BEING DONE AT CLEVELAND ELECTRIC ILLUMINATING COMPANY FOR THE PRACTICAL IMPLEMENTATION OF THE DESIGN CONCEPTS ON THIS SYSTEM.

CONTROL SYSTEM + DESIGN STUDY + ECONOMICS + ELECTRIC POWER, GENERAL + EMERGENCY SYSTEM + INSTABILITY + RELIABILITY, SYSTEM

10-27988 ALSO IN CATEGORY 17

WALSH EM

EDUCATION - WHO IS SNAGGING THE LINES

VIRGINIA POLYTECHNIC INSTITUTE

4 PAGES, ELECTRICAL WORLD, 170(7), PAGES 73-77 (AUGUST 12, 1968)

SUMMARIZES A SURVEY BY VPI ENERGY RESEARCH GROUP ON THE STATUS OF ELECTRICAL POWER IN 82 OF 130 U.S. UNIVERSITY CURRICULA IN THE EAST AND MIDWEST. TABLES SHOW LECTURE AND LAB HOURS (GRAD AND UNDERGRAD), EQUIPMENT, FACULTY NUMBER, AND COMMUNICATION QUALITY WITH UTILITIES. ***69 REQUIRED A POWER COURSE FOR ALL EE MAJORS, 37 HAVE NO POWER COURSE TAUGHT AS AN ELECTIVE. ONLY 7 HAVE UNDERGRADUATE FELLOWSHIPS PROVIDED BY UTILITIES, ONLY 28 COOP WITH UTILITIES. 69 OFFER GRADUATE EE, BUT ONLY 27 GIVE GRADUATE COURSES IN POWER. 72 OF 163 EE THESES IN PROGRESS ARE IN POWER. ONLY 12 REPORTED GOOD COMMUNICATION WITH UTILITIES. OF 34 SAYING COMMUNICATION WAS NEGLIGIBLE, THE MAJORITY HAVE POWER ORIENTED TEACHER ON THEIR STAFFS.

*STAFFING, TRAINING, QUALIFICATION + ELECTRICAL CONDUCTION + REACTOR, POWER

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-25885 ALSO IN CATEGORY 18
BELL PSAR SECTION V STATION CONTAINMENT SYSTEMS
NEW YORK STATE ELECTRIC + GAS CORPORATION
65 PAGES, 5 FIGURES, 2 TABLES, PAGE V-1-1 THRU V-3-6. MARCH 1968. DOCKET 50-319.

THE SUPPRESSION CHAMBER AND DRY WELL ARE NOW STEEL-LINED REINFORCED-CONCRETE PRESSURE VESSELS. THE DRY WELL WILL CONSIST OF VERTICAL CYLINDERS AND TRUNCATED CONES TO RETAIN THE LIGHT-BULB SHAPE, WHILE THE SUPPRESSION CHAMBER CONSISTS OF A TORUS WITH A SQUARE CROSS SECTION. OTHERWISE, SYSTEMS ARE AS BEFORE. DRY-WELL DESIGN IS FOR 62 PSIG/300 F, AND POOL IS 62 PSIG/220 F. THE CONCRETE WILL BE 6 FT THICK, AND THE LINER NOT LESS THAN 0.25 IN. DESIGN LEAK RATE IS 0.5% VOLUME/DAY AT 62 PSIG. AIR CONDITIONING WILL KEEP AIR AT 135 F (MAX., 150 F) AND 40% REL. HUMIDITY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONCRETE + *CONTAINMENT, PRESSURE SUPPRESSION + *STEEL LINER + BELL (BWR) + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR, BWR + REPORT, PSAR

11-25908 ALSO IN CATEGORIES 12 AND 18
CLOSURE OF MAIN STEAM LINE ISOLATION VALVE
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 7 PAGES, 2 FIGURES, PAGES 6-1 THROUGH 6-7 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

DESCRIBES THE TEST PROGRAM TO DEMONSTRATE THE PERFORMANCE CAPABILITY OF A FULL-SIZE MAIN-STEAM ISOLATION VALVE CLOSING UNDER STEAM AND TWO-PHASE-MIXTURE FLOW CONDITIONS CALCULATED FOR AN EXTERNAL STEAM-LINE BREAK. THE VALVE DESIGN IS A Y TYPE AND USES AN AIR-CYLINDER OPERATOR AND CLOSING SPRINGS. TESTS WILL BE CONDUCTED FOR A RANGE OF SIMULATED BREAK SIZES AND STEAM QUANTITIES.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CONTAINMENT ISOLATION + *SYSTEM CAPABILITY + *TEST, PROOF + *VALVE + ACCIDENT, STEAM LINE RUPTURE + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FLOW, TWO PHASE + LEAK + REACTOR, BWR + RESPONSE TIME + SYSTEM OPERABILITY IN ACCIDENT

11-25910 ALSO IN CATEGORIES 5 AND 18
REEVALUATION OF STEAM LINE BREAK ACCIDENT
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 2 PAGES, PAGES 8-1 THROUGH 8-2 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS IN JUNE 15, 1967, VERMONT YANKEE REVIEW FURTHER EVALUATION OF FUEL CLAD TEMPERATURES FOLLOWING A STEAM-LINE BREAK. GE WILL DEVELOP AN IMPROVED ANALYTICAL MODEL, AND ANALYSIS WILL BE COMPLETED IN FALL OF 1968, BASED ON STEAM-LINE-ISOLATION-VALVE CLOSURE IN 3-10 SEC.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT ANALYSIS + *ACCIDENT, STEAM LINE RUPTURE + ACCIDENT MODEL + ACCIDENT, CONSEQUENCES + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CONTAINMENT ISOLATION + REACTOR, BWR + RESPONSE TIME

11-25951
HILTSCHER R
IMPROVEMENTS IN NOZZLE CONNECTIONS FOR PRESSURE VESSELS
BRITISH PATENT 1,042,537 +. 9 PAGES, 4 FIGURES, SEPTEMBER 14, 1966

A METHOD IS DESCRIBED FOR FABRICATION OF UNSYMMETRICAL CONNECTIONS BETWEEN PIPES AND CURVED AREAS ON NONSPHERICAL PRESSURE VESSEL WALLS. THE CONSTRUCTION IS SUCH THAT ON THE INNER SIDE OF THE VESSEL WALL WHERE THE REINFORCING EFFECT OF THE EXTERNAL NOZZLE IS LOW OR NONEXISTENT, THE ORIFICE IS ELONGATED SO THAT VERY LITTLE STRESS CONCENTRATION OCCURS. OUTSIDE OF THE VESSEL THE NOZZLE REINFORCES THE AREA AND REDUCES STRESS CONCENTRATIONS.

AVAILABILITY - BRITISH PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*CONTAINMENT CONSTRUCTION + *NOZZLE + *PRESSURE VESSEL + *STEEL

11-25952
ZIEGLER A
CONCRETE PRESSURE VESSELS FOR NUCLEAR REACTORS AND METHOD OF MANUFACTURING THE SAME
SIEMENS-SCHUCKERTWERKE, GERMANY
CANADIAN PATENT 752,118 +. 15 PAGES, 13 FIGURES, FEBRUARY 7, 1967

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-25952 *CONTINUED*

THE INNER CAVITY OF THE PRESSURE VESSEL IS ASSEMBLED AT THE SITE FROM PREFABRICATED TRAPEZOIDAL-SHAPED SECTIONS AND IS EQUIPPED WITH PRESTRESSING ELEMENTS ON THE OUTSIDE. FOLLOWING ASSEMBLY, RATED PRESSURE IS APPLIED AND THE WIDENED BUTT GAPS WHICH DEVELOP BETWEEN COMPONENTS ARE FILLED WITH PRESSURE-RESISTANT MATERIAL. PRESSURE IS APPLIED WITH A LARGE BALLOON OF ELASTIC MATERIAL INFLATED WITH WATER. AN INSIDE STEEL LINER PREVENTS PENETRATION OF THE GAPS BY THE BALLOON.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*CONCRETE, PRESTRESSED + *CONTAINMENT CONSTRUCTION + *PRESSURE VESSEL + *STEEL LINER

11-25953

PROCESS FOR THE PRODUCTION OF A PRESTRESSED CONCRETE PRESSURE VESSEL FOR A NUCLEAR REACTOR
SIEMENS-SCHUCKERTWERKE, GERMANY
BRITISH PATENT 1,063,235 +. 4 PAGES, 5 FIGURES, MARCH 30, 1967

A METHOD IS DESCRIBED FOR PRODUCING PRESTRESSED CONCRETE CYLINDRICAL PRESSURE VESSELS FOR NUCLEAR REACTORS. THE ENDS OF THE VESSELS ARE CLOSED BY END WALLS FORMED BY FRUSTOCONICAL BLOCKS WHICH ARE SUPPORTED BY A RING OF WEDGE-SHAPED SUPPORTING ELEMENTS. THE FRUSTO-CONICAL BLOCKS ARE POSITIONED BEFORE THE INTERIOR OF THE VESSEL IS BROUGHT TO ITS RATED OPERATING PRESSURE.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*CONCRETE, PRESTRESSED + *CONTAINMENT CONSTRUCTION + *PRESSURE VESSEL

11-25954

ZIEGLER A + PETERSEN G
SAFETY EQUIPMENT FOR NUCLEAR POWER-REACTOR PLANTS
SIEMENS-SCHUCKERTWERKE, GERMANY
CANADIAN PATENT 749,748 +. 9 PAGES, FIGURE, JANUARY 3, 1967

THE REACTOR CONTAINMENT VESSEL HAS A SPRAY SYSTEM FED BY A RESERVOIR AT THE TOP OF THE VESSEL. AN ENCLOSED AIR CHAMBER ABOVE THE RESERVOIR IS CONNECTED TO THE CHAMBER SURROUNDING THE REACTOR PRESSURE VESSEL. THE REACTOR SPACE IS CONNECTED THE BOTTOM SPACE WHERE THE SPRINKLERS DISCHARGE BY LINES CONTAINING BURSTABLE DIAPHRAGMS.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*CONTAINMENT SPRAY + *CONTAINMENT, PRESSURE RELIEF

11-25955

FISTEDIS SH
REACTOR CONTAINMENT VESSEL
U.S. PATENT 3,349,524 +. 5 PAGES, 7 FIGURES, OCTOBER 31, 1967

A CONCRETE CONTAINMENT VESSEL DESIGN FOR A NUCLEAR REACTOR HAVING JACKETED REINFORCING CABLES EXTENDING ABOUT THE VESSEL THROUGH THE CONCRETE IS GIVEN. EACH CABLE CAN MOVE LENGTHWISE WITHIN ITS JACKET. THUS, WHEN AN EXPLOSION OCCURS AND CRACKS A CERTAIN REGION OF THE CONCRETE, THE RESULTING STRAIN OF ANY CABLE IS NOT LIMITED TO THE SECTION OF THE CABLE WHERE THE CONCRETE CRACKS, BUT IS DISTRIBUTED OVER THE LENGTH OF THE CABLE. THUS, THE CABLE IS NOT LIKELY TO BREAK, AND THE INTEGRITY OF THE CONTAINMENT VESSEL IS PRESERVED IN SPITE OF LOCALIZED CRACKING OF THE CONCRETE.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (25 CENTS/COPY)

*CONCRETE + *CONTAINMENT, SHOCK GENERATION AND PROTECTION + *PRESSURE VESSEL + EXCURSION, LARGE + EXPLOSION

11-25956 . . . ALSO IN CATEGORY 13

DELESTRE L + LEFORT G + PILLERAULT J
IMPROVEMENTS IN OR RELATING TO SEALABLE PORTS
COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE
BRITISH PATENT 1,065,319 +. 3 PAGES, FIGURE, APRIL 12, 1967

A SEALABLE PORT WHICH IS USED IN A GLOVE BOX IS DESCRIBED. THE PORT CONSISTS OF A NUMBER OF BOLTS OR RODS REGULARLY SPACED AROUND THE PERIMETER OF THE PORT MOVING PARALLEL TO THE PORT, AND ACTUATED BY A SINGLE CONTROL MECHANISM. THE BOLTS ARE SPRING-LOADED FOR INSERTION INTO NOTCHES PROVIDED FOR THEM ON AN INCLINED FIXED FRAME. THE BOLTS HAVE CASTERS WHICH ROLL ON THE INCLINED PLANE WHEN THEY ARE ENGAGED CAUSING THE DISPLACEMENT OF THE PORT PERPENDICULAR TO ITS PLANE, TIGHTENING UP A SEALED JOINT LOCATED BETWEEN THE PORT AND THE FRAME.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*FLANGE + *GLOVE BOX + SEAL

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-25957
COMPLIANT FLANGE NUCLEAR REACTOR PRESSURE VESSEL CLOSURE
UNITED STATES ATOMIC ENERGY COMMISSION
BRITISH PATENT 1,080,064 +. 7 PAGES FIGURE, AUGUST 23, 1967

A REACTOR CORE CONTAINMENT VESSEL IS PROVIDED WITH A SYSTEM OF FLEXIBLE BELLOWS, ANNULAR SEAL RINGS, AND GASKETS WHICH SEAL BUT ALLOW ENTRY TO THE TOP ACCESS PORT WITHOUT THE USUAL ARRANGEMENT OF BOLTS, DOGS, AND CLAMPS. THE SEAL IS DESIGNED TO CONDUCT HEAT FROM THE PRESSURE VESSEL, OPERATE AT A LOWER TEMPERATURE THAN THE PRESSURE VESSEL, AND TO INHERENTLY COMPENSATE FOR SKEW AND UNEVEN MATING SURFACES.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*FLANGE + *SEAL + COOLING, GENERAL + PRESSURE VESSEL + STEEL

11-25958
IMPROVEMENTS IN AND RELATING TO CONCRETE PRESSURE VESSELS FOR NUCLEAR REACTORS
SULZER FRERES SOCIETE ANONYME, SWITZERLAND
BRITISH PATENT 1,079,486 +. 4 PAGES, 2 FIGURES, AUGUST 16, 1967

A CONCRETE REACTOR VESSEL IS DESCRIBED WHICH COMPRISES CONCRETE WALLS AND FLOOR, PRESTRESSED AFTER PARTIAL HARDENING OF THE CONCRETE, AND A GAS-TIGHT STEEL LINING SEPARATED FROM THE CONCRETE BY A SPACE WHICH IS LATER FILLED WITH A FLOWABLE MATERIAL CAPABLE OF HARDENING AND TRANSMITTING PRESSURE.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*CONCRETE, PRESTRESSED + *PRESSURE VESSEL + *STEEL LINER + COOLING, GENERAL

11-25959
WINDLE GV + BRADLEY N + JOHNSON FG
IMPROVEMENTS IN OR RELATING TO PRESSURIZED NUCLEAR REACTOR INSTALLATIONS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY
BRITISH PATENT 1,081,673 +. 5 PAGES, 5 FIGURES, AUGUST 31, 1967

A SYSTEM DESIGNED TO PREVENT ESCAPE OF RADIOACTIVE CONTAMINANTS FROM A PRESSURIZED REACTOR, IF THE CONTAINING VESSEL IS BREACHED, COMPRISES A CHAMBER CONTAINING THE REACTOR AND AN OUTER CHAMBER CONTAINING A POOL OF LIQUID WHERE SOLID AND CONDENSABLE CONTAMINANTS ARE SEGREGATED. PRESSURE SENSITIVE VALVES, BURSTING PANELS, AND FLUID FLOW DUCTS ARE INCORPORATED IN THE SYSTEM AS ARE MEANS FOR CLEANUP OF FUEL.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*CONTAINMENT, PRESSURE RELIEF + *CONTAINMENT, PRESSURE SUPPRESSION + FISSION PRODUCT RETENTION + REACTOR, WATER

11-25968
KEOPCKE VW
ON THE TECHNOLOGICAL STATUS OF REACTOR PRESSURE-VESSELS, ESPECIALLY THOSE MADE OF PRESTRESSED CONCRETE
6 PAGES, 8 FIGURES, 13 REFERENCES, KERntechnik, 8 PAGES 391-396 (AUG.-SEPT., 1966) IN GERMAN

THE SIZE OF STEEL PRESSURE-VESSELS IS LIMITED BY PRODUCTION POSSIBILITIES. REACTOR CONTAINERS OF PRE-STRESSED CONCRETE, ON THE CONTRARY, CAN BE MADE IN NEARLY EVERY SHAPE AND SIZE- SO THEY ARE ESPECIALLY QUALIFIED FOR LARGE NUCLEAR PLANTS IN INTEGRATED CONSTRUCTION. THE CONCRETE CONTAINERS WHICH HAVE BEEN BUILT, ARE UNDER CONSTRUCTION, OR ARE DESIGNED ARE DESCRIBED AND SHOWN IN SEVERAL DRAWINGS. PARTICULAR PROBLEMS ASSOCIATED WITH THE CONSTRUCTION OF PRE-STRESSED CONCRETE CONTAINERS ARE ANALYZED. TECHNOLOGY IS DEVELOPED FAR ENOUGH THAT SECURITY REQUIREMENTS CAN BE FULFILLED.

*CONCRETE, PRESTRESSED + *DESIGN CRITERIA + *PRESSURE VESSEL + CONTAINMENT CONSTRUCTION

11-26310 ALSO IN CATEGORIES 15 AND 17
U.S. TESTING CO. CITED FOR NON-COMPLIANCE IN RADIOGRAPHY OPERATIONS
UNITED STATES ATOMIC ENERGY COMMISSION
4 PAGES, LETTER TO U.S. TESTING CO. FROM E.R. PRICE, NOVEMBER 10, 1965

NONCOMPLIANCE ITEMS INCLUDE PERSONNEL FAILING TO WEAR DOSIMETERS AND BADGES, INADEQUATE PERSONNEL MONITORING RECORDS, PERFORMING RADIOGRAPHY WITHOUT OPERABLE SURVEY INSTRUMENTS, UNQUALIFIED PERSONNEL ACTING AS RADIOGRAPHERS, ASSISTANTS HAD NOT RECEIVED COPIES OF OPERATING AND EMERGENCY PROCEDURES, SURVEILLANCE INADEQUATE TO PREVENT UNAUTHORIZED ENTRY INTO HIGH RADIATION AREAS, SURVEY INSTRUMENTS WERE NOT CALIBRATED EVERY 3 MONTHS, IMPROPER UTILIZATION LOOP, AND COMPANY FAILURE TO REPORT AN EMPLOYEE OVEREXPOSURE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-26310 *CONTINUED*
*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, OPERATOR ERROR + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY

11-26413 ALSO IN CATEGORIES 1 AND 7
COTTRELL WB
NUCLEAR SAFETY PROGRAM ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1967
OAK RIDGE NATIONAL LABORATORY
ORNL-4228 +. 443 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1968

THE ORNL NUCLEAR SAFETY PROGRAM INVOLVES TASKS IN SEVERAL LABORATORY DIVISIONS AND IS CLOSELY RELATED TO PROGRAMS AT OTHER LABORATORIES. THIS REPORT IS ONE OF A CONTINUING SERIES STARTING WITH ORNL-3319 IN 1962. IT CONTAINS PROGRESS REPORTS ON VARIOUS ASPECTS OF CHARACTERIZATION AND BEHAVIOR OF ACCIDENT-RELEASES, FISSION PRODUCTS, FILTRATION AND ADSORPTION TECHNOLOGY, SPRAY AND ADSORPTION TECHNOLOGY, SAFETY STUDIES FOR HIGH-TEMPERATURE GAS-COOLED REACTORS, SAFETY STUDIES FOR MSBR, PRESSURE VESSEL AND PIPING TECHNOLOGY, GENERAL NUCLEAR SAFETY STUDIES, AND NUCLEAR SAFETY INFORMATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ADSORPTION + *FILTRATION + *FISSION PRODUCT RELEASE, GENERAL + *INFORMATION RETRIEVAL + *NSIC + *PIPING +
*PRESSURE VESSEL + *REACTOR, BREEDER + *REACTOR, HTGR + *REACTOR, MOLTEN SALT + *SAFETY PROGRAM +
*SPRAY, GENERAL

11-26558 ALSO IN CATEGORIES 7 AND 1
COTTRELL WB
ORNL NUCLEAR SAFETY RESEARCH AND DEVELOPMENT PROGRAM BIMONTHLY REPORT FOR MARCH-APRIL 1968
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2230 +. 164 PAGES, FIGURES, TABLES, MAY 30, 1968

INCLUDED IN THIS PROGRESS REPORT IS 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. ALTHOUGH MOST OF THE WORK HAS BEEN AND CONTINUES TO BE IN GENERAL SUPPORT OF WATER POWER-REACTOR TECHNOLOGY, INCLUDING SOME IN DIRECT SUPPORT OF THE LOFT AND CSE PROGRAMS, SEVERAL PROJECTS WERE STARTED THE FIRST OF THE CALENDAR YEAR IN SUPPORT OF THE HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGR) PROGRAM. THESE PROJECTS INCLUDE BOTH IN-PILE AND OUT-PILE STUDIES OF REACTION RATES AND FISSION PRODUCT RELEASE AND TRANSPORT PHENOMENA RELEVANT TO POTENTIAL HTGR ACCIDENT SITUATIONS. OTHER MAJOR PROJECTS INCLUDE FUEL TRANSPORT SAFETY INVESTIGATIONS, A SERIES OF DISCUSSION PAPERS ON VARIOUS ASPECTS OF SAFETY INVESTIGATIONS, A SERIES OF DISCUSSION PAPERS ON VARIOUS ASPECTS OF WATER REACTOR TECHNOLOGY, AND THE STUDIES ON PRESSURE VESSEL TECHNOLOGY. EXPERIMENTAL WORK RELATIVE TO PRESSURE VESSEL TECHNOLOGY INCLUDES INVESTIGATIONS OF THE ATTACHMENT OF NOZZLES TO SHELLS AND THE VARIABILITY OF IMPACT DATA ON LOW-ALLOY STEELS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*CHEMICAL KINETICS + *CONTAINMENT, GENERAL + *CSE + *FISSION PRODUCT RETENTION +
*FISSION PRODUCT TRANSPORT + *FISSION PRODUCT, AIRBORNE + *IMPACT PROPERTY + *IN PILE EXPERIMENT +
*LOFT (S-RR) + *NOZZLE + *OUT OF PILE LOOPS AND EXPERIMENTS + *STEEL + CONTAINMENT SPRAY +
FISSION PRODUCT RELEASE, GENERAL + PRESSURE VESSEL + REACTOR, HTGR

11-26571 ALSO IN CATEGORY 17
DRL COMMENTS ON REPAIR OF FINAL TWO STUB TUBES
DIVISION OF REACTOR LICENSING, AEC
2 PAGES, LETTER TO J. E. LOGAN, JERSEY CENTRAL P + L CO. FROM LETTER TO J. E. LOGAN FROM P. A. MORRIS.
DOCKET 50-219. TYPE--BWR, MFG--G.E., AE--BURNS + ROE

RESULTS AND DISCUSSIONS GIVE US A BASIS TO CONCLUDE THAT THE TWO REMAINING UNTOUCHED STUB TUBES CAN BE REPAIRED. THEY SHOULD BE CAREFULLY MEASURED AND GIVEN DYE-PENETRANT TESTS BEFORE AND AFTER REMOVING ALL FIELD WELDS. ***WE ARE STUDYING NEED FOR A SURVEILLANCE PROGRAM OF SENSITIZED SS MATERIAL. YOU SHOULD HAVE ADEQUATE GLAD AND UNCLAD STUB-TUBE MATERIAL (FREE OF 308LSS WELD METAL). ***PERMISSION TO REPAIR TUBES DOES NOT IMPLY APPROVAL OF PROPOSED REPAIR WORK.

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

*WELDING + CONTAINMENT PENETRATION, PIPE + FAILURE, PRESSURE VESSEL + OYSTER CREEK 1 (BWR) + PIPING +
PRESSURE VESSEL + REACTOR, BWR + STEEL, STAINLESS + SURVEILLANCE PROGRAM

11-26742 ALSO IN CATEGORIES 17 AND 3
ERR COLD HYDROTEST AT 240 PSIG.
RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINNESOTA
COO-651-60 +. 25 PAGES, 3 FIGURES, 4 TABLES, RURAL COOPERATIVE POWER ASSOCIATION'S ELK RIVER REACTOR SIXTY-SEVENTH MONTHLY OPERATING REPORT, MAY, 1968 DOCKET NO. 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY
REACTOR HAS NOT OPERATED SINCE JANUARY. A 240-PSIG COLD HYDROTEST WITH SR-85 DISPERSED IN THE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-26742 *CONTINUED*

PRIMARY SYSTEM WAS TERMINATED AFTER 7 DAYS, WITH NO SR-85 FOUND IN CAVITY WATER. RUPTURE DISK RUPTURE ON FUEL SHIPPING CASK WAS TRACED TO ALCONOX SOLUTION USED IN DECONTAMINATION AT SRL. APPENDIX A -DESCRIBES 240-PSIG HYDROTEST AND RESULTS. APPENDIX B -PROCEDURE FOR 1000-PSIG HYDROTEST AT 300 F, USING SR-85 AND RB-86.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C. (\$0.25 CENTS/PAGE)

*MAIN COOLING SYSTEM + *TEST, PROOF + CORROSION + DECONTAMINATION + ELK RIVER (BWR) + FAILURE, EQUIPMENT + FAILURE, PRESSURE VESSEL + PRESSURE RELIEF + PRESSURE VESSEL + PRESSURE, INTERNAL + PROCEDURES AND MANUALS + REACTOR, AEC OWNED + REACTOR, BWR + REPORT, OPERATIONS + RUBIDIUM + SHIPPING CONTAINER + STRONTIUM + TRACER, RADIOACTIVE

11-26743 ALSO IN CATEGORIES 17 AND 1
ELK RIVER TECHNICAL SUPPORT CONTRACT, REACTOR VESSEL LEAKS
RURAL COOPERATIVE POWER ASSOCIATION

COO-651-57 +. 22 PAGES, 5 FIGURES, FEBRUARY, 1968, DOCKET NO. 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR SHUT DOWN ENTIRE MONTH BECAUSE RCPA AND AGC CONTRACTURAL NEGOTIATIONS WERE IN PROGRESS REGARDING THE TECHNICAL-SUPPORT SUBCONTRACTOR (TECHNICAL SPECIFICATIONS REQUIRE THERE BE ONE). ***REACTOR CAVITY WATER, WHICH HAD ACCUMULATED AT ABOUT 1 GAL/DAY IN THE LAST THREE MONTHS, ACCUMULATED AT ABOUT 250 ML/DAY, MAINLY DUE TO CONDENSATION. CAVITY DRAIN SAMPLES WERE MAINLY NA-24, BUT CAVITY VENT SAMPLES HAD LESS RB-88 THAN CONTAINMENT AIR.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*FAILURE, PRESSURE VESSEL + *LEAK RATE + *SAFETY REVIEW + ELK RIVER (BWR) + REACTOR, AEC OWNED + REACTOR, BWR + REPORT, OPERATIONS + SAMPLING + TECHNICAL SPECIFICATIONS

11-26768 ALSO IN CATEGORY 18
RITTER GH

MATERIAL SURVEILLANCE FOR REACTOR VESSEL STUB TUBES

JERSEY CENTRAL POWER + LIGHT CO., MORRISTOWN, N. J.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(29), PAGE 33, (JULY 15, 1968), DOCKET NO. 50-219, TYPE--BWR, MFG--G.E., AE--BURNS + ROE

(TWX, JULY 5) REGARDING THE SUGGESTION ON PG 2 OF THE JUNE 25 ORL LETTER, WE ARE UNABLE TO DETERMINE ANY MEANINGFUL INFORMATION (WHICH COULD RESULT FROM PLACING UNCLAD STUB-TUBE SPECIMENS INSIDE THE VESSEL) BECAUSE THE MATERIAL IS NOW CLAD WITH 308L (MORE RESISTANT TO INTERGRANULAR CORROSION) AND WOULD NOT BE EXPOSED TO ACTUAL OPERATING CONDITIONS (THERMAL GRADIENTS, PRESSURE, AND RESIDUAL STRESSES). WE ARE PROCEEDING WITH THE REPAIR ASSUMING THAT THE PROGRAM WILL NOT BE REQUIRED. MATERIAL SAMPLES ARE AVAILABLE.

*PIPING + *SURVEILLANCE PROGRAM + FAILURE, PIPE + OYSTER CREEK 1 (BWR) + REACTOR, BWR

11-27040

PRESSURE VESSEL AND PIPING TECHNOLOGY

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-4228 +. 37 PAGES, 12 FIGURES, 2 TABLES, 18 REFERENCES, PAGES 311-347 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT DEALING WITH - PRESSURE VESSEL TECHNOLOGY. HEAVY-SECTION STEEL TECHNOLOGY - PROGRAM ADMINISTRATION, MATERIAL PROPERTIES AND MATERIAL INTEGRITY, FRACTURE BEHAVIOR, PERIODIC PROOF TESTING, SIMULATED SERVICE TEST. EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF NOZZLES - ORNL PROGRAM, UNIVERSITY OF TENNESSEE (EXPERIMENTAL STRESS ANALYSIS OF SINGLE NOZZLES ATTACHED TO SPHERICAL SHELLS), AUBURN UNIVERSITY (EXPERIMENTAL STRESS ANALYSIS OF CLUSTERED NOZZLES ATTACHED TO FLAT PLATES), WESTINGHOUSE RESEARCH LABORATORIES (PHOTOELASTIC STUDIES), APPLIED TECHNOLOGY ASSOCIATES (THEORETICAL STRESS SOLUTION FOR CLUSTERS OF NOZZLES ATTACHED TO SPHERICAL SHELLS), AUBURN UNIVERSITY (THEORETICAL STRESS SOLUTION FOR SINGLE NONRADIAL NOZZLES ATTACHED TO SPHERICAL SHELLS). DESIGN CRITERIA FOR PIPING, PUMPS, AND VALVES - PVRC RESEARCH PROGRAM, ORNL PROGRAM, STRESS INDICES AND PARAMETRIC STUDIES.

*NOZZLE + *PIPING + *PRESSURE VESSEL + *PROPERTY, PHYSICAL + *PUMP + *STEEL + *TESTING + *WELDING + CONTAINMENT RESEARCH AND DEVELOPMENT + CONTAINMENT, GENERAL + FAILURE, FATIGUE + FAILURE, PRESSURE VESSEL + FRACTURE TOUGHNESS + IRRADIATION TESTING + MATERIAL

11-27297 ALSO IN CATEGORY 18
OXIDATION OF PRESTRESSING TENDONS AT ROBINSON 2
CAROLINA POWER + LIGHT CO., RALEIGH, N. C.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 27, (JULY 29, 1968), DOCKET 50-261, TYPE--PWR, MFG--WEST., AE--EBASCO

(LETTER, JULY 16) AN UNANTICIPATED MINOR AMOUNT OF OXIDATION WAS FOUND ON THE LOWER SECTION OF VERTICAL PRESTRESSING TENDONS SURFACES. TENDONS ARE SATISFACTORY, BUT CORROSION PROTECTION WILL BE IMPROVED. ATTACHED REPORT DESCRIBES WORK TO DETERMINE CAUSES OF CORROSION, TO VERIFY THAT TENDONS ARE STILL SATISFACTORY, AND TO DESCRIBE THE IMPROVED CORROSION PROTECTION.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-27297 *CONTINUED*
*CONCRETE, PRESTRESSED + *CORROSION + *STEEL + CONTAINMENT CONSTRUCTION +
CONTAINMENT, CORROSION PROTECTION + OPERATING EXPERIENCE + REACTOR, PWR + ROBINSON 2 (PWR)

11-27298 ALSO IN CATEGORY 18
CONTAINMENT VESSEL CRACKS MAY EXIST AT MILLSTONE
MILLSTONE POINT CO., HARTFORD, CONN.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 28, (JULY 29, 1968), DOCKET 50-245, TYPE--BWR,
MFG--G.E., AE--EBASCO

(LETTER, JULY 17) REQUESTS DATA ON 26 ITEMS. COMPLIANCE STATES THAT CRACKS HAVE BEEN FOUND IN
WELDS ON INSERT PLATES ON CONTAINMENT VESSELS SIMILAR TO MILLSTONE VESSEL. WE UNDERSTAND
THAT YOU BELIEVE THAT SIMILAR CRACKS ARE NOT PRESENT. WE LACK DETAILED INFORMATION TO
SUPPORT YOUR POSITION AND THEREFORE REQUEST A DETAILED REPORT.

*CONTAINMENT LINER + *FAULT + *WELDS + MILLSTONE POINT (BWR) + OPERATING EXPERIENCE + REACTOR, BWR

11-27428 ALSO IN CATEGORY 18
SECTION I - REACTOR VESSEL
NIAGARA MOHAWK POWER CORP.
30 PAGES, 11 FIGURES, 10 TABLES, 3 REFERENCES, PAGE I-1 THROUGH I-30 OF NINE MILE POINT FSAR VOL. IV
(EXHIBIT D-2), SEPTEMBER 1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

INCLUDES APPLICABILITY OF FORMAL CODES AND PERTINENT CERTIFICATIONS, DESIGN ANALYSIS,
INSPECTION AND TEST REPORT SUMMARY (MULTIPLE CRACKING OF WELD AT NOZZLE WAS TRACED TO EXCESS
MANGANESE IN WIRE AND FLUX USED), AND-SURVEILLANCE PROGRAM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FAULT + *PRESSURE VESSEL + *WELDS + CODES AND STANDARDS + EXAMINATION + NINE MILE POINT (BWR) + NOZZLE +
REACTOR, BWR + REPORT, SAR + STRESS ANALYSIS + SURVEILLANCE PROGRAM

11-27429 ALSO IN CATEGORY 18
SECTION II - PRESSURE SUPPRESSION CONTAINMENT
NIAGARA MOHAWK POWER CORP.
14 PAGES, 12 FIGURES, 14 TABLES, 3 REFERENCES, PAGES II-1 THROUGH II-14 OF NINE MILE POINT FSAR VOL. IV
(EXHIBIT D-2), SEPTEMBER 1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

PROVIDES APPLICABILITY OF FORMAL CODES AND PERTINENT CERTIFICATIONS, DESIGN ANALYSIS, AND
INSPECTION AND TEST REPORT SUMMARY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CONTAINMENT, PRESSURE SUPPRESSION + CODES AND STANDARDS + CONTAINMENT DESIGN + EXAMINATION +
MISSILE GENERATION AND PROTECTION + NINE MILE POINT (BWR) + REACTOR, BWR + REPORT, SAR + STRESS ANALYSIS

11-27432 ALSO IN CATEGORY 18
SECTION V - CONTAINMENT DESIGN REVIEW
NIAGARA MOHAWK POWER CORP.
9 PAGES, 4 REFERENCES, PAGES V-1 THROUGH V-9 OF NINE MILE POINT FSAR VOL. IV (EXHIBIT D-2), SEPTEMBER
1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

REVIEW OF CB AND I CONTAINMENT ASME STRESS REPORT AND OF NOZZLE EXTENSION BELLOWS BY TEMP.
FLEX. TMR CONCLUDES ANALYSIS IS ADEQUATE FOR FUNCTION BUT NOT ADEQUATE TO ESTABLISH ASME III
REQUIREMENTS BECAUSE OF INTERPRETATION OF PARAGRAPH N-414. DISAGREEMENT IS IN STRESS
DISCONTINUITY REGIONS AT VESSEL OPENINGS, WHERE CB AND I USED FORMULA (ALLOWABLE WHERE ONLY
PRESSURE STRESS OCCURS) WHILE TMR BELIEVES AN ANALYSIS IS NEEDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CODES AND STANDARDS + *CONTAINMENT DESIGN + *REVIEW + CONTAINMENT EQUIPMENT HATCH +
CONTAINMENT PENETRATION, PIPE + CONTAINMENT, PRESSURE SUPPRESSION + NINE MILE POINT (BWR) + REACTOR, BWR +
REPORT, SAR + STRESS ANALYSIS

11-27448
SKIRT FOR SUPPORTING A REACTOR
HITACHI, LTD., JAPAN
JAPANESE PATENT 1966-11679 +. 2 PAGES, MAY 31, 1966

A DESIGN IS GIVEN FOR A CYLINDRICAL SUPPORT-SKIRT WHICH IS INSTALLED ON THE UPPER PART OF A
HIGH-TEMPERATURE REACTOR PRESSURE-VESSEL WITH THE UPPER EDGE BEING FIXED TO THE CONCRETE
SHIELD, THE SPACE OVER THE PRESSURE-VESSEL, WITHIN THE SKIRT AND ABOVE, IS FILLED WITH

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-27448 *CONTINUED*

SHIELDING WATER. WITHIN THE SKIRT, IN THE SHIELDING WATER, AT LEAST TWO ANNULAR PLATES ARE PLACED HORIZONTALLY SURROUNDING THE SPHERICAL PART OF THE PRESSURE VESSEL. THESE ANNULAR PLATES ARE LOCATED WITH SOME SPACE BETWEEN THE PLATE AND THE SKIRT AND BETWEEN THE PLATE AND THE VESSEL.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*CONTAINMENT DESIGN + *CONTAINMENT STRUCTURE + *JAPAN + *PATENT + CONTAINMENT CONSTRUCTION + PRESSURE VESSEL

11-27450

RACHAIS CG

SUPPORTING SYSTEM FOR THE SKIRT SUPPORTING A NUCLEAR REACTOR

ELECTRICITE DE FRANCE

BRITISH PATENT 1,070,507 +. 3 PAGES, 3 FIGURES, JUNE 1, 1967

A STRUCTURE DESIGN FOR SUPPORTING THE CORE OF A NUCLEAR REACTOR IS GIVEN. THIS TYPE OF STRUCTURE HAS BEEN DESIGNED TO ALEVIATE UNEQUAL DEFORMATION OF THE FOUNDATION AND SUPPORTING PILLARS WHICH SUPPORT THE CORE ASSEMBLY. THE STRUCTURE CONSISTS OF A GENERALLY CYLINDRICAL SKIRT SUPPORTING THE CORE AND SURROUNDING THE HEAT EXCHANGER AND A NUMBER OF ANGULARLY SPACED PILLAR ASSEMBLIES EACH INCLUDING A RESILIENT COMPRESSION BAR FOR TRANSMISSION OF FORCE FROM THE SKIRT TO THE LOWER PORTION OF THE PRESSURE VESSEL, IN ORDER TO MAINTAIN AN EVEN DISTRIBUTION OF THE TOTAL LOAD BETWEEN ALL THE PILLAR ASSEMBLIES.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON W.C. 2, ENGLAND (49 CENTS/COPY)

*CONTAINMENT CONSTRUCTION + *PATENT + *UNITED KINGDOM + CONTAINMENT DESIGN + CONTAINMENT STRUCTURE

11-27474

ALSO IN CATEGORIES 17 AND 10

SAFETY EVALUATION FOR PROPOSED 115 MWTH PEACH BOTTOM OPERATION

PHILADELPHIA ELECTRIC COMPANY

19 PAGES, NOVEMBER 14, 1966, DOCKET 50-171, TYPE--HTGR, MFG--G.A., AE--BECHTEL

EXCESS REACTIVITY (0.20 INSTEAD OF 0.15 DUE TO CARBON DENSITY AND THORIUM ABSORPTION CROSS SECTION OVERESTIMATE) WAS ADJUSTED WITH LUMPED BURNABLE POISON TO GIVE AN 0.06 SHUTDOWN MARGIN. LIMITS ON REACTIVITY AND FLUX ANOMALIES WILL BE SET. AFTER 1965 CABLE FIRE (WELDING SLAG INITIATION, CHIMNEY EFFECT), CO2 SYSTEM EXTENDED TO CABLE AREAS, REROUTED TO INCREASE INDEPENDENCE, SMOKE DETECTORS INSTALLED, AND FIREPROOF COVERS AND FIRE STOPS INSTALLED. HELIUM LEAKAGE IS 10-20 TIMES DESIRED 0.2 LB/DAY. CONTROL ROD DRIVE BALLS ARE NOW 100 PERCENT TESTED AFTER FAILURES FROM INTERNAL DEFECTS. A LARGER CONTAINMENT VACUUM RELIEF IS PROVIDED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*OPERATING EXPERIENCE SUMMARY + *SAFETY EVALUATION + CONTAINMENT PENETRATION, ELECTRICAL + CONTAINMENT VACUUM BREAKER + CROSS SECTION + ELECTRICAL CONDUCTION + EXAMINATION + FAILURE, SCRAM MECHANISM + FIRE + INDEPENDENCE + PEACH BOTTOM 1 (HTGR) + POWER UPGRATING + REACTIVITY EFFECT, ANOMALOUS + REACTOR, HTGR + SHUTDOWN MARGIN + THORIUM

11-27502

ALSO IN CATEGORIES 18 AND 10

ACRS REPORT ON RANCHO SECO

UNITED STATES ATOMIC ENERGY COMMISSION

3 PAGES, LETTER TO G.T. SEABORG, USAEC, JULY 19, 1968, DOCKET 50-312, TYPE--PWR, MFG--B.W., AE--BECHTEL

ACRS APPROVES CONSTRUCTION, CALLING ATTENTION TO PREVIOUS STATEMENTS ON LARGE WATER COOLED POWER REACTORS. SUGGESTS FURTHER ANALYSIS OF FAST FLUX DAMAGE TO REACTOR VESSEL, AND ADEQUACY OF VESSEL SURVEILLANCE PROGRAM. ACRS REITERATES BELIEF CONTROL AND PROTECTION INSTRUMENTATION SHOULD BE INDEPENDENT OF COMMON FAILURE MODES. APPLICANT AND REG. STAFF SHOULD REVIEW FOR SYSTEMATIC, NONRANDOM CONCURRENT FAILURES OF REDUNDANT DEVICES NOT CONSIDERED IN THE SINGLE FAILURE CRITERION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C., 20545 (\$0.25 CENTS/COPY)

*AKLS + *FAILURE, SIMULTANEOUS + *PLANT PROTECTIVE SYSTEM + *PRESSURE VESSEL + *REVIEW + BRITTLE FRACTURE + RANCHO SECO (PWR) + REACTOR, PWR + REPORT, PSAR + SINGLE FAILURE CRITERION + SURVEILLANCE PROGRAM

11-27504

ALSO IN CATEGORY 17

SELECTED LACROSSE OPERATING EXPERIENCE

ALLIS-CHALMERS, BETHESDA, MARYLAND

ACNP-68508 +. 11 PAGES, FIGURES, TABLES, JUNE 1968, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR NOT OPERATED WHILE CONTAINMENT LEAK RATE DETERMINED TO BE 0.6% PER 24 HR AT 52 PSIG. 95% OF THIS WAS LEAKAGE THROUGH INTERNAL VENT HEADER 4 IN. VALVE AND THROUGH SHUTDOWN CONDENSER 1 IN VENT VALVE. THEY WILL BE REPAIRED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-27504 *CONTINUED*

*CONTAINMENT, HIGH PRESSURE + *TEST, LEAK RATE + CONTAINMENT PENETRATION, PIPE +
CONTAINMENT REFERENCE MEASURING SYSTEM + LACROSSE (BWR) + REACTOR, BWR + REPORT, OPERATIONS

11-27805 ALSO IN CATEGORY 5

BIRSS IR

CALCULATION OF RELATIVE DISPLACEMENT DAMAGE RATES IN DIFFERING REACTOR TYPES

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, DOUNREAY (SCOTLAND)

TRG-REPORT-1561 +. 18 PAGES, 6 FIGURES, 3 TABLES, 10 REFERENCES, 1967

A NUMBER OF MATERIALS NOT NECESSARILY DESTINED FOR USE IN FAST REACTORS, IN WHICH ATOMIC DISPLACEMENTS ARE THE MAIN DAMAGE MECHANISM UNDER OBSERVATION, ARE PRESENTLY BEING IRRADIATED IN THE DOUNREAY FAST REACTOR. IN THIS PAPER IT IS SHOWN THAT, IF IT CAN BE ACCEPTED THAT THE RATIO OF ATOMIC DISPLACEMENT RATE IN THE TEST REACTOR TO DISPLACEMENT RATE IN THE PARENT REACTOR IS AN ACCEPTABLE PARAMETER FOR COMPARISON PURPOSES, THEN THE ATOMIC DISPLACEMENT ENERGY AND THE ELECTRONIC CUT OFF ENERGY OF A MATERIAL ARE NOT CRITICAL PARAMETERS IN THE DERIVATION OF THIS RATIO. IT IS ALSO SHOWN THAT, IF THE EQUIVALENT FISSION FLUX CONCEPT IS USED TO DESCRIBE REACTOR SPECTRA, IT CAN LEAD TO APPRECIABLE ERRORS IN DERIVING THE DAMAGE RATIO, BUT THAT INTEGRATION OVER THE REAL SPECTRUM IS UNNECESSARY BELOW ABOUT 0.1 MEV.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DAMAGE + *IRRADIATION TESTING + *MATERIAL + IN PILE EXPERIMENT + METAL

11-27827 ALSO IN CATEGORIES 1 AND 17

MANUAL OF LECTURE NOTES - REACTOR SAFETY COURSE NO. 7

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY, WARRINGTON, LANCASHIRE

200 PAGES, FIGURES, TABLES, REFERENCES, SEPTEMBER 23, 1968

NINE SECTIONS. (I) INTRODUCTION, 5 LECTURES. (II) FISSION PRODUCT RELEASE, 5 LECTURES. (III) CONTAINMENT ENGINEERING, 7 LECTURES. (IV) CONTROL AND INSTRUMENTATION, 7 LECTURES. (V) GAS COOLED REACTORS, 11 LECTURES. (VI) WATER REACTORS, 12 LECTURES. (VII) GENERAL, 5 LECTURES. (VIII) FAST REACTORS, 7 LECTURES. (IX) SITING AND EMERGENCY PROCEDURES, 4 LECTURES. NEW LECTURES APPEAR TO BE (7) ASSESSMENT OF ENVIRONMENTAL HAZARDS FROM FISSION PRODUCT RELEASES. (8A) FISSION PRODUCT BEHAVIOR IN LIQUID COOLED REACTORS. (10A) CONTAINMENT OF FISSION PRODUCTS WITHIN FUEL ELEMENTS. (24A) METHODS AND PROBLEMS IN REACTOR ASSESSMENTS. (40) PROBABILITY TECHNIQUES APPLIED TO WATER REACTORS.

AVAILABILITY - AUTHORITY HEALTH AND SAFETY BRANCH, U.K.A.E.A., 11 CHARLES II STREET, LONDON, S. W.1.

*SAFETY ANALYSIS + *SAFETY REVIEW + FISSION PRODUCT RETENTION + FUEL ELEMENT + PARTITION COEFFICIENT +
PROBABILITY + REACTOR, GCR + REACTOR, HTGR + REACTOR, LMFBR + REACTOR, WATER +
SAFETY PRINCIPLES AND PHILOSOPHY + UNITED KINGDOM

11-27882 ALSO IN CATEGORY 5

VANDENDERB SM

STATUS OF PIPE-RUPTURE STUDY AT GENERAL ELECTRIC

8 PAGES, 8 FIGURES, 13 REFERENCES, NUCLEAR SAFETY 8(2), PAGES 148-55 (WINTER 1966-67)

THIS PIPE-RUPTURE STUDY IS CONCERNED WITH IMPROVING CURRENT UNDERSTANDING OF FAILURE-CAUSING MECHANISMS AND PROVIDING IMPROVED CAPABILITY FOR EVALUATING AND MONITORING REACTOR PIPING SYSTEMS TO MINIMIZE THE PROBABILITY OF FAILURES. THIS STATUS REPORT SUMMARIZES THE ACCOMPLISHMENTS DURING THE INITIAL YEAR OF A BROAD 4-YEAR PROGRAM IN (1) RELIABILITY ENGINEERING OF ACTUAL REACTOR PIPING SYSTEMS, (2) SOLUTION OF HERETOFORE INTRACTABLE PROBLEMS IN STRESS ANALYSIS, (3) APPLICATION OF FRACTURE MECHANICS TO DUCTILE MATERIALS, AND (4) FATIGUE STUDIES THROUGH BOTH BENCH-SCALE AND LARGE-COMPONENT TESTS.

*ACCIDENT ANALYSIS + *FAILURE, PIPE + *PIPING + ACCIDENT, STEAM LINE RUPTURE + FAILURE, TUBING +
PLANT PROTECTIVE SYSTEM

11-27975 ALSO IN CATEGORY 2

CURRENT STATUS AND FUTURE TECHNICAL AND ECONOMIC POTENTIAL OF LIGHT WATER REACTORS

JACKSON AND MORELAND, S. M. STROLLER ASSOCIATES

WASH-1082 +. 125 PAGES, FIGURE, TABLES, REFERENCES, MARCH 1968

THIS TASK-FORCE STUDY OF LIGHT-WATER REACTORS DISCUSSES (1) THE CURRENT AND FUTURE ECONOMIC POSITION OF BOILING AND PRESSURIZED WATER REACTORS (2) FUELS, FUEL MANAGEMENT, FUEL ECONOMICS, AND (3) REACTOR SITING. OF GREATEST SAFETY INTEREST IS THE SECTION ON NEUTRON PLANT SITING (SECTION 4). THIS SECTION DISCUSSES THE PROBLEM, THE NEED FOR GREATER FLEXIBILITY, ANTICIPATED DEVELOPMENTS, AND TRENDS IN SITING PRACTICES. THE ASPECTS OF FUTURE SITING TRENDS ARE DISCUSSED (GENERALLY) WITH REGARD TO THE USE OF ENGINEERED SAFETY FEATURES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

*CONTAINMENT, GENERAL + *ECONOMICS + *SITING, REACTOR + ENGINEERED SAFETY FEATURE + REACTOR, BWR +
REACTOR, POWER + REACTOR, PWR + REACTOR, WATER + REGULATION, AEC + SAFETY PRINCIPLES AND PHILOSOPHY

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-28011 ALSO IN CATEGORY 17
THIRTEENTH MONTHLY OPERATIONAL REPORT ON THE LA CROSSE BOILING WATER REACTOR COVERING THE MONTH OF JULY 1968
ALLIS-CHALMERS, BETHESDA, MARYLAND
ACNP-68509 +. 16 PAGES, JULY 1968, DOCKET 115-5, TYPE--BWR + MFG--A.C., AE--SGT + LUNDY

REACTOR SHUT DOWN. SHUTDOWN CONDENSER SHOWED NO HELIUM LEAKAGE DESPITE 3 DAYS AT 55 PSIG, BOTH COLD AND AT 230 F. ***A BENT FEEDWATER PIPE HANGER INDICATED THAT THE PIPE MOVED MORE THAN THE 1/16 IN. PREDICTED. CALCULATIONS WILL BE REDONE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20545

COMPARISON, THEORY AND EXPERIENCE + LACROSSE (BWR) + PIPING + REACTOR, BWR + REPORT, OPERATIONS + STEAM GENERATOR + STRESS ANALYSIS + TEST, LEAK RATE + THERMAL MECHANICAL EFFECT + TUBING

11-28034 ALSO IN CATEGORY 17
ELK RIVER OPERATING EXPERIENCE
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-63 +. 41 PAGES, FIGURES, TABLES, JULY 1968, DOCKET 115-1, TYPE--BWR, MFG-A.C., AE--SGT + LUNDY

REACTOR NOT OPERATED BECAUSE PRIMARY SYSTEM LEAK RATE TESTS CONTINUED USING SR-85 AND RB-86 TRACERS. WHEN RB-86 WAS INJECTED INTO PRIMARY SYSTEM WITH 1100 PSIG STEAM, THE REACTOR CAVITY WATER COLLECTION RATE INCREASED FROM 1500 TO 2100 ML/HR, BUT RB-86 NOT FOUND. STEAM WAS INJECTED INTO REACTOR CAVITY TO FLUSH OUT ANY TRACER DEPOSITED, CONDENSATE SHOWED BOTH RB AND SR TRACERS. ***PROCEDURES GIVEN FOR PERSONNEL AND FOR EMERGENCY AIR LOCK LEAK RATE TESTS. CONTAINMENT VESSEL WILL BE LEAK RATE TESTED NEXT. SHIELD BLOCKS ARE BEING REMOVED FOR VISUAL INSPECTION OF THE VESSEL BOTTOM.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*TEST, LEAK RATE + CONTAINMENT AIR LOCK + ELK RIVER (BWR) + FAILURE, PRESSURE VESSEL + PRESSURE VESSEL + REACTOR, BWR + REPORT, OPERATIONS + TRACER, RADIOACTIVE

11-28067 ALSO IN CATEGORIES 12 AND 9
PEDERSEN HN + SPANNER JC
DETECTION, LOCATION, AND CHARACTERIZATION OF FLAW GROWTH IN METALS USING ACOUSTIC EMISSION METHODS
BATTELLE-NORTHWEST
CONF-671011 +. 2 PAGES, 4 REFERENCES, OCTOBER 1966

BATTELLE-NORTHWEST IN FEBRUARY OF 1966 BEGAN A PROGRAM TO NONDESTRUCTIVELY DETECT INCIPIENT FAILURE OF REACTOR PRESSURE PIPING, USING THE ACOUSTIC EMISSION GENERATED BY FRACTURE, CLEAVAGE, DISLOCATION UNPINNING, TWINNING, ETC., OF SINGLE OR MULTIPLE GRAINS OF THE PIPING MATERIAL. THE PURPOSE OF THE PROGRAM IS - (1) THE DETECTION OF ACOUSTIC EMISSION AGAINST THE NOISE BACKGROUND OF THE OPERATING REACTOR, (2) THE LOCATION OF THE POINT OF ORIGIN OF THE ACOUSTIC EMISSION, (3) THE CHARACTERIZATION OF THE ACOUSTIC EMISSION BY THE TYPE OF FAILURE OR FLAW-GROWTH MECHANISM IN THE METAL, AND (4) PREDICTION OF THE TIME OF FAILURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ANALYTICAL TECHNIQUE, CALIBRATION + FLAW + INSTRUMENTATION, SURVEILLANCE + INTEGRITY + METAL + PIPING + TEST, NONDESTRUCTIVE

11-28068 ALSO IN CATEGORIES 12 AND 9
HUTTON PH
ACOUSTIC EMISSION IN METALS AS A NDT TOOL
BATTELLE MEMORIAL INSTITUTE, PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-1262 + CONF-671002-4 +. 8 PAGES, 3 REFERENCES, FOR PRESENTATION AT THE 27TH NATIONAL CONFERENCE OF THE SOCIETY FOR NONDESTRUCTIVE TESTING AT CLEVELAND, OHIO, OCTOBER 18, 1967, SEPTEMBER 1967

SOME OF THE MORE EVIDENT APPLICATIONS OF ACOUSTIC EMISSION, IN ADDITION TO MONITORING FLAW GROWTH IN REACTOR PRESSURE SYSTEMS, ARE - (1) REMOTE AND CONTINUOUS SURVEILLANCE OF OPERATIONAL SYSTEMS SUCH AS NATURAL-GAS PIPE LINES AND AIRCRAFT STRUCTURES TO DETECT FORMATION AND/OR GROWTH OF FLAWS, (2) MONITORING WELDS, PARTICULARLY IN HEAVY SECTIONS, AS THEY COOL TO DETECT INTERNAL CRACKING, (3) USE AS A STUDY TOOL FOR FRACTURE MECHANICS RESEARCH IN BOTH METALLICS AND NONMETALLICS, (4) MONITORING SPACE VEHICLES FOR MICROMETEORITE PENETRATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ANALYTICAL TECHNIQUE, CALIBRATION + FLAW + INSTRUMENTATION, SURVEILLANCE + INTEGRITY + METAL + PIPING + PRESSURE VESSEL + TEST, NONDESTRUCTIVE

CATEGORY 12
PLANT SAFETY FEATURES

12-25903 ALSO IN CATEGORIES 18 AND 5

BRAY AP + IANNI P + MURRAY JL
GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 40 PAGES, 5 FIGURES, 4 TABLES, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY (MAR. 14, 1967) INDICATED THAT ADDITIONAL TESTING OR ANALYSIS WAS REQUIRED. THE TEST OR ANALYSIS PROGRAM IS DESCRIBED FOR THE FOLLOWING - (1) EFFECTS OF FUEL-ROD FAILURE ON ECCS PERFORMANCE, (2) EFFECTS OF FUEL-BUNDLE FLOW BLOCKAGE, (3) VERIFICATION OF FUEL-DAMAGE-LIMIT CRITERION, (4) EFFECTS OF CLADDING TEMPERATURE AND MATERIAL ON ECCS PERFORMANCE, (5) CLOSURE OF MAIN-STEAM-LINE ISOLATION VALVE, (6) TESTS OF DIESEL-GENERATOR PERFORMANCE, (7) STEAM-LINE-BREAK ACCIDENT, AND (8) DEPRESSURIZATION PERFORMANCE OF HPCI SYSTEM.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ENGINEERED SAFETY FEATURE + *R AND D PROGRAM + ACCIDENT, LOSS OF COOLANT + ACCIDENT, STEAM LINE RUPTURE + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CONTAINMENT ISOLATION + CORE SPRAY + FLOW BLOCKAGE + FUEL ELEMENT + GENERATOR, ENGINE + PERFORMANCE LIMIT + SYSTEM OPERABILITY IN ACCIDENT

12-25904 ALSO IN CATEGORIES 5 AND 18

EFFECTS OF FUEL ROD FAILURE ON ECCS PERFORMANCE
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 4 PAGES, PAGES 2-1 THROUGH 2-5 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY VOICED CONCERN FOR EFFECT ON HEAT-TRANSFER EFFECTIVENESS OF ECCS RESULTING FROM FUEL-CLAD BULGING OR PERFORATION IN LOSS-OF-COOLANT ACCIDENTS. ANALYTICAL AND EXPERIMENTAL PROGRAMS TO RESOLVE THE CONCERN ARE DESCRIBED. FAILURE TEMPERATURES, WITH SINGLE ROD TESTS HAVING GAS-PLENUM PRESSURES FROM 130 TO 1500 PSIG, WERE 1348 TO 1732 F. NIN-ROD-BUNDLE TESTS SHOWED THAT GROSS FLOW BLOCKAGE DOES NOT OCCUR AS A RESULT OF MULTI-ROD PERFORATIONS. FULL-SIZE HEATER-BUNDLE TESTS WILL BE PERFORMED. ANALYSIS TO BE MADE OF WORST CONFIGURATION OF FLOW PATH AND INCLUDE RADIATION EFFECTS ON CHANNEL WALLS. PROGRESS TO BE COMPLETED IN 1969.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT, LOSS OF COOLANT + *SYSTEM OPERABILITY IN ACCIDENT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CORE SPRAY + EMERGENCY COOLING CONSIDERATIONS + FAILURE, CLADDING + FLOW BLOCKAGE + PERFORMANCE LIMIT + REACTOR, BWR + SYSTEM CAPABILITY + TEST, PROOF

12-25908 ALSO IN CATEGORIES 11 AND 18

CLOSURE OF MAIN STEAM LINE ISOLATION VALVE
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 7 PAGES, 2 FIGURES, PAGES 6-1 THROUGH 6-7 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

DESCRIBES THE TEST PROGRAM TO DEMONSTRATE THE PERFORMANCE CAPABILITY OF A FULL-SIZE MAIN STEAM ISOLATION VALVE CLOSING UNDER STEAM AND TWO-PHASE-MIXTURE FLOW CONDITIONS CALCULATED FOR AN EXTERNAL STEAM-LINE BREAK. THE VALVE DESIGN IS A Y TYPE AND USES AN AIR-CYLINDER OPERATOR AND CLOSING SPRINGS. TESTS WILL BE CONDUCTED FOR A RANGE OF SIMULATED BREAK SIZES AND STEAM QUANTITIES.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CONTAINMENT ISOLATION + *SYSTEM CAPABILITY + *TEST, PROOF + *VALVE + ACCIDENT, STEAM LINE RUPTURE + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FLOW, TWO PHASE + LEAK + REACTOR, BWR + RESPONSE TIME + SYSTEM OPERABILITY IN ACCIDENT

12-25909 ALSO IN CATEGORIES 10 AND 18

TESTS OF DIESEL GENERATOR PERFORMANCE
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 3 PAGES, PAGES 7-1 THROUGH 7-3 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL 1968

ACRS RECOMMENDED TESTING GENERATORS UNDER SIMULATED EMERGENCY CONDITIONS. GE RESPONDED THAT TESTS WILL BE CONDUCTED AT THE MANUFACTURERS PLANT TO CONFIRM ADEQUACY WITH RESPECT TO START TIMES, SYNCHRONIZATION, AND SIMULATED LOADING. TESTS (FOR SINGLE DIESEL) ON STARTING RELIABILITY, START TIMES, AND SIMULATED LOAD-CARRYING CAPABILITY WERE ALMOST COMPLETE. TESTS OF STARTING AND SYNCHRONIZING TWO OR MORE DIESELS ARE BEING PLANNED FOR 1968. SITE TESTS WILL BE CONDUCTED AND INTEGRATED WITH SPECIFIC PROJECTS.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*GENERATOR, ENGINE + *RELIABILITY, COMPONENT + *SYSTEM CAPABILITY + *TEST, SYSTEM OPERABILITY + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + ELECTRIC POWER, SHUTDOWN + EMERGENCY POWER, ELECTRIC + REACTOR, BWR + SYSTEM OPERABILITY IN ACCIDENT

CATEGORY 12
PLANT SAFETY FEATURES

12-25911 ALSO IN CATEGORY 18
DEPRESSURIZATION PERFORMANCE OF HPCT SYSTEM
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 5 PAGES, 3 FIGURES, PAGES 9-1 THROUGH 9-5 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND
EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS STATES (OCT. 12, 1967, PEACH BOTTOM 2 AND 3 REPORT) THAT THE FILM CONDENSATION
COEFFICIENT USED TO PREDICT THE DEPRESSURIZATION PERFORMANCE OF THE HPCT SYSTEM IS BASED ON
EXTRAPOLATION OF AVAILABLE HEAT-TRANSFER DATA AND SHOULD BE SUBSTANTIATED BY EXPERIMENTS.
TEST PROGRAM TO BE COMPLETED IN LATE 1968 IS DESCRIBED. SUBCOOLED WATER WILL BE INJECTED
INTO A CONSTANT-VOLUME, HIGH-PRESSURE, STEAM-WATER SYSTEM. DEPRESSURIZATION RATE, MASS FLOW
RATE, ETC., WILL BE MEASURED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*BLOWDOWN + *CORE SPRAY + *HEAT TRANSFER COEFFICIENT + *SYSTEM CAPABILITY + ACCIDENT, LOSS OF COOLANT +
ACRS + AEC QUESTION + PEACH BOTTOM 2 AND 3 (BWR) + REACTOR, BWR + SYSTEM OPERABILITY IN ACCIDENT +
TEST, PROOF

12-26303 ALSO IN CATEGORY 9
SHAW MK
LIQUID SHUTDOWN SYSTEM FOR WINFRITH SGHWR
3 PAGES, FIGURES, NUCLEAR ENGINEERING, 13(144), PAGES 418-420 (MAY 1968)

SYSTEM CONSISTS OF BUILT-IN SHUTDOWN TUBES IN THE CALANDRIA WHICH PERMIT RECOVERY OF THE
POISON. LOOP CONSISTS OF A U-TUBE, SHUTDOWN VALVE, HIGH PRESSURE HEAD TANK AND A BUFFER
TANK. FLUID INLET VELOCITY IS 80 FT/SEC, WHICH IS ARRESTED BY COMPRESSING HELIUM IN THE TUBE
WHILE DISCHARGING A FRACTION TO A BUFFER TANK. THE ABSORBER FLUID CAN BE DRAINED FROM THE
TUBES FOR REUSE. VALVE DESIGN IS SUCH THAT OPENING TIME IS 0.1 SEC AND CONSISTS OF A 2-WAY
BODY AND SPOOL WITH A 1.5-IN. STROKE BETWEEN SEALS. SIX COIL SPRINGS PUSH SPOOL TOWARD ITS
SEAT WHEN A SPLIT ELECTROMAGNET IS ACTIVATED.

*SHUTDOWN SYSTEM, SECONDARY + *SYSTEM DESCRIPTION + *VALVE + DESIGN CRITERIA + REACTOR CONTROL +
REACTOR, HWR + REACTOR, PRESSURE TUBE + UNITED KINGDOM

12-27282 ALSO IN CATEGORY 13
RANDALL JD + BATES EF + SANDEL PS + FELTZ DE
DESIGN AND PERFORMANCE OF A LOW-COST FISSION-PRODUCT MONITOR SYSTEM
TEXAS A AND M COLLEGE
2 PAGES, FIGURE, 3 REFERENCES, ANS TRANSACTIONS 11(1) PAGES 272-273 OF THE 1968 ANNUAL MEETING OF THE
AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-18, 1968

DESCRIBES EXPERIMENT AND FINAL DESIGN OF A FISSION-PRODUCT MONITORING SYSTEM BASED ON PARTICLE
AND GAS COUNTING FOR DETECTING FUEL-ELEMENT FAILURES.

*FISSION PRODUCT RELEASE, GENERAL + *MONITOR, RADIATION, GAS + *REACTOR, GENERAL + CESIUM +
FAILURE, FUEL ELEMENT + FISSION GAS RELEASE + KRYPTON + PARTICULATE + RUBIDIUM + XENON

12-27283
KUNKEL WP + POLLOCK BD + GUON J + ZWETZIG GB + SILBERBERG M + BERGER S
LMFBR FISSION PRODUCT CONTAMINATION AND CONTROL STUDIES - A STATUS REPORT
ATOMICS INTERNATIONAL
AI-AEC-12687 +. 78 PAGES, 24 FIGURES, 13 TABLES, 29 REFERENCES, JUNE 30, 1968

THE STATUS IS PRESENTED OF STUDIES AND EXPERIMENTS BEING CONDUCTED AT ATOMICS INTERNATIONAL TO
DESCRIBE THE DISTRIBUTION OF FISSION PRODUCTS AND OTHER CONTAMINATION SOURCES RELEASED TO THE
COOLANT OF THE LIQUID METAL FAST BREEDER REACTOR. EXPERIMENTAL RESULTS DERIVED FROM STUDIES
OF CESIUM AND SODIUM IODIDE VAPORIZATION FROM SODIUM SOLUTIONS AND CESIUM COLD TRAPPING
STUDIES ARE PRESENTED. THE FISSION PRODUCT BEHAVIOR LOOP WHICH WILL BE USED FOR A MORE
COMPREHENSIVE SERIES OF INVESTIGATIONS OF FISSION PRODUCT BEHAVIOR IN SODIUM IS ALSO
DESCRIBED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*FISSION PRODUCT RELEASE, GENERAL + *REACTOR, FAST + *REACTOR, LMCR + *SODIUM + ATOMICS INTERNATIONAL +
DEPOSITION + EXPERIMENT, GENERAL + FISSION PRODUCT TRANSPORT + RADIOACTIVITY RELEASE

12-27285
WEED RD
DECONTAMINATION OF THE PLUTONIUM RECYCLE TEST REACTOR (PRTR) PRIMARY SYSTEM
BATELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-711 +. 28 PAGES, 11 TABLES, REFERENCES, MARCH, 1968

CATEGORY 12
PLANT SAFETY FEATURES

12-27285 *CONTINUED*

THE PLUTONIUM RECYCLE TEST REACTOR PRIMARY SYSTEM WAS SUCCESSFULLY DECONTAMINATED IN LATE DECEMBER 1965. AN IMPROVED DECONTAMINATION PROCESS CONSISTING OF ALKALINE PERMANGANATE FOLLOWED BY AN INHIBITED OXALIC-CITRATE MIXTURE WAS USED. THE DECONTAMINATING SOLUTIONS EFFECTIVELY REMOVED MORE THAN 31 CI OF RADIOACTIVITY WITH AN EFFECTIVE PRIMARY SYSTEM DECONTAMINATION FACTOR OF 24. CORROSION OF CARBON STEEL AND STAINLESS STEELS DURING THE DECONTAMINATION PROCESS AND DEVELOPMENT DATA FOR THE DECONTAMINATION PROCESS ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*DECONTAMINATION + *ETR (TR) + *PRTR (TR) + *REACTOR, GENERAL + CORROSION + HANFORD SITE + IDAHO FALLS + REACTOR, TEST

12-27430 ALSO IN CATEGORY 18
SECTION III - ENGINEERED SAFEGUARDS

NIAGARA MOHAWK POWER CORP.

21 PAGES, 21 FIGURES, 8 REFERENCES, 18 TABLES, PAGES III-1 THROUGH III-21 OF NINE MILE POINT FSAR VOL. IV (EXHIBIT D-2) SEPTEMBER 1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

DESCRIBES CONTAINMENT AND CORE SPRAY SEISMIC ANALYSIS AND STRESS REPORT, CONTAINMENT SPRAY SYSTEM, (CONDENSATION EFFECTIVENESS, SPRAY NOZZLE TESTS), AND VENDOR TESTS AND CERTIFICATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*ENGINEERED SAFETY FEATURE + CORE SPRAY + EARTHQUAKE ENGINEERING + EXAMINATION + HEAT TRANSFER, CONDENSATION + NINE MILE POINT (BWR) + NOZZLE + REACTOR, BWR + REPORT, SAR + STRESS ANALYSIS + TEST, COMPONENT

12-27709 ALSO IN CATEGORIES 17 AND 5
SAXTON-LOSS OF COOLANT ACCIDENT PREVENTION AND PROTECTION
SAXTON NUCLEAR EXPERIMENTAL CORPORATION

150 PAGES, FIGURES, TABLES, JUNE, 1968, DOCKET 50-146, TYPE--PWR, MFG--WEST., AE--GILBERT ASSOC.

RESPONDS TO DEC. 1966, DRL REQUEST FOR REANALYSIS WITH MODERN TECHNIQUES. SYSTEMS WILL LIMIT CLAD MELT TO LESS THAN 3 PER CENT OF CLAD AREA FOR A DOUBLE ENDED COOLANT LINE RUPTURE. NO EVIDENCE OF REACTOR VESSEL OR STEAM GENERATOR LEAKS. SAFETY VALVE LEAKS HAVE BEEN SHOWN BY BORIC ACID CRYSTALS. ***PAST VISUAL AND RADIOGRAPH INSPECTIONS HAVE BEEN GOOD, BUT A SPECIFIC INSPECTION PROGRAM WILL BE REPEATED EVERY 5 YEARS. MODIFICATIONS TO BE MADE INCLUDE BETTER ISOLATION BETWEEN BUILDING COMPARTMENTS, RECIRC. PUMP PRESSURE INDICATORS, RELAY REDUNDANCE IN SAFETY INJECTION SYSTEMS, AND TO PREVENT A SINGLE FAILURE FROM CLOSING INJECTION ISOLATION VALVE. APPENDIX D DESCRIBES COMPUTER PROGRAMS USED (FLASH, CHICK-KIN, LOCTA-R2).

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + CORE REFLOODING SYSTEM + EXAMINATION + LEAK + MODIFICATION, SYSTEM OR EQUIPMENT + PIPING + PLANT PROTECTIVE SYSTEM + PRESSURE RELIEF + PRESSURE VESSEL + REACTOR, PWR + SAXTON (PWR) + SURVEILLANCE PROGRAM + TEST, NONDESTRUCTIVE

12-27875 ALSO IN CATEGORY 13

CLARKE JH + CUMBERLAND RF + SMYTH MJ

THE TREATMENT OF LOW LEVEL RADIOACTIVE EFFLUENT BY A FERRIC HYDROXIDE PRECIPITATION

ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, BERKSHIRE

AERE-R-5724 +. 17 PAGES, 3 FIGURES, 10 TABLES, 3 REFERENCES, APRIL 1968

GIVES AN ACCOUNT OF LABORATORY AND PILOT PLANT INVESTIGATIONS INTO THE USE OF A FERRIC HYDROXIDE PRECIPITATION METHOD FOR THE TREATMENT OF LOW LEVEL ACTIVE EFFLUENT AT HARWELL. DETAILS ARE ALSO GIVEN OF THE RESULTS OBTAINED ON THE MAIN TREATMENT PLANT OVER SEVERAL MONTHS OF OPERATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*FUEL REPROCESSING + *REACTOR, GENERAL + HARWELL + IRON + PRECIPITATION + TESTING + WASTE TREATMENT, GENERAL

12-27877 ALSO IN CATEGORIES 13 AND 3

FINNEY BC + LOWRIE RS + WATSON CD

A CONCEPTUAL DESIGN AND A COST ESTIMATE OF AN ON-SITE FACILITY FOR CLEANING, DISASSEMBLING, AND CANNING SHORT-COOLED LMFBR FUEL IN PREPARATION FOR SHIPMENT TO A CENTRAL REPROCESSING PLANT

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-TM-2050 +. 29 PAGES, 3 FIGURES, 4 TABLES, 9 REFERENCES, MAY 1968

THIS REPORT PRESENTS A CONCEPTUAL DESIGN AND A PRELIMINARY COST ESTIMATE FOR A FUEL PRESHIPMENT PREPARATION FACILITY THAT WOULD BE LOCATED AT A 1000-MW (ELECTRICAL) SODIUM-COOLED FAST-BREEDER-REACTOR STATION. THIS FACILITY WOULD PROVIDE MEANS FOR CLEANING,

CATEGORY 12
PLANT SAFETY FEATURES

12-27877 *CONTINUED*

DISASSEMBLING, SORTING (SEPARATING BED RODS FROM FUEL RODS), CANNING, AND LOADING SPEND FUEL RODS (INTO CASKS) PRIOR TO SHIPMENT TO A CENTRAL REPROCESSING PLANT. THE FUEL WOULD BE ALLOWED TO COOL 10 TO 25 DAYS BEFORE THE START OF THESE OPERATIONS. THE FACILITY WOULD CONSIST OF A SODIUM REMOVAL AREA, A SPENT-FUEL STORAGE POOL, A MECHANICAL CELL CONTAINING EQUIPMENT FOR DISASSEMBLING FUEL ELEMENTS, AND A POOL IN WHICH FUEL CANS COULD BE STORED AND CASKS WOULD BE LOADED. A PRELIMINARY ESTIMATE GIVES \$5 MILLION IN CAPITAL COST AN ANNUAL OPERATING COST OF \$1 MILLION. CONCLUSION - SUCH A FACILITY WOULD BE PROHIBITIVE FOR A SINGLE REACTOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DESIGN STUDY + *FUEL HANDLING + *FUEL STORAGE + *REACTOR, GENERAL + REACTOR, BREEDER + REACTOR, FAST

12-27980 ALSO IN CATEGORY 13

BURTON JH + PECKINPAUGH CL
CONCEPTUAL DESIGN FOR FAST FLUX TEST FACILITY MAINTENANCE AND DECONTAMINATION CELL
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
NAA-SR-MEMO-12367 +. 116 PAGES, FIGURES, REFERENCES, JULY 27, 1967

FACILITY CONSISTS OF FOUR IN-LINE CELLS - TRANSFER, INSPECTION-CLEANING, REMOTE MAINTENANCE, AND CONTACT MAINTENANCE. ACCESS TO EACH IS PROVIDED TO REACTOR OPERATING FLOOR DIRECTLY ABOVE. TRANSFER BETWEEN CELLS IS PROVIDED. DETAILED SYSTEM DESCRIPTION, PRINCIPLES OF OPERATION, SAFETY PRECAUTIONS, MAINTENANCE, AND DRAWINGS ARE INCLUDED IN THE MEMO.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*HOT CELL + *REACTOR, GENERAL + DESIGN STUDY + IRRADIATION FACILITY + MAINTENANCE AND REPAIR + REACTOR, FAST

12-27981 ALSO IN CATEGORY 13

ARNESON SO
IRRADIATION TESTING FACILITIES - NEEDS, LIMITATIONS, AND AVAILABILITY
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-1754 + CONF-680419-1 +. 4 PAGES, FROM AMERICAN NUCLEAR SOCIETY NATIONAL TOPICAL MEETING, CINCINNATI, OHIO, APRIL 1, 1968

THE NEEDS FOR FAST-REACTOR IRRADIATION-TESTING FACILITIES ARE REVIEWED, AND THE AVAILABILITY OF TESTING REACTORS TO MEET THE NEEDS ARE DISCUSSED. LIMITATIONS OF AVAILABLE FACILITIES ARE IDENTIFIED AND SPACE REQUIREMENTS ARE COMPARED WITH AVAILABILITY. THE NEED FOR CONTINUED AND IMPROVED AVAILABILITY OF EBR-II FOR NEAR-TERM FAST-REACTOR FUELS AND MATERIALS TESTING IS EMPHASIZED, AND ALTERNATE TESTING FACILITIES SUCH AS FERMI ARE BRIEFLY REVIEWED. THE OVERALL TESTING CAPABILITIES OF THE FAST FLUX TEST FACILITY ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*HOT CELL + *REACTOR, GENERAL + IRRADIATION FACILITY + REACTOR, FAST + TESTING

12-28033 ALSO IN CATEGORY 17

PARTIAL INOPERABILITY OF SAFETY INJECTION SYSTEM
SOUTHERN CALIFORNIA EDISON COMPANY
3 PAGES, IFTTR TO P.A. MORRIS, DRL, SEPTEMBER 6, 1968, DOCKET 50-206, TYPE--PWR, MFG--WEST., AE--BECHTEL

ON AUG. 27, 1968, CALIBRATION SHOWED BOILER FEED PUMP SPEED SWITCHES WERE MADE UP AT 2800 AND 3800 RPM RESPECTIVELY, INSTEAD OF 3200. SPEED SWITCHES ENSURE UNBORATED WATER FLUSHED OUT BEFORE SAFETY INJECTION BEGINS. A 23 CU. FT. DILUTION WAS ANALYZED IN THE FSAR, IT WOULD HAVE BEEN ADDED HERE. ***SAFETY INJECTION FLOW COMPARATOR DID NOT CLOSE ONE INJECTION VALVE 850 C ON A HIGH FLOW RATE TEST. A BLOCKING DIODE WAS INSTALLED IN THE COMMON GROUND LEG OF THE AUCTIONEERING RELAYS, AND ALL THREE VALVES WORKED PROPERLY. ***EACH CONDITION HAD BEEN ANALYZED IN FSAR. NEITHER WOULD HAVE PREVENTED SAFETY INJECTION SYSTEM FROM WORKING.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CORE REFLOODING SYSTEM + *FAILURE, COMPONENT + *SHUTDOWN SYSTEM, SECONDARY + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, FLOW + PUMP + REACTOR, PWR + SAN ONOFRE (PWR) + SET POINT

12-28067 ALSO IN CATEGORIES 11 AND 9

PEDERSEN HN + SPANNER JC
DETECTION, LOCATION, AND CHARACTERIZATION OF FLAW GROWTH IN METALS USING ACOUSTIC EMISSION METHODS
BATTELLE-NORTHWEST
CONF-671011 +. 2 PAGES, 4 REFERENCES, OCTOBER 1966

BATTELLE-NORTHWEST IN FEBRUARY OF 1966 BEGAN A PROGRAM TO NONDESTRUCTIVELY DETECT INCIPIENT FAILURE OF REACTOR PRESSURE PIPING, USING THE ACOUSTIC EMISSION GENERATED BY FRACTURE, CLEAVAGE, DISLOCATION UNPINNING, TWINNING, ETC., OF SINGLE OR MULTIPLE GRAINS OF THE PIPING

CATEGORY 12
PLANT SAFETY FEATURES

12-28067 *CONTINUED*

MATERIAL. THE PURPOSE OF THE PROGRAM IS - (1) THE DETECTION OF ACOUSTIC EMISSION AGAINST THE NOISE BACKGROUND OF THE OPERATING REACTOR, (2) THE LOCATION OF THE POINT OF ORIGIN OF THE ACOUSTIC EMISSION, (3) THE CHARACTERIZATION OF THE ACOUSTIC EMISSION BY THE TYPE OF FAILURE OR FLAW-GROWTH MECHANISM IN THE METAL, AND (4) PREDICTION OF THE TIME OF FAILURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ANALYTICAL TECHNIQUE, CALIBRATION + FLAW + INSTRUMENTATION, SURVEILLANCE + INTEGRITY + METAL + PIPING + TEST, NONDESTRUCTIVE

12-28068 ALSO IN CATEGORIES 11 AND 9

HUTTON PH

ACOUSTIC EMISSION IN METALS AS A NOT TOOL

BATTELLE MEMORIAL INSTITUTE, PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON

BNWL-SA-1262 + CONF-671002-4 +. 8 PAGES, 3 REFERENCES, FOR PRESENTATION AT THE 27TH NATIONAL CONFERENCE OF THE SOCIETY FOR NONDESTRUCTIVE TESTING AT CLEVELAND, OHIO, OCTOBER 18, 1967, SEPTEMBER 1967

SOME OF THE MORE EVIDENT APPLICATIONS OF ACOUSTIC EMISSION, IN ADDITION TO MONITORING FLAW GROWTH IN REACTOR PRESSURE SYSTEMS, ARE - (1) REMOTE AND CONTINUOUS SURVEILLANCE OF OPERATIONAL SYSTEMS SUCH AS NATURAL-GAS PIPE LINES AND AIRCRAFT STRUCTURES TO DETECT FORMATION AND/OR GROWTH OF FLAWS, (2) MONITORING WELDS, PARTICULARLY IN HEAVY SECTIONS, AS THEY COOL TO DETECT INTERNAL CRACKING, (3) USE AS A STUDY TOOL FOR FRACTURE MECHANICS RESEARCH IN BOTH METALLICS AND NONMETALLICS, (4) MONITORING SPACE VEHICLES FOR MICROMETEORITE PENETRATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ANALYTICAL TECHNIQUE, CALIBRATION + FLAW + INSTRUMENTATION, SURVEILLANCE + INTEGRITY + METAL + PIPING + PRESSURE VESSEL + TEST, NONDESTRUCTIVE

12-28169 ALSO IN CATEGORY 17

BAWTR REACTOR HEADER FAILS TO DROP ON LOSS OF FLOW

BABCOCK + WILCOX CO., LYNCHBURG, VA.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 19, (SEPT. 23, 1968), DOCKET NO. 50-200

(LETTER, SEPT. 9) FAILURE CAUSED BY 3 HEADER GUIDE RODS BROKEN, WHICH PREVENTED THEIR ALIGNING THE HEADER AND CAUSED IT TO BIND. THESE BROKE DUE TO REPEATED LOADINGS. WE WILL SHUT DOWN UNTIL TECH.-SPEC. APPROVAL OF OPERATION WITH HEADER LOCKED UP. (HEADER IS APPARENTLY FLAPPER VALVE OPENING ON LOW FLOW).

ACCIDENT, LOSS OF FLOW + ENGINEERED SAFETY FEATURE + FAILURE, EQUIPMENT + REACTOR, POOL TYPE + REACTOR, TEST + TECHNICAL SPECIFICATIONS

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-24634 ALSO IN CATEGORIES 17 AND 14
INDUSTRIAL RADIOACTIVE WASTE BULLETINS
ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
6 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(16), PAGES 5-10 (APRIL 15, 1968)

(NO. 3, FEB. 28, 1968) - CORRECTS ERRONEOUS DATA IN PREVIOUS DATA BULLETIN. ON DEC. 16, 1967, THE CS-137/SR-90 CONCENTRATION (PCI/1) AT NFS OUTFALL WAS 160,000/86,900. AT BUTTERMILK CREEK, 6,600/4,010. RCSI QUESTIONS OFFICIAL VIEW THAT MEASUREMENTS COMPLY WITH LAW BECAUSE CATTARANGUS CREEK MEETS INDUSTRIAL EFFLUENT RADIOACTIVITY STANDARDS. ***(NO. 2, FEB. 24, 1968) - DISCUSSES EFFLUENT MEASUREMENT REPORTED OVER A PERIOD OF YEARS. ASSERTS THAT NFS SENDS SLUGS OF VERY HOT EFFLUENT INTO CREEK, AS ACTUAL MEASUREMENTS INDICATE DISCHARGE AT SEWER OUTLET WAS 30,000 TIMES PERMISSIBLE LIMIT. ASSERTS OFFICIAL SAMPLING IS NOT DONE AT THE PLACE WHERE LIMITS EXCEEDED.

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + *WASTE DISPOSAL, LIQUID + DILUTION + EFFLUENT + FUEL REPROCESSING + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + NFS

13-25956 ALSO IN CATEGORY 11
DELESTRE L + LEFORT G + PILLERAULT J
IMPROVEMENTS IN OR RELATING TO SEALABLE PORTS
COMMISSARIAT A L ENERGIE ATOMIQUE, FRANCE
BRITISH PATENT 1,065,319 +. 3 PAGES, FIGURE, APRIL 12, 1967

A SEALABLE PORT WHICH IS USED IN A GLOVE BOX IS DESCRIBED. THE PORT CONSISTS OF A NUMBER OF BOLTS OR RODS REGULARLY SPACED AROUND THE PERIMETER OF THE PORT MOVING PARALLEL TO THE PORT, AND ACTUATED BY A SINGLE CONTROL MECHANISM. THE BOLTS ARE SPRING-LOADED FOR INSERTION INTO NOTCHES PROVIDED FOR THEM ON AN INCLINED FIXED FRAME. THE BOLTS HAVE CASTERS WHICH ROLL ON THE INCLINED PLANE WHEN THEY ARE ENGAGED CAUSING THE DISPLACEMENT OF THE PORT PERPENDICULAR TO ITS PLANE, TIGHTENING UP A SEALED JOINT LOCATED BETWEEN THE PORT AND THE FRAME.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BUILDING, LONDON, W.C. 2, ENGLAND (49 CENTS/COPY)

*FLANGE + *GLOVE BOX + SEAL

13-26737 ALSO IN CATEGORY 17
CONSTRUCTION OF RADIOCHEMISTRY LABORATORY IN REACTOR LABORATORY
UNIVERSITY OF TEXAS
5 PAGES, 3 FIGURES, LETTER TO E. R. PRICE, DSLR. FROM A LETTER TO EBER R. PRICE FROM S. J. GAGE. JUNE 11, 1968. DOCKET 50-192.

(RESPONSE TO LETTER OF MAY 17, 1968). ROOM WILL BE USED FOR RADIOCHEMICAL SEPARATIONS IN TRACE ANALYSIS WITH NEUTRON-ACTIVATION TECHNIQUES. ROOM WILL CONTAIN TERMINUS OF THE PNEUMATIC (RABBIT) TRANSFER SYSTEM, A FUME HOOD, A GLOVE BOX, AND STORAGE. OUTSIDE AIR IS DRAWN DIRECTLY INTO ROOM AND EXHAUSTED FROM GLOVE BOX AND FUME HOOD TO A 30-FT STACK. GLOVE-BOX DUCT HAS A FILTER.

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

GLOVE BOX + IRRADIATION FACILITY + RADIOISOTOPE + REACTOR, RESEARCH + VENTILATION SYSTEM

13-27017
SMITH SR
SUPPRESSION OF RADIOIODINE RELEASES FROM A RADIOCHEMICAL SEPARATIONS PLANT
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS + CO., AIKEN, SOUTH CAROLINA
4 PAGES, 1 FIGURE, 2 TABLES, 7 REFERENCES, NUCLEAR APPLICATIONS, 5(1), PAGES 20-23 (JULY, 1968)

IN THE PUREX PROCESS USED AT THE SAVANNAH RIVER PLANT, THE SUPPRESSION OF THE RELEASE OF RADIOIODINE BY COMPLEXING IT WITH MERCURY WAS TESTED. SUPPRESSING RADIOIODINE RELEASE WOULD BE DESIRABLE IF SHORT-COOLED FUEL WERE INADVERTENTLY CHARGED TO THE DISSOLVER IN THE PLANT. THIS RELEASE IS SUPPRESSED BY ADDING MERCURIC NITRATE TO THE DISSOLVER SOLUTION. WITH 0.04M HG(NO3)2 IN THE DISSOLVER SOLUTION AND A GELATIN CLARIFIER, THE RADIOIODINE ATMOSPHERIC RELEASE WAS REDUCED 55-FOLD.

*DISSOLUTION + *FUEL REPROCESSING + *IODINE + MANGANESE + MERCURY + OPERATING EXPERIENCE + SAVANNAH RIVER PLANT + SOLVENT EXTRACTION PROCESS

13-27018
ZIMMERMAN CA + HOFFMAN TL
CORROSION EVALUATION OF EQUIPMENT USED FOR REPROCESSING ZIRCONIUM ALLOY NUCLEAR FUELS
IDAHO NUCLEAR CORPORATION, NATIONAL REACTOR TESTING STATION, IDAHO FALLS, IDAHO
IN-1134 +. 10 PAGES, FIGURE, 4 TABLES, 8 REFERENCES, FEBRUARY, 1968

CORROSION RATES FOR MONEL-400 AND VARIOUS STAINLESS STEELS IN PROCESS SOLUTIONS WERE DETERMINED IN LABORATORY STUDIES AND PLANT SERVICE. THE PLANT SERVICE PERIOD INCLUDED THE

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-27018 *CONTINUED*

FIRST REPROCESSING OF ZIRCONIUM ALLOY NUCLEAR FUELS USING BORIC ACID AS A SOLUBLE POISON DURING DISSOLUTION. CORROSION RATES FOR A MONEL-400 DISSOLVER USING HYDROFLUOROIC-FLUOBORIC ACID DISSOLVENT AND SULFURIC AND CHROMIC ACIDS FOR CLEANOUT RANGED BETWEEN TWO AND EIGHT MILS PER MONTH. CORROSION RATES FOR STAINLESS STEEL PLATES CONTAINING BORON AS A FIXED POISON IN THE FIRST CYCLE PRODUCT EVAPORATOR WERE VERY LOW. THE LOW CORROSION RATES FOR THIS AND OTHER PROCESS EQUIPMENT INDICATE THAT THE SYSTEM CAN BE USED FOR FUTURE AND REPROCESSING OPERATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CORROSION + *FUEL REPROCESSING + *OPERATING EXPERIENCE + *TESTING + DISSOLUTION + EQUIPMENT, GENERAL + FLUORIDE + ICRP + METAL + ZIRCONIUM

13-27282 ALSO IN CATEGORY 12

RANDALL JD + BATES EF + SANDEL PS + FELTZ DE
DESIGN AND PERFORMANCE OF A LOW-COST FISSION-PRODUCT MONITOR SYSTEM
TEXAS A AND M COLLEGE

2 PAGES, FIGURE, 3 REFERENCES, ANS TRANSACTIONS 11(1) PAGES 272-273 OF THE 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-18, 1968

DESCRIBES EXPERIMENT AND FINAL DESIGN OF A FISSION-PRODUCT MONITORING SYSTEM BASED ON PARTICLE AND GAS COUNTING FOR DETECTING FUEL-ELEMENT FAILURES.

*FISSION PRODUCT RELEASE, GENERAL + *MONITOR, RADIATION, GAS + *REACTOR, GENERAL + CESIUM + FAILURE, FUEL ELEMENT + FISSION GAS RELEASE + KRYPTON + PARTICULATE + RUBIDIUM + XENON

13-27284 ALSO IN CATEGORY 7

ADDISON RA + POTTER JE + SMITH SE + WHITE PA
INSTALLATION OF HIGH-EFFICIENCY FILTERS
UKAEA, ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON, ENGLAND
AWRE-O-81/65 +. 19 PAGES, 6 FIGURES, OCTOBER, 1965

SUMMARIZES THE PRINCIPLES EVOLVED OVER SEVERAL YEARS AT AWRE FOR THE INSTALLATION OF HIGH EFFICIENCY AIR FILTERS IN RADIOACTIVE AND TOXIC PROCESS BUILDINGS PARTICULARLY WITH RESPECT TO THE SAFETY ASPECTS OF THE INSTALLATION. IT IS BASED ON A MORE DETAILED REPORT, AWRE REPORT NO. O-24/65, WHICH CONTAINS DETAILS OF EXPERIMENTAL WORK ETC. CARRIED OUT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*FABRICATION + *FILTER + *FILTER INSTALLATION + *FUEL CONVERSION + *FUEL ELEMENT + *FUEL REPROCESSING + *ORE CONVERSION + *RADIOISOTOPE + *REACTOR, GENERAL + TESTING

13-27288 ALSO IN CATEGORY 17

FIRE AND EXPLOSION SENSITIVITY OF METAL - HALOGENATED SOLVENT SYSTEMS
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

5 PAGES, 1 TABLE, 9 REFERENCES, HEALTH AND SAFETY INFORMATION, USAEC, ISSUE NO. 263, MAY 6, 1968

FIRE HAZARDS OF METALS, PARTICULARLY IN FINELY DIVIDED FORM, ARE STRONGLY INFLUENCED BY WIDE NUMBER OF VARIABLES. HALOGENATED-SOLVENT REACTIVITY CONSIDERABLY MODIFIED BY TEMPERATURE, MOISTURE, CONTAMINANTS, ACIDITY, STABILIZERS, ETC. GIVES RESULTS OF 60 IMPACT TESTS ON TEN DIFFERENT KINDS OF METALLIC POWDERS OR GRANULES (AL, MG, TI, BA, LI, BE, BI) AND SIX SOLVENTS (FREONS, CCL4, TRI- AND PERCHLOROETHYLENE, TRICHLOROETHANE). REFERENCES TO OTHER HAZARDOUS SYSTEMS INCLUDED.

USAEC, DIVISION OF OPERATIONAL SAFETY, WASHINGTON, D.C. 20545

*FABRICATION + *FUEL CONVERSION + *FUEL ELEMENT + *SAFETY PRINCIPLES AND PHILOSOPHY + CHEMICAL REACTION + DECONTAMINATION + EXPLOSION + FIRE + HALOGEN + INDUSTRIAL SAFETY + METAL + TEST, BENCH

13-27597 ALSO IN CATEGORY 9

HARDTKE FC
TWO METHODS FOR EVALUATING THE SUSCEPTIBILITY OF IRRADIATED GLASS TO FRACTURE BY ELECTRICAL DISCHARGE
UNIVERSITY OF MO., ROLLA, ROLLA, MISSOURI
1 PAGE, 3 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 360, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

USING 200- TO 300-KW ELECTRONS, TWO METHODS HAVE BEEN DEVELOPED FOR TESTING SHIELDING GLASS FORMULATIONS FOR THEIR SUSCEPTIBILITY TO DISCHARGE AND FRACTURE UPON RADIATION EXPOSURE. THESE TESTS ARE INTENDED TO SUPERSEDE THOSE THAT HAVE FEATURED LARGE SAMPLES EXPOSED TO INTENSE GAMMA SOURCES AS WELL AS THOSE THAT MEASURE DIRECTLY THE INTRINSIC RESISTIVITY AND DIELECTRIC CONSTANT OF THE GLASS.

*GLASS + *RADIOISOTOPE + *SHIELDING + ELECTRICAL CONDUCTION + FAILURE, COMPONENT + IRRADIATION TESTING + RADIATION EFFECT + TEST, COMPONENT

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-27875 ALSO IN CATEGORY 12
CLARKE JH + CUMBERLAND RF + SMYTH MJ
THE TREATMENT OF LOW LEVEL RADIOACTIVE EFFLUENT BY A FERRIC HYDROXIDE PRECIPITATION
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, BERKSHIRE
AERE-R-5724 +. 17 PAGES, 3 FIGURES, 10 TABLES, 3 REFERENCES, APRIL 1968

GIVES AN ACCOUNT OF LABORATORY AND PILOT PLANT INVESTIGATIONS INTO THE USE OF A FERRIC HYDROXIDE PRECIPITATION METHOD FOR THE TREATMENT OF LOW LEVEL ACTIVE EFFLUENT AT HARWELL. DETAILS ARE ALSO GIVEN OF THE RESULTS OBTAINED ON THE MAIN TREATMENT PLANT OVER SEVERAL MONTHS OF OPERATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FUEL REPROCESSING + *REACTOR, GENERAL + HARWELL + IRON + PRECIPITATION + TESTING + WASTE TREATMENT, GENERAL

13-27876
KOYANAKA Y
STUDIES ON SEPARATION OF FISSION PRODUCT BY FLOTATION METHOD
JAPAN ATOMIC ENERGY INSTITUTE
NSJ-TR-90 +. 11 PAGES, DECEMBER 1967

FLOTATION HAS PROVED EFFECTIVE IN REMOVING CS-137 FROM ITS AQUEOUS DILUTE SOLUTION, WITH THE AID OF SUITABLE COPRECIPITANT SUCH AS CUPRIC OR NICKEL FERROCYANIDE AND PERTINENT COLLECTOR SUCH AS SODIUM OLEATE AND OCTADECYLAMINE ACETATE. IT HAS BEEN FOUND IN THE EXPERIMENTS ON SINGLE STAGE FLOTATION THAT 90-99% OF CS-137 CAN BE REMOVED BY OPTIMUM CHOICE OF THE CONCENTRATIONS OF COPRECIPITANT AND COLLECTOR, AS WELL AS OF PH OF FLOTATION MEDIUM. MULTIPLE FLOTATION FOR FOUR SUCCESSIVE STAGES GAVE DECONTAMINATION FACTOR OF 10,000 TO 1 MILLION, WITH A VOLUME REDUCTION RATIO OF HIGHER THAN 50.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FUEL REPROCESSING + *RADIOISOTOPE + *WASTE TREATMENT, LIQUID + CESIUM + EXPERIMENT, GENERAL

13-27877 ALSO IN CATEGORIES 12 AND 3
FINNEY BC + LOWRIE RS + WATSON CD
A CONCEPTUAL DESIGN AND A COST ESTIMATE OF AN ON-SITE FACILITY FOR CLEANING, DISASSEMBLING, AND CANNING SHORT-COOLED LMFBR FUEL IN PREPARATION FOR SHIPMENT TO A CENTRAL REPROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2050 +. 29 PAGES, 3 FIGURES, 4 TABLES, 9 REFERENCES, MAY 1968

THIS REPORT PRESENTS A CONCEPTUAL DESIGN AND A PRELIMINARY COST ESTIMATE FOR A FUEL PRESHIPMENT PREPARATION FACILITY THAT WOULD BE LOCATED AT A 1000-MW (ELECTRICAL) SODIUM-COOLED FAST-BREEDER-REACTOR STATION. THIS FACILITY WOULD PROVIDE MEANS FOR CLEANING, DISASSEMBLING, SORTING (SEPARATING BEO RODS FROM FUEL RODS), CANNING, AND LOADING SPEND FUEL RODS (INTO CASKS) PRIOR TO SHIPMENT TO A CENTRAL REPROCESSING PLANT. THE FUEL WOULD BE ALLOWED TO COOL 10 TO 25 DAYS BEFORE THE START OF THESE OPERATIONS. THE FACILITY WOULD CONSIST OF A SODIUM REMOVAL AREA, A SPENT-FUEL STORAGE POOL, A MECHANICAL CELL CONTAINING EQUIPMENT FOR DISASSEMBLING FUEL ELEMENTS, AND A POOL IN WHICH FUEL CANS COULD BE STORED AND CASKS WOULD BE LOADED. A PRELIMINARY ESTIMATE GIVES \$5 MILLION IN CAPITAL COST AN ANNUAL OPERATING COST OF \$1 MILLION. CONCLUSION - SUCH A FACILITY WOULD BE PROHIBITIVE FOR A SINGLE REACTOR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DESIGN STUDY + *FUEL HANDLING + *FUEL STORAGE + *REACTOR, GENERAL + REACTOR, BREEDER + REACTOR, FAST

13-27878
PASHLEY JH + SCHAPPEL RB
ORGDP FUEL REPROCESSING STUDIES - SUMMARY PROGRESS REPORT JANUARY THROUGH JUNE 1967
OAK RIDGE GASEOUS DIFFUSION PLANT, OAK RIDGE, TENNESSEE
K-1738 +. 101 PAGES, 12 FIGURES, 28 TABLES, MAY 9, 1968

THE OAK RIDGE GASEOUS DIFFUSION PLANT GASEOUS DIFFUSION DEVELOPMENT DIVISION IS PARTICIPATING IN STUDIES OF A GROUP OF PROCESSES AIMED AT PURIFYING AND RECOVERING VALUABLE URANIUM AND PLUTONIUM FROM SPENT NUCLEAR REACTOR FUELS. THE PROGRAM INCLUDES TWO MAIN PHASES - (A) PREPARATION OF CONCEPTUAL PLANT STUDIES WITH CONCOMITANT DEFINITION OF PROBLEM AREAS ASSOCIATED WITH THE PROCESS AND TECHNOLOGY AND PLANT DESIGN, AND (B) COMPONENT DEVELOPMENT, INCLUDING SCALE-UP AND TESTING OF CRUCIAL PROCESS EQUIPMENT AND AUXILIARIES. THE CURRENT REPORT IS THE FIFTH IN A SERIES OF PROGRESS REPORTS TO BE ISSUED SEMIANNUALLY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-27878 *CONTINUED*

*DESIGN STUDY + *FUEL REPROCESSING + BROMINE + EQUIPMENT, GENERAL + EXPERIMENT, GENERAL + FLUORIDE + TESTING + URANIUM DIOXIDE + VOLATILITY PROCESS

13-27978

SCHULZ WW

EFFECTS OF SOME SYNERGISTIC AND ANTAGONISTIC AGENTS ON HDEHP EXTRACTION OF STRONTIUM
BATTELLE NORTHWEST LABORATORY

BNWL-759 +. 27 PAGES, 3 FIGURES, 8 TABLES, 40 REFERENCES, JULY 1968

HDEHP, DILUTED WITH TBP AND KEROSENE, IS USED AS THE EXTRACTANT IN THE HANFORD B-PLANT TO EXTRACT SR-90 FROM VARIOUS RADIOACTIVE WASTE SOLUTIONS. PROCESS-CHEMISTRY-ORIENTED STUDIES WERE PERFORMED TO DETERMINE THE EFFECTS OF VARIOUS KNOWN AND POSSIBLE EXTRACTANT COMPONENTS ON EXTRACTION OF STRONTIUM BY THE B-PLANT SOLVENT. SMALL CONCENTRATIONS OF TBP AND OF THE MORE POWERFUL SYNERGIST DBBP (DIBUTYL BUTYL PHOSPHONATE) ENHANCE EXTRACTION OF STRONTIUM (SYNERGISTIC EFFECT). CONVERSELY, SMALL CONCENTRATIONS OF EITHER H-SUB 2MEHP (MONO(2-ETHYLHEXYL) PHOSPHORIC ACID) OR 2-ETHYLHEXANOL DEPRESS STRONTIUM DISTRIBUTION COEFFICIENTS (ANTAGONISTIC EFFECT). CONSEQUENCES OF THESE OBSERVATIONS TO PLANT OPERATION ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 CPY, \$0.65 MICROFICHE

*FUEL REPROCESSING + *WASTE TREATMENT, LIQUID + EXPERIMENT, GENERAL + HANFORD SITE + SOLVENT EXTRACTION PROCESS + STRONTIUM + TESTING

13-27979

TRAUTH CA

A SYSTEMS APPROACH TO CONTAMINATION CONTROL

SANDIA CORPORATION

SC-M-68-235 +. 35 PAGES, REFERENCES, APRIL 1968

THOUGH NOT DIRECTLY APPLICABLE TO RADIOACTIVE CONTAMINATION, THE PARALLEL APPROACH BY OTHERS INVOLVED IN CONTAMINATION CONTROL COULD INVOKE BETTER METHODS OF CONTROL IN THE NUCLEAR INDUSTRY.

AVAILABILITY - C. A. TRAUTH, JR., SANDIAN CORPORATION, ALBUQUERQUE, NEW MEXICO

*CONTROL, GENERAL + *FUEL CONVERSION + *FUEL REPROCESSING + *RADIOISOTOPE + *SURFACE CONTAMINATION + HOT CELL + THEORETICAL INVESTIGATION

13-27980

ALSO IN CATEGORY 12

BURTON JH + PECKINPAUGH CL

CONCEPTUAL DESIGN FOR FAST FLUX TEST FACILITY MAINTENANCE AND DECONTAMINATION CELL

ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.

NAA-SR-MEMO-12367 +. 116 PAGES, FIGURES, REFERENCES, JULY 27, 1967

FACILITY CONSISTS OF FOUR IN-LINE CELLS - TRANSFER, INSPECTION-CLEANING, REMOTE MAINTENANCE, AND CONTACT MAINTENANCE. ACCESS TO EACH IS PROVIDED TO REACTOR OPERATING FLOOR DIRECTLY ABOVE. TRANSFER BETWEEN CELLS IS PROVIDED. DETAILED SYSTEM DESCRIPTION, PRINCIPLES OF OPERATION, SAFETY PRECAUTIONS, MAINTENANCE, AND DRAWINGS ARE INCLUDED IN THE MEMO.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*HOT CELL + *REACTOR, GENERAL + DESIGN STUDY + IRRADIATION FACILITY + MAINTENANCE AND REPAIR + REACTOR, FAST

13-27981

ALSO IN CATEGORY 12

ARNESON SO

IRRADIATION TESTING FACILITIES - NEEDS, LIMITATIONS, AND AVAILABILITY

BATTELLE-NORTHWEST, RICHLAND, WASHINGTON

BNWL-SA-1754 + CONF-680419-1 +. 4 PAGES, FROM AMERICAN NUCLEAR SOCIETY NATIONAL TOPICAL MEETING, CINCINNATI, OHIO, APRIL 1, 1968

THE NEEDS FOR FAST-REACTOR IRRADIATION-TESTING FACILITIES ARE REVIEWED, AND THE AVAILABILITY OF TESTING REACTORS TO MEET THE NEEDS ARE DISCUSSED. LIMITATIONS OF AVAILABLE FACILITIES ARE IDENTIFIED AND SPACE REQUIREMENTS ARE COMPARED WITH AVAILABILITY. THE NEED FOR CONTINUED AND IMPROVED AVAILABILITY OF EBR-II FOR NEAR-TERM FAST-REACTOR FUELS AND MATERIALS TESTING IS EMPHASIZED, AND ALTERNATE TESTING FACILITIES SUCH AS FERMI ARE BRIEFLY REVIEWED. THE OVERALL TESTING CAPABILITIES OF THE FAST FLUX TEST FACILITY ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*HOT CELL + *REACTOR, GENERAL + IRRADIATION FACILITY + REACTOR, FAST + TESTING

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-27982
PASHLEY JH
ORGDP FUEL REPROCESSING STUDIES. PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1967
OAK RIDGE GASEOUS DIFFUSION PLANT, OAK RIDGE, TENN.
K-L-1780(PT.24) +. 16 PAGES, APRIL 5, 1968

PROGRESS REPORT OF SCALE-UP AND COMPONENT STUDIES OF FLUORIDE VOLATILITY PROGRAM AT SEMI-WORKS LEVEL. WORK COVERED WAS THE EFFECTS OF BACKPRESSURE AND HYDROGEN CHLORIDE PRETREATMENT OF URANIUM DIOXIDE FUEL PELLETS ON ELUTRIATION AND THE EXPOSURE OF SINTERED NICKEL FILTERS USING ZRCL₄ POWDER. THE STATUS OF THE PROGRAM AND CLOSE-OUT PLANS ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*FLUIDIZED BED + *FLUORIDE + *FUEL REPROCESSING + EXPERIMENT, GENERAL + TESTING + URANIUM DIOXIDE

13-28003 ALSO IN CATEGORIES 17 AND 1
AEC PLANS REVISION OF RADIOISOTOPE LICENSING PROCEDURES
U.S. ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE IN-866 +. 3 PAGES, APRIL 29, 1968

REVISIONS PROPOSED TO 10CFR33 WOULD BE ALONG LINES OF PRESENT BROAD LICENSES (TYPE A - INSTITUTIONS ALLOWED TO POSSESS LARGE MULTI-CURVE QUANTITIES. RADIOLOGICAL SAFETY OFFICER AND AN ISOTOPE SAFETY COMMITTEE REQUIRED.). ADDED WOULD BE TYPE B (INSTITUTION MAY POSSESS UP TO 10,000 TIMES THE QUANTITY WHICH 10CFR20 WOULD ALLOW TO BE INHALED BY ONE PERSON IN ONE YEAR, MUST HAVE A QUALIFIED RADIOLOGICAL SAFETY OFFICER AND ADMINISTRATIVE PROCEDURES FOR CONTROLLING USAGE) AND TYPE C (INDIVIDUAL USER MUST HAVE SCIENTIFIC BACKGROUND AND RADIATION PROTECTION TRAINING, MAY POSSESS UP TO 100 TIMES THE QUANTITY WHICH 10 CFR 20 WOULD ALLOW ONE PERSON TO INHALE IN ONE YEAR). ***COMMENT REQUESTED ON FEDERAL REGISTER PUBLICATION OF APRIL 30, 1968.

*RADIOISOTOPE + *REGULATION, AEC + APPLICATION FOR AEC LICENSE

13-28004 ALSO IN CATEGORIES 17 AND 1
HOW TO GET A LICENSE TO USE RADIOISOTOPES
U.S. ATOMIC ENERGY COMMISSION
35 PAGES, JULY 1967

BRIEFLY REVIEWS (FOR AN APPLICANT WITHOUT PRIOR KNOWLEDGE) THE OBJECTIVES AND REQUIREMENTS OF THE REGULATORY PROGRAM, PLUS THE SAFETY RESPONSIBILITIES OF THE USER. A STARTING POINT FOR FURTHER INFORMATION. ***REVIEWS RADIOISOTOPE LICENSING, STATE REGULATION, AEC SAFETY STANDARDS AND REGULATIONS, QUALIFYING FOR A SPECIFIC LICENSE, RESPONSIBILITY OF LICENSEES. APPENDICES INCLUDE RULES AND REGULATIONS, INSTRUCTION SHEETS, AND SAMPLE APPLICATION/LICENSE REFERENCES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

*RADIOISOTOPE + *REGULATION, AEC + APPLICATION FOR AEC LICENSE + GUIDE

13-28025
KING LJ + SHIMOZATO A + HOLMES JM
PILOT PLANT STUDIES OF THE DECONTAMINATION OF LOW-LEVEL PROCESS WASTE BY A SCAVENGING-PRECIPITATION FOAM SEPARATION PROCESS
OAK RIDGE NATIONAL LABORATORY
ORNL-3803 +. 57 PAGES, 11 FIGURES, TABLES, 23 REFERENCES, JULY 1968

THE SCAVENGING-PRECIPITATION FOAM-SEPARATION (SPFS) PROCESS FOR TREATING LOW-LEVEL RADIOACTIVE WASTE WATER WAS STUDIED ON A PILOT PLANT SCALE. PROCESSING RATES OF 300 GPH FOR SCAVENGING PRECIPITATION AND 120 GPH FOR FOAM SEPARATION WERE ACHIEVED. AT ITS PRESENT STAGE OF DEVELOPMENT, THE SPFS PROCESS DOES NOT APPEAR TO BE ECONOMICALLY COMPETITIVE WITH OTHER LOW-LEVEL WASTE TREATMENT PROCESSES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*FUEL REPROCESSING + *RADIOISOTOPE + *REACTOR, GENERAL + *WASTE TREATMENT, LIQUID + ECONOMIC STUDY + EXPERIMENT, GENERAL + FOAM + PRECIPITATION

13-28028
PHILLIPS JF + HUBER HO
PROCESS FOR THE DISSOLUTION OF ALUMINUM-CLAD THORIA FUEL ELEMENTS
BATTELLE-NORTHWEST, RICHLAND, WASH.
BNWL-240 +. 36 PAGES, 9 FIGURES, 5 TABLES, 22 REFERENCES, JULY 1968

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-28028 *CONTINUED*

IN AN EFFORT TO DEVELOP A PROCESS FOR SIMULTANEOUS DISSOLUTION OF THORIA AND ITS C-64 ALUMINUM ALLOY CONTAINER, THE FOLLOWING PROPERTIES WERE MEASURED - (1) ACTIVATION AND DISSOLUTION CHARACTERISTICS OF THE ALUMINUM ALLOY IN MERCURY-CATALYZED NITRIC ACID, NICKEL (II) NITRATE SOLUTIONS, (2) THORIA DISSOLUTION RATES IN NITRIC ACID, HYDROGEN FLUORIDE, ALUMINUM NITRATE, THORIUM NITRATE SOLUTION, AND (3) THE SOLUBILITY OF THORIUM NITRATE IN NITRIC ACID-ALUMINUM NITRATE. A PROCESS FOR DISSOLVING IS GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*DISSOLUTION + *FUEL REPROCESSING + *THORIUM + ALUMINUM + EXPERIMENT, GENERAL + TESTING

13-28029 ALSO IN CATEGORY 17
MILES FW

ION-EXCHANGE-RESIN SYSTEM FAILURES IN PROCESSING ACTINIDES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
13 PAGES, 3 TABLES, 72 REFERENCES, NUCLEAR SAFETY 9(5), PAGES 393-406 (SEPT.-OCT. 1968)

SEVEN INSTANCES OF ION-EXCHANGE-RESIN SYSTEM FAILURES HAVE BEEN REPORTED IN NUCLEAR WORK SINCE JUNE 26, 1962, AND FIVE STUDIES HAVE BEEN MADE OF THE THERMAL STABILITY OF NITRATE-FORM RESINS. ALL INSTANCES APPARENTLY INVOLVED THE SELF-IGNITION OF NITRATE-FORM RESINS (WITH BOTH AROMATIC AND ALIPHATIC MATRICES) IN STRONG (MORE THAN 7N) NITRIC ACID IN THE PRESENCE OF SOME AMOUNT OF HEAT. TWO GROUPS OF PRECAUTIONARY MEASURES ARE SUGGESTED - (1) THOSE ASSOCIATED WITH THE CHEMISTRY OF RESINS, SUCH AS MAXIMUM OPERATING TEMPERATURE AND IONIC LOADING LIMITS, AND (2) THOSE COMMON TO CHEMICAL PROCESSING, SUCH AS PRESSURE-RELIEF DEVICES AND ADEQUATE RULES CONCERNING PROCEDURAL CHANGES.

*ACCIDENT ANALYSIS + *FUEL CONVERSION + *FUEL REPROCESSING + *ION EXCHANGE + *RADIOISOTOPE + *RESIN +
CURIUM + NEPTUNIUM + PLUTONIUM + THORIUM + URANIUM

13-28049 ALSO IN CATEGORIES 17 AND 7

FILTER FAILURE AT WEST VALLEY PLANT
NUCLEAR FUEL SERVICES, INC., WEST VALLEY, N. Y.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(38), PAGE 29 AND 30, (SEPT. 16, 1968), DOCKET NO. 50-201

(TWX TO COMPLIANCE) ON SEPT. 4, 1968, ONE FILTER OF 30 IN THE MAIN VENTILATION FILTER BANK FAILED. 1-2% OF THE FILTER WAS DISCHARGED FROM THE STACK AND FELL ON TO ROOF. PROBABLE CAUSE WAS FILTER PRESSURE DROP, AT UPPER OPERATING LIMIT. HIGH PRESSURE DROP ALARM IS BEING REDUCED 18%, AND LOW PRESSURE DROP ALARM IS ADJUSTED TO INCREASE SENSITIVITY TO SINGLE FILTER FAILURE. NOT A REPORTABLE INCIDENT BECAUSE ANALYSIS OF ADJACENT FILTER AND STACK SAMPLER INDICATE 11% OF MONTHLY ALLOWANCE DISCHARGED. SURVEY OF SITE PERIMETER DID NOT SHOW RADIATION INCREASE ABOVE BACKGROUND.

*FILTER, DAMAGED + *PRESSURE DROP + AIRBORNE RELEASE + FUEL REPROCESSING + INCIDENT, EQUIPMENT + NFS +
STACK + VENTILATION SYSTEM

13-28050 ALSO IN CATEGORIES 17 AND 7

NFS SHUTDOWN TO EVALUATE FILTER FAILURE
NUCLEAR FUEL SERVICES, INC., WEST VALLEY, N. Y.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(38), PAGE 30, (SEPT. 16, 1968), DOCKET NO. 50-201

(LETTER TO NFS, SEPT. 6, 1968) CONFIRMS SEPT. 6 PHONE CALL THAT WEST VALLEY PLANT OPERATION WILL NOT BE RESUMED UNTIL THE FOLLOWING IS REVIEWED BY AEC - (1) AMOUNT OF RADIOACTIVITY RELEASED FROM STACK SEPT. 4, 1968, (2) NFS EVALUATION, INCLUDING PROBABLE CAUSE AND CORRECTIVE ACTION, (3) INFORMATION REQUESTED IN APRIL 2, 1968, LETTER, INCLUDING IMMEDIATE WARNING OF ABNORMAL CONDITIONS IN VENTILATION AND OFFGAS SYSTEMS. ITEMS 1 AND 2 ARE NECESSARY TO CONFIRM TECH.-SPEC. REQUIREMENTS MET (PARAGRAPHS 4.1.1, 7.1.2.2 AND 7.1.7.3).

*AIRBORNE RELEASE + *FILTER, DAMAGED + FUEL REPROCESSING + INCIDENT, EQUIPMENT +
INSPECTION AND COMPLIANCE + NFS + OFF GAS + STACK + VENTILATION SYSTEM

13-28167 ALSO IN CATEGORY 17

CORRESPONDENCE RELATIVE TO NFS OFFGAS FILTERS
NUCLEAR FUEL SERVICES, INC.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 14 AND 15, (SEPT. 23, 1968), DOCKET NO. 50-201

(SEPT. 10) MARCH 1968 DOG FILTER FAILURE WAS DUE TO MOISTURE WEAKENING PLYWOOD CASING. (SEPT. 11 TWX) PROVIDES INTERIM TECHNICAL SPECIFICATIONS ON FILTER RESISTANCE AND PRESSURE DROP. (SEPT. 14 TWX) SPECS. CANNOT BE MET WITHOUT EXTENSIVE SHUTDOWN AND REDESIGN OF PLANT. (SEPT. 16 TWX) INTERPRETATIONS SUPPLIED BY NFS OF AEC SEPT. 13 TWX. (SEPT. 16 TWX) AEC NOT AWARE OF NFS SEPT. 14 TWX DURING MEETING OF SEPT. 14. CONFIRM ORAL AGREEMENTS. (SEPT. 17 TWX) DML AGREES NFS MAY OPERATE ACCORDING TO AEC SEPT. 13 SPECIFICATIONS INTERPRETED BY NFS SEPT. 16 TWX.

*FILTER, HIGH EFFICIENCY + *PRESSURE DROP + *TECHNICAL SPECIFICATIONS + FAILURE, ADMINISTRATIVE CONTROL +
FILTER, DAMAGED + FUEL REPROCESSING + INSPECTION AND COMPLIANCE + NFS + OFF GAS

CATEGORY 13
RADIOCHEMICAL PLANT SAFETY

13-28170 ALSO IN CATEGORIES 17 AND 14
ALTERNATIVE IN REDUCING BUTTERMILK CREEK RADIOACTIVITY
NUCLEAR FUEL SERVICES, INC.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(39), PG 19 AND 20, (SEPT. 23, 1968), DOCKET NO. 50-201

(LETTER, SEPT. 9) DESCRIBES ALTERNATIVES - (1) PIPING WASTE DIRECTLY TO CATTARAUGUS CREEK
WOULD NOT MEET INTENT OF REDUCING DISCHARGE. (2) DEEP WELL DISPOSAL WOULD ALSO TAKE CARE OF
TRITIUM. A CONTRACTOR IS NOW INVESTIGATING. (3) SHALE FRACTURING DEMONSTRATION WELL WILL BE
COMPLETED BY ORNL AT NFS IN 1969. TIME SCHEDULE IS DIFFICULT TO PREDICT.

FUEL REPROCESSING + NFS + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, LIQUID

13-28171 ALSO IN CATEGORY 17
CONTAMINATION DUE TO POWER FAILURE AND LOOSE STOPPER
3M COMPANY, ST. PAUL, MINN.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 26, (SEPT. 23, 1968)

(LETTER TO COMPLIANCE AUG. 14) ON THE MORNING OF JULY 24, ALL HOOD FANS WERE NOT WORKING DUE
TO A POWER FAILURE DURING THE NIGHT. IN CHECKING MODULE 107N, A SMALL BRASS BOTTLE
CONTAINING 50 CURIES OF SR-90 WAS MOVED, AND ITS LOOSE TOP NOTED. HIS GLOVE AND SHOE COVERS
WERE CONTAMINATED, AND THE HOOD WAS CONTAMINATED TO 2R/HR. TWO EMPLOYEES DRESSED IN FULL
ANTI-C SUITS WITH RESPIRATORS SPENT 25 MIN CLEANING UP THE HOOD. A SAMPLER SHOWED THEY WERE
EXPOSED TO 14.1 MICROC/ML AIR, GIVING A TECHNICAL OVEREXPOSURE OF 14.7 MPC. URINALYSIS
SHOWED NEGATIVE RESULTS. NO CORRECTIVE ACTION IS CONTEMPLATED, ELECTRICAL FAILURES MUST BE
EXPECTED.

*CONTAMINATION + *FAILURE, SIMULTANEOUS + *STRONTIUM + ACCIDENT, LOSS OF POWER + AIRBORNE RELEASE +
FAILURE, OPERATOR ERROR + GLOVE BOX + INHALATION + PERSONNEL EXPOSURE, RADIATION +
PERSONNEL PROTECTIVE DEVICE + RADIOISOTOPE

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-03954 ALSO IN CATEGORY 15
MEREDITH JL + MALONEY JC (ARMY NUCLEAR DEFENSE LAB.) + BRADBURY HG + MILLER WR (GENERAL DYNAMICS)
COLD WEATHER DECONTAMINATION STUDY-MCCOY IV
ARMY NUCLEAR DEFENSE LAB., MARYLAND + GENERAL DYNAMICS, FORT WORTH, TEXAS
113 PAGES- APRIL 1964, NDL-TR-58(PT. I)

THE DECONTAMINATION BY VARIOUS METHODS OF LOSSE SNOW, FROZEN GROUND, THAWING GROUND AND DRY ASPHALT IS DESCRIBED.

*DECONTAMINATION + CIVIL DEFENSE + SNOW + SURFACE CONTAMINATION

14-24634 ALSO IN CATEGORIES 17 AND 13
INDUSTRIAL RADIOACTIVE WASTE BULLETINS
ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
6 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(16), PAGES 5-10 (APRIL 15, 1968)

(NO. 3, FEB. 28, 1968) - CORRECTS ERRONEOUS DATA IN PREVIOUS DATA BULLETIN. ON DEC. 16, 1967, THE CS-137/SR-90 CONCENTRATION (PCI/1) AT NFS OUTFALL WAS 160,000/86,900, AT BUTTERMILK CREEK, 6,600/4,010. RCSI QUESTIONS OFFICIAL VIEW THAT MEASUREMENTS COMPLY WITH LAW BECAUSE CATTARANGUS CREEK MEETS INDUSTRIAL EFFLUENT RADIOACTIVITY STANDARDS. *** (NO. 2, FEB. 24, 1968) - DISCUSSES EFFLUENT MEASUREMENT REPORTED OVER A PERIOD OF YEARS. ASSERTS THAT NFS SENDS SLUGS OF VERY HOT EFFLUENT INTO CREEK, AS ACTUAL MEASUREMENTS INDICATE DISCHARGE AT SEWER OUTLET WAS 30,000 TIMES PERMISSIBLE LIMIT. ASSERTS OFFICIAL SAMPLING IS NOT DONE AT THE PLACE WHERE LIMITS EXCEEDED.

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + *WASTE DISPOSAL, LIQUID + DILUTION + EFFLUENT + FUEL REPROCESSING + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + NFS

14-26618 ALSO IN CATEGORY 17
CLARIFICATION OF A-41 RELEASE CONCENTRATION
WASHINGTON STATE UNIVERSITY
1 PAGE, LETTER TO DRL, FROM LETTER TO DIR., DRL FROM HAROLD W. DODGEN. JUNE 14, 1968. DOCKET 50-27.

THE NOV. 14, 1966, SAFETY ANALYSIS (PG 46-50) CONCLUDED THAT CONTINUOUS RELEASE OF AR-41 AT 1.5 X 10(MINUS 5TH) MICROCURIE/CC WOULD NOT VIOLATE 10 CFR 20. WE REQUESTED AUTHORIZATION TO RELEASE AR -41 AT A CONCENTRATION THAT WOULD PRODUCE A YEARLY AVERAGE OF 1.5 X 10(MINUS 5TH) WHEN CONTROLLED AND KEPT TO A MINIMUM CONSISTENT WITH EXPERIMENTAL PROGRAMS. AS A RESULT OF AMENDMENT 3 (JULY 12, 1967), WE UNDERSTAND THAT WE ARE AUTHORIZED TO RELEASE AR-41 AT A YEARLY AVERAGE CONCENTRATION OF 1.5 X 10(MINUS 5TH) MICROCURIE/ML.

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

*ARGON + *MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *SOURCE, CONTINUOUS + POWER UPGRATING + REACTOR, RESEARCH + REPORT, SAR + STACK + TECHNICAL SPECIFICATIONS + TRIGA (RR)

14-26970
HABASHI F
RADIOACTIVITY IN PHOSPHATE ANIMAL FEED AND FERTILIZERS
MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY, BUTTE, MONT.
2 PAGES, 1 FIGURE, 1 TABLE, 12 REFERENCES, JOURNAL OF THE A.O.A.C. 49(5), PAGES 944-5 (1966)

COMMERCIAL DEFLUORINATED PHOSPHATE AND DICALCIUM PHOSPHATES MARKETING AS ANIMAL FEED CONTAIN 0.01-0.02 PER CENT URANIUM. IF AN ANIMAL IS FED 1 LB OF THIS MATERIAL, A DOSE OF ABOUT 0.17 MICROCURIE WILL BE GIVEN, WHICH IS ABOUT 20 TIMES THE MAXIMUM PERMISSIBLE LIMIT.

*BIOLOGICAL CONCENTRATION, ANIMAL FEED + *CALCIUM + *PHOSPHORUS + *URANIUM + MAXIMUM PERMISSIBLE DOSE (MPD) + RADIATION SAFETY AND CONTROL

14-26971
PARSONS PJ
INTERNATIONAL SYMPOSIUM ON THE DISPOSAL OF RADIOACTIVE WASTES INTO THE GROUND
LONDON UNIVERSITY
9 PAGES, 1 TABLE, 2 REFERENCES, NUCLEAR SAFETY 9(4), PAGES 313-21 (JULY-AUGUST 1968)

THE SYMPOSIUM WAS CONCERNED WITH ALL TYPES OF RADIOACTIVE-WASTE DISPOSAL AND STORAGE IN THE SOIL, INCLUDING THE RELEASE OF RADIOACTIVE EFFLUENTS INTO PITS OR PONDS. THE SHALLOW BURIAL OF SOLID OR SOLIDIFIED WASTES AND, FOR THE EXPLOITATION OF GEOLOGICAL FORMATIONS, THE DEEP INJECTION OF FLUID WASTES AND THE USE OF MINES. PAPERS ON HYDROLOGY AND GEOCHEMISTRY CONCERNING THE MINERAL REACTIONS AND MIGRATION RATES OF RADIONUCLIDES IN GROUNDWATER WERE ALSO INCLUDED IN THE CONTEXT OF SITE INVESTIGATION AND THE CHOICE OF SUITABLE AREAS FOR DISPOSAL GROUNDS.

*WASTE DISPOSAL, HYDRAULIC FRACTURING + *WASTE DISPOSAL, LIQUID + *WASTE DISPOSAL, SALT + *WASTE DISPOSAL, SOLID + *WASTE TREATMENT, GENERAL + AUSTRIA + CALCINATION + CONCRETE + GLASS +

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-26971 *CONTINUED*

ION EXCHANGE + POPULATION EXPOSURE + SOIL + SORPTION + WASTE DISPOSAL, GENERAL

14-27020

PURUSHOTHAMAN K + GLOYNA EF
RADIOACTIVITY TRANSPORT IN WATER
UNIVERSITY OF TEXAS

CRWR-21 + EHE-12-6701 +. 120 PAGES, FIGURES, TABLES, 85 REFERENCES, JANUARY, 1968

THE PURPOSE OF THIS STUDY WAS TO EVALUATE THE EFFECT OF INDUCED CLAY SUSPENSIONS ON THE TRANSPORT OF SR-85 AND CS-137 IN AN AQUEOUS ENVIRONMENT. AN INSTRUMENTED FLUME WAS USED AS A MODEL RIVER TO SIMULATE AN ENVIRONMENT TYPICAL OF A SLOW-MOVING, UNPOLLUTED, TURBID STREAM. MODIFIED LONGITUDINAL DISPERSION RELATIONSHIPS WERE USED TO DESCRIBE THE TRANSPORT OF RADIONUCLIDES IN TURBID STREAMS. DATA WERE DERIVED FROM INSTANTANEOUS RELEASE OF SR-85 AND CS-137 WITH SUSPENDED ATTAPULGITE AND KAOLINITE CLAYS. CONTINUOUS RELEASE OF CS-137 WITH AN ATTAPULGITE CLAY SUSPENSION HELPED TO ESTABLISH UPTAKE AND TRANSPORT CHARACTERISTICS FOR ONE ENVIRONMENTAL CONDITION. SUSPENDED CLAY IN THE MODEL RIVER SYSTEM PRODUCED A SIGNIFICANT REDUCTION IN THE TRANSPORT OF CS-137. CONVERSELY, THE TRANSPORT OF SR-85 WAS NOT AFFECTED APPRECIABLY SINCE MOST OF THE SR-85 REMAINED IN SOLUTION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CESIUM + *MODEL TESTING + *SEDIMENT + *STRONTIUM + *TRANSPORT PROPERTY + DISPERSION + ENVIRONMENTAL CONDITION + HYDROLOGICAL CONSIDERATION, GENERAL + SAMPLING + SOIL + SORPTION + WATER, GENERAL

14-27021

FENIMORE JW

TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C.

DP-MS-68-23 + CONF-680309-1 +. 25 PAGES, 14 FIGURES, 7 REFERENCES, MARCH, 1968

RADIOACTIVE WASTE MANAGEMENT IS A PROBLEM ASSOCIATED WITH THE PRODUCTION OF NUCLEAR MATERIALS AT THE SAVANNAH RIVER PLANT. GROUNDWATER FLOW IS IMPORTANT IN THE MANAGEMENT OF THREE CATEGORIES OF THIS WASTE - BURIED SOLID WASTE, LOW-LEVEL LIQUID WASTE DISCHARGED TO SEEPAGE BASINS, AND HIGH-LEVEL LIQUID WASTE STORED IN UNDERGROUND TANKS. TRITIUM TRACING METHODS ARE REPORTED FROM THE STANDPOINT OF STRATIGRAPHY, HYDROLOGY, FISSURES, ELEVATION, TYPE OF SOIL, ETC., WITH RESPECT TO EACH OF THE THREE CATEGORIES OF WASTE.

AVAILABILITY - J.W. FENIMORE, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

*HYDROLOGICAL CONSIDERATION, GENERAL + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *SURFACE WATER, TRACER + *TRITIUM + GEOLOGICAL CONSIDERATION, GENERAL + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + WASTE STORAGE

14-27023

COREY JC

CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S. C.

DP-MS-67-95 +. 23 PAGES, 7 FIGURES, 2 TABLES, 16 REFERENCES, PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL SURVEILLANCE IN THE VICINITY OF NUCLEAR FACILITIES, JANUARY 24-25, 1968, AUGUSTA, GEORGIA

TRITIATED WATER DEPOSITED ON THE SOIL RETURNS DIRECTLY TO THE ATMOSPHERE BY EVAPORATION FROM THE SOIL SURFACE AND BY TRANSPIRATION BY PLANTS. THE TIME FOR TRITIATED WATER TO EVAPORATE FROM A LOAMY SAND WAS MEASURED WHEN TRITIATED WATER WAS PLACED 0 TO 14, 14 TO 28, OR 28 TO 42 CM BELOW THE SURFACE AND FOR SOIL WATER CONTENTS OF 0.05 AND 0.10 G/G OF OVEN-DRY SOIL. THE EVAPORATION TIME INCREASED WITH THE DEPTH OF PLACEMENT AND WITH A DECREASE IN WATER CONTENT. TRITIATED WATER 14 TO 28 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 60 HR. TRITIATED WATER 28 TO 42 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 200 HR FROM SOIL WET TO 0.10 G/G OF OVEN-DRY SOIL, AND NOT BEFORE 300 HR FROM SOIL WET TO 0.05 G/G OF OVEN-DRY SOIL.

AVAILABILITY - J.C. COREY, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

*ECOLOGICAL CONSIDERATION + *EVAPORATION + *SOIL + *TRITIUM + DEPOSITION

14-27024

OVERMAN RF + COREY JC + HAWKINS RH

USE OF GAMMA-NEUTRON REACTION FOR DETERMINING D2O IN H2O AND IN TRACING SOIL MOISTURE
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

DP-MS-66-9 +. 12 PAGES, 10 FIGURES, PRESENTED AT THE 14TH ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, TORONTO, CANADA, JUNE 9-13, 1968

A NONDESTRUCTIVE METHOD WAS DEVELOPED FOR DETERMINING DEUTERIUM BY THE (GAMMA,N) REACTION. THE METHOD WAS USED TO DETERMINE THE D2O EXTRACTED FROM THE RIVER WATER IN THE FIRST STAGE OF THE HEAVY WATER PRODUCTION PROCESS, AND TO LOCATE D2O IN SOIL MOISTURE STUDIES. THE USE OF THIS REACTION IS NOT NEW. HOWEVER, ITS APPLICATION HAS BEEN LIMITED BECAUSE A SUITABLE GAMMA

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-27024 *CONTINUED*

SOURCE WAS NOT AVAILABLE. SUCH SOURCE SHOULD EMIT A CONSTANT FLUX FOR A LONG TIME. ONE GAMMA SOURCE WAS MADE BY IRRADIATING NA-28 TO GIVE NA-24.

AVAILABILITY - R.F. OVERMAN, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA 29801

*COUNTER + *DEUTERIUM + *GAMMA EMITTER + *NEUTRON + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *SURFACE WATER, TRACER + *TRACER, RADIOACTIVE + DIFFUSION + DISPERSION + HYDROLOGICAL CONSIDERATION, GENERAL + WATER VAPOR

14-27025

COREY JC + FENIMORE JW

TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL

SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S. C.

DP-MS-67-64 +. 13 PAGES, 4 FIGURES, 13 REFERENCES, PROPOSED FOR PUBLICATION IN INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES, APRIL, 1968

CHLORIDE IONS AND TRITIUM WERE COMPARED AS GROUNDWATER TRACERS FOR ACID SOILS CONTAINING KAOLINITIC CLAYS IN LABORATORY AND FIELD TESTS. THE BREAKTHROUGH FOR CHLORIDE WAS RETARDED MORE THAN THAT FOR TRITIUM, WHICH INDICATED THAT CHLORIDE IONS INTERACTED WITH THE ACID SOILS. THUS CHLORIDE AND OTHER NEGATIVELY CHARGED IONS HAVE LIMITED USEFULNESS AS WATER TRACERS IN ACID SOILS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*EXPERIMENT, GENERAL + *SURFACE WATER, TRACER + CHLORIDE + DISPERSION + ION EXCHANGE + SAVANNAH RIVER PLANT + SOIL, RADIONUCLIDE MOVEMENT THROUGH + TRITIUM

14-27074

FINEMAN P

PROGRESS IN WASTE-DISPOSAL RESEARCH AND DEVELOPMENT

10 PAGES, 5 FIGURES, 3 TABLES, 52 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 11(2), PAGES 107-116 (SPRING 1968)

AT PACIFIC NORTHWEST LABORATORY (PNL), A PROGRAM IS IN PROGRESS TO DEMONSTRATE ON AN ENGINEERING SCALE THE TECHNICAL, ECONOMIC, AND SAFETY ASPECTS OF VARIOUS SOLIDIFICATION PROCESSES FOR CONVERTING HIGH-LEVEL-ACTIVITY WASTES TO SOLID FORM. THREE PROCESSES HAVE BEEN SELECTED FOR TESTING IN A MULTIPURPOSE FACILITY KNOWN AS THE WASTE-SOLIDIFICATION ENGINEERING PROTOTYPES (WESP). THEY ARE (1) THE PNL SPRAY-SOLIDIFICATION PROCESS, (2) THE ORNL (OAK RIDGE NATIONAL LABORATORY) POT-CALCINATION AND RISING-LEVEL GLASS PROCESSES, AND (3) THE BNL (BROOKHAVEN NATIONAL LABORATORY) PHOSPHATE-GLASS PROCESS.

*WASTE DISPOSAL, ECONOMICS + *WASTE DISPOSAL, SALT + *WASTE DISPOSAL, SOLID + *WASTE TREATMENT, ECONOMICS + *WASTE TREATMENT, FIXATION + *WASTE TREATMENT, GAS + *WASTE TREATMENT, LIQUID + CALCINATION + GLASS + PHOSPHATE + WASTE STORAGE

14-27075

ALSO IN CATEGORY 15

AIR SAMPLING METHOD AND APPARATUS

UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

BELGIUM PATENT NO. 674,456 +. 10 PAGES, 2 FIGURES, DECEMBER 29, 1965, IN FRENCH

THE INVENTION RELATES TO AN IMPROVED METHOD AND APPARATUS FOR MEASURING AIRBORNE CONTAMINATION. A PIECE OF FILTER PAPER IS MOUNTED OVER AN APERTURE IN A DATA-PROCESSING CARD WHICH IS PRECODED WITH IDENTIFYING INFORMATION. THE CARD IS PLACED IN A HOLDER HAVING OPPOSED RESILIENT GRASPING MEMBERS FOR HOLDING THE FILTER PAPER TAUT WHILE AIR IS DRAWN THROUGH IT.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*DATA PROCESSING + *INSTRUMENTATION, RADIATION MONITORING + *PATENT + AIR + CONTAMINATION + FILTER + SAMPLING

14-27078

COREY JC + HORTON JH

MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH ACIDIC KAOLINITIC SOIL

SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA

DP-MS-67-55 +. 25 PAGES, 3 FIGURES, 2 TABLES, 45 REFERENCES, PRESENTED AT THE MEETING OF THE SOIL SCIENCE SOCIETY OF AMERICA, WASHINGTON, D.C. NOVEMBER 10, 1967

MISCIBLE DISPLACEMENT TECHNIQUES WERE USED TO COMPARE THE BEHAVIOR OF DEUTERIUM, TRITIUM, AND O-18 AS WATER TRACERS. DISPLACEMENT OF A 170-ML PORTION OF TRIPLY TAGGED WATER THROUGH A 186-CM-LONG COLUMN OF WATER-SATURATED ACIDIC KAOLINITIC SOIL BY DISTILLED WATER REVEALED NO DIFFERENCES IN THE RELATIVE RATES OF MOVEMENT OF DEUTERIUM-, TRITIUM-, AND O-18-TAGGED WATER.

AVAILABILITY - J.C. COREY + J.H. HORTON, SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA 29801

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-27078 *CONTINUED*

*DEUTERIUM + *HYDROLOGICAL CONSIDERATION, GENERAL + *ION EXCHANGE + *OXYGEN +
*SOIL, RADIONUCLIDE MOVEMENT THROUGH + *TRITIUM + DIFFUSION + TRACER, RADIOACTIVE

14-27080 ALSO IN CATEGORY 15

NEWTON D

A CASE OF ACCIDENTAL INHALATION OF PROTACTINIUM-231 AND ACTINIUM-227

UKAEA, BERKS HARWELL

7 PAGES, 3 FIGURES, 14 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 11-17 (JULY, 1968)

THE BEHAVIOUR OF ACCIDENTALLY INHALED PA-231 AND AC-227 WAS FOLLOWED OVER THE PERIOD 7-900 DAYS AFTER INTAKE, USING A SINGLE LARGE SODIUM IODIDE DETECTOR PLACED CLOSE TO THE CHEST. THE RESULTS COULD BE EXPLAINED BY A LONG-TERM CLEARANCE FROM THE THORAX INVOLVING BIOLOGICAL HALF-LIVES OF 1000 +/- 300 DAYS AND 300-400 DAYS RESPECTIVELY. THERE WAS NEGLIGIBLE MIGRATION OF AC-227 DAUGHTERS FROM THE CHEST.

*ACTINIUM + *DOSE MEASUREMENT, INTERNAL + *INHALATION + *PROTACTINIUM + ALPHA EMITTER + HAZARDS ANALYSIS +
RADIATION SAFETY AND CONTROL + UNITED KINGDOM

14-27081 ALSO IN CATEGORY 15

BUTLER FE

RAPID BIOASSAY METHODS FOR PLUTONIUM, NEPTUNIUM, AND URANIUM

SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA

7 PAGES, 3 FIGURES, 2 TABLES, 15 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 19-24 (JULY, 1968)

VERY SENSITIVE RAPID METHODS WERE DEVELOPED TO DETERMINE PLUTONIUM, NEPTUNIUM, AND ENRICHED URANIUM IN URINE. CHLORIDE COMPLEXES OF THE ACTINIDES ARE EXTRACTED FROM OXIDIZED URINE SALTS WITH THE LIQUID ION EXCHANGER TRI-ISOOCTYLAMINE (TIOA). THE ACTINIDES ARE BACK-EXTRACTED AND THEN COUNTED ON LOW-BACKGROUND SOLID-STATE COUNTERS.

*ANALYTICAL TECHNIQUE, URINE + *BIOLOGICAL CONCENTRATION, MAN + *NEPTUNIUM + *PLUTONIUM + *URANIUM +
CHEMICAL ANALYSIS + COUNTER + ION EXCHANGE

14-27082 ALSO IN CATEGORY 15

TAYLOR RW + BOULOGNE AR

RAPID SEPARATION OF STRONTIUM AND BARIUM

SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND CO., AIKEN, SOUTH CAROLINA

5 PAGES, 3 FIGURES, TABLE, 6 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 25-29 (JULY, 1968)

AN ANALYTICAL PROCEDURE IS DESCRIBED FOR THE RAPID DETERMINATION OF SR-89/90 IN THE PRESENCE OF BA/LA-140 AND OTHER FISSION PRODUCTS IN WASTE WATER FROM REACTOR ISOLATION BASINS, WHEN THE BA-140 CONCENTRATION IS GREATER THAN 25% OF THE SR-89/90 CONCENTRATION. THE METHOD COMBINES A RAPID INORGANIC ION EXCHANGE SEPARATION OF BARIUM FROM STRONTIUM WITH PRECIPITATION OF $\text{Sr}(\text{NO}_3)_2$ FROM FUMING NITRIC ACID INTO A 4-HR METHOD SUITABLE FOR PRE-RELEASE ANALYSIS OF WASTE WATER. DECONTAMINATION FACTORS FOR THE COMMON FISSION PRODUCTS ARE BETTER THAN 1000. THE RECOVERY OF ADDED STRONTIUM IS 85%, WITH A RELATIVE STANDARD DEVIATION OF +/- 7% AT THE 90% CONFIDENCE LEVEL.

*ANALYTICAL TECHNIQUE, WATER + *RADIATION SAFETY AND CONTROL + *REACTOR POWER + *WASTE TREATMENT, LIQUID +
DECONTAMINATION + ENVIRONMENTAL CONDITION + ION EXCHANGE + PRECIPITATION

14-27083 ALSO IN CATEGORY 15

PALMER BD + KURUDA PK

DISTRIBUTION OF STRONTIUM-90 AND CERIUM-144 IN THE STRATOSPHERE

DEPARTMENT OF CHEMISTRY, UNIVERSITY OF ARKANSAS, FAYETTEVILLE, ARKANSAS

6 PAGES, 5 FIGURES, TABLE, 3 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 31-36 (JULY, 1968)

DISTRIBUTION OF SR-90 AND CE-144 IN THE STRATOSPHERE WAS INVESTIGATED BY ANALYZING HIGH-ALTITUDE AIR FILTER SAMPLES COLLECTED IN 1962 AND 1963. THE HIGHEST CONCENTRATIONS OF SR (5.4 DIS/MIN/SCF) AND CE-144 (122 DIS/MIN/SCF) WERE OBSERVED IN APRIL 1963 AT 64-70 DEG N AND AT AN ALTITUDE OF 16.7 KM. THE CE-144/SR-90 RATIO IN THE NORTHERN STRATOSPHERE WAS FAIRLY CONSTANT (ABOUT 20, AS OF JANUARY 1963). THE DISTRIBUTION PATTERNS OF SR-90 AND CE-144 WERE QUITE DIFFERENT FROM THOSE OF MN-54 AND SB-124.

*AIRBURST + *CERIUM + *RADIOCHEMICAL ANALYSIS + *STRATOSPHERE + *STRONTIUM + AIR +
ATMOSPHERIC DIFFUSION, GLOBAL + FILTER + MONITOR, RADIATION, ENVIRONMENTAL + SAMPLING

14-27087 ALSO IN CATEGORY 15

EVANS AG + MARTER WL + REINIG WC

GUIDES LIMITING THE RELEASE OF RADIONUCLIDES BY THE SAVANNAH RIVER PLANT

SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA

9 PAGES, 6 TABLES, 14 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 57-65 (JULY, 1968)

THE SAVANNAH RIVER PLANT HAS DEVELOPED PLANT RELEASE GUIDES TO DEFINE THE AMOUNT OF VARIOUS RADIONUCLIDES THAT CAN BE RELEASED TO THE ENVIRONS IN AIR AND WATER. RELEASES ARE HELD TO

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-27087 *CONTINUED*

THE LOWEST PRACTICABLE LEVEL WITHIN PLANT OPERATING GUIDES BASED ON CAREFUL OPERATION AND ARE WELL BELOW THE RADIATION PROTECTION GUIDES RECOMMENDED BY THE FEDERAL RADIATION COUNCIL FOR NEIGHBORING POPULATIONS.

*MONITOR, RADIATION, ENVIRONMENTAL + *RADIOACTIVITY RELEASE + *SURVEILLANCE PROGRAM + FEDERAL RADIATION COUNCIL + POPULATION EXPOSURE + RADIATION SAFETY AND CONTROL + SAVANNAH RIVER PLANT

14-27293 ALSO IN CATEGORY 16

MELICK R + VAN MIDDLESWORTH L
RADIO-IODINE FALLOUT IN AUSTRALIAN SHEEP
UNIVERSITY OF MELBOURNE DEPARTMENT OF MEDICINE, THE ROYAL MELBOURNE HOSPITAL + DEPARTMENTS OF PHYSIOLOGY AND BIOPHYSICS, UNIVERSITY OF TENNESSEE, U.S.A.
3 PAGES, 2 FIGURES, 2 TABLES, 11 REFERENCES, THE MEDICAL JOURNAL OF AUSTRALIA, 2, PAGES 930-932 (NOVEMBER 12, 1966)

SINCE APRIL 1957, THE THYROID I-131 CONTENT OF VICTORIAN LAMBS HAS BEEN FOLLOWED. RESULTS UP TO AUGUST 1958 HAVE BEEN REPORTED PREVIOUSLY. THIS PAPER PRESENTS RESULTS UP TO JANUARY 1966. THE RADIOACTIVITY FOUND IN THYROIDS OF VICTORIAN SHEEP HAS BEEN VERY MUCH LESS THAN THAT FOUND IN THE NORTHERN HEMISPHERE, AND PRESENT FOR A MUCH SHORTER TIME.

*BIOLOGICAL CONCENTRATION, ANIMAL + *FISSION PRODUCT, IODINE + ATMOSPHERIC DIFFUSION, GLOBAL + AUSTRALIA + FALLOUT + NUCLEAR DETONATION

14-27451

COREY JC
EVALUATION OF DYES FOR TRACING WATER MOVEMENT IN ACID SOILS
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA
DP-MS-67-41 +. 3 FIGURES, 4 TABLES, 9 REFERENCES, APRIL 1967

THIS REPORT PRESENTS THE USE OF SUITABLE DYES TO STUDY FLOW LINES AROUND GRAVEL LENSES OF VARIOUS SIZES AND SHAPES TO DETERMINE THE INFLUENCE OF DEPTH OF GRAVEL LENS, SOIL TYPE, AND INFILTRATION RATE ON THE DIVERSION OF FLOW. THE INFORMATION WILL BE USED TO EVALUATE THE FEASIBILITY OF STORING SOLID RADIOACTIVE WASTE IN GRAVEL LENSES TO PREVENT LEACHING.

AVAILABILITY - J.C. COREY, SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA 29801

*SOIL, RADIONUCLIDE MOVEMENT THROUGH + *TRACER, FLUORESCENT + *WASTE DISPOSAL, SOLID + *WASTE STORAGE + FLOW DISTRIBUTION + MODEL TESTING + RATE + SOIL

14-27619

ALSO IN CATEGORIES 17 AND 15
WATER POLLUTION CONTROL--TECHNICAL TRAINING PROGRAM--BULLETIN OF COURSES
U.S. DEPARTMENT OF THE INTERIOR
66 PAGES, FROM CLEAN WATER, BULLETIN OF COURSES, JULY 1968 TO JUNE 1969

DESCRIBES 27 SHORT COURSES (1-2 WEEKS, GIVEN AT VARIOUS REGIONAL CENTERS IN 1968-69) IN THE GENERAL AREAS OF CHEMISTRY (4), MICROBIOLOGY (7), AND ENGINEERING AND WASTE TREATMENT (13). NONE SEEM SLANTED AT RADIATION OR AT POWER STATIONS, BUT SOME OF THE INTRODUCTORY BIOLOGY AND ECOLOGY COURSES SEEM GENERALLY APPLICABLE.

*ECOLOGICAL CONSIDERATION + *STAFFING, TRAINING, QUALIFICATION + *WASTE DISPOSAL, LIQUID + THERMAL POLLUTION

14-27855

ALSO IN CATEGORIES 17 AND 15
TRAINING COURSES - NATIONAL CENTER FOR RADIOLOGICAL HEALTH
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PHS-PUB-1633 REV. +. 33 PAGES, JULY 1968

SIXTY-SIX 1 OR 2 WEEK PRESENTATIONS AT VARIOUS REGIONAL CENTERS IN FY 1969 WILL BE MADE OF ONE OR MORE OF THE 16 COURSES AVAILABLE. AMONG THOSE OF INTEREST ARE - BASIC RADIOLOGICAL HEALTH, RADIOLOGICAL HEALTH FOR NURSES, TWO FOR X-RAY PROTECTION, OCCUPATIONAL RADIATION PROTECTION, REACTOR SAFETY AND HAZARDS EVALUATION, MANAGEMENT OF RADIATION ACCIDENTS, OPERATIONAL ASPECTS OF RADIATION ACCIDENTS, OPERATIONAL ASPECTS OF RADIATION SURVEILLANCE, MEASUREMENT OF AIRBORNE RADIOACTIVITY, CHEMICAL AND GAMMA SPECTROSCOPY ANALYSIS OF RADIONUCLIDES, AND RADIUM HAZARDS AND CONTROL.

AVAILABILITY - U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, CENTER FOR RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND

*HEALTH PHYSICS TRAINING + *STAFFING, TRAINING, QUALIFICATION + RADIATION INJURY, TREATMENT OF + RADIOLOGICAL ASSISTANCE + RADIUM + REACTOR, POWER + REACTOR, RESEARCH + SURVEY, RADIATION, ENVIRONMENTAL + X-RAY

14-27874

ALSO IN CATEGORY 16
HARDY EP + RIVERA J

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-27874 *CONTINUED*

FALLOUT PROGRAM. QUARTERLY SUMMARY REPORT, MARCH 1--JUNE 1, 1968 + APPENDIX TO FALLOUT PROGRAM QUARTERLY SUMMARY REPORT, MARCH 1, 1967--JUNE 1, 1968

U. S. ATOMIC ENERGY COMMISSION

HASL-197 + HASL-197(APP.) +. 832 PAGES, FIGURES, TABLES, REFERENCES, JULY 1, 1968

PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, THE UKAERE HEALTH PHYSICS AND MEDICAL DIVISION, EURATOM JOINT NUCLEAR RESEARCH CENTRE, THE NATIONAL RADIATION LABORATORY IN NEW ZEALAND, AND THE DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH AT ARGONNE NATIONAL LABORATORY. THIS REPORT IS DIVIDED INTO FOUR MAIN PARTS - (1) INTERPRETIVE REPORTS AND NOTES, (2) HASL FALLOUT PROGRAM DATA, (3) DATA FROM SOURCES OTHER THAN HASL, AND (4) RECENT PUBLICATIONS RELATED TO RADIONUCLIDE STUDIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*BIBLIOGRAPHY + *BIOLOGICAL CONCENTRATION, AGRICULTURAL PRODUCE + *BIOLOGICAL CONCENTRATION, MAN + *DOSE MEASUREMENT, INTERNAL + *FALLOUT + *MONITORING PROGRAM, ENVIRONMENTAL + *SAMPLING, HIGH ALTITUDE + NUCLEAR DETONATION + OCEAN AND SEA + RADIOCHEMICAL ANALYSIS

14-27914 ALSO IN CATEGORY 15

LACHAPPELLE DG + TARBOX JL + MALONEY JC + BRADBURY HG + GODBOLT NH + MILLER WH

A FIELD-EXPEDIENT INCINERATOR (PROJECT TEE PEE)

GENERAL DYNAMICS, FORT WORTH, TEXAS + ARMY NUCLEAR DEFENSE LAB

AD-664118 + NDL-TR-98 +. 132 PAGES, REFERENCES, JANUARY 1968

AN INCINERATOR FOR EXPEDIENT CONCENTRATION OF COMBUSTIBLE RADIOACTIVE WASTE HAS BEEN DESIGNED, BUILT, AND EVALUATED. IT FEATURES PORTABILITY AND EASE OF ASSEMBLY. THIS INCINERATOR (REFERRED TO AS TEE PEE) EMPLOYS FIVE OIL-FIRED BURNERS THAT IGNITE THE WASTE MATERIAL AND REDUCE THE PARTICULATE EMISSION. FOUR INCINERATIONS WERE CONDUCTED WITH ROUGH-CUT LUMBER CONTAMINATED LA-140. THE CONCLUSION BASED ON THESE RESULTS IS THAT THE TEE PEE IS A PRACTICAL DEVICE FOR EFFICIENT FIELD-EXPEDIENT INCINERATION AND CONCENTRATION OF COMBUSTIBLE RADIOACTIVE WASTE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*AIRBORNE RELEASE + *INCINERATION + *LANTHANUM + *WASTE TREATMENT, SOLID + CONCENTRATION, MAXIMUM + EFFLUENT + MAXIMUM PERMISSIBLE CONCENTRATION (MPC)

14-27918 ALSO IN CATEGORY 15

BURCH WD + AREHART TA

SAFETY REVIEW PROCEDURES FOR HOT-CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL

OAK RIDGE NATIONAL LABORATORY

ORNL-P-3227 + CONF-671102-3 +. 5 PAGES, 1 FIGURE, 1 TABLE, 3 REFERENCES, PAGES 187-191 OF SAFETY REVIEW PROCEDURES FOR HOT CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL, FOR PRESENTATION AT 15TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY AND ATOM FAIR, CHICAGO, ILLINOIS, 1966

RESPONSIBILITY FOR THE RADIATION SAFETY OF ALL HOT-CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL IS ASSIGNED TO THE DIRECTOR OF RADIATION SAFETY AND CONTROL, WHO, AIDED BY VARIOUS REVIEW AND ADVISORY COMMITTEES AS WELL AS A FULL-TIME STAFF OF THREE SENIOR EMPLOYEES, HAS ESTABLISHED UNIFORM POLICIES THROUGHOUT THE LABORATORY. ADEQUATE SAFETY REGULATIONS THUS ESTABLISHED HAVE BEEN MAINTAINED SUCH THAT NO RADIATION INCIDENTS OF ANY CONSEQUENCE HAVE OCCURRED WITHIN THE PAST SEVEN YEARS. THIS PAPER DESCRIBES THE ORGANIZATION RESPONSIBLE FOR RADIATION SAFETY AND ALSO DISCUSSES SOME OF THE ESTABLISHED STANDARDS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*OPERATION + *REACTOR POWER + DESIGN CRITERIA + HOT CELL + MONITOR, RADIATION, GENERAL + RADIATION SAFETY AND CONTROL + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + VENTILATION SYSTEM + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE STORAGE

14-27930

REICHERT SO

SOME GEOLOGICAL ASPECTS OF RADIOACTIVE WASTE MANAGEMENT

SAVANNAH RIVER LABORATORY

DP-MS-67-108 + CONF-680202-4 +. 28 PAGES, REFERENCES, DECEMBER 8, 1967, FROM 97TH ANNUAL MEETING OF THE AMERICAN INSTITUTE OF MINING, METALLURGICAL AND PETROLEUM ENGINEERS, NEW YORK

AT NUCLEAR FACILITIES, THREE TYPES OF RADIOACTIVE WASTE MUST BE MANAGED - (1) HIGH-LEVEL LIQUID WASTE CONTAINING FISSION PRODUCTS FROM THE CHEMICAL SEPARATION OF IRRADIATED URANIUM, (2) LOW-LEVEL CONDENSATES FROM THE CONCENTRATION OF THE HIGH-LEVEL WASTE, AND (3) DRY SOLIDS SUCH AS OBSOLETE PROCESS EQUIPMENT, SPENT ION EXCHANGE RESINS, AND IRRADIATED METAL SCRAP. WITHIN THE GENERAL AREA WHERE THE WASTE ORIGINATES, STUDIES ARE MADE TO LOCATE SEEPAGE BASINS AND BURIAL GROUNDS IN THE MOST FAVORABLE SITES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*GEOLOGICAL CONSIDERATION, GENERAL + *GROUND WATER, GENERAL + *SOIL, RADIONUCLIDE MOVEMENT THROUGH +

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-27930 *CONTINUED*

*WASTE MANAGEMENT + HYDROLOGICAL CONSIDERATION, GENERAL + ION EXCHANGE + RADIATION SAFETY AND CONTROL + SOIL + WASTE TREATMENT, ECONOMICS + WATER POLLUTION

14-28000

DE LAGUNA W

ISOTOPES IN HYDROLOGY. PROCEEDINGS OF A SYMPOSIUM VIENNA - BOOK REVIEW

OAK RIDGE NATIONAL LABORATORY

ORNL-P-3860 +. 5 PAGES, 1967

THE SYMPOSIUM PRECEEDINGS WERE COMPRISED OF 41 PAPERS COVERING THE TOPIC OF HYDROLOGY. THERE WERE 167 PARTICIPANTS FROM 36 COUNTRIES AND SEVEN INTERNATIONAL ORGANIZATIONS. THE PAPERS PRESENTED TOPICS SUCH AS HYDROMETEOROLOGY AND STEAM FLOW MEASUREMENTS, SEDIMENT STUDIES, GEOPHYSICS AND ENVIRONMENTAL STUDIES, AQUIFER CHARACTERISTICS, UNSATURATED ZONE, SEEPAGE AND TRACER TECHNOLOGY, AND SURFACE WATER, LIMNOLOGY, AND GLACIOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*GEOLOGICAL CONSIDERATION, GENERAL + *HYDROLOGICAL CONSIDERATION, GENERAL + *SURFACE WATER, GENERAL + *TRACER, GENERAL + *TRACER, RADIOACTIVE + AUSTRIA + ENVIRONMENTAL CONDITION + SEDIMENT

14-28005

BJERGE T

RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS

DANISH ATOMIC ENERGY COMMISSION, RISØ

RISO-M-735 +. 6 PAGES, 1 TABLE, APRIL 1968

THE HIGHLY RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS IS AT PRESENT IN GENERAL STORED IN LIQUID FORM IN STAINLESS-STEEL CONTAINERS. IT SEEMS POSSIBLE TO FURTHER CONCENTRATE THE WASTES BY SOLIDIFICATION IN THE FORM OF GLASS. EVEN WITH AN ATOMIC POWER PRODUCTION LEVEL MUCH IN EXCESS OF THE PRESENT TOTAL POWER PRODUCTION LEVEL, THE STORAGE FOR A THOUSAND YEARS OR MORE WILL NOT CONSTITUTE A SERIOUS SPACE-CONSUMING PROBLEM. THE QUESTIONS OF KRYPTON-85 AND TRITIUM ARE ALSO TOUCHED UPON. THESE DO NOT CONSTITUTE ANY SERIOUS PROBLEMS.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*KRYPTON + *SINTERING + *TRITIUM + *WASTE STORAGE + *WASTE TREATMENT, FIXATION + REACTOR POWER

14-28007

BROWN DJ + HANEY WA

THE ROLE OF GEOLOGY IN THE DISPOSAL OF RADIOACTIVE WASTES

BATTELLE-NORTHWEST, RICHLAND, WASHINGTON

BNWL-SA-57 +. 19 PAGES, 2 REFERENCES, FEBRUARY 28, 1965

THIS PAPER IS A SHORT DISCUSSION ON THE TYPES OF RADIOACTIVE WASTES GENERATED IN THE NUCLEAR INDUSTRY, AND THE KINDS OF GEOLOGIC FORMATIONS WHICH HAVE BEEN SUGGESTED AS POSSIBLE STRUCTURES SUITABLE FOR THE DISPOSAL OR STORAGE OF RADIOACTIVE WASTES. THE PURPOSE IS TO DESCRIBE THE ROLE WHICH GEOLOGY PLAYS IN THE EVALUATION OF DISPOSAL SITES PRIOR TO THEIR USE, AND HOW GEOLOGY IS UTILIZED IN THE INTERPRETATION OF MONITORING RESULTS AFTER THE DISPOSAL FACILITY IS PUT IN OPERATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*GEOLOGICAL CONSIDERATION, GENERAL + *HYDROLOGICAL CONSIDERATION, GENERAL + *SITING, GENERAL + *WASTE DISPOSAL, LIQUID + *WASTE STORAGE + FUEL REPROCESSING + INTEGRITY + ROCK MECHANICS + SOIL

14-28023

ALSO IN CATEGORY 16

CRAWFORD TO

THE LONG RANGE DIFFUSION OF THE EFFLUENT CLOUD FROM THE PHOEBUS 1B EP-IV REACTOR TEST OF FEBRUARY 23, 1967

UNIVERSITY OF CALIFORNIA, LIVERMORE

UCRL-50,418 +. 29 PAGES, 14 FIGURES, 4 TABLES, 20 REFERENCES, APRIL 1968

THIS REPORT DISCUSSES THE MOVEMENT AND DIFFUSION OF THE EFFLUENT CLOUD PRODUCED BY THE PHOEBUS 1B EP-IV EVENT OF FEBRUARY 23, 1967. THE CLOUD WAS TRACKED BY AIRCRAFT FOR ALMOST THREE DAYS, AND USEFUL CONCENTRATION MEASUREMENTS WERE OBTAINED FOR ALMOST TWO DAYS. PRE- AND POST-RUN CALCULATIONS WERE DONE WITH A COMPUTER CODE FOR LARGE CLOUD DIFFUSION USING CLIMATOLOGY AND OBSERVED METEOROLOGY RESPECTIVELY. CALCULATIONS OF CONCENTRATIONS AND CLOUD SIZE ARE COMPARED WITH THE AVAILABLE MEASUREMENTS. CALCULATIONS AGREE WELL WITH MEASUREMENT FOR THE FIRST FEW HOURS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*COMPUTER PROGRAM, METEOROLOGICAL + *METEOROLOGICAL SUPPORT + *NEVADA TEST SITE + *RADIOACTIVITY RELEASE + ATMOSPHERIC DIFFUSION + COMPARISON, THEORY AND EXPERIENCE + NUCLEAR ROCKET

CATEGORY 14
RADIONUCLIDE RELEASE AND MOVEMENT IN THE ENVIRONMENT

14-28048
AMES LL + HAJEK BF
STATISTICAL ANALYSIS OF CESIUM AND STRONTIUM SORPTION ON SOILS
BATTELLE-NORTHWEST, RICHLAND, WASH.
BNWL-CC-539 +. 11 PAGES, MARCH 8, 1966

A STATISTICAL DESIGN TO STUDY REMOVAL OF RADIOISOTOPES BY A SOIL WAS TESTED. A SIMPLE TWO-LEVEL FACTORIAL UTILIZING NaNO_3 , KNO_3 , HNO_3 AND $\text{Ca}(\text{NO}_3)_2$ AS INDEPENDENT VARIABLES YIELDED SATISFACTORY CESIUM AND STRONTIUM REMOVAL RESULTS. A REGRESSION EQUATION WAS USED TO PREDICT CESIUM AND STRONTIUM REMOVAL RESULTS, GIVEN THE LEVEL OF INDEPENDENT VARIABLES. THE RESULTS INDICATE THE STATISTICAL TREATMENT AND PREDICTION OF RADIOISOTOPE REMOVAL BY SOILS IS FEASIBLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CESIUM + *SOIL + *SORPTION + *STATISTICAL ANALYSIS + *STRONTIUM + RADIOISOTOPE

14-28170 ALSO IN CATEGORIES 17 AND 13
ALTERNATIVE IN REDUCING BUTTERMILK CREEK RADIOACTIVITY
NUCLEAR FUEL SERVICES, INC.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(39), PG 19 AND 20, (SEPT. 23, 1968), DOCKET NO. 50-201

(LETTER, SEPT. 9) DESCRIBES ALTERNATIVES - (1) PIPING WASTE DIRECTLY TO CATTARAUGUS CREEK WOULD NOT MEET INTENT OF REDUCING DISCHARGE. (2) DEEP WELL DISPOSAL WOULD ALSO TAKE CARE OF TRITIUM. A CONTRACTOR IS NOW INVESTIGATING. (3) SHALE FRACTURING DEMONSTRATION WELL WILL BE COMPLETED BY ORNL AT NFS IN 1969. TIME SCHEDULE IS DIFFICULT TO PREDICT.

FUEL REPROCESSING + NFS + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, LIQUID

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-03954 ALSO IN CATEGORY 14
MEREDITH JL + MALONEY JC (ARMY NUCLEAR DEFENSE LAB.) + BRADBURY HG + MILLER WR (GENERAL DYNAMICS)
COLD WEATHER DECONTAMINATION STUDY-MCCOY IV
ARMY NUCLEAR DEFENSE LAB., MARYLAND + GENERAL DYNAMICS, FORT WORTH, TEXAS
113 PAGES- APRIL 1964, NDL-TR-58(PT. I)

THE DECONTAMINATION BY VARIOUS METHODS OF LOSSE SNOW, FROZEN GROUND, THAWING GROUND AND DRY ASPHALT IS DESCRIBED.

*DECONTAMINATION + CIVIL DEFENSE + SNOW + SURFACE CONTAMINATION

15-25982 ALSO IN CATEGORY 17
GRENON M
LE TRAVAIL EN MILIEU HOSTILE
220 PAGES, 8 TABLES, 26 FIGURES, PUBLISHED BY PRESSES UNIVERSITAIRES DE FRANCE, 1968 (IN FRENCH)

(IN FRENCH) PAGES 1-146 DESCRIBE REMOTE MANIPULATIONS IN RADIOACTIVITY USAGE. PAGES 147-205 DESCRIBE UNDERWATER AND OUTER-SPACE USAGES. CHAPTERS DESCRIBE PRINCIPLES OF REMOTE MANIPULATION DEVICES (50 PG), REMOTE VIEWING TV AND SHIELD-WINDOWS (16 PG), FUEL-HANDLING AND REACTOR-REFUELING DEVICES (34 PG), AND REMOTE-CONTROL VEHICLES FOR NUCLEAR ACCIDENT RECOVERY. INCLUDES 21 PAGES ON SLI RECOVERY OPERATIONS.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS

*INCIDENT, RECOVERY FROM + *REMOTE MANIPULATING AND VIEWING + INCIDENT, SL 1 + REACTOR, POWER

15-26305 ALSO IN CATEGORY 17
RADIOGRAPHY EXPOSURE AT GREEN BAY X-RAY SERVICE INC.
GREEN BAY X-RAY SERVICE INC., HARBOR BEACH, MICHIGAN
3 PAGES, TWX TO AEC DIVISION OF COMPLIANCE FROM R.G. GALLAGHER, OCTOBER 9, 1967

REPORTS THAT A RADIOGRAPHER AND HIS ASSISTANT MAY HAVE RECEIVED A WHOLE-BODY DOSE OF 5 TO 20 R AND POSSIBLY UP TO 10,000 R TO THE HAND OF ONE MAN FROM AN UNRETRACTED 64-CURIE IRIIDIUM-192 SOURCE. DOSIMETERS OF BOTH INDIVIDUALS WERE OFF SCALE, INDICATING GREATER THAN 1-R EXPOSURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26306 ALSO IN CATEGORY 17
COBALT 60 RADIOGRAPHY SOURCE DROPPED INTO GULF OF MEXICO
GLOBAL X-RAY AND TESTING CORPORATION
1 PAGE, TWX TO AEC DIVISION OF COMPLIANCE FROM I. ST ROMAIN, JUNE, 1966

GLOBAL X-RAY AND TESTING CO. REPORTS THAT A 7.8-CURIE CO-60 SOURCE WAS DROPPED INTO THE GULF OF MEXICO 50 MILES SOUTH OF IFFSVIIIF, LA. DEPTH OF WATER WAS 150 FT. AN UNSUCCESSFUL ATTEMPT WAS MADE TO RETRIEVE THE SOURCE WITH A LARGE MAGNET. THE CRANK AND SOURCE TUBE HAD BEEN REMOVED FOR TRANSFER TO A NEW LOCATION. WHEN RADIOGRAPHER WAS READY FOR NEXT EXPOSURE, HE NOTICED PIGTAIL WAS GONE. DOSE WAS 10 MR FOR 3 DAYS WORK.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + OCEAN AND SEA

15-26307 ALSO IN CATEGORY 17
RADIOGRAPHY EXPOSURE AT AVONDALE SHIPYARDS INC.
AVONDALE SHIPYARDS
1 PAGES, TWX TO AEC DIVISION OF COMPLIANCE FROM J.K. MCCUE, APRIL 7, 1967

RADIOGRAPHER RECEIVED ESTIMATED EXPOSURE OF 6 REMS WHEN AN IRIIDIUM SOURCE STUCK IN THE CABLE. DOSIMETER DID NOT INDICATE A DOSE. TWO FILM BADGES ARE TO BE PROCESSED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, EQUIPMENT + INCIDENT, NONREACTOR

15-26308 ALSO IN CATEGORY 17
OVEREXPOSURE TO RADIOGRAPHER
GENERAL DYNAMICS CORP., GROTON, CONNECTICUT
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(9), PAGE 27 (FEBRUARY 26, 1968)

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26308 *CONTINUED*

A RADIOGRAPHER RECEIVED A CALCULATED DOSE OF 14.5 REMS GAMMA WHILE PERFORMING OPERATIONS WITH A 96-CURIE IR-192 SOURCE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + RADIOGRAPHY

15-26309 ALSO IN CATEGORY 17

ONEIL RW

FAILURE TO SURVEY RESULTS IN OVEREXPOSURES TO RADIOGRAPHERS

BOSTON NAVAL SHIPYARD, BOSTON, MASSACHUSETTS

2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(9), PAGES 27-28 (FEBRUARY 26, 1968)

A RADIOGRAPHER AND 2 ASSISTANTS WERE EXPOSED TO A 7.2-CURIE SOURCE WHEN IT FAILED TO RETURN TO ITS SHIELD AND A SURVEY WAS NOT MADE. TWO MEN RECEIVED THEIR DOSE WHILE PERFORMING RADIOGRAPHY, THE THIRD WHILE RETURNING THE TUBE, WHICH CONTAINED THE UNSHIELDED SOURCE, TO STORAGE. INCIDENT DISCOVERED WHEN ANOTHER RADIOGRAPHER SURVEYED THE STORAGE ROOM. ESTIMATED EXPOSURES ARE 2.2 REMS, 800 MILLIREMS, AND A POSSIBLE MAXIMUM OF 230 REMS TO THE THIRD MAN.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + INCIDENT, NONREACTOR

15-26310 ALSO IN CATEGORIES 11 AND 17

U.S. TESTING CO. CITED FOR NON-COMPLIANCE IN RADIOGRAPHY OPERATIONS

UNITED STATES ATOMIC ENERGY COMMISSION

4 PAGES, LETTER TO U.S. TESTING CO. FROM E.R. PRICE, NOVEMBER 10, 1965

NONCOMPLIANCE ITEMS INCLUDE PERSONNEL FAILING TO WEAR DOSIMETERS AND BADGES, INADEQUATE PERSONNEL MONITORING RECORDS, PERFORMING RADIOGRAPHY WITHOUT OPERABLE SURVEY INSTRUMENTS, UNQUALIFIED PERSONNEL ACTING AS RADIOGRAPHERS, ASSISTANTS HAD NOT RECEIVED COPIES OF OPERATING AND EMERGENCY PROCEDURES, SURVEILLANCE INADEQUATE TO PREVENT UNAUTHORIZED ENTRY INTO HIGH RADIATION AREAS, SURVEY INSTRUMENTS WERE NOT CALIBRATED EVERY 3 MONTHS, IMPROPER UTILIZATION LOOP, AND COMPANY FAILURE TO REPORT AN EMPLOYEE OVEREXPOSURE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, OPERATOR ERROR + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY

15-26311 ALSO IN CATEGORY 17

OVEREXPOSURE TO FILM BADGE WHILE CALIBRATING INSTRUMENTS

U.S. ARMY, FORT MCPHERSON

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM G.L. GALLIER, MARCH 25, 1965

A FILM-BADGE REPORT INDICATED AN EXPOSURE OF 41 REMS (BETA). INVESTIGATION REVEALED THAT EXPOSURE WAS TO FILM BADGE ONLY AND OCCURRED EITHER WHEN OPERATOR PERFORMING INSTRUMENT CALIBRATION LEFT HIS BADGE ON THE TABLE NEXT TO THE SOURCE FOR AN INDEFINITE TIME, OR WHEN HE LEANED OVER THE CALIBRATOR WHILE ITS PORT WAS OPEN AND THE BADGE WAS ON HIS BELT OVER THE FRONT OF THE RIGHT HIP.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *INSTRUMENTATION CALIBRATION + *MONITOR, RADIATION, PERSONNEL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY

15-26312 ALSO IN CATEGORY 17

AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS

UNITED STATES ATOMIC ENERGY COMMISSION

2 PAGES, LETTER TO FOSTER WHEELER CORPORATION FROM E.R. PRICE, NOVEMBER 6, 1963

AN AEC INSPECTION ON AUGUST 29, 1963, RESULTED IN A CITATION FOR (1) PERMITTING EMPLOYEES TO PERFORM RADIOGRAPHY BEFORE COMPLETING THE TRAINING COURSE, (2) FAILING TO INCLUDE IN REPORTS OF RADIATION EXPOSURE TO FORMER EMPLOYEES THE STATEMENTS THAT THE REPORT WAS FURNISHED UNDER PROVISIONS OF AEC REGULATIONS AND SHOULD BE PRESERVED FOR FUTURE REFERENCE, AND (3) FAILING TO LABEL A SOURCE CONTAINER.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + RADIATION SAFETY AND CONTROL + SOURCE, RADIATION + STAFFING, TRAINING, QUALIFICATION

15-26314 ALSO IN CATEGORY 17

CITATION FOR NONCOMPLIANCE TO RADIOGRAPHY REGULATIONS

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26314 *CONTINUED*

UNITED STATES ATOMIC ENERGY COMMISSION

3 PAGES, LETTER TO RADIOLOGICAL TESTING LAB FROM L.D. LOW, MARCH 6, 1968

AEC CITED COMPANY FOR FAILING TO (1) SURVEY UNRESTRICTED AREAS, (2) MAINTAIN RECORDS OF SURVEYS, (3) POST RADIATION AREAS, (4) PERFORM ADEQUATE SURVEYS AFTER EXPOSURES, (5) DIRECTLY SURVEY TO PROTECT AGAINST UNAUTHORIZED ENTRY DURING OPERATIONS, (6) PREVENT UNAUTHORIZED PERSONNEL FROM PERFORMING RADIOGRAPHY, AND (7) POST THE VEHICLE USED FOR TRANSPORTING SOURCE AND EXPOSURE DEVICE. AEC STATED THAT IMPROVEMENTS WERE NEEDED IN MANAGEMENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + SOURCE, RADIATION

15-26315 ALSO IN CATEGORY 17

RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM

PARKER INDUSTRIAL X-RAY CORP., NEW HAVEN, CONNECTICUT

1 PAGE, LETTER TO AEC DIVISION STATE AND LICENSEE RELATIONS FROM P.J. ROSENBAUM, NOVEMBER 30, 1964

COMPANY RESPONSE TO AEC CITATION IS THAT THE AREA MONITOR FOR THE RADIOGRAPHY ROOM HAS BEEN REPAIRED. COMPANY DISAGREES WITH AEC RECOMMENDATION FOR CALIBRATION OF THE SURVEY METER AND REQUESTS AEC TO INDICATE IF THE CALIBRATION POINTS ARE SUGGESTED OR MANDATORY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL PROTECTIVE DEVICE + *RADIOGRAPHY + INSPECTION AND COMPLIANCE + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, RADIATION MONITORING

15-26316 ALSO IN CATEGORY 17

RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

1 PAGE, LETTER TO PARKER INDUSTRIAL X-RAY LABORATORY FROM E.R. PRICE, JANUARY 4, 1965

AEC AGAIN REQUESTS THAT COMPANY SPECIFY STEPS TAKEN TO ENSURE THAT RADIOGRAPHY WILL BE CONDUCTED IN ROOM ONLY WHEN IT IS EQUIPPED WITH AN OPERABLE CONTROL DEVICE. ALSO, THE SURVEY INSTRUMENT SHOULD BE CALIBRATED BY CHECKING AT LEAST TWO POINTS ON THE SCALE. THIS WILL BE A REQUIREMENT WHEN THE LICENSE IS RENEWED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSTRUMENTATION CALIBRATION + *INSTRUMENTATION, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + INSPECTION AND COMPLIANCE + RADIOGRAPHY

15-26317 ALSO IN CATEGORY 17

RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM

PARKER INDUSTRIAL X-RAY, NEW HAVEN, CONNECTICUT

1 PAGE, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM P.J. ROSENBAUM, JANUARY 11, 1965

COMPANY RESPONSE TO AEC CITATION FOR LACK OF OPERABLE RADIATION CONTROL DEVICE IN RADIOGRAPHY ROOM STATED THAT (1) DOOR TO ROOM IS EQUIPPED WITH A BAR ACROSS IT TO PREVENT ACCIDENTAL ACCESS, (2) AN AREA MONITOR MONITORS THE RADIATION LEVEL NEAR THE ENTRANCE TO THE ROOM WHENEVER RADIOGRAPHY IS PERFORMED IN THE ROOM, AND (3) IF THE BELL FAILS TO RETURN TO THE POT WHEN THE SAFE LIGHT FLASHES, THE AREA MONITOR WOULD INDICATE THIS FACT WHEN THE DOOR IS OPENED. THE MONITOR IS CONSIDERED AS A CONTROL.

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*INSTRUMENTATION, RADIATION MONITORING + INSPECTION AND COMPLIANCE + PERSONNEL PROTECTIVE DEVICE + RADIOGRAPHY

15-26318 ALSO IN CATEGORY 17

RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

2 PAGES, LETTER TO PARKER INDUSTRIAL X-RAY LABORATORY FROM E.R. PRICE, MARCH 23, 1965

CLARIFIES STATEMENTS MADE BY COMPANY CONCERNING THE CONTROL DEVICE (AREA MONITOR). REGULATIONS STATE THAT THE DEVICE SHALL EITHER CAUSE THE RADIATION LEVEL TO BE REDUCED WHEN AREA ENTRY OCCURS OR SHALL ENERGIZE A CONSPICUOUS OR AUDIBLE ALARM SUCH THAT THE INDIVIDUAL ENTERING AND THE LICENSEE ARE MADE AWARE OF THE ENTRY. COMPANY CONSIDERS THE AREA MONITOR AS A CONTROL, AND IT WAS REPAIRED AND OPERATING WITHIN A WEEK AFTER INSPECTION FOUND IT INOPERATIVE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSPECTION AND COMPLIANCE + *INSTRUMENTATION, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + MONITOR, RADIATION, AREA + RADIOGRAPHY

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26319 ALSO IN CATEGORY 17
OVEREXPOSURE TO RADIOGRAPHER - SOURCE NOT CONNECTED TO CABLE
GENERAL DYNAMICS CORP., CONVAIR
2 PAGES, MEMORANDA ON OVEREXPOSURE, AUGUST 7, 1964.

ON AUGUST 6, 1964, RADIOGRAPHER RECEIVED A DOSE OF 3.8 REMS. AFTER AN EXPOSURE, THE SOURCE WAS RETRACTED, BUT THE LIGHT INDICATING THAT THE SOURCE WAS SAFELY STORED WAS NOT RECEIVED. THE EXPOSURE DEVICE WAS OUTSIDE A TANK, WHILE THE SOURCE TUBE WAS INSIDE. WHEN THE RADIOGRAPHER FOUND HIS DOSIMETER WAS OFF SCALE, IT WAS DISCOVERED THAT THE SOURCE WAS NOT ATTACHED TO THE OPERATING CABLE. CORRECTIVE ACTION INCLUDED 3 DAYS SUSPENSION WITHOUT PAY AND A REVIEW OF THE INCIDENT AND CORRECT PROCEDURES WITH ALL RADIOGRAPHERS.

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*FAILURE, OPERATOR ERROR + INCIDENT, NONREACTOR + PERSONNEL EXPOSURE, RADIATION + RADIOGRAPHY + SOURCE, RADIATION

15-26320 ALSO IN CATEGORY 17
OVEREXPOSURE TO RADIOGRAPHERS
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
1 PAGE, TEX TO AEC DIVISION OF COMPLIANCE REGION IV FROM N.C. CHEATHAM, MAY 26, 1966

A MONTHLY DOSIMETRY REPORT SHOWED THAT EXPOSURES TO TWO INDIVIDUALS WERE 42 AND 3.5 REMS, APPARENTLY TO COLLIMATED BEAMS. A INVESTIGATION IS UNDERWAY.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR

15-26321 ALSO IN CATEGORY 17
AEC CITATION FOR NONCOMPLIANCE WITH RADIOGRAPHY PROCEDURES
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
2 PAGES, LETTER TO GLOBAL X-RAY AND TESTING CORP. FROM E.R. PRICE, DECEMBER 1, 1965

AN AEC INSPECTION IN OCTOBER 1965 RESULTED IN CITATION FOR (1) POSSESSING A SOURCE NOT AUTHORIZED BY LICENSE AND (2) USING A SOURCE IN ANCHORAGE, ALASKA, CONTRARY TO LICENSE.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + SOURCE, RADIATION

15-26325 ALSO IN CATEGORY 17
CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
2 PAGES, LETTER TO PIPEWELD X-RAY CORPORATION FROM E.R. PRICE, JANUARY 28, 1965

AEC INSPECTIONS RESULTED IN CITATIONS FOR (1) NOT PROVIDING RADIOGRAPHERS WITH COPIES OF AEC LICENSE, (2) ALLOWING OPERATIONS BY 3 RADIOGRAPHERS WHO WERE UNABLE TO READ A SURVEY METER CORRECTLY, (3) FAILURE OF RADIOGRAPHERS TO PERFORM RADIATION SURVEY AFTER EXPOSURES, AND (4) EMPLOYEES NOT KNOWING AEC REGULATIONS.

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*INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + STAFFING, TRAINING, QUALIFICATION

15-26326 ALSO IN CATEGORY 17
RADIOGRAPHY EXPOSURE AT GENERAL DYNAMICS CORP.
GENERAL DYNAMICS CORP., GROTON, CONNECTICUT
3 PAGES, LETTER TO AEC DIVISION OF LICENSES FROM W. GORVINE, APRIL 4, 1967

A RADIOGRAPHER RECEIVED A DOSE OF 3.51 REMS WHEN THE SOURCE WAS NOT FULLY RETRACTED INTO ITS SHIELD. BOTH THE RADIOGRAPHER AND ASSISTANT STATED THAT THE STORED LIGHT WAS ON, INDICATING RETRACTION. A SURVEY WAS MADE FROM THE REAR AND SIDE BUT NOT IN FRONT OF THE DEVICE. THE DEVICE WAS LOCKED AND MOVED TO A NEW POSITION. A SECOND ASSISTANT DISCOVERED THE CONDITION WHEN HE NOTED THAT HIS SURVEY METER WAS READING 5 MR/HR.

USACC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26328 ALSO IN CATEGORY 17
AEC CITATION FOR NONCOMPLIANCE WITH RADIOGRAPHY REGULATIONS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
4 PAGES, LETTER TO SARNIA INSPECTION COMPANY, LTD. FROM E.R. PRICE, OCTOBER 1, 1965

AN INSPECTION IN JUNE 1965 RESULTED IN CITATIONS FOR FAILING TO (1) LIMIT RADIATION LEVEL AT SURFACE OF SOURCE DEVICE, (2) SURVEY AFTER EXPOSURES, (3) POST RADIATION AREAS, (4) MAINTAIN UTILIZATION LOGS, (5) MAINTAIN RECORDS OF RECEIPT AND TRANSFER OF BYPRODUCT MATERIAL, (6) RECORD DOSIMETER DOSES, (7) PERFORM QUARTERLY INVENTORIES OF BY-PRODUCT MATERIAL, (8) PERFORM INSTRUMENT CALIBRATIONS, (9) PERFORM LEAK TESTS, (10) KEEP PERSONNEL-MONITORING RECORDS, (11) KEEP RECORDS OF SURVEYS CONDUCTED AT SITE, AND (12) KEEP RECORDS OF PERSONNEL TRAINING.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + RADIATION SAFETY AND CONTROL

15-26329 ALSO IN CATEGORY 17
FAILURE TO USE SURVEY METER RESULTS IN OVEREXPOSURE TO RADIOGRAPHER
SCOPE INSPECTION CO., INC., HOUSTON, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM D. THOMAS, MAY 11, 1967

ON APRIL 23, 1967, RADIOGRAPHER RECEIVED A WHOLE-BODY DOSE OF 6.1 REMS AND A CALCULATED DOSE OF 162 REMS TO THE LEFT HAND. SOURCE FAILED TO RETURN TO CAMERA, AND RADIOGRAPHER DID NOT USE SURVEY METER. WHEN FILM WAS PROCESSED, HE BECAME AWARE THAT THE SOURCE WAS STILL IN THE SNORKEL. HE GOT SURVEY METER, CUT PLASTIC SNORKEL, AND REPLACED THE SOURCE IN THE CAMERA.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26330 ALSO IN CATEGORY 17
OVEREXPOSURE TO SUPERVISORS DURING RECOVERY OF EXPOSED SOURCE
U.S. NAVY, PORTSMOUTH NAVAL SHIPYARD, PORTSMOUTH, NEW HAMPSHIRE
3 PAGES, LETTER TO DIVISION OF MATERIALS LICENSING FROM W.C. HUSHING, FEBRUARY 10, 1965

AT 3 AM ON JANUARY 13, 1965, A RADIOGRAPHER NOTIFIED HIS SUPERVISOR OF DIFFICULTIES IN RETRACTING A 108-CURIE SOURCE. THE SUPERVISOR AND ASSOCIATE SUPERVISOR RECEIVED OVEREXPOSURES RETURNING THE SOURCE TO THE PROJECTOR (FAILED TO SURVEY THE AREA PROPERLY). ALSO, THE SUPERVISOR TOOK OFF HIS JACKET CONTAINING HIS FILM BADGE DURING THE OPERATION. DOSES WERE 3 AND 3.124 REMS. HAND EXPOSURE WAS ESTIMATED AT 6 REMS. CAUSE OF INCIDENT - RADIOGRAPHER FAILED TO CONNECT THE SOURCE TUBE TO THE PROJECTOR.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM

15-26332 ALSO IN CATEGORY 17
RUST INHIBITOR CAUSES OVEREXPOSURE
U.S. ARMY, U.S. ARMY NUCLEAR DEFENSE LABORATORY, EDGEWOOD ARSENAL, MARYLAND
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM E.G. WRIGHT, MAY 29, 1967

DURING A REMOTE HYDRAULIC TRANSFER OF A 700-CURIE CO-60 SOURCE THROUGH TUBING, IT STUCK BECAUSE OF BUILDUP OF DECOMPOSED RUST INHIBITOR ON THE SOURCE. THE RADIATION-AREA SUPERVISOR RECEIVED A DOSE IN EXCESS OF 5 R RETURNING THE SOURCE TO THE SHIELD. HE WAS NOT AWARE OF THE CORRECT OPERATING PROCEDURES FOR THE SURVEY METER AND FAILED TO NOTE THAT BATTERIES WERE LOW, RESULTING IN A DECEPTIVELY LOW READING. THE USE OF THE RUST INHIBITOR WAS DISCONTINUED AND ADDITIONAL TRAINING GIVEN TO OPERATIONAL PERSONNEL.

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*FAILURE, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + *REMOTE MANIPULATING AND VIEWING + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26333 ALSO IN CATEGORY 17
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
NATIONAL TANK COMPANY, TULSA, OKLAHOMA
2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM F.L. SILVERS, JUNE 12, 1967

ON MARCH 12, 1967, A RADIOGRAPHER RECEIVED A DOSE OF 4550 MR (APPARENTLY FAILED TO SURVEY AND SOURCE DID NOT RETRACT). COMPANY RESPONSE TO AEC CITATION - (1) CALIBRATED AND OPERABLE SURVEY INSTRUMENTS WILL BE AVAILABLE AND USED AFTER EACH EXPOSURE, (2) APOLOGIZED FOR NOT INCLUDING EXPOSURE INFORMATION IN PREVIOUS LETTER, (3) LOG SHEET IMPROVED, (4) RADIOGRAPHERS.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26333 *CONTINUED*

INSTRUCTED TO MAKE SURVEYS AT BEGINNING AND END OF EACH SHIFT (IN ADDITION TO OTHER SURVEYS REQUIRED BY PROCEDURES), AND (5) A NEW SURVEY INSTRUMENT WITH AUDIBLE-SIGNAL ATTACHMENT WAS PURCHASED.

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*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR +
INSPECTION AND COMPLIANCE + RADIOGRAPHY + SOURCE, RADIATION

15-26336

ALSO IN CATEGORY 17

RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES

SINCO TESTING INC., PORT HURON, MICHIGAN

6 PAGES, LETTER TO AEC, WASHINGTON, D. C., OCTOBER 17, 1966

ON SEPT. 26, 1966, AEC CITED COMPANY FOR 33 DEFICIENCIES. COMPANY RESPONSE - (1) RECORDS NOW ARE ON FILE FOR INSTRUMENT CALIBRATIONS, QUALIFICATION RECORDS OF RADIOGRAPHERS, AND SOURCE LEAK TESTS, (2) STORAGE OF SOURCE IN UNLOCKED CAMERA OCCURRED BECAUSE OF SHORTAGE OF STORAGE CONTAINERS (THE SOURCE HAD DECAYED AND WAS READY TO BE SHIPPED TO SUPPLIER, AND THE LOCK WAS BEING REPAIRED), (3) RADIOGRAPHERS HAVE BEEN INSTRUCTED TO RECHARGE DOSIMETERS DAILY, AND (4) UNPOSTED AREAS HAVE BEEN POSTED.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + MONITOR, RADIATION, PERSONNEL +
RADIOGRAPHY + SOURCE, RADIATION + STORAGE CONTAINER

15-26337

ALSO IN CATEGORY 17

RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES

SCOPE INSPECTION CO., INC., HOUSTON, TEXAS

4 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM D. THOMAS, AUGUST 2, 1967

ON APRIL 27, 1967, RADIOGRAPHER RECEIVED A DOSE OF 6.1 REMS WHILE RETURNING A SOURCE TO SAFE WHICH HAD STUCK IN SNORKEL TUBE. COMPANY RESPONDED TO CITATION THAT (1) ALL EMPLOYEES HAD BEEN NOTIFIED OF INCIDENT AND THAT THE INDIVIDUAL HAD BEEN DISCHARGED (WHICH DID MORE GOOD THAN A WEEK OF LECTURES), (2) RETRAINING OF ALL RADIOGRAPHERS STARTED, (3) IF UNAUTHORIZED PERSONS VISIT EXPOSURE AREAS, RADIOGRAPHY WILL CEASE, (4) WEEKLY UNANNOUNCED INSPECTION AT ALL OF JOB SITES ARE NOW BEING MADE.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION +
FAILURE, OPERATOR ERROR + RADIOGRAPHY

15-26338

ALSO IN CATEGORY 17

RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES

SARNIA INSPECTION COMPANY, SARNIA, ONTARIO

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM T. ARNESEN, OCTOBER 26, 1965

AN AEC INVESTIGATION IN JUNE 1965, AND A CITATION FOR DEFICIENCIES, RESULTED IN COMPANY RESPONDING THAT (1) CRACKS SEEMINGLY DEVELOP OVERNIGHT IN THE LEAD-SHIELDED CAMERAS, RESULTING IN DOSE RATES IN EXCESS OF 50 MR/HR (ALL CAMERAS WILL BE REPLACED WITH THOSE USING DEPLETED URANIUM), (2) OPERATORS HAVE BEEN INSTRUCTED TO USE SURVEY METERS AFTER EXPOSURES, (3) SIGNS WILL BE POSTED DURING EXPOSURES. RECORD-KEEPING DEFICIENCIES AT THE ORANGE, TEXAS, OFFICE HAVE BEEN CORRECTED.

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*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR +
*INSPECTION AND COMPLIANCE + *STORAGE CONTAINER + RADIOGRAPHY + SOURCE, RADIATION

15-26340

ALSO IN CATEGORY 17

RADIATION EXPOSURE TO EXPERIENCED RADIOGRAPHERS

U.S. NAVY, PUGET SOUND NAVAL SHIPYARD, BREMERTON, WASHINGTON

4 PAGES, MEMORANDUM OF RADIATION EXPOSURE INCIDENT, SEPTEMBER 6, 1967

RADIOGRAPHER B, WITH 5 YEARS EXPERIENCE, ASSUMED THAT SOURCE HAD BEEN RETRACTED WHEN CRANKING BECAME DIFFICULT. ACTUALLY, MORE EFFORT WAS NEEDED ON LAST TURN TO RETRACT SOURCE AROUND AN S CURVE IN SHIELD. RADIOGRAPHER A, WITH 10 YEARS EXPERIENCE, SURVEYED FROM REAR AND OBTAINED NORMAL READINGS SINCE SOURCE WAS SHIELDED BY CAMERA. NEITHER OBSERVED THAT STORAGE LIGHT WAS NOT INDICATING THAT SOURCE HAD BEEN RETRACTED. RADIOGRAPHER A RECEIVED A DOSE OF 3500 MR, AND B 290 MR.

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*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + RADIOGRAPHY

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26342 ALSO IN CATEGORY 17
RESPONSE TO AEC CITATION FOR INFRACTION OF SOURCE-HANDLING PROCEDURES
ATOMIC ENERGY OF CANADA LTD., OTTAWA, CANADA
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM G.E. MCCULLUM, JUNE 16, 1966

COMPANY RESPONSE INCLUDED - (1) WORKERS DID NOT WEAR DOSIMETERS BECAUSE THEY WERE UNABLE TO ZERO THEM AFTER THE CHARGER WAS DAMAGED. IN FUTURE FIELD TRIPS, EACH PERSON WILL HAND CARRY A CHARGER. (2) ALL FIELD PERSONNEL ARE NOW EQUIPPED WITH AN AUDIBLE PERSONNEL MONITOR AND FILM BADGES FOR HEAD MONITORING.

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*INSPECTION AND COMPLIANCE + *INSTRUMENTATION, RADIATION MONITORING + *MONITOR, RADIATION, PERSONNEL + FAILURE, INSTRUMENT + FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + RADIOGRAPHY

15-26344 ALSO IN CATEGORY 17
RADIOGRAPHY SOURCE - LOST AND FOUND
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
1 PAGE, LETTER TO SCHLUMBERGER WELL SERVICES FROM K.N. THOMAS, OCTOBER 16, 1967

A SOURCE WAS PLACED ON THE BUMPER OF A TRUCK PARKED NEXT TO A SECOND TRUCK IN WHICH EQUIPMENT CALIBRATIONS WERE BEING PERFORMED. THE DRIVER DROVE OFF, NOT KNOWING THAT THE SOURCE WAS ON THE BUMPER OF HIS TRUCK, NOR DID HE KNOW THAT IT HAD FALLEN OFF ALONG THE WAY. THE SOURCE WAS FOUND SHORTLY THEREAFTER IN A DITCH BY ONE OF SEVERAL SEARCH PARTIES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR

15-26345 ALSO IN CATEGORY 17
RADIOGRAPHY SOURCE ABANDONED IN OKLAHOMA WELL
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM O.C. CHEATHAM, SEPTEMBER 21, 1967

ON SEPT. 12, 1967, A 1.5-CURIE CS-137 SOURCE STUCK IN A WELL IN OKLAHOMA. FISHING OPERATIONS CONTINUED UNTIL SEPT. 18, WHEN IT WAS DETERMINED THAT THE SOURCE WAS CLEAR OF THE CENTER OF THE WELL AND THAT A 4-1/2-IN. CASING COULD BE RUN TO THE PRODUCING ZONE BELOW. TWENTY FEET OF CEMENT WAS SPOTTED BELOW AND ABOVE THE SOURCE, WHICH WAS AT A DEPTH OF 3520 FEET, AND THE SOURCE WAS ABANDONED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST

15-26346 ALSO IN CATEGORY 17
RADIOGRAPHY SOURCE LOST IN PACIFIC OCEAN
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM O.C. CHEATHAM, AUGUST 6, 1965

ON AUGUST 1, 1965, A 1.5-CURIE CS-137 SOURCE WAS LOST IN A STANDARD OIL CO. OF CALIFORNIA WELL 12 MILES OFF THE COAST OF OREGON. THE SOURCE HAD 4 CONTAINING SHELLS, OF WHICH TWO WERE PRESSURE TESTED AT 25,000 PSI. THE 12,000-FT WELL WAS ABANDONED AS A DRY HOLE. THE BOTTOM 200 FT WAS PLUGGED WITH CEMENT CONTAINING JUNK IRON.

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*OCEAN AND SEA + *RADIOGRAPHY + *SOURCE, RADIATION, LOST

15-26347 ALSO IN CATEGORY 17
RADIOGRAPHY SOURCE LOST IN 4,186 FT. WELL
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM O.C. CHEATHAM, JUNE 17, 1965

ON JUNE 7, 1965, A 1-CURIE CS-137 SOURCE STUCK AT THE BOTTOM OF A 4186-FT WELL IN WEST VIRGINIA. RETRIEVAL EFFORTS WERE DISCONTINUED 5 DAYS LATER. THE BOTTOM 50 FT OF THE WELL WAS FILLED WITH CEMENT AND JUNK IRON TO PRECLUDE REENTRY. THE SOURCE MATERIAL HAD 5 CONTAINING SHELLS, OF WHICH ONE WAS PRESSURE TESTED AT 25,000 PSI. FRESH-WATER ZONES IN THE VICINITY ARE AT DEPTHS NO GREATER THAN 100 FT FROM THE SURFACE.

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*RADIOGRAPHY + *SOURCE, RADIATION, LOST

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26350 ALSO IN CATEGORY 17
RADIOGRAPHY SOURCE FALLS APART
RADIATION PRODUCTS, BURLINGTON, MASSACHUSETTS
2 PAGES, LETTER TO DIRECTOR DIVISION OF MATERIALS LICENSING FROM R.J. PREST, MARCH 24, 1967

A 10-CURIE IRIIDIUM-192 SOURCE FELL APART WHILE BEING USED BY WALWORTH CO., GREENSBURG, PA. RETRIEVAL OF THE 5 PELLETS WAS ACCOMPLISHED WITH MINOR CONTAMINATION AND PERSONNEL EXPOSURES OF 280 AND 5 MR. STEPS WERE TAKEN BY THE FABRICATOR TO EXAMINE AND IMPROVE THE QUALITY OF THE CAPSULE WELDS.

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*FAILURE, FABRICATION ERROR + *SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION

15-26351 ALSO IN CATEGORY 17
RADIOGRAPHY INCIDENT - CARELESS ATTITUDE TOWARD RADIATION RESULTS IN TERMINATION
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, OCTOBER 24, 1964

THE RADIOLOGICAL SAFETY COORDINATOR DISCOVERED THAT A RADIOGRAPHER HAD EXCEEDED HIS QUARTERLY EXPOSURE LIMIT, ACCORDING TO A PHONE CALL FROM THE FILM-BADGE PROCESSOR. RADIOGRAPHER COULD NOT EXPLAIN BUT ADMITTED THAT HIS DOSIMETER HAD GONE BEYOND RANGE ON ONE OCCASION. HE WAS TERMINATED BECAUSE OF CARELESS ATTITUDE TOWARD RADIATION SAFETY, FAILING TO RECORD THE FACT THAT HIS DOSIMETER HAD GONE BEYOND RANGE, FAILING TO REPORT THE OVEREXPOSURE, AND TARDINESS IN FORWARDING A STATEMENT CONCERNING THE EXPOSURE.

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*ADMINISTRATIVE CONTROL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + RADIATION SAFETY AND CONTROL

15-26352 ALSO IN CATEGORY 17
RADIOGRAPHY INCIDENT - CHANGING HANDS DURING SOURCE RETRIEVAL RESULTS IN EXPOSURE
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R.G. GALLAGHER, OCTOBER 21, 1964

RADIOGRAPHER RECEIVED BODY DOSE OF 3.1 R AND HAND DOSE OF 3.9. AT THREE AM, AFTER MAKING AN EXPOSURE, THE RADIOGRAPHER WAS CRANKING THE SOURCE BACK TOWARD THE STORAGE CONTAINER AND CHANGED HANDS DURING THE CRANKING, INVERTING THE SOURCE DRIVE MECHANISM. THE SOURCE WENT BACK DOWN THE TUBE BELOW A THICK CONCRETE FLOOR WHERE IT WAS SHIELDED FROM THE SURVEY METER. WHEN THE METER READING DROPPED BACK TO NORMAL, HE ASSUMED THAT THE SOURCE WAS BACK IN THE SAFE AREA SURVEY.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26353 ALSO IN CATEGORY 17
RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
6 PAGES, LETTER TO E.R. PRICE, AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM H.F. HEDDERICH, AUGUST 7, 1964

EXPLANATIONS GIVEN FOR EACH OF 8 VIOLATIONS AT THE ALABAMA BRANCH AND 5 VIOLATIONS AT THE PITTSBURGH BRANCH. ALABAMA BRANCH DENIES (1) NOT INSTRUCTING EMPLOYEES ON HAZARDS AND PRECAUTIONS TO MINIMIZE EXPOSURES, AND (2) USING AN UNAUTHORIZED CONTROL CABLE IN AN EXPOSURE DEVICE. PENNSYLVANIA BRANCH DENIES (1) FAILURE TO MAKE SURVEYS IN UNRESTRICTED AREAS AND (2) ALLOWING RADIATION LEVELS ON SURFACE OF STORAGE CONTAINER TO EXCEED LIMITS. THE CONTAINER WAS RECEIVED THE SAME DAY THE INSPECTOR ARRIVED. HOWEVER, ITS INADEQUACY HAD BEEN ANTICIPATED, AND SPECIAL CONTAINERS HAD BEEN CONSTRUCTED, WHICH WERE BEING PAINTED. THE CONTAINER IN QUESTION WAS SHOWN TO THE INSPECTOR TO VERIFY THEY HAD ANTICIPATED ITS INADEQUACY.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + *STORAGE CONTAINER + FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + SOURCE, RADIATION

15-26355 ALSO IN CATEGORY 17
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
PIPEWELD X-RAY CORPORATION, PERRYSBURG, OHIO
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM C. EARLE, JR., FEBRUARY 14, 1966

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26355 *CONTINUED*

COMPANY RESPONSE TO CITATIONS - (1) RADIOGRAPHERS DID NOT HAVE A COPY OF THE AEC LICENSE BECAUSE OF OVERSIGHT. (2) INABILITY OF 3 RADIOGRAPHERS TO READ A SURVEY METER CORRECTLY WAS CAUSED BY EMPLOYEES BECOMING EXCITED AND HIGHLY NERVOUS WHEN CONFRONTED BY AN AEC REPRESENTATIVE AND FAILING TO CHECK THE METER-SCALE SETTING. (3) THOSE WHO FAILED TO SURVEY AFTER EXPOSURES WERE FINED AND REINSPECTED. EMPLOYEES WERE REINSTRUCTED IN REQUIREMENTS OF AEC REGULATIONS AND COMPANY OPERATING MANUAL.

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*INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + SURVEY, RADIATION, GENERAL

15-26356 ALSO IN CATEGORY 17

RESPONSE TO AEC RADIOGRAPHY CITATION

PIPEWELD X-RAY CORPORATION, PERRYSBURG, OHIO

5 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM C. EARLE, JR., JANUARY 30, 1967

IN THE FUTURE, PERSONNEL WILL SIGN A STATEMENT THAT THEY HAVE RECEIVED INSTRUCTION ON COMPANY RADIOGRAPHY PROCEDURES. PERSON HAVING COPY OF RADIOGRAPHERS TEST QUESTIONS AND ANSWERS HAD GOTTEN AN OLDER RADIOGRAPHER TO WRITE THEM OUT FROM MEMORY TO ASSIST HIM IN STUDYING TO CHANGE HIS CLASSIFICATION (REPRESENTED LESS THAN 1/2 OF TEST QUESTIONS). RECURRING VIOLATIONS - FAILURE TO SURVEY AFTER EXPOSURE AND RECORD KEEPING OCCUR BECAUSE AEC DID NOT DIRECT THE CITATIONS TO THE RADIOGRAPHER BUT TO THE COMPANY. ADVOCATES THAT AEC LICENSE (NOT COMPANY) INDIVIDUAL SO THAT THREAT OF REVOCATION WOULD ELIMINATE RADIOGRAPHER LAXITY IN FOLLOWING PROCEDURES.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + RADIATION SAFETY AND CONTROL + STAFFING, TRAINING, QUALIFICATION

15-26357 ALSO IN CATEGORY 17

RADIOGRAPHY OVEREXPOSURES FOR CALENDAR QUARTER

PIPEWELD X-RAY CORP., PERRYSBURG, OHIO

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM C. EARLE, JR., JULY 22, 1964

REPORTS THAT SIX RADIOGRAPHERS RECEIVED EXPOSURES FOR QUARTER EXCEEDING 1.25 REMS. MAXIMUM WAS 2.25 REMS. ONE RADIOGRAPHER HAD BEEN LEAVING HIS CLOTHES (AND BADGE) ON A STEAM RADIATOR AT NIGHT. ANOTHER OVERDOSE WAS ATTRIBUTED TO INACCURATE FILM-BADGE READINGS BECAUSE OF A PARTIALLY OBLITERATED FILM.

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*FAILURE, ADMINISTRATIVE CONTROL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, OPERATOR ERROR

15-26359 ALSO IN CATEGORY 17

LOOSE SCREW ON RADIOGRAPHY EQUIPMENT RESULTS IN EXPOSURES

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, NEW JERSEY

3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E.P. ANDERSON, NOVEMBER 15, 1963

FIVE INDIVIDUALS RECEIVED RADIATION EXPOSURES - 1.2 R, 1.2, 280 MR, 130 MR, 90 MR - WHEN AN ALLEN SET-SCREW ON THE SOURCE DISCONNECT WORKED LOOSE AND CAUSED THE SOURCE TO STICK IN THE SOURCE TUBE ABOUT 2 FT OUT FROM THE SHIELD. THE SOURCE WAS REMOVED BY CUTTING OFF THE OUTBOARD END OF THE SOURCE TUBE AND PLACING THE OPEN END, CONNECTED TO THE CAMERA, INTO A LEAD BALL. THE SOURCE WAS THEN CRANKED OUT INTO THE LEAD BALL AND DISCONNECTED FROM THE OPERATING CABLE. ALL SUPERVISORS WERE INSTRUCTED TO PERIODICALLY CHECK THE DISCONNECTS.

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*INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, RECOVERY FROM + SOURCE, RADIATION

15-26362 ALSO IN CATEGORY 17

LEAKING RADIOGRAPHY SOURCE CONTAMINATES EQUIPMENT

NATIONAL TANK COMPANY, TULSA, OKLAHOMA

2 PAGES, LETTER TO E.R. PRICE, AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM F.L. SILVERS, JUNE 25, 1965

A RADIOGRAPHIC CAMERA AND SOURCE TUBE WERE FOUND TO BE CONTAMINATED FROM A LEAKING IRIIDIUM SOURCE. INTERCHANGING OF SOURCE TUBES HAD ALSO CONTAMINATED A COBALT SOURCE.

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*CONTAMINATION + *RADIOGRAPHY + *SOURCE, RADIATION + INCIDENT, NONREACTOR

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26364 ALSO IN CATEGORY 17
RADIOGRAPHY OVEREXPOSURE DUE TO FAILURE TO SURVEY
MATERIALS TESTING LAB, EAST HARTFORD, CONNECTICUT
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM F. LENT, JULY 26, 1965

A RADIOGRAPHER RECEIVED A DOSE OF 1.74 REMS AS A RESULT OF FAILURE TO SURVEY AFTER COMPLETING AN EXPOSURE. THE SOURCE HAD NOT RETRACTED TO THE STORED POSITION IN THE CONTAINER. THE INCIDENT WAS DISCUSSED WITH ALL COMPANY RADIOGRAPHERS, AND AN AUDIBLE RADIATION ALARM WAS INSTALLED IN THE EXPOSURE ROOM.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION + SURVEY, RADIATION, GENERAL

15-26365 ALSO IN CATEGORY 17
INCIDENT INVOLVING 3000 CURIE CO-60 THERAPY SOURCE
LUTHERAN GENERAL HOSPITAL, PARK RIDGE, ILLINOIS
2 PAGES, LETTER TO DIVISION OF MATERIALS LICENSING FROM F.L. HUSSEY, M.D., MARCH 23, 1966

A 3000-CURIE COBALT-60 SOURCE WAS DROPPED ONTO THE TREATMENT ROOM FLOOR OF THE LUTHERAN GENERAL HOSPITAL WHILE BEING TRANSFERRED FROM ITS SHIPPING CONTAINER INTO A THERAPY MACHINE. BARRICADES AND SIGNS WERE POSTED UNTIL REMOTE-HANDLING EQUIPMENT COULD BE OBTAINED. THE FOLLOWING EVENING THE SOURCE WAS RECOVERED. NO CONTAMINATION RESULTED. (EXPOSURE DOSES NOT GIVEN.)

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*RADIOLOGY + *REMOTE MANIPULATING AND VIEWING + *SOURCE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + RADIATION SAFETY AND CONTROL + RADIOGRAPHY

15-26366 ALSO IN CATEGORY 17
CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
UNITED STATES ATOMIC ENERGY COMMISSION
2 PAGES, LETTER TO PIPEWELD X-RAY CORPORATION FROM E.R. PRICE, JANUARY 13, 1967

CITED FOR (1) ALLOWING RADIOGRAPHY BY PERSONS NOT INSTRUCTED IN PROCEDURES NOR SHOWN USE OF DEVICES, (2) POOR RECORD KEEPING, AND (3) FAILURE TO SURVEY AFTER EXPOSURES. AEC NOTED THAT ONE RADIOGRAPHER HAD A COPY OF THE QUESTIONS AND ANSWERS TO THE COMPANY'S RADIOGRAPHY EXAMINATION. ITEMS 2 AND 3 ARE VIOLATIONS WHICH HAVE BEEN CITED IN PREVIOUS INSPECTIONS, AND THE REASON FOR THEIR RECURRENCE SHOULD BE IDENTIFIED.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR

15-26368 ALSO IN CATEGORIES 17 AND 3
FIRE CONSUMES TRUCK TRANSPORTING RADIOGRAPHY SOURCE
LANE-WELLS, HOUSTON, TEXAS
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM J.C. WILSON, AUGUST 29, 1966

A FIRE CONSUMED A TRUCK TRANSPORTING A 1-CURIE CESIUM SOURCE. WHEN THE FIRE WAS EXTINGUISHED, THE SOURCE WAS FOUND FLOATING ON THE MOLTEN LEAD FROM THE SHIELD. THE SOURCE WAS RETRIEVED, UNDAMAGED, AND PLACED ON A LID OF A TOOL BOX. WHILE WAITING FOR A RADIOLOGICAL ASSISTANCE TEAM CALLED BY A HIGHWAY PATROLMAN ON THE SCENE, THE PATROLMAN PICKED UP THE SOURCE AND HELD IT FOR 1 MIN. HE RECEIVED A DOSE OF 100 MILLIREMS WHOLE BODY AND 10 REMS TO HANDS. OTHER EXPOSURES WERE MINIMAL.

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*FIRE + *RADIOGRAPHY + *TRANSPORTATION AND HANDLING + INCIDENT, NONREACTOR + PERSONNEL EXPOSURE, RADIATION + SOURCE, RADIATION

15-26370 ALSO IN CATEGORY 17
RADIOGRAPHY SOURCE DROPPED INTO KAW RIVER
H.R. INSPECTION SERVICE, SHAWNEE, KANSAS
1 PAGE, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM H.W. ROGERS, APRIL 12, 1964

WHILE MAKING EXPOSURES ON A BRIDGE BEING BUILT OVER THE KAW RIVER, A GUST OF WIND BLEW A WELDERS SCAFFOLD OVER, KNOCKING A CAMERA AND SOURCE INTO 5 FT OF WATER. THE SOURCE GUIDE-TUBE BROKE, AND THE SOURCE DISCONNECTED FROM THE CONTROL CABLE. THE SOURCE WAS RETRIEVED WITH A ROPE AND MAGNET. MAXIMUM PERSONNEL EXPOSURE WAS 125 MILLIREMS. A SAFETY CHAIN ON THE CAMERA WILL BE USED FOR FUTURE EXPOSURES.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26370 *CONTINUED*
USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + RIVER, GENERAL

15-26371 ALSO IN CATEGORY 17
RADIOGRAPHY EXPOSURE AT GENERAL DYNAMICS CORP.
GENERAL DYNAMICS CORPORATION, GROTON, CONNECTICUT
4 PAGES, LETTER TO AEC DIVISION OF LICENSING FROM W. GORVINE, JULY 20, 1965

RADIOGRAPHER RECEIVED A DCSE OF 4.2 REMS, AS INDICATED BY A FILM BADGE WORN ON HIS LAPEL. CALCULATIONS INDICATED A DOSE OF 9.6 REMS TO THE BODY MIDSECTION. THE SOURCE WAS NOT COMPLETELY RETRACTED AFTER AN EXPOSURE. DISCOVERY OF THE UNSAFE CONDITION WAS MADE BY A RADIATION AUDITOR DURING A ROUTINE SURVEY, WHO THEN ALERTED THE RADIOGRAPHER THAT THE CONTROL LIGHTS ON THE DEVICE WERE INDICATING THAT THE SOURCE WAS NOT RETRACTED. THE CAUSE WAS ATTRIBUTED TO FAILURE TO FOLLOW PROCEDURES AND MAKE PROPER SURVEYS.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26372 ALSO IN CATEGORY 17
RADIOGRAPHY EXPOSURE AT CONSOLIDATED X-RAY SERVICE CORP.
CONSOLIDATED X-RAY SERVICE CORPORATION, DALLAS, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM J.E. WRIGHT, DEC. 17, 1965

((LETTER) AT MIDNIGHT ON DECEMBER 4, 1965, FOLLOWING AN EXPOSURE, THE SOURCE DID NOT RETURN TO THE CAMERA. AN ASSISTANT RADIOGRAPHER COILED THE SNORKLE WITH THE END CONTAINING THE SOURCE ABOUT 2 FT FROM HIS HAND, WALKED TO A DITCH, THEN SET UP FOR ANOTHER EXPOSURE. AFTER WALKING OUT OF THE RADIATION FIELD, IT WAS DISCOVERED THAT THE SOURCE WAS NOT SHIELDED. COPIES OF A COMPILATION OF INCIDENTS WERE SENT TO ALL EMPLOYEES TO EMPHASIZE NECESSITY OF PROPER SURVEYS.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26373 ALSO IN CATEGORY 17
RADIOGRAPHY INCIDENT - SOURCE FELL APART
CONAM INSPECTION, INC., TULSA, OKLAHOMA
2 PAGES, LETTER TO E.R. PRICE (AEC) FROM L.E. COOMBS, SEPTEMBER 30, 1966

SURVEY METER INDICATED THAT SOURCE HAD NOT RETRACTED. THE SOURCE TUBE WAS DISCONNECTED AND SHAKEN SO THE LOOSE SOURCE COULD BE RETRIEVED WITH TONGS. THE SOURCE HAD BECOME UNSCREWED AND FIVE IRIIDIUM PELLETS FELL OUT ONTO THE GROUND. THE EARTH WAS SCOOPED UP AND PELLETS LOCATED. CONTAMINATED DIRT WAS SHIPPED TO LOUISIANA FOR DISPOSAL, AND SOURCE SUPPLIER WAS NOTIFIED SO ACTION COULD BE TAKEN TO PREVENT A RECURRENCE.

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*INCIDENT, EQUIPMENT + *INCIDENT, RECOVERY FROM + *RADIOGRAPHY + SOURCE, RADIATION

15-26374 ALSO IN CATEGORY 17
RADIOGRAPHY EXPOSURE AT CONAM INSPECTION, INC.
CONAM INSPECTION COMPANY
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM L.E. COOMBS, JULY 31, 1967

RADIOGRAPHER PERFORMING ROUTINE MAINTENANCE ON EXPOSURE DEVICE REMOVED 3 SCREWS FROM CAMERA, WHICH PERMITTED SOURCE TO DISLODGE FROM SHIELDED POSITION. SOURCE WAS RETURNED BUT WENT BETWEEN LEAD CONTAINER AND OUTSIDE ALUMINUM CASE. SURVEY METER WAS ON TOP OF EXPOSURE DEVICE (PARTIALLY SHIELDED FROM SOURCE), INDICATING SOURCE WAS IN PROPER PLACE. WITH THE SHIELD AND SOURCE IN THE TRUCK, RADIOGRAPHER AND HELPER DROVE 13 HR TO RETURN TO CONAM FACILITY, WHERE THE UNSHIELDED SOURCE WAS DISCOVERED IMMEDIATELY. FILM BADGE OF ONE READ 24.5 MR. DRIVER OF TRUCK WAS NOT WEARING BADGE. ESTIMATED RANGE OF EXPOSURES WAS 15 R TO 300 R.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26375 ALSO IN CATEGORY 17
RADIOLOGIST QUARTERLY DOSE EXCESSIVE
SAINT FRANCIS HOSPITAL, TULSA, OKLAHOMA
1 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM J.E. KAUTH M.D., MARCH 19, 1968

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26375 *CONTINUED*

RADIOLOGIST WAS HOLDING PATIENTS WHILE PORTABLE FILMS WERE TAKEN. QUARTERLY DOSE WAS 1874 MILLIREMS. YEARLY DOSE FOR 1967 WAS 6723 MILLIREMS.

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*FAILURE, OPERATOR ERROR + *RADIOLOGY + PERSONNEL EXPOSURE, RADIATION + RADIOGRAPHY

15-26376

ALSO IN CATEGORY 17

CITATION FOR DEFICIENCY IN RADIOGRAPHY OPERATIONS

PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM H.F. HEDDERICH, FEBRUARY 23, 1965

COMPANY RESPONSES TO CITATIONS RESULTING FROM INVESTIGATION DEC. 7 THE NATURE AND EXTENT OF EXPOSURE WAS BECAUSE WE COULD NOT HONESTLY EVALUATE THE EXTENT OF EXPOSURE IN THE ALLOTTED TIME, AND (2) FAILURE TO PERFORM SIX UNANNOUNCED INSPECTIONS IN THE THIRD QUARTER WAS OVERSIGHT BY FORMER EMPLOYEE, AND PERFORMANCE OF ALL SIX WITHIN TWO WEEKS WAS DUE TO CHANGE IN PERSONNEL AND NEED TO MEET REQUIREMENT.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + STAFFING, TRAINING, QUALIFICATION

15-26377

ALSO IN CATEGORY 17

RECOVERY OF UNCOUPLED SOURCE - PLAN MINIMIZED PERSONNEL EXPOSURE

PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, DECEMBER 8, 1964

ON NOV. 9, 1964, AT 3/30 AM, A RADIOGRAPHER NOTICED THAT THE CRANK HANDLE OF RADIOGRAPHY EXPOSURE DEVICE WAS WORKING TOO FREELY. AN INTERMEDIATE CONNECTION BETWEEN TWO LENGTHS OF SOURCE TUBE HAD WORKED LOOSE. THE SOURCE HAD RUN OUT OF THE TUBE AT THAT POINT, AND THE CONTROL CABLE HAD EXTENDED BEYOND THE GEAR WHEEL. THE PIGTAIL ALSO BECAME UNCOUPLED WHILE OUTSIDE THE SOURCE TUBE. THE SUPERVISOR, RADIOGRAPHER, AND RADIATION SAFETY OFFICER FORMULATED A PLAN. THE RSO, WHILE STANDING BEHIND STEEL COLUMN AND USING 8-FT HANDLING RODS, MANIPULATED SOURCE AND RETURNED IT TO THE EXPOSURE DEVICE. MAXIMUM EXPOSURE WAS 250 MR.

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*INCIDENT, RECOVERY FROM + *RADIOGRAPHY + INCIDENT, NONREACTOR + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SOURCE, RADIATION

15-26378

ALSO IN CATEGORY 17

FILM BADGE REPORT OF RADIOLOGIST AT MILWAUKEE HOSPITAL

MILWAUKEE HOSPITAL, MILWAUKEE, WISCONSIN

3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM J.R. CAMERON, MARCH 19, 1964

SUBSEQUENT TO EXTENSIVE REMODELING OF THE X-RAY DEPARTMENT, A RADIOLOGICAL PHYSICIST SURVEYED THE DEPARTMENT AND RECOMMENDED REPORTING THE QUARTERLY FILM-BADGE READINGS FOR 1962 AND 1963 BECAUSE HOSPITAL HAD A BY-PRODUCT LICENSE. OVEREXPOSURES BELIEVED TO BE DUE TO HEAVY FLUOROSCOPIC WORK LOAD. READINGS WERE 0.32 REM, 1.269, 1.404, 0.45, 2.125, 1.587, 0.581, 0.216.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOLOGY + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL + RADIOGRAPHY + SOURCE, RADIATION + X-RAY

15-26379

ALSO IN CATEGORY 17

OVEREXPOSURE TO THERAPY TECHNICIAN

U.S. ARMY, WALTER REED ARMY MEDICAL CENTER

8 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R. NYSTROM, JR., JANUARY 19, 1967

A FILM-BADGE REPORT INDICATED THAT A RADIATION-THERAPY TECHNICIAN HAD RECEIVED AN EXPOSURE OF 15.3 REMS GAMMA AND 4.93 BETA FOR THE PERIOD 6 NOV. THROUGH 3 DEC. 1965. ON ONE OCCASION THE TECHNICIAN WAS REQUIRED TO ASSIST A PATIENT FROM THE TREATMENT TABLE WHEN THE 1850-CURIE COBALT-60 SOURCE FAILED TO RETRACT. A DOSE OF 3.3 REMS WAS ATTRIBUTED TO THIS INCIDENT. WHEN AND HOW THE ADDITIONAL DOSAGE WAS ACQUIRED COULD NOT BE DETERMINED. A COMMITTEE DECLARED THE THERAPY UNIT UNSAFE, SHUT IT DOWN FOR REPLACEMENT, AND RECOMMENDED THAT TECHNICIAN BE RETURNED TO DUTY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOLOGY + FAILURE, EQUIPMENT + INCIDENT, EQUIPMENT + INCIDENT, NONREACTOR + RADIOGRAPHY + SOURCE, RADIATION

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26380 ALSO IN CATEGORY 17
SEQUENCE OF EVENTS LEADS TO OVEREXPOSURE
U.S. NAVY

5 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E. FARY, DECEMBER 17, 1965

RADIOGRAPHS WERE BEING MADE OF A SUBMARINE UNDERGOING OVERHAUL IN DRYDOCK. ALL WORKMEN HAD LEFT FOR LUNCH. ROPE BARRICADES AND WARNING SIGNS HAD BEEN SET UP, A 4-MIN. EXPOSURE STARTED, AND THE 2 RADIOGRAPHERS WERE ON GUARD TO PREVENT ENTRY INTO THE RADIATION AREA. NO ANNOUNCEMENT OF THE RADIOGRAPHY WAS MADE BECAUSE THE INTERCOM WAS NOT WORKING. THE LIGHTS IN THE EXPOSURE AREA WENT OUT FOR TRANSFER TO ANOTHER POWER SOURCE. AN OFFICER ON AN INSPECTION TOUR PROCEEDED FROM ANOTHER DIRECTION IN A DARKENED PASSAGEWAY, FELT THE SIGN BUT COULDN'T TELL WHAT IT SAID, WENT UNDER THE ROPE BARRICADE, NOTICED THE EXPOSURE HEAD, TOUCHED IT AND WAS THEN OBSERVED BY THE RADIOGRAPHERS, WHO WARNED HIM OUT OF THE RADIATION AREA. DOSE WAS 5 REMS WHOLE-BODY, AND 350 TO FINGERTIPS OF LEFT HAND.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, SEQUENTIAL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + RADIATION SAFETY AND CONTROL

15-26381 ALSO IN CATEGORY 17

CLUSS RD
OVEREXPOSURE TO RADIOGRAPHER DURING STORAGE OF SOURCE

U.S. NAVY, MARE ISLAND SHIPYARD
3 PAGES, LETTER TO AEC DIVISION OF MATERIALS LICENSING FROM CHIEF OF BUREAU OF SHIPS, APRIL 14, 1965

ON MARCH 10, 1965, A RADIOGRAPHER RECEIVED AN ESTIMATED DOSE OF 46.6 REMS TO THE LEFT HAND AND 400 MREM WHOLE BODY. A PROJECTOR WITH SOURCE HAD BEEN DAMAGED WHEN A TRANSFER WAGON OVERTURNED. TWO BOLTS HOLDING THE CONTROL BOX TO THE PROJECTOR WERE BROKEN, AND UNKNOWN TO THE OPERATORS, THE THREADS OF THE REMAINING TWO BOLTS WERE STRIPPED. THE PROJECTOR WAS BEING RETURNED TO STORAGE, AND, WHILE SUSPENDED FROM A CRANE, THE WEIGHT OF THE CABLES CAUSED THE CONTROL BOX, PIGTAIL, AND SOURCE TO PULL FREE. THE RADIOGRAPHER PICKED UP THE PIGTAIL AND RETURNED THE SOURCE TO THE PROJECTOR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

15-26382 ALSO IN CATEGORY 17

FARY EJ
INADEQUATE SURVEY RESULTS IN OVEREXPOSURE TO RADIOGRAPHER

U.S. NAVY
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM COMMANDER OF SAN FRANCISCO BAY NAVAL SHIPYARD, JULY 7, 1965

DURING THE MIDNIGHT TO 8 AM SHIFT ON JUNE 10, 1964, A RADIOGRAPHERS HELPER RECEIVED A DOSE OF 12.5 REMS, THE RADIOGRAPHER 0.09. AFTER AN EXPOSURE, THE SOURCE DID NOT COMPLETELY RETURN TO THE SHIELD, AND AN INADEQUATE SURVEY FAILED TO REVEAL THE NARROW RADIATION BEAM. THE CONNECTOR OF THE SHIELDING NOZZLE WAS MISALIGNED, WHICH COULD CAUSE THE SOURCE TO HANG IN THE PARTIALLY SHIELDED POSITION. THE SURVEY METER HAD A RESPONSE LAG TIME WHEN SWITCHED FROM OFF TO ON, WHICH MAY HAVE CONTRIBUTED TO INADEQUATE SURVEY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

15-26383 ALSO IN CATEGORY 17

OVEREXPOSURE TO RADIOGRAPHERS
U.S. NAVY, PHILADELPHIA NAVAL SHIPYARD

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R.A. MOUNT, NOVEMBER 18, 1965

ON NOVEMBER 2, 1965, TWO RADIOGRAPHERS RECEIVED OVEREXPOSURES OF 2.5 AND 3.5 REMS WHEN THEY TRIED TO RETURN THE SOURCE TO THE SHIELD. THEY HAD SUPPOSEDLY CONNECTED THE SOURCE CABLE TO THE DRIVE CABLE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

15-26384 ALSO IN CATEGORY 17

RESPONSE TO AEC CITATION FOR NONCOMPLIANCE IN RADIOGRAPHY OPERATIONS

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26384 *CONTINUED*

UNITED STATES TESTING COMPANY, HOBOKEN, N. J.

5 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM A. L. BRASSSELL, NOVEMBER 26, 1965

PERSONNEL CHANGES RESULTED IN RELAXATION OF EMPLOYEE TRAINING. SHORTAGES OF DOSIMETERS RECTIFIED BY PURCHASE OF OTHERS, FILM BADGES NOW ASSIGNED TO PERSONNEL, RECORD-KEEPING SYSTEM WAS REVISED, MONTHLY EQUIPMENT INVENTORY STARTED TO ENSURE THAT PERSONNEL WILL HAVE SURVEY METERS AND THAT REGULAR CALIBRATION IS PERFORMED. RETRAINING PROGRAM GIVEN TO ALL RADIOGRAPHERS AND ASSISTANTS, ALL WORKERS WERE ISSUED COPIES OF EMERGENCY PROCEDURES, RADIATION SAFETY OFFICER NOW REVIEWS DAILY THE UTILIZATION LOG.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, OPERATOR ERROR + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY

15-26385

ALSO IN CATEGORY 17

CONTAMINATION FROM LEAKING RADIOGRAPHY SOURCE

TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA

2 PAGES, LETTER TO AEC, WASHINGTON, D.C. FROM H. T. SCHULZE, SEPTEMBER 30, 1966

AFTER FILM WAS FOUND FOGGED WHILE STORED NEXT TO THE SOURCE TUBES AND CONTROL CABLES, CONTAMINATION FROM A LEAKING IRIIDIUM-192 SOURCE WAS FOUND ON THE PLANT FLOORS, SOURCE STORAGE PIGS. ALSO, TRUCKS PARKED IN THE BACK OF THE PLANT WERE CONTAMINATED TO 5-10 MR/HR BY DIRECT READING. A TARPULIN IN THE TRUNK OF A WORKMANS PRIVATE CAR CONTAINED ACTIVITY UP TO 100 C/SECOND. A SINGLE IRIIDIUM PARTICLE WAS FOUND IN THE DRIVEWAY, WHICH READ 1300 MR/HR. HEALTH PHYSICIST RECOMMENDED THAT CABLES BE SURVEYED EACH TIME THEY ARE REMOVED FROM THE SHIELDED CONTAINER TO PREVENT SUCH INCIDENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CONTAMINATION + *FAILURE, EQUIPMENT + *RADIOGRAPHY + *SOURCE, RADIATION +
FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

15-26386

ALSO IN CATEGORY 17

FORGETFULNESS RESULTS IN OVEREXPOSURE TO RADIOGRAPHER

TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM H. T. SCHULZE, NOVEMBER 2, 1967

AFTER PERFORMING 15 EXPOSURES, RADIOGRAPHER SURVEYED IN THE USUAL MANNER TO ASCERTAIN THAT SOURCE WAS IN THE SAFE POSITION, BUT THIS ONE TIME HE FORGOT TO PUSH THE KEY-OPERATED LOCK IN, WHICH WOULD LOCK THE SOURCE IN THE EXPOSURE DEVICE. DURING THE TRANSFER TO ANOTHER LOCATION, THE CRANK CAUGHT ON AN OBSTRUCTION AND FORCED THE SOURCE TO AN EXPOSED POSITION. WHILE SETTING UP FOR THE NEXT EXPOSURE HIS FILM BADGE IN THE SHIRT POCKET WAS 3 FT FROM THE 90-CURIE SOURCE. HIS LEFT THIGH WAS 6 TO 12 IN. AWAY. FILM BADGE READ 8.8 REMS. ESTIMATED DOSE TO THIGH WAS 70 REMS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR +
SOURCE, RADIATION

15-26387

ALSO IN CATEGORY 17

RESPONSE TO AEC CITATION FOR NONCOMPLIANCE IN RADIOGRAPHY PROCEDURES

TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA

3 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM C. W. BRITZIUS, JANUARY 22, 1968

AEC COMPLIANCE CITED FOUR ITEMS OF NONCOMPLIANCE - (1) RADIOGRAPHER FAILED TO LOCK EXPOSURE DEVICE AFTER EXPOSURE, AND FAILED TO REPORT DISCHARGE OF DOSIMETER, (2) SURVEY WAS NOT MADE TO DETERMINE EXTENT OF DOSE RECEIVED BY RADIOGRAPHER, (3) AEC NOT NOTIFIED IMMEDIATELY OF EXPOSURE INCIDENT, AND (4) STORAGE OF MATERIAL AT PLACE NOT SPECIFIED BY LICENSE. COMPANY RESPONSE - (1) ITEM REVIEWED WITH ALL RADIOGRAPHERS, (2) SURVEY TECHNIQUES WERE REVIEWED AND RADIOGRAPHERS INSTRUCTED TO LEAVE SURVEY METERS ON AT ALL TIMES, (3) FAILED TO MARK ENVELOPE CONTAINING BADGE, SO THAT RESULTS OF READING WERE DELAYED, (4) COMPANY MOVED 2 BLOCKS AWAY AND NEGLECTED TO INFORM AEC.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR +
RADIATION SAFETY AND CONTROL

15-26388

ALSO IN CATEGORY 17

FAILURE TO SURVEY RESULTS IN OVEREXPOSURE TO RADIOGRAPHER

VESTER J. THOMPSON, JR., INC., MOBILE, ALABAMA

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM V. J. THOMPSON, JR., JULY 1, 1965

RADIOGRAPHER RECEIVED A QUARTERLY DOSE OF 1820 MR, OF WHICH 1050 WAS RECEIVED IN ONE EXPOSURE AS A RESULT OF FAILING TO SURVEY TO ENSURE THE RETURN OF A SOURCE TO A SAFE POSITION. THE OVEREXPOSURE AND CAUSE WERE DISCUSSED WITH ALL THE EMPLOYEES, AND THE RADIOGRAPHER WAS

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26388 *CONTINUED*
RELIEVED OF HIS DUTIES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR +
SOURCE, RADIATION

15-26389 ALSO IN CATEGORY 17
RADIATION DAMAGE TO HANDS DISCOVERED 2 WEEKS AFTER EXPOSURE
TECHNICAL OPERATIONS RESEARCH, BURLINGTON, MASSACHUSETTS
7 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E. T. CLARKE, APRIL 16, 1965

THE RIGHT HANDS OF TWO MEN BECAME SWOLLEN AND TENDER 2 WEEKS AFTER AN ESTIMATED EXPOSURE OF
250 R GAMMA AND 1000 RADS BETA. TO DISLODGE IRRADIATED IRIIDIUM PELLETS ADHERING TO AN
ALUMINUM SPOOL BY CORROSION, THE MEN STOOD BEHIND A LEAD SHIELD AND TOOK TURNS FOR 10 MIN
RAPPING THE CAPSULE CORE AGAINST THE INNER WALL OF A LEAD CONTAINER. TEN-INCH-LONG TWEEZERS
WERE USED, BUT THE HANDS WERE IMMEDIATELY ABOVE THE ACTIVITY. NEITHER MAN WORE FILM BADGES
OR DOSIMETERS. FUTURE HANDLING TO BE DONE UNDER SURVEILLANCE OF RADIATION SAFETY OFFICER.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + CORROSION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR +
SOURCE, RADIATION

15-26390 ALSO IN CATEGORY 17
RADIATION EXPOSURE IS QUESTIONABLE
WARD W. SPARROW HOSPITAL, LANSING, MICHIGAN
2 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM J. C. SPENCER M.D., JANUARY 14, 1965

A FILM-BADGE REPORT FOR THE PERIOD 10-26-64 THROUGH 11-8-64 INDICATED THAT ONE EMPLOYEES BADGE
WAS TOO DARK TO READ. DARKENING OF THE FILM IN THE BADGE TO THAT DEGREE REQUIRES AN EXPOSURE
OF 500 TO 1000 R. INVESTIGATION AND QUESTIONING OF THE EMPLOYEE FAILED TO PROVIDE AN
EXPLANATION. THE EMPLOYEE IS WELL, AND BLOOD COUNTS ARE NORMAL. THE FILM BADGE MAY HAVE
BEEN DEFECTIVE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR

15-26391 ALSO IN CATEGORY 17
RADIOGRAPHY INCIDENT AT SINCO TESTING INC.
SINCO TESTING INC., PORT HURON, MICHIGAN
4 PAGES, LETTER TO AEC DSLR FROM A. SAUCIER, OCTOBER 3, 1966

ON JULY 7, 1966, A RADIOGRAPHER RECEIVED AN ESTIMATED DOSE OF 4000 R TO THE SKIN OF HIS HANDS.
WHILE ATTEMPTING TO DISCONNECT A SOURCE FROM THE CONTROL CABLE, HE JERKED IT FROM THE STORAGE
CONTAINER. THE 27-CURIE SOURCE LANDED IN HIS HAND AND MADE CONTACT FOR 1 SEC.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR +
SOURCE, RADIATION

15-26392 ALSO IN CATEGORY 17
THIRD DEGREE BURNS SUSTAINED FROM RADIOGRAPHY INCIDENT
PITTSBURGH TESTING LAB, BIRMINGHAM, ALABAMA
2 PAGES, LETTER TO AEC DIV. OF LICENSING AND REGULATION, APRIL 7, 1964

A 47.7-CURIE COBALT-60 SOURCE BECAME UNCOUPLED AND JAMMED IN THE RADIOGRAPHY SOURCE TUBE 1
FOOT FROM THE STORAGE CONTAINER. AN ATTEMPT TO RECTIFY THE MALFUNCTION RESULTED IN ONE
RADIOGRAPHER RECEIVING THIRD-DEGREE BURNS ON THREE FINGERS OF HIS LEFT HAND. FILM BADGE,
WORN ON HIS BELT, READ 3.45 R. THE OTHER RADIOGRAPHER RECEIVED AN ESTIMATED DOSE TO THE
HANDS OF 1000 RADS, AND 2.05 RADS WHOLE BODY.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT +
INCIDENT, NONREACTOR + SOURCE, RADIATION

15-26393 ALSO IN CATEGORY 17
FLUOROSCOPIC RADIATION EXPOSURE AT MILWAUKEE HOSPITAL
MILWAUKEE HOSPITAL, MILWAUKEE, WISCONSIN
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS, MAY 22, 1964

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-26393 *CONTINUED*

A TECHNICIANS FILM-BADGE EXPOSURES FOR 2 QUARTERS OF 1963 WERE 2.125 AND 1.587 REMS AS A RESULT OF IMPROPER SHIELDING ON A NEW FLUOROSCOPIC UNIT. CORRECTIVE ACTION INCLUDED PROPER SHIELDING, WEARING OF HEAVY LEAD APRONS FOR ALL FLUOROSCOPY, AND USE OF MORE TECHNICIANS TO LESSEN INDIVIDUAL EXPOSURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOLOGY

15-26394 ALSO IN CATEGORY 17

LOST SOURCE USED FOR DENSITY GAUGE

THE SHERWIN-WILLIAMS CO., CHICAGO, ILLINOIS

1 PAGE, LETTER TO AEC DIV. OF COMPLIANCE FROM W. A. STARKOVICH, APRIL 2, 1968

IN EARLY DEC. 1967, COMPANY DISCOVERED THAT A 50-MILLICURIE CESIUM-137 SEALED SOURCE (PART OF A DENSITY GAUGE) WAS MISSING BUT FAILED TO NOTIFY AEC UNTIL MARCH 26, 1968. DURING THE INTERIM, AN EXTENSIVE SEARCH WAS MADE. ONE EMPLOYEE STATED THAT HE REMEMBERED CLEANING UP THE AREA AND HAD THROWN THE MATERIAL IN THE WASTE DUMPSTER. THE COMPANY WAS CITED FOR FAILURE TO NOTIFY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

15-26644 ALSO IN CATEGORY 17

SIVINTSEV YV

RADIATION SAFETY IN NUCLEAR REACTORS

640 PAGES, REFERENCES, MOSCOW, ATOMIZDAT, 1967, IN RUSSIAN

THE STANDARDS FOR RADIATION SAFETY IN NUCLEAR REACTORS ARE REVIEWED IN DETAIL. THE MAXIMUM PERMISSIBLE RADIATION LEVELS ARE OUTLINED. METHODS USED FOR THE DOSIMETRY OF EXTERNAL RADIATION AND THE SHIELDING NECESSARY ARE GIVEN. THE RETENTION OF FISSION PRODUCTS IN THE FUEL AND PRIMARY COOLANT OF NUCLEAR REACTORS IS DISCUSSED. THE PRECAUTIONS REQUIRED FOR RADIOACTIVE GASES AND AEROSOLS IN REACTORS ARE DESCRIBED. METHODS USED FOR MEASURING THE INTERNAL RADIATION OF REACTORS ARE GIVEN.

*RADIATION SAFETY AND CONTROL + MAXIMUM PERMISSIBLE DOSE (MPD) + REACTOR, BWR + REACTOR, POWER + REACTOR, PWR + USSR

15-27019

HULL AP

1965 ENVIRONMENTAL MONITORING RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY

BROOKHAVEN NATIONAL LABORATORY

BNL-50093 +. 27 PAGES, 16 FIGURES, 30 TABLES, 18 REFERENCES, SEPTEMBER, 1967

SUMMARIZES MEASUREMENTS OF NATURAL BACKGROUND RADIATION LEVELS AND OF INCREMENTS ATTRIBUTABLE TO LABORATORY OPERATIONS OBTAINED ON SITE AND IN THE VICINITY OF BROOKHAVEN NATIONAL LABORATORY DURING 1965. THESE INCREMENTS INCLUDE CONTRIBUTIONS FROM THE GASEOUS AND PARTICULATE EFFLUENT OF THE BROOKHAVEN GRAPHITE RESEARCH REACTOR STACK, FROM MULTICURIE FIELD GAMMA SOURCES, AND FROM THE DISCHARGE OF FLOW-LEVEL LIQUID WASTES FROM THE LABORATORY'S SANITARY WASTE TREATMENT PLANT INTO THE HEADWATERS OF THE PECONIC RIVER. THE ENVIRONMENTAL MONITORING PROGRAM HAS ESTABLISHED THAT DURING 1965 RADIATION LEVELS ATTRIBUTABLE TO LABORATORY OPERATIONS WERE MAINTAINED WELL BELOW THE ESTABLISHED RADIATION PROTECTION STANDARDS OF THE AEC FOR EXTERNAL EXPOSURES, AIR PARTICULATE CONCENTRATIONS, AND LIQUID EFFLUENT CONCENTRATIONS. RADIATION LEVELS ATTRIBUTABLE TO FALLOUT WERE ALSO WELL BELOW THE ESTABLISHED LIMITS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*AIRBORNE RELEASE + *BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + *BIOLOGICAL CONCENTRATION, MILK + *EFFLUENT + *IODINE + *MONITOR, RADIATION, BACKGROUND + *MONITOR, RADIATION, ENVIRONMENTAL + *SEDIMENT + *WASTE TREATMENT, GENERAL + AIR + BNL + PARTICULATE + RADIATION SAFETY AND CONTROL + STACK + TRACER, RADIOACTIVE

15-27075 ALSO IN CATEGORY 14

AIR SAMPLING METHOD AND APPARATUS

UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

BELGIUM PATENT NO. 674,456 +. 10 PAGES, 2 FIGURES, DECEMBER 29, 1965, IN FRENCH

THE INVENTION RELATES TO AN IMPROVED METHOD AND APPARATUS FOR MEASURING AIRBORNE CONTAMINATION. A PIECE OF FILTER PAPER IS MOUNTED OVER AN APERTURE IN A DATA-PROCESSING CARD WHICH IS PRECODED WITH IDENTIFYING INFORMATION. THE CARD IS PLACED IN A HOLDER HAVING OPPOSED RESILIENT GRASPING MEMBERS FOR HOLDING THE FILTER PAPER TAUT WHILE AIR IS DRAWN THROUGH IT.

AVAILABILITY - IT IS OUR UNDERSTANDING THAT FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S.

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27075 *CONTINUED*
PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (30 CENTS/PAGE)

*DATA PROCESSING + *INSTRUMENTATION, RADIATION MONITORING + *PATENT + AIR + CONTAMINATION + FILTER + SAMPLING

15-27076
BURCH WM
THERMOLUMINESCENCE, LOW RADIATION DOSAGE AND BLACK-BODY RADIATION
8 PAGES, 2 FIGURES, 15 REFERENCES, PHYS. MED. BIOL., 12(4), PAGES 523-530 (FEBRUARY 23, 1967)

IT IS SHOWN THAT THE EMISSION OF QUANTA IN THE VISIBLE REGION BY THE HEATING UNIT OF A THERMOLUMINESCENCE READER IS A MAJOR SOURCE OF SPURIOUS SIGNALS IN OBSERVATIONS OF LOW RADIATION DOSAGE. AT A HEATER TEMPERATURE OF 300 C, ABOUT 120 PHOTOELECTRONS PER SECOND ARE EMITTED FROM AN S11 PHOTOMULTIPLIER CATHODE FOR A TYPICAL READER CONSTRUCTION. A QUANTUM RESPONSE TAIL FOR THE CATHODE, EXTENDING INTO THE INFRA-RED, IS ALSO DISCUSSED AS A POSSIBLE SOURCE OF SPURIOUS SIGNALS. IT IS SHOWN THAT WITH CAREFUL OPTICAL FILTERING, AND BY COOLING THE PHOTOMULTIPLIER TUBE TO DARK-CURRENT PLATEAU REGION, THE LOWER LIMIT OF OBSERVATION OF THERMOLUMINESCENCE SIGNALS CAN BE EXTENDED.

*DOSIMETRY, THERMOLUMINESCENCE + *INSTRUMENTATION, RADIATION MONITORING +
*MONITOR, RADIATION, ENVIRONMENTAL + *THERMAL CONSIDERATION + RADIATION SAFETY AND CONTROL

15-27077
MIYAKE Y
ARTIFICIAL RADIOACTIVITY IN THE SEA
10 PAGES, 6 TABLES, 28 REFERENCES, THE SEAS (ARTIFICIAL RADIOACTIVITY), 2, PAGES 78-87 (1963)

AT PRESENT, THE ARTIFICIAL RADIOACTIVITY IN THE OCEANS CONSISTS MAINLY OF THE FISSION PRODUCTS OF U-235, PU-239, AND U-238 FROM TESTS OF NUCLEAR WEAPONS. IN SOME AREAS A SMALL AMOUNT OF ARTIFICIAL RADIOACTIVITY HAS BEEN INTRODUCED INTO THE SEA BY ATOMIC WASTE DISPOSAL. THE SPECTRUM OF FISSION PRODUCTS VARIES FROM ONE SOURCE TO ANOTHER ACCORDING TO THE TYPE OF PARENT NUCLIDES AS WELL AS THE KINETIC ENERGY OF THE FISSION NEUTRONS. MORE SIGNIFICANT ARE THE CHANGES IN THEIR COMPOSITION AND ACTIVITY WITH THE LAPSE OF TIME AFTER THE FISSION. THE ARTICLE TREATS IN TABULAR FORM PERCENTAGES OF ACTIVITY FOUND, ENRICHMENT OF RADIOACTIVE SUBSTANCES IN MARINE PRODUCTS, CONCENTRATION OF ELEMENTS IN MEMBERS OF THE MARINE BIOSPHERE, AND MAXIMUM PERMISSIBLE LEVELS OF ACTIVITY IN MARINE MATERIALS.

*FALLOUT + *NUCLEAR EXPLOSION DEBRIS + *TRACER, RADIOACTIVE + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + UNITED KINGDOM + WASTE DISPOSAL, OCEAN

15-27080 ALSO IN CATEGORY 14
NEWTON D
A CASE OF ACCIDENTAL INHALATION OF PROTACTINIUM-231 AND ACTINIUM-227
UKAEA, BERKS HARWELL
7 PAGES, 3 FIGURES, 14 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 11-17 (JULY, 1968)

THE BEHAVIOUR OF ACCIDENTALLY INHALED PA-231 AND AC-227 WAS FOLLOWED OVER THE PERIOD 7-900 DAYS AFTER INTAKE, USING A SINGLE LARGE SODIUM IODIDE DETECTOR PLACED CLOSE TO THE CHEST. THE RESULTS COULD BE EXPLAINED BY A LONG-TERM CLEARANCE FROM THE THORAX INVOLVING BIOLOGICAL HALF-LIVES OF 1000 +/- 300 DAYS AND 300-400 DAYS RESPECTIVELY. THERE WAS NEGLIGIBLE MIGRATION OF AC-227 DAUGHTERS FROM THE CHEST.

*ACTINIUM + *DOSE MEASUREMENT, INTERNAL + *INHALATION + *PROTACTINIUM + ALPHA EMITTER + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + UNITED KINGDOM

15-27081 ALSO IN CATEGORY 14
BUIER FE
RAPID BIOASSAY METHODS FOR PLUTONIUM, NEPTUNIUM, AND URANIUM
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
7 PAGES, 3 FIGURES, 2 TABLES, 15 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 19-24 (JULY, 1968)

VERY SENSITIVE RAPID METHODS WERE DEVELOPED TO DETERMINE PLUTONIUM, NEPTUNIUM, AND ENRICHED URANIUM IN URINE. CHLORIDE COMPLEXES OF THE ACTINIDES ARE EXTRACTED FROM OXIDIZED URINE SALTS WITH THE LIQUID ION EXCHANGER TRI-ISOOCTYLAMINE (TIOA). THE ACTINIDES ARE BACK-EXTRACTED AND THEN COUNTED ON LOW-BACKGROUND SOLID-STATE COUNTERS.

*ANALYTICAL TECHNIQUE, URINE + *BIOLOGICAL CONCENTRATION, MAN + *NEPTUNIUM + *PLUTONIUM + *URANIUM + CHEMICAL ANALYSIS + COUNTER + ION EXCHANGE

15-27082 ALSO IN CATEGORY 14
TAYLOR RW + BOULOGNE AR
RAPID SEPARATION OF STRONTIUM AND BARIUM
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND CO., AIKEN, SOUTH CAROLINA
5 PAGES, 3 FIGURES, TABLE, 6 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 25-29 (JULY, 1968)

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27082 *CONTINUED*

AN ANALYTICAL PROCEDURE IS DESCRIBED FOR THE RAPID DETERMINATION OF SR-89/90 IN THE PRESENCE OF BA/LA-140 AND OTHER FISSION PRODUCTS IN WASTE WATER FROM REACTOR ISOLATION BASINS, WHEN THE BA-140 CONCENTRATION IS GREATER THAN 25% OF THE SR-89/90 CONCENTRATION. THE METHOD COMBINES A RAPID INORGANIC ION EXCHANGE SEPARATION OF BARIUM FROM STRONTIUM WITH PRECIPITATION OF SR(NO₃)₂ FROM FUMING NITRIC ACID INTO A 4-HR METHOD SUITABLE FOR PRE-RELEASE ANALYSIS OF WASTE WATER. DECONTAMINATION FACTORS FOR THE COMMON FISSION PRODUCTS ARE BETTER THAN 1000. THE RECOVERY OF ADDED STRONTIUM IS 85%, WITH A RELATIVE STANDARD DEVIATION OF $\pm 7\%$ AT THE 90% CONFIDENCE LEVEL.

*ANALYTICAL TECHNIQUE, WATER + *RADIATION SAFETY AND CONTROL + *REACTOR POWER + *WASTE TREATMENT, LIQUID + DECONTAMINATION + ENVIRONMENTAL CONDITION + ION EXCHANGE + PRECIPITATION

15-27083 ALSO IN CATEGORY 14

PALMER BD + KURODA PK

DISTRIBUTION OF STRONTIUM-90 AND CERIUM-144 IN THE STRATOSPHERE

DEPARTMENT OF CHEMISTRY, UNIVERSITY OF ARKANSAS, FAYETTEVILLE, ARKANSAS

6 PAGES, 5 FIGURES, TABLE, 3 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 31-36 (JULY, 1968)

DISTRIBUTION OF SR-90 AND CE-144 IN THE STRATOSPHERE WAS INVESTIGATED BY ANALYZING HIGH-ALTITUDE AIR FILTER SAMPLES COLLECTED IN 1962 AND 1963. THE HIGHEST CONCENTRATIONS OF SR (5.4 DIS/MIN/SCF) AND CE-144 (122 DIS/MIN/SCF) WERE OBSERVED IN APRIL 1963 AT 64-70 DEG N AND AT AN ALTITUDE OF 16.7 KM. THE CE-144/SR-90 RATIO IN THE NORTHERN STRATOSPHERE WAS FAIRLY CONSTANT (ABOUT 20, AS OF JANUARY 1963). THE DISTRIBUTION PATTERNS OF SR-90 AND CE-144 WERE QUITE DIFFERENT FROM THOSE OF MN-54 AND SB-124.

*AIRBURST + *CERIUM + *RADIOCHEMICAL ANALYSIS + *STRATOSPHERE + *STRONTIUM + AIR + ATMOSPHERIC DIFFUSION, GLOBAL + FILTER + MONITOR, RADIATION, ENVIRONMENTAL + SAMPLING

15-27085

BRADY JM + AARESTAD NO + SWARTZ HM

IN VIVO DOSIMETRY BY ELECTRON SPIN RESONANCE SPECTROSCOPY

WALTER REED ARMY MEDICAL CENTER, WASHINGTON, D.C.

5 PAGES, 8 FIGURES, 7 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 43-47 (JULY, 1968)

SEVERAL TISSUES, ESPECIALLY HARD TISSUES, SHOWED PERSISTENT ELECTRON-SPIN RESONANCES FOLLOWING IN VIVO OR IN VITRO IRRADIATIONS. THE RESONANCES HAD A LINEAR RELATION TO DOSE. DOSE MEASUREMENTS WERE MADE IN TEETH AT LESS THAN 100 RADS OF CO-60 RADIATION. THE METHOD APPEARS TO BE APPLICABLE FOR DOSIMETRY OF ACCIDENTAL IRRADIATIONS, ESPECIALLY X- OR GAMMA-RAY EXPOSURES.

*BIOLOGICAL CONCENTRATION, ANIMAL + *BIOLOGICAL CONCENTRATION, MAN + *DOSE MEASUREMENT, INTERNAL + *DOSIMETRY, GENERAL + GAMMA EMITTER + RADIATION SAFETY AND CONTROL + X-RAY

15-27086

ATTIX FH

BASIC GAMMA-RAY DOSIMETRY

NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

8 PAGES, 6 FIGURES, 4 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 49-56 (JULY, 1968)

TO DO MEANINGFUL DOSIMETRY IT IS FIRST NECESSARY TO DECIDE WHAT YOU ARE TRYING TO MEASURE, AND THEN TO CHOOSE THE BEST METHOD OF MEASURING IT. IT IS OFTEN NOT EASY TO ANSWER EVEN THE FIRST, APPARENTLY TRIVIAL, QUESTION. IN ANY CASE, IT REQUIRES AT LEAST AN UNDERSTANDING OF THE 2-STEP PROCESS BY WHICH GAMMA RAYS DEPOSIT ENERGY IN MATTER, AND OF THE CONCEPTS OF CHARGED-PARTICLE EQUIVALENT AIR (OR TISSUE) EQUIVALENCE, ENERGY DEPENDENCE, FLUENCE, KERMA, ABSORBED DOSE, AND EXPOSURE.

*DOSE MEASUREMENT, INTERNAL + *DOSIMETRY, GENERAL + *GAMMA EMITTER + MATHEMATICAL TREATMENT + RADIATION SAFETY AND CONTROL

15-27087 ALSO IN CATEGORY 14

EVANS AG + MARTER WL + REINIG WC

GUIDES LIMITING THE RELEASE OF RADIONUCLIDES BY THE SAVANNAH RIVER PLANT

SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA

9 PAGES, 6 TABLES, 14 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 57-65 (JULY, 1968)

THE SAVANNAH RIVER PLANT HAS DEVELOPED PLANT RELEASE GUIDES TO DEFINE THE AMOUNT OF VARIOUS RADIONUCLIDES THAT CAN BE RELEASED TO THE ENVIRONMENT IN AIR AND WATER. RELEASES ARE HELD TO THE LOWEST PRACTICABLE LEVEL WITHIN PLANT OPERATING GUIDES BASED ON CAREFUL OPERATION AND ARE WELL BELOW THE RADIATION PROTECTION GUIDES RECOMMENDED BY THE FEDERAL RADIATION COUNCIL FOR NEIGHBORING POPULATIONS.

*MONITOR, RADIATION, ENVIRONMENTAL + *RADIOACTIVITY RELEASE + *SURVEILLANCE PROGRAM + FEDERAL RADIATION COUNCIL + POPULATION EXPOSURE + RADIATION SAFETY AND CONTROL + SAVANNAH RIVER PLANT

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27089
SCHIMMERLING W + SASS RE
EXPERIENCE WITH A COMMERCIAL FILM BADGE SERVICE
HEALTH PHYSICS GROUP, PRINCETON UNIVERSITY, PRINCETON, NEW JERSEY
10 PAGES, 6 FIGURES, 4 TABLES, 11 REFERENCES, HEALTH PHYSICS, 15(1), PAGES 73-82 (JULY, 1968)

THE PERFORMANCE OF A COMMERCIAL FILM-BADGE SERVICE WAS STUDIED OVER A PERIOD OF 3 YR. KNOWN DOSES WERE ADMINISTERED TO 800 FILM BADGES IN THIS TIME AND THE REPORTED RESULTS ANALYZED. SOME OF THE PROBLEMS INHERENT IN NEUTRON DOSIMETRY IN THE VICINITY OF HIGH-ENERGY ACCELERATION ARE PRESENTED. THE NEED FOR IMPROVED NEUTRON PERSONNEL DOSIMETERS IS CONSIDERED, AND THE RELATION OF FILM BADGE READINGS TO PERSONNEL DOSE IS BRIEFLY DISCUSSED.

BETA EMITTER + DOSE MEASUREMENT, EXTERNAL + DOSIMETRY, GENERAL + GAMMA EMITTER + MONITOR, RADIATION, ENVIRONMENTAL + MONITOR, RADIATION, PERSONNEL + NEUTRON + STATISTICAL ANALYSIS

15-27290
RIEL GK + DUFFEY D
MONITORING OF RADIOSOTOPES IN ENVIRONMENTAL WATER
U.S. NAVY + UNIVERSITY OF MARYLAND
2 PAGES, TABLE, 5 REFERENCES, ANS TRANSACTIONS 11(1) PAGES 52-53 FROM THE TRANSACTIONS OF THE 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-18, 1968

THE ARTICLE PROPOSES THE ELIMINATION OF OFF-SITE MONITORING BY THE USE OF AN ON-SITE MONITORING SYSTEM, COMPLETE AND CONTINUOUS. A GAMMA-RAY SPECTROMETER WOULD BE USED BELOW THE SURFACE OF THE COOLING DISCHARGED WATER TO GIVE THE OPERATOR OF THE REACTOR A CONTINUOUS RECORD OF RADIOACTIVITY DISCHARGED TO THE WATER. THE SPECTROMETER WOULD GIVE A SENSITIVITY READING IN THE PICOCURIE-PER-LITER RANGE.

*ION EXCHANGE + *MONITOR, RADIATION, ENVIRONMENTAL + *RESIN + *SPECTROMETRY, GAMMA + REACTOR, POWER

15-27331 ALSO IN CATEGORIES 16 AND 17
TURNER DB
WORKBOOK OF ATMOSPHERIC DISPERSION ESTIMATES
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO
PHS-959-AP-26 +. 84 PAGES, FIGURES, TABLES, 1967

THIS WORKBOOK PRESENTS METHODS OF PRACTICAL APPLICATION OF THE BINOMIAL CONTINUOUS PLUME DISPERSION MODEL TO ESTIMATE CONCENTRATIONS OF AIR POLLUTANTS. ESTIMATES OF DISPERSION ARE THOSE OF PASQUILL AS RESTATED BY GIFFORD. EMPHASIS IS ON THE ESTIMATION OF CONCENTRATIONS FROM CONTINUOUS SOURCES FOR SAMPLING TIMES OF 10 MIN. SOME OF THE TOPICS DISCUSSED ARE DETERMINATION OF EFFECTIVE HEIGHT OF EMISSION, EXTENSION OF CONCENTRATION ESTIMATES TO LONGER SAMPLING INTERVALS, INVERSION BREAK-UP FUMIGATION CONCENTRATIONS, AND CONCENTRATIONS FROM AREA, LINE, AND MULTIPLE SOURCES. TWENTY-SIX EXAMPLE PROBLEMS AND THEIR SOLUTIONS ARE GIVEN. SOME GRAPHICAL AIDS TO COMPUTATION ARE INCLUDED.

AVAILABILITY - D.B. TURNER, AIR RESOURCES FIELD RESEARCH OFFICE, ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION, U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO

*HEALTH PHYSICS TRAINING + *METEOROLOGY + *STAFFING, TRAINING, QUALIFICATION + ATMOSPHERIC POLLUTION + METEOROLOGICAL SUPPORT + REACTOR, POWER + REACTOR, RESEARCH

15-27441
STRAIN WH + PORIES WJ + ZARESKY SA + DATTILO E
HEALTH HAZARDS FROM ZN-65 POLLUTION
ROCHESTER UNIVERSITY
2 PAGES, 1 TABLE, 6 REFERENCES, PAGES 60-61 OF TRANSACTIONS OF THE 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-18, 1968

ZINC-65, A RECOGNIZED POLLUTANT FROM NUCLEAR BOMBS AND REACTORS, ACCUMULATES IN THE ENVIRONMENT AND CAN BECOME A PUBLIC HEALTH HAZARD. TO STUDY THIS DANGER, WE HAVE INVESTIGATED THE INFLUENCE OF AGE AND SEX ON THE RETENTION OF THE RADIONUCLIDE AFTER INGESTION BY RATS. THE WORK IS AN EXTENSION OF EARLIER STUDIES ON THE PROMOTION OF EXCRETION OF RADIOZINC BY ZINC DISODIUM EDTA.

*ATMOSPHERIC POLLUTION + *ZINC + BIOLOGICAL CONCENTRATION, ANIMAL + BIOMEDICAL + ENVIRONMENTAL CONDITION + INGESTION + NUCLEAR DETONATION

15-27442
SUNTHARALINGAM N
THERMOLUMINESCENCE IN RADIATION MEASUREMENTS
1 PAGE, PAGE 68 OF THE TRANSACTIONS OF THE 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, 11(1), TORONTO, CANADA, JUNE 1968

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27442 *CONTINUED*

METHODS OF MEASURING RADIATION EXPOSURE BASED UPON THE LUMINESCENCE OF SOLIDS HAVE RECEIVED CONSIDERABLE ATTENTION OVER THE LAST FEW YEARS. MORE SPECIFICALLY, THERMOLUMINESCENCE METHODS HAVE BEEN INVESTIGATED IN SOME DETAIL AND FOUND TO SHOW CONSIDERABLE PROMISE IN THE DOSIMETRY OF X AND GAMMA RADIATION. THE HIGH SENSITIVITY, GOOD REPRODUCIBILITY, WIDE RANGE, LONG-TERM STABILITY OF THE STORED SIGNAL, RUGGEDNESS, SMALL SIZE, AND GOOD REUSABILITY ARE SOME OF THE ADVANTAGES OF THE THERMOLUMINESCENT DOSIMETRY SYSTEMS.

*DOSIMETRY, THERMOLUMINESCENCE + *INSTRUMENTATION, RADIATION MONITORING + *MEASUREMENT, GENERAL + GAMMA EMITTER + X-RAY

15-27443

MULLER AC + HILL FB

THE RADIATION-SENSITIZED QUARTZ DOSIMETER

BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK

2 PAGES, 1 FIGURE, 1 REFERENCE, PAGES 74-75 OF THE TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY AND THE CANADIAN NUCLEAR ASSOCIATION, 11(1), TORONTO, CANADA, JUNE 1968

A NEW TYPE OF QUARTZ DOSIMETER SUITABLE FOR USE IN THE 5- TO 50-KRAD RANGE IS DESCRIBED. THE DOSIMETER IS PRODUCED BY EXPOSING A PLATE OF VERY PURE FUSED OR NATURAL CRYSTALLINE QUARTZ TO 10(8TH) TO 10(10TH) RADS OF CO-60 GAMMA RADIATION. THE IRRADIATION IS FOLLOWED BY AN ANNEALING TREATMENT AT A TEMPERATURE BETWEEN 200 AND 400 C FOR A PERIOD OF APPROXIMATELY 24 H. AT THIS POINT THE DOSIMETER IS READY FOR USE.

*DOSIMETRY, GENERAL + *INSTRUMENTATION, RADIATION MONITORING + COBALT + GAMMA EMITTER + IRRADIATION TESTING

15-27444

BAYLISS RJ

RADON LEAKAGE FROM SEALED RADIUM SOURCES IN MEDICAL USE

DEPARTMENT OF PUBLIC HEALTH, N.S.W.

3 PAGES, 1 TABLE, 2 REFERENCES, THE MEDICAL JOURNAL OF AUSTRALIA, 1, PAGES 496-498 (MARCH 11, 1967)

RADIUM, COMBINED AS THE SULPHATE AND SEALED IN VARIOUS TYPES OF CAPSULES, IS USED IN A NUMBER OF HOSPITALS AND PRIVATE SURGERIES FOR INTRACAVITARY AND EXTERNAL IRRADIATION. RADIUM IS COMMONLY SEALED IN THREE WAYS--NAMELY, IN NEEDLES, IN TUBES, AND IN PLAQUES. THERE IS A SIGNIFICANT DOSAGE OF BETA RAYS FROM THE PLAQUE, USE OF WHICH IS MADE IN SUPERFICIAL SKIN THERAPY. OWING TO THE PROPERTIES OF RADIUM, ITS USE IN A FAULTY CAPSULE CAN LEAD TO CONSIDERABLE PUBLIC HEALTH PROBLEMS. IF RADON GAS LEAKS FROM THE SOURCE, CONTAMINATION OF STORAGE CONTAINERS AND HANDLING EQUIPMENT IS INEVITABLE. ANY DEFECT IN THE CONTAINER WHICH GIVES RISE TO THE ESCAPE OF RADON GAS MAY, WITH CARELESS TREATMENT, WIDEN AND PRODUCE LEAKAGE OF THE FINELY DIVIDED RADIUM SALT.

*LEAK + *RADIUM + *RADON + *SOURCE, RADIATION + BIOMEDICAL + CONTAMINATION

15-27445

WHITEHOUSE WJ

THE POINT SOURCE METHOD OF DOSE CALCULATION IN MEDIA OF VARYING DENSITY WITH SPECIAL REFERENCE TO BETA-PARTICLES

UKAEA, BERKS HARWELL

AERE-R-5679 +. 22 PAGES, JANUARY, 1968

THE POINT SOURCE METHOD IS ADAPTED TO CALCULATING THE ENERGY DEPOSITION IN MEDIA OF VARYING DENSITY AND DISCUSSED, WITH SPECIAL REFERENCE TO THE DOSE FROM BETA PARTICLES IN TRABECULAR BONE. THE DOSE RECIPROCITY THEOREM IS RESTATED, IN A FORM CONSISTENT WITH THE DENSITY-DEPENDENT POINT SOURCE FORMULA. BY WAY OF ILLUSTRATION THE LOEVIENG POINT SOURCE FORMULA FOR BETA RAYS IS USED TO SOLVE TWO MODELS, (A) ALTERNATING INFINITE SLABS OF DIFFERENT SUBSTANCES, (B) A HOLLOW SPHERE FILLED WITH ONE SUBSTANCE, AND SURROUNDED BY ANOTHER. THE NUMERICAL VALUES USED IN THESE SOLUTIONS CORRESPOND TO THE BONE-SEEKING NUCLIDES SR-90, Y-90 AND P-32, AND TO SUBSTANCES WITH THE DENSITY AND MEAN COMPOSITION OF TRABECULAR BONE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*BETA EMITTER + *DOSE CALCULATION, INTERNAL + *MATHEMATICAL TREATMENT + *SOURCE, POINT + PHOSPHORUS + STRONTIUM + UNITED KINGDOM + YTTRIUM

15-27619

ALSO IN CATEGORIES 17 AND 14

WATER POLLUTION CONTROL--TECHNICAL TRAINING PROGRAM--BULLETIN OF COURSES

U.S. DEPARTMENT OF THE INTERIOR

66 PAGES, FROM CLEAN WATER, BULLETIN OF COURSES, JULY 1968 TO JUNE 1969

DESCRIBES 27 SHORT COURSES (1-2 WEEKS, GIVEN AT VARIOUS REGIONAL CENTERS IN 1968-69) IN THE GENERAL AREAS OF CHEMISTRY (4), MICROBIOLOGY (7), AND ENGINEERING AND WASTE TREATMENT (13). NONE SEEM SLANTED AT RADIATION OR AT POWER STATIONS, BUT SOME OF THE INTRODUCTORY BIOLOGY AND ECOLOGY COURSES SEEM GENERALLY APPLICABLE.

*ECOLOGICAL CONSIDERATION + *STAFFING, TRAINING, QUALIFICATION + *WASTE DISPOSAL, LIQUID +

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27619 *CONTINUED*
THERMAL POLLUTION

15-27648

NELLIS DO + HUDSPETH EL + MORGAN IL + BUCHANAN PS + BOGGS RF
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION
U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, PUBLIC HEALTH SERVICE
PHS-PUBL. 999-RH-29 +. 47 PAGES, 15 FIGURES, 5 TABLES, 8 REFERENCES, NOVEMBER 1967

TRITIUM-METALLIC TARGETS ARE FREQUENTLY USED IN MANY PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO MINIMIZE THE POTENTIAL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT BOMBARDMENT OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM FOR EACH BOMBARDING DEUTERON, AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS ALSO DETERMINED THAT A RELATIVELY SMALL AMOUNT OF THE TRITIUM RELEASED FROM THE TARGET ACTUALLY REMAINS WITHIN THE ACCELERATOR ITSELF. MOST OF THE TRITIUM LOST BY A BOMBARDED TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - PUBLIC HEALTH SERVICE, WASHINGTON, D.C., FREE

*CONTAMINATION + *TRITIUM + ACCELERATOR + MONITOR, RADIATION, GAS

15-27828

CRIMMINS TW + GIBSON NN + PELLETIER AM + JACOBSON JR
EXPOSURE-RATE DEPENDENCE OF SELECTED GAMMA DOSIMETERS
ARMY, NUCLEAR DEFENSE LABORATORY, EDGEWOOD ARSENAL, MARYLAND
NDL-TR-94 +. 32 PAGES, FIGURES, TABLES, 9 REFERENCES, JANUARY 1968

THIS EXPERIMENT STUDIED THE EFFECTS OF EXPOSURE RATE ON THE RESPONSE OF THE FOLLOWING GAMMA DOSIMETERS - SILVER-ACTIVATED METAPHOSPHATE GLASS PLATES AND RODS, LITHIUM FLUORIDE AND MANGANESE-ACTIVATED CALCIUM FLUORIDE MICROTHERMOLUMINESCENT DOSIMETERS, AND COBALT-ACTIVATED BOROSILICATE GLASS PLATES. THE EXPERIMENT WAS CONDUCTED AT THE FLASH X-RAY FACILITY OF THE ION PHYSICS CORPORATION OF BURLINGTON, MASS. DATA WERE OBTAINED IN THE EXPOSURE RANGE OF ABOUT 1,500 TO 45,000 R AT EXPOSURE RATES FROM 5.2 X 10 TO THE MINUS 1 TO 2.2 X 10 TO THE 11 R TO THE MINUS 1. THE RESULTS OF THIS EXPERIMENT INDICATE THAT NO DIFFERENCES EXIST IN THE RELATIVE RESPONSES OF THE VARIOUS DOSIMETERS THAT MAY BE ATTRIBUTED TO EXPOSURE RATE OR TO AN INTERACTION BETWEEN EXPOSURE AND EXPOSURE RATE.

*DESIGN STUDY + *DOSIMETRY, GENERAL + *EQUIPMENT, GENERAL

15-27855 ALSO IN CATEGORIES 17 AND 14
TRAINING COURSES - NATIONAL CENTER FOR RADIOLOGICAL HEALTH
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PHS-PUB-1623 REV. +. 33 PAGES, JULY 1968

SIXTY-SIX 1 OR 2 WEEK PRESENTATIONS AT VARIOUS REGIONAL CENTERS IN FY 1969 WILL BE MADE OF ONE OR MORE OF THE 16 COURSES AVAILABLE. AMONG THOSE OF INTEREST ARE - BASIC RADIOLOGICAL HEALTH, RADIOLOGICAL HEALTH FOR NURSES, TWO FOR X-RAY PROTECTION, OCCUPATIONAL RADIATION PROTECTION, REACTOR SAFETY AND HAZARDS EVALUATION, MANAGEMENT OF RADIATION ACCIDENTS, OPERATIONAL ASPECTS OF RADIATION ACCIDENTS, OPERATIONAL ASPECTS OF RADIATION SURVEILLANCE, MEASUREMENT OF AIRBORNE RADIOACTIVITY, CHEMICAL AND GAMMA SPECTROSCOPY ANALYSIS OF RADIONUCLIDES, AND RADIUM HAZARDS AND CONTROL.

AVAILABILITY - U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, CENTER FOR RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND

*HEALTH PHYSICS TRAINING + *STAFFING, TRAINING, QUALIFICATION + RADIATION INJURY, TREATMENT OF + RADIOLOGICAL ASSISTANCE + RADIUM + REACTOR, POWER + REACTOR, RESEARCH + SURVEY, RADIATION, ENVIRONMENTAL + X-RAY

15-27856

ALSO IN CATEGORIES 17 AND 1
TRAINING MANUAL - MANAGEMENT OF RADIATION ACCIDENTS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
150 PAGES, FIGURES, TABLES, 39 REFERENCES, SEPTEMBER 12, 1966

A SET OF COURSE NOTES FOR 29 LECTURES IN THE GENERAL SUBJECT AREAS OF - I, RADIATION ACCIDENT CONTROL PLANNING AND RESPONSE (4). II, TYPES OF ACCIDENTS (5). III, RADIATION CONTAMINATION MONITORING (3). IV, EVALUATION AND CONTROL OF ACCIDENTAL EXPOSURE (7). V, NUCLEAR REACTOR HAZARDS (6). MEDICAL ASPECTS OF RADIATION ACCIDENTS (4). ***FOR USE IN A ONE WEEK COURSE PRESENTED BY NCRH.

AVAILABILITY - DIVISION OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND 20852

*STAFFING, TRAINING, QUALIFICATION + HEALTH PHYSICS TRAINING + RADIATION INJURY, TREATMENT OF + RADIATION SAFETY AND CONTROL + RADIOLOGICAL ASSISTANCE + SURVEY, RADIATION, EMERGENCY

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27859 ALSO IN CATEGORY 4
BILLINGHAM J + ROBBINS DE + EWING D
A METHOD OF EVALUATING RADIATION RISKS FOR MANNED SPACE FLIGHTS
AMES RESEARCH CENTER + MANNED SPACECRAFT CENTER
16 PAGES, 8 FIGURES, 1 TABLE, 14 REFERENCES, RADIATION RESEARCH, 30, PAGES 541-546 (MARCH 1967)

PROBLEMS CONCERNING AN EVALUATION OF THE HAZARD FROM DOSES OF IONIZING RADIATION DURING MANNED SPACE FLIGHT 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.

*AIRCRAFT + *DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + *RADIATION SAFETY AND CONTROL + *RADIOBIOLOGY + *SPACECRAFT + ATMOSPHERIC POLLUTION + HAZARDS ANALYSIS + METEOROLOGICAL SUPPORT

15-27860
BUSH WR
ANALYSIS OF RADIATION EXPOSURES IN 1967
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO
AECL-3063 +. 16 PAGES, 8 FIGURES, 2 TABLES, MARCH, 1968

EXPOSURES TO EXTERNAL BETA AND GAMMA RADIATION AND TO INTERNAL RADIATION FROM TRITIATED WATER (HTO) ARE ANALYSED AND COMPARED WITH EXPOSURES IN PREVIOUS YEARS. THE TOTAL, AVERAGE, AND HIGHEST EXPOSURES RECEIVED AT AECL SITES IN 1967 ARE GIVEN. ABOUT 85% OF THE EXTERNAL AND 100% OF THE INTERNAL EXPOSURE WAS RECEIVED AT CRNL, OF WHICH NEARLY 10% WAS RECEIVED BY OPERATING, MAINTENANCE AND RADIATION CONTROL PERSONNEL, MOSTLY IN THE NRX AND NRU REACTOR BUILDINGS. THE COMBINED DOSES FROM EXTERNAL AND INTERNAL EXPOSURES TO THE WHOLE BODY, EYE LENSES, AND SKIN, AND THEIR DISTRIBUTION AMONG BRANCHES AND INDIVIDUALS, ARE PRESENTED IN GRAPHICAL FORM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*BIOLOGICAL CONCENTRATION, MAN + *DOSIMETRY, GENERAL + *RADIATION SAFETY AND CONTROL + CHALK RIVER + GROSS BETA + GROSS GAMMA + MONITOR, RADIATION, PERSONNEL + TRITIUM

15-27861
YOSHIDA Y + DENNIS JA
A PROPORTIONAL COUNTER FOR PERSONNEL NEUTRON DOSIMETRY
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL, BERKSHIRE
AERE-R-5656 +. 21 PAGES, 6 FIGURES, 3 TABLES, 23 REFERENCES, MARCH 1968

A PROPORTIONAL COUNTER WAS DEVELOPED AS A SOLUTION TO THE SPECIFIC PROBLEM OF MEASURING THE DOSE EQUIVALENT TO PERSONNEL FROM NEUTRONS WITH ENERGIES GREATER THAN 10 KEV. THE DIMENSIONS OF THE PROTOTYPE COUNTER ARE 12 X 3 X 1 CM. IT CONSISTS OF THREE CELLS WITH CONDUCTIVE PLASTIC WALLS WITH ATOMIC COMPOSITION EQUIVALENT TO TISSUE AND FILLED WITH HYDROGENOUS GAS. IT IS SUGGESTED THAT IT WILL BE POSSIBLE TO MODIFY THE COUNTER TO MEASURE WITH REASONABLE ACCURACY THE DOSE EQUIVALENT FROM THE NEUTRONS OVER THE ENTIRE ENERGY RANGE FROM THERMAL TO 20 MEV.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*COUNTER + *INSTRUMENTATION, RADIATION MONITORING + *MONITOR, RADIATION, PERSONNEL + *RADIATION SAFETY AND CONTROL + DESIGN CRITERIA + NEUTRON + UNITED KINGDOM

15-27862
EAKINS JD
THE DETERMINATION OF PLUTONIUM ALPHA ACTIVITY IN URINE BY SURFACE ADSORPTION AND ION EXCHANGE
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, BERKSHIRE
AERE-R-5637 +. 12 PAGES, 1 FIGURE, 5 TABLES, 14 REFERENCES, DECEMBER 1967

DESCRIBES WORK CARRIED OUT TO SELECT AND EVALUATE AN ION EXCHANGE PROCEDURE WHICH, IN CONJUNCTION WITH THE SURFACE ADSORPTION METHOD FOR DETERMINING GROSS ALPHA ACTIVITY IN URINE, GIVES A HIGHLY SPECIFIC PROCEDURE FOR PLUTONIUM ALPHA ACTIVITY. THE CHOSEN PROCEDURE IS EXAMINED WITH REFERENCE TO DECONTAMINATION FROM OTHER ACTINIDE ELEMENTS, RECOVERY ACTINIDE ELEMENTS ARE IN EXCESS OF 100 IN ALL CASES. THE OVERALL RECOVERY OF PLUTONIUM IS 89 +/- 4%, AND THE BACKGROUND ACTIVITY OBTAINED FROM THE URINE OF UNEXPOSED PEOPLE IS 0.015 +/- 0.005 PCI/1500 ML. THE PROCEDURE IS SUITABLE FOR ANALYSING LARGE NUMBERS OF SAMPLES AND REQUIRES LITTLE OPERATOR EXPERTISE. THE USE OF THE PROCEDURE FOR GROSS ALPHA ACTIVITY AND PLUTONIUM HAS ADVANTAGES BOTH IN ECONOMY OF MATERIALS AND EASE OF STAFF TRAINING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

ADSORPTION SURFACE + BIOLOGICAL CONCENTRATION, MAN + DECONTAMINATION FACTOR + GROSS ALPHA + ION EXCHANGE +

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN15-27862 *CONTINUED*
PLUTONIUM + UNITED KINGDOM15-27865
HANKINS DE + HANSEN GE
REVISED DOSE ESTIMATES FOR THE CRITICALITY EXCURSION AT LOS ALAMOS SCIENTIFIC LABORATORY, MAY 21, 1946
LOS ALAMOS SCIENTIFIC LABORATORY
LA-3861 +. 13 PAGES, 7 FIGURES, 3 TABLES, DECEMBER 1967

PRESENTS REVISED ESTIMATES OF THE DOSE RECEIVED BY PERSONNEL EXPOSED IN THE LOS ALAMOS CRITICALITY EXCURSION THAT OCCURRED MAY 21, 1946. THE REVISED DOSES ARE BASED ON A CALCULATION OF THE LEAKAGE NEUTRON SPECTRUM FROM THE CRITICAL SYSTEM AND THE RESULTS OBTAINED FROM A RECENT STUDY OF BLOOD-SODIUM ACTIVATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE*CRITICAL ASSEMBLY FACILITY + *CRITICALITY SAFETY + *DOSE CALCULATION, EXTERNAL +
*DOSE CALCULATION, INTERNAL + LASL + NEUTRON15-27866
HANKINS DE
STUDY OF SELECTED CRITICALITY - DOSIMETRY METHODS
LOS ALAMOS SCIENTIFIC LABORATORY
LA-3910 +. 56 PAGES, FIGURES, TABLES, 48 REFERENCES, DECEMBER 1967

SEVERAL METHODS FOR DETERMINING THE DOSE RECEIVED BY PERSONS ACCIDENTALLY EXPOSED TO A CRITICALITY EXCURSION HAVE BEEN INVESTIGATED. THIS STUDY INDICATES THAT CONSIDERABLE INFORMATION MUST BE AVAILABLE BEFORE AN ACCURATE ASSESSMENT OF A PERSONS DOSE CAN BE MADE. IF NO INFORMATION ABOUT THE ACCIDENT IS AVAILABLE, DOSIMETRY USING A RATIO OF THE HAIR AND BLOOD-SODIUM ACTIVATION WILL GIVE THE DOSE TO WITHIN PLUS OR MINUS 20 TO 30% EXCEPT WHERE MASSIVE URANIUM OR IRON SHIELDING OCCURS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE*CRITICAL ASSEMBLY FACILITY + *DOSE + *DOSIMETRY, GENERAL + *SHIELDING + COUNTER + GAMMA EMITTER +
PHANTOM, HUMAN BODY + THERMAL NEUTRON15-27867
GOODALL G
THE DETERMINATION OF STRONTIUM IN BONE, MILK AND VEGETABLE ASHES USING ION EXCHANGE SEPARATION AND FLAME
PHOTOMETRY
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, CAPENHURST, GREAT BRITAIN
PG-815 (CA) +. 12 PAGES, 3 FIGURES, 4 TABLES, 12 REFERENCES, 1968

A RAPID AND SENSITIVE METHOD FOR DETERMINING SR IN THE PRESENCE OF LARGE AMOUNTS OF CA AND OTHER INTERFERING ELEMENTS FOUND IN BIOLOGICAL MATERIALS HAS BEEN DEVELOPED USING CATION EXCHANGE AND FLAME PHOTOMETRY. AMMONIUM LACTATE IS USED AS ELUANT, AND THE SR IN THE ELUATE IS DETERMINED DIRECTLY BY FLAME PHOTOMETRY. THE METHOD HAS A NEGATIVE BIAS OF 3%, AND THE SR CONTENT OF 0.2 OF BONE ASH CAN BE DETERMINED WITH A COEFFICIENT OF VARIATION OF 2%.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*BIOLOGICAL CONCENTRATION, MAN + *CHROMATOGRAPHY + *ION EXCHANGE + *STRONTIUM + CALCIUM + CHEMICAL ANALYSIS

15-27868
ROHWER PS + KAYE SV
AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS.
PLOWSHARE RESEARCH AND DEVELOPMENT PROGRESS REPORT, OCTOBER 1, 1967-APRIL 1, 1968
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-2229 +. 36 PAGES, FIGURES, REFERENCES, APRIL 1, 1968

PRESENTS AGE-DEPENDENT MODELS WHICH ARE USED IN THE INREM COMPUTER CODE FOR CALCULATING THE RADIATION DOSE RESULTING FROM INHALATION OR INGESTION OF RADIONUCLIDES. USE OF AGE-DEPENDENT MODELS IN FEASIBILITY STUDIES PERMITS IDENTIFICATION OF THE CRITICAL SEGMENT OF THE POPULATION AND PROVIDES THE GUIDANCE NECESSARY FOR PLANNING OF REMEDIAL ACTION. RESULTS OF EXAMPLE DOSE CALCULATIONS ARE PRESENTED FOR TRITIUM AND I-131 TO ILLUSTRATE USE OF THE INREM CODE. THE RADIONUCLIDE INPUT USED FOR THE TRITIUM EXAMPLE IS BASED ON ESTIMATED CONCENTRATIONS RELEASED TO AIR AFTER COMBUSTION OF NATURAL GAS STORED IN THE PROJECT KETCH RESERVOIR. THE I-131 EXAMPLE ILLUSTRATES THE INFLUENCE OF THE AGE-DEPENDENT PARAMETERS IN THE DOSE MODEL UPON THE RESULTING DOSE ESTIMATES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*DOSE CALCULATION, INTERNAL + *IODINE + *POPULATION EXPOSURE + *RADIATION MODEL + *TRITIUM + INGESTION +

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27868 *CONTINUED*
PLOWSHARE PROGRAM

15-27880 ALSO IN CATEGORY 16
RICHARDSON LC
USER(S) MANUAL FOR THE FORTRAN VERSION OF RSAC. A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM
PHILLIPS PETROLEUM COMPANY
IDO-17261 +. 136 PAGES, FIGURES, 3 TABLES, 5 REFERENCES, JUNE 1968

THIS REPORT IS A MANUAL FOR THE FORTRAN VERSION OF THE RSAC COMPUTER CODE. THE MATHEMATICAL MODEL AND EQUATIONS ARE DESCRIBED IN IDO-17151, RSAC--A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM, BY R. L. COATES AND N. R. NORTON, MAY 1966. THE PROGRAM COMPUTES THE POTENTIAL RADIOLOGICAL DOSES RESULTING FROM EITHER A CONTINUOUS OR INSTANTANEOUS RELEASE OF RADIOACTIVE FISSION PRODUCTS TO THE ATMOSPHERE. THE DOSES CONSIDERED ARE CLOUD GAMMA, DEPOSITION GAMMA, INGESTION, AND INHALATION AND ARE BASED UPON THE RELEASE OF UP TO 450 ISOTOPES, THE RELATIVE ABUNDANCE OF EACH ISOTOPE BEING DEPENDENT UPON THE OPERATING HISTORY OF THE NUCLEAR REACTOR UNDER CONSIDERATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*COMPUTER PROGRAM + *DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + *SOURCE, CONTINUOUS + *SOURCE, INSTANTANEOUS + DEPOSITION + INGESTION + INHALATION

15-27897
SUTTON DC + KELLY JJ
SR-90 AND CS-137 MEASUREMENTS OF LARGE COLUME SEA WATER SAMPLES
U. S. ATOMIC ENERGY COMMISSION
HASL-196 +. 44 PAGES, 3 FIGURES, 4 TABLES, 15 REFERENCES, APRIL 1968

METHODS REQUIRING LESS SAMPLE HANDLING AND FEWER REAGENTS THAN THOSE OF OTHER INVESTIGATORS HAVE BEEN DEVELOPED FOR THE MEASUREMENT OF SR-90 AND CS-137 IN AVERAGE 55-LITER SURFACE OR DEEP SEA SAMPLES. DURING FOUR YEARS, SR AND CS YIELDS AVERAGED 75 PLUS OR MINUS 15 AND 70 PLUS OR MINUS 10%, RESPECTIVELY. IN THE DESCRIPTION OF THE METHODS, EMPHASIS IS PLACED ON SAMPLE PREPARATION, CS ISOLATION (FROM AMMONIUM PHOSPHOMOLYBDATE, ITS COLLECTING REAGENT, ATTAINED BY A SINGLE ION EXCHANGE PASS IN THE PRESENCE OF EDTA), SODIUM CARBONATE OR AMMONIUM CARBONATE AS PRECIPITANTS FOR SR COLLECTION, REAGENT AND SAMPLE QUALITY CONTROL, BETA COUNTING, AND DATA ANALYSIS. APPENDED ARE DERIVATIONS OF EQUATIONS USED TO CALCULATE SR-90 FROM Y-90 COUNTING DATA AND A PROGRAM IN FORTRAN IV FOR AN IBM 360/30 COMPUTER WHICH RESOLVES THE Y-90 DATA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CESIUM + *DATA PROCESSING + *EQUIPMENT, GENERAL + *EXPERIMENT, GENERAL + *STRONTIUM + COUNTER + OCEAN AND SEA + RADIATION SAFETY AND CONTROL

15-27900
PROCEEDINGS FOR THE CONFERENCE ON PRINCIPLES OF RADIATION PROTECTION, AUGUST 24-26, 1966, OAK RIDGE, TENNESSEE
OAK RIDGE NATIONAL LABORATORY
CONF-660815 +. 172 PAGES, FIGURES, TABLES, REFERENCES, AUGUST 26, 1968

THE CONFERENCE WAS DESIGNED TO REVIEW RECENT RESEARCH IN RADIATION PROTECTION AND HEALTH PHYSICS AND TO DESCRIBE THE INTERESTING OPPORTUNITIES FOR TEACHING, RESEARCH AND APPLIED ACTIVITIES IN THE BROAD FIELD OF HEALTH PHYSICS. PAPERS GIVEN DURING THE MEETING INCLUDED SUBJECTS AS RADIATION PROTECTION, EVOLUTION OF DATA, RESEARCH HORIZONS, RADIOBIOLOGY AND BIOMEDICINE, DOSIMETRY AND SHIELDING, MEDICAL PHYSICS, AND HEALTH PHYSICS ENGINEERING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*DESIGN CRITERIA + *DOSIMETRY, GENERAL + *EMERGENCY SYSTEM + *HEALTH PHYSICS TRAINING + *INSTRUMENTATION, RADIATION MONITORING + *RADIATION SAFETY AND CONTROL + *SITING, REACTOR + BIOLOGICAL CONCENTRATION, MAN + BIOMEDICAL + FILTER + MAXIMUM PERMISSIBLE BODY BURDEN + MAXIMUM PERMISSIBLE DOSE (MPD) + R AND D PROGRAM + RADIATION DAMAGE + RADIOLOGY + SHIELDING + STACK + WASTE DISPOSAL, GENERAL + X-RAY

15-27911
ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE SUBSTANCES
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ROCKVILLE, MARYLAND 20852
24 PAGES, REPORT TO THE DIRECTOR, NATIONAL CENTER FOR RADIOLOGICAL HEALTH PUBLIC HEALTH SERVICE, DECEMBER 1, 1967

THIS REPORT IS CONCERNED PRIMARILY WITH THE NEED FOR A NATIONWIDE SURVEILLANCE TO MEASURE THE LEVELS OF RADIOACTIVE CONTAMINATION OF AIR, WATER, FOOD, AND OTHER VECTORS OF JUMAN EXPOSURE TO RADIOACTIVE SUBSTANCES. THE COMMITTEE HAS IDENTIFIED THE REQUIREMENTS OF A NATIONAL SURVEILLANCE SYSTEM TO MEET PROGRAM OBJECTIVES AND HAS OUTLINED THE RESPONSIBILITIES OF

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27911 *CONTINUED*

FEDERAL AND STATE AGENCIES. IN ORDER FOR THE NATIONAL CENTER FOR RADIOLOGICAL HEALTH TO MEET ITS RESPONSIBILITIES FOR PROTECTING PUBLIC HEALTH, THE COMMITTEE, IN THIS REPORT, MAKES A NUMBER OF RECOMMENDATIONS TO THE DIRECTOR AND URGES THAT APPROPRIATE ACTION BE TAKEN FOR THEIR IMPLEMENTATION.

AVAILABILITY - U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE

AEROSPACE SAFETY + BIOLOGICAL CONCENTRATION, FOOD + BIOLOGICAL CONCENTRATION, GENERAL + BIOLOGICAL CONCENTRATION, MAN + BIOLOGICAL CONCENTRATION, MILK + BIOLOGICAL CONCENTRATION, VEGETATION + MONITOR, RADIATION, ENVIRONMENTAL + NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL + RADIOISOTOPE + RADIOLOGICAL ASSISTANCE + REACTOR POWER + SHIPPING ANALYSIS + SURVEILLANCE PROGRAM + TRANSPORTATION AND HANDLING + WASTE MANAGEMENT

15-27914 ALSO IN CATEGORY 14

LACHAPELLE DG + TARBOX JL + MALONEY JC + BRADBURY HG + GODBOLT NH + MILLER WM
A FIELD-EXPEDIENT INCINERATOR (PROJECT TEE PEE)
GENERAL DYNAMICS, FORT WORTH, TEXAS + ARMY NUCLEAR DEFENSE LAB
AD-664118 + NDL-TR-98 +. 132 PAGES, REFERENCES, JANUARY 1968

AN INCINERATOR FOR EXPEDIENT CONCENTRATION OF COMBUSTIBLE RADIOACTIVE WASTE HAS BEEN DESIGNED, BUILT, AND EVALUATED. IT FEATURES PORTABILITY AND EASE OF ASSEMBLY. THIS INCINERATOR (REFERRED TO AS TEE PEE) EMPLOYS FIVE OIL-FIRED BURNERS THAT IGNITE THE WASTE MATERIAL AND REDUCE THE PARTICULATE EMISSION. FOUR INCINERATIONS WERE CONDUCTED WITH ROUGH-CUT LUMBER CONTAMINATED LA-140. THE CONCLUSION BASED ON THESE RESULTS IS THAT THE TEE PEE IS A PRACTICAL DEVICE FOR EFFICIENT FIELD-EXPEDIENT INCINERATION AND CONCENTRATION OF COMBUSTIBLE RADIOACTIVE WASTE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*AIRBORNE RELEASE + *INCINERATION + *LANTHANUM + *WASTE TREATMENT, SOLID + CONCENTRATION, MAXIMUM + EFFLUENT + MAXIMUM PERMISSIBLE CONCENTRATION (MPC)

15-27917

DENHAM DH
HEALTH PHYSICS AT THE LRL-LIVERMORE TRANSURANIC PROCESSING FACILITY
UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
ORNL-P-3227 + CONF-671102-3 +. 8 PAGES, 4 TABLES, 16 REFERENCES, PAGES 179-186 OF SAFETY REVIEW PROCEDURES FOR HOT CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL, FOR PRESENTATION AT 15TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY AND ATOM FAIR, CHICAGO, ILLINOIS, 1966

THIS REPORT DESCRIBES THE LRL TRANSURANIC FACILITY AND DISCUSSES THE HEALTH PHYSICS CONTROLS USED TO LIMIT PERSONNEL EXPOSURE AND TO MAINTAIN COMPLETE CONFINEMENT OF THE HIGHLY RADIOACTIVE AND RADIOTOXIC MATERIALS, AND ENUMERATES SOME OF THE SPECIAL HAZARDS OF HANDLING THE TRANSURANIUM ELEMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*HAZARDS ANALYSIS + *MONITOR, RADIATION, PERSONNEL + *RADIATION SAFETY AND CONTROL + *TRANSURANIUM ELEMENT + MONITOR, RADIATION, AIR + MONITOR, RADIATION, GENERAL + SURVEILLANCE PROGRAM + VENTILATION SYSTEM

15-27918 ALSO IN CATEGORY 14

BURCH WD + AREHART TA
SAFETY REVIEW PROCEDURES FOR HOT-CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL
OAK RIDGE NATIONAL LABORATORY
ORNL-P-3227 + CONF-671102-3 +. 5 PAGES, 1 FIGURE, 1 TABLE, 3 REFERENCES, PAGES 187-191 OF SAFETY REVIEW PROCEDURES FOR HOT CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL, FOR PRESENTATION AT 15TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY AND ATOM FAIR, CHICAGO, ILLINOIS, 1966

RESPONSIBILITY FOR THE RADIATION SAFETY OF ALL HOT-CELL AND RADIOCHEMICAL PROCESSING FACILITIES AT ORNL IS ASSIGNED TO THE DIRECTOR OF RADIATION SAFETY AND CONTROL, WHO, AIDED BY VARIOUS REVIEW AND ADVISORY COMMITTEES AS WELL AS A FULL-TIME STAFF OF THREE SENIOR EMPLOYEES, HAS ESTABLISHED UNIFORM POLICIES THROUGHOUT THE LABORATORY. ADEQUATE SAFETY REGULATIONS THUS ESTABLISHED HAVE BEEN MAINTAINED SUCH THAT NO RADIATION INCIDENTS OF ANY CONSEQUENCE HAVE OCCURRED WITHIN THE PAST SEVEN YEARS. THIS PAPER DESCRIBES THE ORGANIZATION RESPONSIBLE FOR RADIATION SAFETY AND ALSO DISCUSSES SOME OF THE ESTABLISHED STANDARDS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*OPERATION + *REACTOR POWER + DESIGN CRITERIA + HOT CELL + MONITOR, RADIATION, GENERAL + RADIATION SAFETY AND CONTROL + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + VENTILATION SYSTEM + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE STORAGE

15-27976

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-27976 *CONTINUED*

MORRIS EC
REMOTE TRITIUM AIR MONITORING SYSTEM
SAVANNAH RIVER LABORATORY

DPSPU-67-30-1 + SM-95-50 + CONF-670705-7 +. 9 PAGES, REFERENCES, APRIL 1967, FROM IAEA SYMPOSIUM ON INSTRUMENTS AND TECHNIQUES FOR THE ASSESSMENT OF AIRBORNE RADIOACTIVITY IN NUCLEAR OPERATIONS, VIENNA, AUSTRIA

TRITIUM IS PRODUCED IN HEAVY-WATER-MODERATED REACTORS THROUGH NEUTRON CAPTURE BY DEUTERIUM. THE RATE OF TRITIUM PRODUCTION IS A FUNCTION OF NEUTRON FLUX AND IRRADIATION TIME. ANY TRITIUM OXIDE, SUBSEQUENTLY PRODUCED, IS RELEASED TO THE ATMOSPHERE READILY BY VAPORIZATION WHENEVER THE MODERATOR IS EXPOSED, FOR EXAMPLE ON THE SURFACES OF FUEL BEING DISCHARGED. THE ATTENDANT HEALTH HAZARD IS ONE OF TRITIUM ABSORPTION EITHER DIRECTLY THROUGH THE SKIN OR THROUGH THE RESPIRATORY SYSTEM. THIS HAZARD IS BEST CONTROLLED BY THOROUGHLY TRAINING PERSONNEL, ACCURATELY KNOWING THE CONDITIONS TO WHICH PERSONS ARE EXPOSED, AND PRESCRIBING PROPER PROTECTIVE CLOTHING. AT THE SAVANNAH RIVER PLANT, ALL THESE MEANS ARE USED TO PROVIDE EFFECTIVE CONTROL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*AIRBORNE RELEASE + *HEALTH PHYSICS TRAINING + *REACTOR, HWR + *TRITIUM + INHALATION + INSTRUMENTATION, RADIATION MONITORING + RADIATION SAFETY AND CONTROL + SAVANNAH RIVER PLANT + SORPTION + VAPOR, VAPOR PRESSURE

15-27977

COOLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS

SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 + CONF-680607-1 +. 15 PAGES, TABLES, MAY 1968, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*MONITORING SYSTEM, RADIATION + *REACTOR, HWR + *TRITIUM + ANALYTICAL TECHNIQUE, URINE + BIOLOGICAL CONCENTRATION, MAN + HAZARDS ANALYSIS + INHALATION + RADIATION SAFETY AND CONTROL + SORPTION

15-27990 ALSO IN CATEGORY 17
AEC SPECIAL FELLOWSHIPS IN HEALTH PHYSICS
OAK RIDGE ASSOCIATED UNIVERSITIES
45 PAGES, SEPTEMBER 1966

DESCRIBES WHO MAY APPLY AND TYPE OF PROGRAM, TENURE, CONDITIONS, FEES AND STIPENDS, (6 PAGES). DESCRIBES COURSES AND REQUIREMENTS AT 14 APPROVED UNIVERSITIES (29 PAGES). DESCRIBES 8 AEC LOCATIONS WHERE 3 MONTHS APPLIED HEALTH PHYSICS TRAINING IS GIVEN (6 PAGES).

AVAILABILITY - OAK RIDGE ASSOCIATED UNIVERSITIES, OAK RIDGE, TENNESSEE

*HEALTH PHYSICS TRAINING + USAEC

15-27995

RINGS AND CANCER

1 PAGE, TIME 92(11), PAGE 66 (SEPTEMBER 13, 1968)

GOLD CAPSULES (CONTAINING RADON GAS, USED IN IRRADIATING CANCER) HAVE BEEN USED TO MAKE RINGS AND JEWELRY AFTER THE RADON RADIATION IS GONE. HOWEVER THE RADON TURNS INTO PB-210 (22-YEAR HALF-LIFE) WHICH HAS CAUSED SEVERAL CANCERS TO DEVELOP ON RING FINGERS. SOME ARE CONCERNED THAT OTHER CONTAMINATED GOLD MAY HAVE FOUND ITS WAY INTO DENTURES AND JEWELRY.

*CONTAMINATION + *GOLD + *RADIOLOGY + LEAD + PERSONNEL EXPOSURE, RADIATION

15-28008

ENDRES GW + GLASS WA + HAVERFIELD AJ

TISSUE EQUIVALENT PROPORTIONAL COUNTER FOR SEPARATING DOSES DUE TO GAMMA AND NEUTRON RADIATION
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON

BNWL-SA-1632 + CONF-680607-6 +. 28 PAGES, TABLES, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO, MAY 1968

SEVERAL METHODS USED TO MEASURE THE NEUTRON RADIATION FIELDS AND RELATE TO AVERAGE DOSE IN

CATEGORY 15
ENVIRONMENTAL SURVEYS, MONITORING AND RADIATION EXPOSURE OF MAN

15-28008 *CONTINUED*

TISSUE HAVE PROVED INADEQUATE WHEN MEASURING NEUTRONS IN A MIXED GAMMA-NEUTRON RADIATION FIELD. THE APPROACH USED IN THE WORK TO BE REPORTED HERE IS ONE OF DIRECT MEASUREMENT OF ABSORBED DOSE ACCOMPLISHED WITH A TISSUE-EQUIVALENT PROPORTIONAL COUNTER (TEPC). THESE TECHNIQUES ARE CLASSED UNDER THE GENERAL FIELD OF MICRODOSIMETRY, WHICH IS A STUDY OF THE MANNER IN WHICH RADIATION DEPOSITS ENERGY IN MATTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*BIOLOGICAL CONCENTRATION, MAN + *DEPOSITION + *DOSE MEASUREMENT, INTERNAL + *DOSIMETRY, GENERAL + *GAMMA EMITTER + *INSTRUMENTATION, RADIATION MONITORING + *NEUTRON + COUNTER + RADIATION SAFETY AND CONTROL

15-28042

HONSTEAD JF

A SURVEY OF ENVIRONMENTAL DOSE EVALUATIONS

BATTELLE MEMORIAL INSTITUTE

10 PAGES, 7 FIGURES, NUCLEAR SAFETY, 9(5), PAGES 383-392 (SEPT.-OCT. 1968)

ENVIRONMENTAL DOSE CALCULATIONS ARE USED AS A BASIS FOR EVALUATING ENVIRONMENTAL SURVEILLANCE DATA. DOSE EVALUATIONS ARE CONSISTENT WITH THE RECOMMENDATIONS OF THE FEDERAL RADIATION COUNCIL (FRC) AND THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION BUT ARE NOT NOW REQUIRED BY THE REGULATIONS GOVERNING THE OPERATION OF NUCLEAR FACILITIES. HANFORD IS THE ONLY U.S. SITE AT WHICH REGULAR ANNUAL DOSE EVALUATIONS ARE PUBLISHED. THE FOLLOWING BENEFITS MIGHT BE DERIVED FROM DOSE EVALUATIONS AT MORE U.S. SITES - (1) DEMONSTRATION OF THE FRC RANGE APPROPRIATE FOR EACH SITE, (2) OPTIMIZATION OF THE SCOPE OF ENVIRONMENTAL MONITORING PROGRAMS, (3) ASSURANCE THAT ANY ENVIRONMENTAL RECONCENTRATION PROCESSES WILL BE DETECTED, AND (4) READY ACCOMMODATION OF NEW SOURCES OF EXPOSURE IN THE ENVIRONMENT.

*BIOLOGICAL CONCENTRATION, FOOD + *BIOLOGICAL CONCENTRATION, MAN + *BIOLOGICAL CONCENTRATION, MILK + *DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + *MONITOR, RADIATION, ENVIRONMENTAL + *RIVER, CLINCH + *SURVEILLANCE PROGRAM + DIETARY HABIT + FEDERAL RADIATION COUNCIL + ICRP + RADIATION SAFETY AND CONTROL

15-28043

HEFT RE + STEELE WA

PROCEDURES FOR THE SYSTEMATIC SEPARATION AND ANALYSIS OF RADIOACTIVE PARTICLES FROM NUCLEAR DETONATIONS CALIFORNIA UNIV., LIVERMORE, LAWRENCE RADIATION LAB.

UCRL-50428 +. 32 PAGES, 9 FIGURES, 3 TABLES, 10 REFERENCES, MAY 17, 1968

A SET OF PROCEDURES FOR THE SYSTEMATIC SEPARATION AND ANALYSIS OF DEVELOPED TO PROVIDE THIS INFORMATION. PARTICLE GROUPS WAS DEVELOPED FOR USE IN A REEXAMINATION OF EARLY TIME AERIAL FILTER AND LOCAL FALLOUT SAMPLES OF RADIOACTIVE PARTICLES FROM NUCLEAR DETONATIONS. ASSESSMENT OF THE OVERALL BIOLOGICAL EFFECT OF A PARTICULAR NUCLEAR DETONATION REQUIRED THAT FOR THE COMPLETE PARTICLE POPULATION, WE KNOW THE SIZE DISTRIBUTION, THE RADIO-ISOTOPIC COMPOSITION AS A FUNCTION OF SIZE, AND, FINALLY, THE CHEMICAL AND PHYSICAL PROPERTIES OF THE PARTICLES, AGAIN AS A FUNCTION OF SIZE. THE EXPERIMENTAL PROCEDURES DESCRIBED HERE WERE OF

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL TECHNIQUE, GENERAL + *PARTICLE SIZE + *PARTICLE SIZE DISTRIBUTION + *RADIOISOTOPE + *SPECTROMETRY, GAMMA + FALLOUT + FILTER + MEASUREMENT, GENERAL + NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL + SEPARATOR

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-25668

HARDY EP + RIVERA J

HEALTH AND SAFETY LABORATORY FALLOUT PROGRAM QUARTERLY SUMMARY REPORT (DECEMBER 1, 1967 THROUGH MARCH 1, 1968)

AEC, HEALTH AND SAFETY LABORATORY

HASL-193 (APP.) +. 250 PAGES, FIGURES, TABLES, APRIL 1, 1968

THIS REPORT PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, THE DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH AT ARGONNE NATIONAL LABORATORY, THE NATIONAL RADIATION LABORATORY IN NEW ZEALAND, THE INSTITUTE OF NUCLEAR SCIENCES IN NEW ZEALAND, AND EURATOM JOINT NUCLEAR RESEARCH CENTRE. RADIONUCLIDE LEVELS IN STRATOSPHERIC AIR, SURFACE AIR, FALLOUT, MILK, OTHER DIET COMPONENTS, AND TAP WATER ARE GIVEN IN TABULAR FORM. THE INITIAL SECTION CONSISTS OF INTERPRETIVE REPORTS AND NOTES COVERING THE FOLLOWING TOPICS - COMPARISON OF FALLOUT COLLECTORS, STRATOSPHERIC RADIOACTIVITY LEVELS THROUGH JANUARY 1968, ISOLATION OF RADIOACTIVE PARTICLES IN FALLOUT, AN OCEAN FALLOUT EXPERIMENT, AND PREDICTED SR-90 LEVELS IN DIET COMPONENTS. A BIBLIOGRAPHY OF RECENT PUBLICATIONS RELATED TO RADIONUCLIDE STUDIES IS ALSO PRESENTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FALLOUT + *MONITORING PROGRAM, ENVIRONMENTAL + CONCENTRATION, GROUND LEVEL + INSTRUMENTATION, AIR SAMPLING + SAMPLING, HIGH ALTITUDE + STRATOSPHERE + STRONTIUM

16-25883

ALSO IN CATEGORIES 18 AND 2

BELL PSAR SECTION II, STATION SITE AND ENVIRONS

NEW YORK STATE ELECTRIC + GAS CORPORATION

100 PAGES, 17 FIGURES, 12 TABLES. PAGE II-1-1 THRU II-6-2. MARCH 1968. DOCKET 50-319.

INCLUDES PRELIMINARY (JAN. 68) REPORTS ON METEOROLOGY (B.E. DETHIER) AND LIMNOLOGY OF CAYUGA LAKE AND INTERRELATIONS WITH NUCLEAR POWER PLANT (J. F. STORR). ***NOCTURNAL DRAINAGE WIND FLOWS UP RIVER FROM ITHACA (13 MILES AWAY) TOWARD THE SITE. ON-SITE TOWER BEING INSTALLED. ***EXTENSIVE MIXING OF WATER EXPECTED. A SURVEY IS BEING MADE, BASED ON FOSSIL PLANT DISCHARGE. A HATCHERY FOR TROUT AND COHO SOLUTION IS PLANNED TO USE THE THERMAL ENRICHMENT PROVIDED BY CONDENSER DISCHARGE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*LAKE + *THERMAL POLLUTION + BELL (BWR) + DIFFUSION + ON SITE WORK + REACTOR, BWR + REPORT, PSAR + TOPOGRAPHY

16-25978

HOLZWORTH GC

ESTIMATES OF MEAN MAXIMUM MIXING DEPTHS IN THE CONTIGUOUS UNITED STATES

U.S. WEATHER BUREAU RESEARCH STATION, CINCINNATI, OHIO

8 PAGES, 16 FIGURES, 2 TABLES, 3 REFERENCES, MONTHLY WEATHER REVIEW 92(5), PAGES 235-42 (MAY 1964)

MEAN RADIOSONDE OBSERVATIONS AND NORMAL MAXIMUM SURFACE TEMPERATURES ARE USED TO ESTIMATE MONTHLY MEAN MAXIMUM MIXING DEPTHS (MMDS) FOR 45 STATIONS IN THE CONTIGUOUS UNITED STATES. FROM THESE DATA ISOPLETH ANALYSES OF MEAN MMDS ARE PRESENTED FOR EACH MONTH. SIXTEEN OF THE AVAILABLE 45 RADIOSONDE STATIONS ARE SELECTED AS GENERALLY REPRESENTATIVE OF THE U.S. AND ARE SUBJECTED TO FURTHER CONSIDERATIONS. THESE CONSIDERATIONS ARE (1) THE RELATIONSHIP BETWEEN MONTHLY MEAN MMDS COMPUTED FROM MEAN OBSERVATIONS AND FROM INDIVIDUAL OBSERVATIONS, (2) COMPARISON OF MONTHLY MEAN MMDS BASED ON OBSERVATIONS FOR 1 YEAR WITH THOSE BASED ON OBSERVATIONS FOR 10 YEARS, AND (3) THE STANDARD DEVIATIONS OF DAILY MMDS.

*METEOROLOGY + *MIXING DEPTH + ATMOSPHERIC DIFFUSION, CLIMATOLOGY + ATMOSPHERIC POLLUTION + ATMOSPHERIC STABILITY + SURVEY, GENERAL

16-26734

ALSO IN CATEGORY 9

JOSHI CW + INGLE NA + JATHAR NB

AN AUTOMATIC DATA-LOGGING SYSTEM FOR METEOROLOGICAL STUDIES IN REACTOR ENVIRONMENTS

ATOMIC ENERGY ESTABLISHMENT TROMBAY, BOMBAY, INDIA

STI/PUB/115 + CN-22/43 +. 8 PAGES, 7 FIGURES, 2 REFERENCES, PAGES 595-602 IN NUCLEAR ELECTRONICS CONFERENCE PROCEEDINGS, BOMBAY, NOV. 22-26, 1965

AN AUTOMATIC DATA-LOGGING SYSTEM WAS DESIGNED FOR METEOROLOGICAL STUDIES FOR THE TARAPUR POWER REACTOR. THESE STUDIES REQUIRE THE MEASUREMENT OF WIND SPEED, WIND DIRECTION, ATMOSPHERIC PRESSURE, TEMPERATURE, ETC., AVERAGED OVER A CERTAIN FIXED PERIOD, AT VARIOUS HEIGHTS ON A TOWER. THE SYSTEM IS DESIGNED TO LOG DATA FROM 256 SENSORS. THE DATA ARE FED TO A DIGITAL COMPUTER FOR ANALYSIS.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016, \$13.50 COPY/BOOK

*DATA PROCESSING + INSTRUMENTATION, METEOROLOGICAL + METEOROLOGY

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-26795

DABBERDT WF

TOWER-INDUCED ERRORS IN WIND PROFILE MEASUREMENTS

UNIVERSITY OF WISCONSIN, MADISON

8 PAGES, 12 FIGURES, REFERENCES, JOURNAL OF APPLIED METEOROLOGY 7(3), PAGES 359-66 (JUNE 1968)

AN INVESTIGATION OF THE EFFECT OF A METEOROLOGICAL TOWER ON THE MEASUREMENT OF WIND SPEED WAS CONDUCTED AT BROOKHAVEN NATIONAL LABORATORY. REDUCTIONS UP TO 35 PER CENT OCCUR IN THE WAKE. THE DISTRIBUTION OF THE VELOCITY DEFICIT IN THE WAKE IS NEARLY GAUSSIAN. CORRECTIONS BASED ON THIS DISTRIBUTION HAVE IMPROVED WIND DATA IN A TRIAL CASE. A SLIGHT DEPENDENCE ON ATMOSPHERIC STABILITY WAS DETECTED. THE DEFICIT APPEARS TO BE INDEPENDENT OF THE WIND SPEED.

*ATMOSPHERIC STABILITY + *ERROR ANALYSIS + *WIND PROFILE + BNL + MICROMETEOROLOGY + STACK + WIND STATISTICS

16-26796

DABBERDT WF

WIND DISTURBANCE BY A VERTICAL CYLINDER IN THE ATMOSPHERIC SURFACE LAYER

UNIVERSITY OF WISCONSIN, MADISON

5 PAGES, 9 FIGURES, 1 TABLE, REFERENCES, JOURNAL OF APPLIED METEOROLOGY 7(3), PAGES 367-371 (JUNE 1968)

THE VELOCITY DISTRIBUTION IN THE NEIGHBORHOOD OF A CYLINDRICAL OBSTACLE WAS MEASURED OVER THE FROZEN SURFACE OF LAKE MENDOTA, MADISON, WIS. NON-DIMENSIONAL ISOTACH PATTERNS WERE CONSTRUCTED DEPICTING THE VELOCITY DISTRIBUTION AT TWO LEVELS WITHIN THE ATMOSPHERIC SURFACE LAYER. DIFFERENCES IN THE VERTICAL SHEAR BETWEEN THE TWO LEVELS IS SEEN TO AFFECT THE NATURE OF THE PATTERNS. WIND SPEED REDUCTIONS OF 6 PER CENT ARE NOTED UPWIND OF THE CYLINDER AND IN EXCESS OF 40 PER CENT DOWNWIND. THE UPWIND PATTERN IS FAIRLY WELL REPRESENTED BY THE POTENTIAL SOLUTION. THE MORE COMPLEX DOWNWIND PATTERN IS ASYMMETRICAL. LARGE VERTICAL COMPONENTS OF THE VELOCITY WERE COMPUTED.

*ERROR ANALYSIS + *STACK + *WIND STATISTICS + ATMOSPHERIC STABILITY + MICROMETEOROLOGY + WIND PROFILE

16-26797

DAVIS FK + NEWSTEIN H

THE VARIATION OF GUST FACTORS WITH MEAN WIND SPEED AND WITH HEIGHT

DREXEL INSTITUTE OF TECHNOLOGY, PA.

7 PAGES, 13 FIGURES, 1 TABLE, REFERENCES, JOURNAL OF APPLIED METEOROLOGY 7(3), PAGES 372-78 (JUNE 1968)

RECORDS FROM WIND INSTRUMENTS INSTALLED ON A 1000-FT TOWER WERE ANALYZED FOR GUSTINESS CHARACTERISTICS. THE RESULTS SHOW THAT GUST FACTORS DECREASE WITH INCREASING WIND SPEED, DECREASE WITH INCREASING HEIGHT, AND HAVE NO OBVIOUS RELATIONSHIP TO THE TEMPERATURE LAPSE RATE.

*TURBULENCE, STATISTICS + *WIND STATISTICS + ATMOSPHERIC STABILITY + MICROMETEOROLOGY + SURVEY, GENERAL + WIND PROFILE

16-26798

STEWART RE

ATMOSPHERIC DIFFUSION OF PARTICULATE MATTER RELEASED FROM AN ELEVATED CONTINUOUS SOURCE

UNIVERSITY OF FLORIDA, GAINESVILLE

8 PAGES, 8 FIGURES, 3 TABLES, REFERENCES, JOURNAL OF APPLIED METEOROLOGY 7(3), PAGES 425-32 (JUNE 1968)

DUSTFALL-SIMULATION EXPERIMENTS WERE CONDUCTED TO ESTIMATE THE GROUND-LEVEL DEPOSITION PATTERN. BATCHES OF DIFFERENT SIZE GLASS MICROSPHERES WERE CONTINUOUSLY RELEASED INTO THE ATMOSPHERE FROM AN ELEVATED POINT SOURCE. THE DATA AND DATA OBTAINED BY PREVIOUS INVESTIGATORS WERE COMPARED WITH THEORY. TWO MATHEMATICAL MODELS WERE USED IN THE COMPARISON - A THREE-DIMENSIONAL CLASSICAL MODEL BY DENISOV, AND A THREE-DIMENSIONAL STATISTICAL MODEL BY CSANADY.

*CONCENTRATION, GROUND LEVEL + *PARTICULATE + *SOURCE, CONTINUOUS + *SOURCE, ELEVATED + ATMOSPHERIC DIFFUSION EXPERIMENT + COMPARISON, THEORY AND EXPERIENCE + DEPOSITION

16-26799

PETERSON KR

CONTINUOUS POINT SOURCE PLUME BEHAVIOR OUT TO 160 MILES

AIR RESOURCES LABORATORY, MD.

10 PAGES, 14 FIGURES, REFERENCES, JOURNAL OF APPLIED METEOROLOGY 7(2), PAGES 217-226 (APRIL 1968)

RADIOACTIVE AR-41 WAS MEASURED BY AN AIRBORNE GAMMA-RAY SPECTROMETER AS FAR AS 160 N MILES DOWNWIND OF BNL ON A DAY WITH NEUTRAL STABILITY. A VERTICAL CROSS SECTION AT 144 N MILES SHOWS THE PLUME TO BE WELL ORGANIZED, WITH A NEARLY UNIFORM VERTICAL DISTRIBUTION TO AT LEAST 2000 FT. THE PEAK CONCENTRATION, WHEN CORRECTED FOR RADIOACTIVE DECAY, DECREASES BY A FACTOR OF 7-10 OVER A DISTANCE OF 150 N MILES AND A TRAVEL TIME OF 10-12 HR. THE LATERAL STANDARD DEVIATION OF THE PLUME APPEARS TO FIT AN EXTENSION OF THE PASQUILL-GIFFORD D CURVE WITH DISTANCE, WHERE THE LATERAL STANDARD DEVIATION IS APPROXIMATELY EQUAL TO TWO-THIRDS OF THE

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-26799 *CONTINUED*
TRAVEL TIME IN HOURS.

*CONCENTRATION, ISOPLETH + *SOURCE, CONTINUOUS + *SOURCE, ELEVATED + ATMOSPHERIC DIFFUSION EXPERIMENT +
BNL + CONCENTRATION, MAXIMUM + PLUME BEHAVIOR, GENERAL + SOURCE, POINT

16-26800
DANIELSEN EF
STRATOSPHERIC-TROPOSPHERIC EXCHANGE BASED ON RADIOACTIVITY, OZONE AND POTENTIAL VORTICITY
UNIVERSITY OF HAWAII, HONOLULU
17 PAGES, 14 FIGURES, REFERENCES, JOURNAL OF THE ATMOSPHERIC SCIENCES 25(3), PAGES 502-518 (MAY 1968)

VERTICAL CROSS SECTIONS OF POTENTIAL VORTICITY, COMPUTED AND CONTOURED BY HAND, AND
HEMISPHERIC DISTRIBUTIONS OF POTENTIAL VORTICITY, COMPUTED AND CONTOURED BY MACHINE, ARE
COMPARED TO BOTH DISCRETE AND CONTINUOUS MEASUREMENTS OF RADIOACTIVITY MADE DURING PROJECT
SPRINGFIELD. COMPARISONS MADE IN THE UPPER TROPOSPHERE AND LOWER STRATOSPHERE SHOW A
POSITIVE CORRELATION BETWEEN POTENTIAL VORTICITY AND RADIOACTIVITY OF STRATOSPHERIC AIR FROM
HIGH LATITUDES IS TRANSPORTED SOUTHWARD AND DOWNWARD INTO THE TROPOSPHERE AS THE TROPOPAUSE
FOLDS.

*ATMOSPHERIC DIFFUSION, GLOBAL + AEROSOL, RADIOACTIVE + COMPARISON, THEORY AND EXPERIENCE + FALLOUT +
OZONE + SAMPLING, HIGH ALTITUDE + STRATOSPHERE + TROPOSPHERE

16-27291
ROBINS DL + MATTIA MM
COMPUTER PROGRAM HELPS DESIGN STACKS FOR CURBING AIR POLLUTION
DAY AND ZIMMERMANN, INC.
4 PAGES, 2 FIGURES, 13 REFERENCES, CHEMICAL ENGINEERING, 75(3), PAGES 119-122 (JANUARY 29, 1968)

DESCRIBES A COMPUTER PROGRAM FOR DETERMINING THE EFFECT OF STACK HEIGHT AND THE GROUND-LEVEL
CONCENTRATION OF GASES AND PARTICLES. THE PROGRAM PERMITS A RAPID AND COMPREHENSIVE ANALYSIS
OF STACK DISPERSION. METEOROLOGICAL PARAMETERS ARE TREATED ONLY SUPERFICIALLY, AND THE
EFFECT OF TOPOGRAPHY ON GROUND-LEVEL CONCENTRATION IS COMPLETELY NEGLECTED.

*COMPUTER PROGRAM, METEOROLOGICAL + *CONCENTRATION, GROUND LEVEL + *HEIGHT OF RISE + EFFLUENT +
PARTICULATE + STACK

16-27292
LUDWIG S
ANTIPOLLUTION PROCESS USES ABSORBENT TO REMOVE SO₂ FROM FLUE GASES
WORLD NEWS, TOKYO
3 PAGES, CHEMICAL ENGINEERING, 75(3), PAGES 70-72 (JANUARY 29, 1968)

DESCRIBES A PILOT PLANT THAT USES MnO₂ AS AN ABSORBENT OF SO₂ FROM THE FLUE GAS OUTPUT OF AN
OIL-BURNING POWER PLANT, AND AMONIUM SULFATE IS RECOVERED AS A BYPRODUCT. THE PLANT OBTAINED
AN SO₂ REMOVAL RATE OF BETTER THAN 90%. THE ECONOMICS OF THE SYSTEM ARE PRESENTED.

*ADSORPTION + *EQUIPMENT DESIGN + *SULFUR DIOXIDE + AIR CLEANING + ATMOSPHERIC POLLUTION + ECONOMICS +
EFFLUENT + JAPAN

16-27293 ALSO IN CATEGORY 14
MELICK R + VAN MIDDLESWORTH L
RADIO-IODINE FALLOUT IN AUSTRALIAN SHEEP
UNIVERSITY OF MELBOURNE DEPARTMENT OF MEDICINE, THE ROYAL MELBOURNE HOSPITAL + DEPARTMENTS OF PHYSIOLOGY
AND BIOPHYSICS, UNIVERSITY OF TENNESSEE, U.S.A.
3 PAGES, 2 FIGURES, 2 TABLES, 11 REFERENCES, THE MEDICAL JOURNAL OF AUSTRALIA, 2, PAGES 930-932 (NOVEMBER
12, 1966)

SINCE APRIL 1957, THE THYROID I-131 CONTENT OF VICTORIAN LAMBS HAS BEEN FOLLOWED. RESULTS UP
TO AUGUST 1958 HAVE BEEN REPORTED PREVIOUSLY. THIS PAPER PRESENTS RESULTS UP TO JANUARY
1966. THE RADIOACTIVITY FOUND IN THYROIDS OF VICTORIAN SHEEP HAS BEEN VERY MUCH LESS THAN
THAT FOUND IN THE NORTHERN HEMISPHERE, AND PRESENT FOR A MUCH SHORTER TIME.

*BIOLOGICAL CONCENTRATION, ANIMAL + *FISSION PRODUCT, IODINE + ATMOSPHERIC DIFFUSION, GLOBAL + AUSTRALIA +
FALLOUT + NUCLEAR DETONATION

16-27295
BOURTSEY JJ + MALAKHOV SG
FALLOUT BY THE PRECIPITATIONS OF THE DIVISION PRODUCTS FROM THE SUBCLOUD LEVEL OF THE ATMOSPHERE
7 PAGES, 5 FIGURES, 13 REFERENCES, FIZIKA ATMOSFERY I OKEANA, 4(3), PAGES 328-334 (1968) IN RUSSIAN

THE SELF-CLEANING OF THE LOWER TROPOSPHERE OF RADIOACTIVE AEROSOLS WAS STUDIED FOR THE PERIOD
OF NUCLEAR TESTS. MEASUREMENTS WERE CARRIED OUT AT THE HIGH-ALTITUDE STATIONS IN CAUCASUS.
THE SUBCLOUD LEVEL IS CLEANED TO A CONSIDERABLE EXTENT BY PRECIPITATIONS OF SMALL INTENSITY.
THE WASHOUT COEFFICIENT OF FALLOUT PRODUCTS WITH AN AGE OF 4-5 MONTHS WAS 5.9×10 (MINUS 5TH)

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-27295 *CONTINUED*
PER SEC FOR SNOW AND 3.1×10 (MINUS 5TH) PER SEC FOR RAIN.

*AEROSOL, RADIOACTIVE + *PRECIPITATION + *WASHOUT + FALLOUT + NUCLEAR DETONATION + RAINOUT + SNOW +
TROPOSPHERE

16-27331 ALSO IN CATEGORIES 15 AND 17
TURNER DB

WORKBOOK OF ATMOSPHERIC DISPERSION ESTIMATES
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO
PHS-999-AP-26 +. 84 PAGES, FIGURES, TABLES, 1967

THIS WORKBOOK PRESENTS METHODS OF PRACTICAL APPLICATION OF THE BINOMIAL CONTINUOUS PLUME DISPERSION MODEL TO ESTIMATE CONCENTRATIONS OF AIR POLLUTANTS. ESTIMATES OF DISPERSION ARE THOSE OF PASQUILL AS RESTATED BY GIFFORD. EMPHASIS IS ON THE ESTIMATION OF CONCENTRATIONS FROM CONTINUOUS SOURCES FOR SAMPLING TIMES OF 10 MIN. SOME OF THE TOPICS DISCUSSED ARE DETERMINATION OF EFFECTIVE HEIGHT OF EMISSION, EXTENSION OF CONCENTRATION ESTIMATES TO LONGER SAMPLING INTERVALS, INVERSION BREAK-UP FUMIGATION CONCENTRATIONS, AND CONCENTRATIONS FROM AREA, LINE, AND MULTIPLE SOURCES. TWENTY-SIX EXAMPLE PROBLEMS AND THEIR SOLUTIONS ARE GIVEN. SOME GRAPHICAL AIDS TO COMPUTATION ARE INCLUDED.

AVAILABILITY - D.B. TURNER, AIR RESOURCES FIELD RESEARCH OFFICE, ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION, U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO

*HEALTH PHYSICS TRAINING + *METEOROLOGY + *STAFFING, TRAINING, QUALIFICATION + ATMOSPHERIC POLLUTION +
METEOROLOGICAL SUPPORT + REACTOR, POWER + REACTOR, RESEARCH

16-27468
TILLES D

RD CADLES PARTICLES IN THE ATMOSPHERE AND SPACE (BOOKREVIEW)
2 PAGES, GEOCHIM COSMOCHIM ACTA, 31(5), PAGES 911-912 (MAY 1967)

ONE-THIRD OF THE BOOK IS DEVOTED TO PARTICLES IN THE ATMOSPHERE-TROPOSPHERE, STRATOSPHERE, AND MESOSPHERE. ANOTHER QUARTER IS DEVOTED TO GLOBAL RADIOACTIVE FALLOUT AND ATMOSPHERIC CIRCULATION. ANOTHER THIRD IS DIVIDED AMONG ZODIACAL LIGHT, METEORITES AND METEORIODS, THE ORIGIN AND SURFACE OF THE MOON, OTHER PLANETS, COMETS, GALACTIC AND INTERPLANETARY DUST, AND TEKTITES.

*AEROSOL PROPERTIES + *ATMOSPHERIC CIRCULATION, GLOBAL + *FALLOUT + BIBLIOGRAPHY + MESOSPHERE +
PARTICULATE + STRATOSPHERE + TROPOSPHERE

16-27620 ALSO IN CATEGORIES 18 AND 5
RUSSELVILLE SUPPLEMENT 6 - TORNADO ANALYSIS

ARKANSAS POWER AND LIGHT COMPANY
8 PAGES, 12 REFERENCES, PAGES 1-8 OF SUPPLEMENT 6 TO THE APPLICATION FOR RUSSELVILLE LICENSES (DOCKET 50-313) JULY 11, 1968

PROVIDES REVISED PSAR PAGES AND (RESPONDING TO INFORMAL URL QUESTIONS) JUSTIFICATION OF TORNADO DESIGN CRITERIA AND BEHAVIOR OF SPENT FUEL POOL DURING TORNADO. DESCRIBES BEST OBSERVATIONAL DATA FOR WIND VELOCITY (USE 300 MPH BROAD FRONT WIND INSTEAD OF 200 MPH VORTEX), PRESSURE DROP (1.7 PSI/4 SEC), WATER LOSS FROM POOLS AND WELLS (2 FT MOUND OF WATER APPEARS FROM LOW PRESSURE, SPRAY AND SUCKING DISPLACE WATER, SURVEY REQUESTED IN PILGRIM STATION REVIEW WILL BE COMPLETED SEPT. 1968 BUT SO FAR RESULTS NEGATIVE), AND MISSILES (ONLY LIGHT WEIGHT MISSILES WOULD REACH REFUELING FLOOR 50 FT ABOVE GRADE, MISSILES FROM REFUELING FLOOR ARE MOSTLY SIDING AND HAND CARTS).

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*DESIGN CRITERIA + *DESTRUCTIVE WIND + *FUEL STORAGE + BIBLIOGRAPHY + CONTAINMENT DESIGN +
MISSILE GENERATION AND PROTECTION + PRESSURE TRANSIENT + PRESSURE, SUBATMOSPHERIC + REACTOR, PWR +
REPORT, PSAR

16-27815
SLADE DH

METEOROLOGY AND ATOMIC ENERGY, 1968
UNITED STATES ATOMIC ENERGY COMMISSION, DIVISION OF TECHNICAL INFORMATION
TID-24190 +. 445 PAGES, FIGURES, TABLES, REFERENCES, JULY 1968

A REVISION OF METEOROLOGY AND ATOMIC ENERGY, AECU-3066, PUBLISHED IN 1955. THE OVERALL SCOPE OF THE VOLUME IS INDICATED BY THE CHAPTER HEADINGS AS FOLLOWS - (I) INTRODUCTION TO THE METEOROLOGY-ATOMIC ENERGY RELATION, (II) METEOROLOGICAL FUNDAMENTALS FOR ATMOSPHERIC TRANSPORT AND DIFFUSION STUDIES, (III) AN OUTLINE OF THE THEORIES OF DIFFUSION IN THE LOWER LAYERS IN THE ATMOSPHERE, (IV) DIFFUSION AND TRANSPORT EXPERIMENTS, (V) PROCESSES OTHER THAN NATURAL TURBULENCE AFFECTING EFFLUENT CONCENTRATIONS, (VI) METEOROLOGICAL INSTRUMENTS FOR USE IN THE ATOMIC ENERGY INDUSTRY, (VII) RADIOACTIVE CLOUD-DOSE CALCULATIONS, (VIII) ENVIRONMENTAL SAFETY ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-27815 *CONTINUED*
\$3.00 COPY, \$0.65 MICROFICHE

*ATMOSPHERIC DIFFUSION + *BIBLIOGRAPHY + *METEOROLOGY + *PLUME BEHAVIOR, GENERAL +
ATMOSPHERIC DIFFUSION EXPERIMENT + ATMOSPHERIC STABILITY + DEPOSITION + GAUSSIAN PLUME FORMULA +
K THEORY + METEOROLOGICAL SUPPORT + RAINOUT + SITE CLIMATOLOGY + STAFFING, TRAINING, QUALIFICATION +
TURBULENCE, STATISTICS + WIND STATISTICS

16-27833 ALSO IN CATEGORIES 18 AND 2
BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2, PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME III
CAROLINA POWER + LIGHT COMPANY
275 PAGES, FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

FOUR APPENDICES - (A) GEOLOGICAL ANALYSIS, FOUNDATION ENGINEERING, SEISMIC DESIGN CRITERIA,
SEISMIC DESIGN RESPONSE SPECTRA, PRELIMINARY MARINE BIOLOGY AND OCEANOGRAPHY, STORM TIDES,
AND WILMINGTON 1959-63 WINDIF WIND DIFFUSION STUDY. THEN FOLLOWS THE USUAL - (B) JET PUMP
DEVELOPMENT, (C) CORE SPRAY TEST PROGRAM, AND (D) COMPARATIVE EVALUATION WITH AEC DESIGN
CRITERIA (A LISTING OF APPROPRIATE PSAR SECTIONS FOR EACH CRITERIA).

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

*AEC DESIGN CRITERIA + *EARTHQUAKE ENGINEERING + BRUNSWICK (BWR) + REACTOR, BWR + REPORT, PSAR

16-27834 ALSO IN CATEGORIES 18 AND 5
BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2, PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME II
CAROLINA POWER + LIGHT COMPANY
400 PAGES FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

VOL. II CONTAINS SECT. VII (INSTRUMENTATION AND CONTROL - INCLUDES AUTO LOAD DISPATCH FROM
RALEIGH, N. C.), VIII (ELECTRICAL POWER - 4 DIESELS), IX (RAD WASTE), X (AUXILIARIES), XI
(POWER CONVERSION), XII (PLANT OPERATIONS - PERSONNEL WILL BE AVAILABLE FROM ROBINSON 2),
XIII (TECH. SPECS.), AND XIV (SAFETY AND ACCIDENT ANALYSIS). 40 PAGES DESCRIBE THE OFFSITE
DOSE CALCULATION MODEL USED IN RADOS COMPUTER CODE, ISOTOPE FRACTIONS RELEASED FROM FUEL IN
EXPERIMENTS AND IN THESE ACCIDENTS, AND PROVIDES BOTH A CONSERVATIVE BASE CASE AND A BEST
ESTIMATE (MARGINS RANGE FROM FACTORS OF 8400 TO 16,700). 6 PAGES PROVIDE A SENSITIVITY
ANALYSIS AND A SPECIAL COMPARISON WITH TID 14844 AND RECENT AEC-DRL SAFETY EVALUATION.

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

*DOSE + *OFF SITE + ACCIDENT MODEL + BRUNSWICK (BWR) + COMPARISON, THEORY AND EXPERIENCE + ERROR ANALYSIS +
REACTOR, BWR + REPORT, PSAR + SAFETY EVALUATION + STAFFING, TRAINING, QUALIFICATION

16-27835
BRAR SS + SVIHLA G + NELSON DM + GUSTAFSON PF
HAS THE HASL ION-EXCHANGE COLUMN BEEN SERIOUSLY IN ERROR
AEC, HEALTH AND SAFETY LABORATORY
HASL-193 +. 16 PAGES, 2 TABLES, APRIL 1, 1968

COMPARES TWO FALLOUT COLLECTORS USED BY HASL - THE STEEP-WALLED STAINLESS-STEEL POTS AND THE
PLASTIC ION-EXCHANGE COLUMN FUNNEL COLLECTORS. RESULTS INDICATE THAT BOTH SYSTEMS ARE VALID
COLLECTORS. WHEN COMPARED WITH SYSTEMS USED BY THE UNITED KINGDOM, CANADA, NEW ZEALAND, AND
AUSTRALIA, THE ION-EXCHANGE SYSTEM WAS LOWER, PROBABLY DUE TO IMPROPER MAINTENANCE. A
CONVECTION FACTOR WAS COMPUTED TO CORRECT THE GLOBAL FALLOUT DATA FOR EACH TEN-DEGREE
LATITUDE BAND, BASED ON THE FRACTION OF ALL COLUMN COLLECTORS IN THE BAND.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*FALLOUT + *INSTRUMENTATION, AIR SAMPLING + *MONITORING PROGRAM, ENVIRONMENTAL +
ATMOSPHERIC DIFFUSION, GLOBAL + COMPARISON, THEORY AND EXPERIENCE + STRONTIUM

16-27874 ALSO IN CATEGORY 14
HARDY EP + RIVERA J
FALLOUT PROGRAM. QUARTERLY SUMMARY REPORT, MARCH 1--JUNE 1, 1968 + APPENDIX TO FALLOUT PROGRAM QUARTERLY
SUMMARY REPORT, MARCH 1, 1967--JUNE 1, 1968
U. S. ATOMIC ENERGY COMMISSION
HASL-197 + HASL-197(APP.) +. 832 PAGES, FIGURES, TABLES, REFERENCES, JULY 1, 1968

PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, THE UKAERE HEALTH PHYSICS AND MEDICAL
DIVISION, EURATOM JOINT NUCLEAR RESEARCH CENTRE, THE NATIONAL RADIATION LABORATORY IN NEW
ZEALAND, AND THE DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH AT ARGONNE NATIONAL LABORATORY.
THIS REPORT IS DIVIDED INTO FOUR MAIN PARTS - (1) INTERPRETIVE REPORTS AND NOTES, (2) HASL
FALLOUT PROGRAM DATA, (3) DATA FROM SOURCES OTHER THAN HASL, AND (4) RECENT PUBLICATIONS
RELATED TO RADIONUCLIDE STUDIES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-27874 *CONTINUED*

*BIBLIOGRAPHY + *BIOLOGICAL CONCENTRATION, AGRICULTURAL PRODUCE + *BIOLOGICAL CONCENTRATION, MAN +
*DOSE MEASUREMENT, INTERNAL + *FALLOUT + *MONITORING PROGRAM, ENVIRONMENTAL + *SAMPLING, HIGH ALTITUDE +
NUCLEAR DETONATION + OCEAN AND SEA + RADIOCHEMICAL ANALYSIS

16-27880 ALSO IN CATEGORY 15

RICHARDSON LC
USER(S) MANUAL FOR THE FORTRAN VERSION OF RSAC. A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM
PHILLIPS PETROLEUM COMPANY
IDO-17261 +. 136 PAGES, FIGURES, 3 TABLES, 5 REFERENCES, JUNE 1968

THIS REPORT IS A MANUAL FOR THE FORTRAN VERSION OF THE RSAC COMPUTER CODE. THE MATHEMATICAL MODEL AND EQUATIONS ARE DESCRIBED IN IDO-17151, RSAC--A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM, BY R. L. COATES AND N. R. NORTON, MAY 1966. THE PROGRAM COMPUTES THE POTENTIAL RADIOLOGICAL DOSES RESULTING FROM EITHER A CONTINUOUS OR INSTANTANEOUS RELEASE OF RADIOACTIVE FISSION PRODUCTS TO THE ATMOSPHERE. THE DOSES CONSIDERED ARE CLOUD GAMMA, DEPOSITION GAMMA, INGESTION, AND INHALATION AND ARE BASED UPON THE RELEASE OF UP TO 450 ISOTOPES, THE RELATIVE ABUNDANCE OF EACH ISOTOPE BEING DEPENDENT UPON THE OPERATING HISTORY OF THE NUCLEAR REACTOR UNDER CONSIDERATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*COMPUTER PROGRAM + *DOSE CALCULATION, EXTERNAL + *DOSE CALCULATION, INTERNAL + *SOURCE, CONTINUOUS +
*SOURCE, INSTANTANEOUS + DEPOSITION + INGESTION + INHALATION

16-28022

COTE D
FLUID DYNAMICS ANALOG STUDIES RELATED TO THE DISPERSION OF PARTICLES IN THE UPPER ATMOSPHERE. FINAL REPORT
GCA CORP., BEDFORD, MASS.
SC-CR-67-2812 +. 67 PAGES, FIGURES, 2 TABLES, REFERENCES, MARCH 1968

MOTIONS PRODUCED BY THERMAL CONVECTION IN A ROTATING FLUID-FILLED ANNULUS BEAR SIMILARITY TO MOTIONS IN THE EARTH'S UPPER ATMOSPHERE. TO EXPLORE THE USEFULNESS OF THIS SIMULATION TO UNDERSTANDING OF TRANSPORT AND MIXING PROCESSES IN THE ATMOSPHERE, FLOW VISUALIZATION EXPERIMENTS USING DYE TRACES IN THE ANNULUS WERE PERFORMED. VALUABLE QUALITATIVE AND QUANTITATIVE INFORMATION ON DISPERSAL RATES WAS OBTAINED WHICH PROVIDES INSIGHT INTO SIMILAR PROCESSES IN THE ATMOSPHERE AND COMPARES WITH OTHER STUDIES OF TRANSPORT AND DIFFUSION PROCESSES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*ANNULUS + *ATMOSPHERIC CIRCULATION, GLOBAL + *SIMULATION + EXPERIMENT, GENERAL + THEORETICAL INVESTIGATION

16-28023 ALSO IN CATEGORY 14

CRAWFORD TD
THE LONG RANGE DIFFUSION OF THE EFFLUENT CLOUD FROM THE PHOEBUS 1B EP-IV REACTOR TEST OF FEBRUARY 23, 1967
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-50,418 +. 29 PAGES, 14 FIGURES, 4 TABLES, 20 REFERENCES, APRIL 1968

THIS REPORT DISCUSSES THE MOVEMENT AND DIFFUSION OF THE EFFLUENT CLOUD PRODUCED BY THE PHOEBUS 1B EP-IV EVENT OF FEBRUARY 23, 1967. THE CLOUD WAS TRACKED BY AIRCRAFT FOR ALMOST THREE DAYS, AND USEFUL CONCENTRATION MEASUREMENTS WERE OBTAINED FOR ALMOST TWO DAYS. PRE- AND POST-RUN CALCULATIONS WERE DONE WITH A COMPUTER CODE FOR LARGE CLOUD DIFFUSION USING CLIMATOLOGY AND OBSERVED METEOROLOGY RESPECTIVELY. CALCULATIONS OF CONCENTRATIONS AND CLOUD SIZE ARE COMPARED WITH THE AVAILABLE MEASUREMENTS. CALCULATIONS AGREE WELL WITH MEASUREMENT FOR THE FIRST FEW HOURS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*COMPUTER PROGRAM, METEOROLOGICAL + *METEOROLOGICAL SUPPORT + *NEVADA TEST SITE + *RADIOACTIVITY RELEASE +
ATMOSPHERIC DIFFUSION + COMPARISON, THEORY AND EXPERIENCE + NUCLEAR ROCKET

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-24634 ALSO IN CATEGORIES 14 AND 13
INDUSTRIAL RADIOACTIVE WASTE BULLETINS
ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
6 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(16), PAGES 5-10 (APRIL 15, 1968)

(NO. 3, FEB. 28, 1968) - CORRECTS ERRONEOUS DATA IN PREVIOUS DATA BULLETIN. ON DEC. 16, 1967, THE CS-137/SR-90 CONCENTRATION (PCI/1) AT NFS OUTFALL WAS 160,000/86,900, AT BUTTERMILK CREEK, 6,600/4,010. RCSI QUESTIONS OFFICIAL VIEW THAT MEASUREMENTS COMPLY WITH LAW BECAUSE CATTARANGUS CREEK MEETS INDUSTRIAL EFFLUENT RADIOACTIVITY STANDARDS. *** (NO. 2, FEB. 24, 1968) - DISCUSSES EFFLUENT MEASUREMENT REPORTED OVER A PERIOD OF YEARS. ASSERTS THAT NFS SENDS SLUGS OF VERY HOT EFFLUENT INTO CREEK, AS ACTUAL MEASUREMENTS INDICATE DISCHARGE AT SEWER OUTLET WAS 30,000 TIMES PERMISSIBLE LIMIT. ASSERTS OFFICIAL SAMPLING IS NOT DONE AT THE PLACE WHERE LIMITS EXCEEDED.

*RADIATION, PUBLIC EDUCATION/ACCEPTANCE + *WASTE DISPOSAL, LIQUID + DILUTION + EFFLUENT + FUEL REPROCESSING + MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + NFS

17-25884 ALSO IN CATEGORIES 18 AND 5
BELL PSAR SECT 3.3.7 DESCRIPTION OF CORE ANALYSIS
NEW YORK STATE ELECTRIC + GAS CORPORATION
85 PAGES, 20 FIGURES, 5 TABLES, PAGE III-3-5 THRU -7. MARCH 1968 50-319.

A COMPUTER PROGRAM (UNSPECIFIED) IS USED TO ANALYZE THE THERMAL AND HYDRAULIC CHARACTERISTICS OF THE CORE AS A WHOLE. OUTPUT AND INPUT DISCUSSED BRIEFLY. RECENT MODIFICATIONS IN CORE DESIGN AND IN THERMAL HYDRAULIC EVALUATION TECHNIQUES ALLOW HIGHER FEEDWATER TEMP. WITHOUT ENCRDACHING ON THERMAL MARGINS. THE ITEMS AND THEIR EFFECT ON INLET SUBCOOLING (BTU/LB) MCHFR ARE - (1) INLET ENTHALPY NOW BASED ON 1920 PSIA DOME PRESSURE, RATHER THAN 1050 INLET (+4/+0.06). (2) CORE BYPASS FLOW NOW ESTABLISHED AS 7% (-/+0.03). (3) CORE MIDPLANE PRESSURE OF 1035 NOW USED INSTEAD OF INLET PRESSURE (-/-0.02). (4) ZIRCONIUM SPACER TEST DATA (-/-0.02). ***THE NET EFFECT, WHEN FEEDWATER INCREASED TO 420 F, IS TO INCREASE SUBCOOLING 0.3 BTU/LB AND MCHFR BY 0.02.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL MODEL + *COMPUTER PROGRAM + *SUBCOOLING + BELL (BWR) + COMPARISON, THEORY AND EXPERIENCE + HEAT FLUX, CRITICAL + HEAT TRANSFER, BOILING + REACTOR, BWR + REPORT, PSAR + SAFETY MARGIN

17-25935 ALSO IN CATEGORIES 1 AND 5
MACPHERSON RE
FAST REACTOR SAFETY CONFERENCE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
8 PAGES, TABLE, REFERENCE, NUCLEAR SAFETY, 9(3), PAGES 202-209 (MAY-JUNE, 1968)

BRIEFLY SUMMARIZES THE SESSIONS COVERING (1) CORE MELTDOWN ACCIDENTS, (2) SODIUM BOILING AND SUPERHEATING, (3) INCIDENTS IN REACTORS, AND (4) SAFETY. MALFUNCTIONS IN THE BRS WERE (1) FUEL-ELEMENT LEAKS CAUSED BY HEATER SHORTING, PLUS AIR IN LEAKAGE CAUSING MASSIVE SODIUM OXIDE PLUGGING, AND (2) REACTIVITY PERTURBATIONS DUE TO ENTRAINMENT OF ARGON BY THE SODIUM STREAM. ***PLUGGING OF SUBASSEMBLIES BY OXIDE HAS BEEN DETECTED PRIMARILY BY THE EFFECT ON PRIMARY FLOW. A PANEL DISCUSSION SHOWED THAT ATTENTION IS SWITCHING FROM THE LARGE, LESS PROBABLE ACCIDENT TO THE SMALLER, MORE FREQUENT ACCIDENTS WHICH AFFECT PLANT USE.

*REACTOR, FAST + *REACTOR, FAST + *SAFETY PRINCIPLES AND PHILOSOPHY + *SAFETY PRINCIPLES AND PHILOSOPHY + ACCIDENT ANALYSIS + ACCIDENT ANALYSIS + ACCIDENT, MAXIMUM CREDIBLE (MCA) + ACCIDENT, MAXIMUM CREDIBLE (MCA) + COOLANT QUALITY + COOLANT QUALITY + FLOW BLOCKAGE + FLOW BLOCKAGE + INCIDENT, GENERAL + INCIDENT, GENERAL + REACTOR, LMCR + REACTOR, LMCR + REVIEW + REVIEW + SODIUM MACPHERSON RE
FAST REACTOR SAFETY CONFERENCE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
8 PAGES, TABLE, REFERENCE, NUCLEAR SAFETY, 9(3), PAGES 202-209 (MAY-JUNE, 1968)

BRIEFLY SUMMARIZES THE SESSIONS COVERING (1) CORE MELTDOWN ACCIDENTS, (2) SODIUM BOILING AND SUPERHEATING, (3) INCIDENTS IN REACTORS, AND (4) SAFETY. MALFUNCTIONS IN THE BRS WERE (1) FUEL-ELEMENT LEAKS CAUSED BY HEATER SHORTING, PLUS AIR IN LEAKAGE CAUSING MASSIVE SODIUM OXIDE PLUGGING, AND (2) REACTIVITY PERTURBATIONS DUE TO ENTRAINMENT OF ARGON BY THE SODIUM STREAM. ***PLUGGING OF SUBASSEMBLIES BY OXIDE HAS BEEN DETECTED PRIMARILY BY THE EFFECT ON PRIMARY FLOW. A PANEL DISCUSSION SHOWED THAT ATTENTION IS SWITCHING FROM THE LARGE, LESS PROBABLE ACCIDENT TO THE SMALLER, MORE FREQUENT ACCIDENTS WHICH AFFECT PLANT USE.

17-25981
HEIDER LH + JONES RF
PRIMARY TO SECONDARY LEAKAGE IN STEAM GENERATORS AND SUBSEQUENT TUBE REPAIRS
YANKEE ATOMIC ELECTRIC COMPANY, ROWE, MASSACHUSETTS
YAEC 1021 +. 30 PAGES, 7 FIGURES, 2 TABLES, NOVEMBER 1, 1967

TUBES IN VARIOUS STEAM GENERATORS WERE PLUGGED AT REFUELING SHUTDOWNS 6/62, 10/63, AND 8/64, USING A DRIVEN TAPERED PLUG, WELDED TO THE TUBE. RADIATION LEVELS OF 2-20 R/HR WERE INSIDE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-25981 *CONTINUED*

THE SECONDARY HAND HOLES, AND 5-15 R/HR INSIDE THE PRIMARY WATER BOX. NO DETECTABLE BETA. LEAKS WERE LOCATED IN THE TUBES BY A SIMPLE MOVABLE PLUG. CHEMICAL AND WIRE-BRUSH DECONTAMINATION WAS NOT FEASIBLE BECAUSE OF THE IRREGULAR SURFACES AND SHINE DOWN THE TUBES. REWELDING THE DIAPHRAGM BACK ON WAS COMPLICATED BY FITTING PROBLEMS AND BY WATER DRIPPING ON THE ARC.

AVAILABILITY - YANKEE ATOMIC ELECTRIC COMPANY, ROWE, MASSACHUSETTS

*FAILURE, TUBING + *MAINTENANCE AND REPAIR + *STEAM GENERATOR + DECONTAMINATION + OPERATING EXPERIENCE + REACTOR, PWR + WELDING + YANKEE (PWR)

17-25982 ALSO IN CATEGORY 15

GRENON M

LE TRAVAIL EN MILIEU HOSTILE

220 PAGES, 8 TABLES, 26 FIGURES, PUBLISHED BY PRESSES UNIVERSITAIRES DE FRANCE, 1968 (IN FRENCH)

(IN FRENCH) PAGES 1-146 DESCRIBE REMOTE MANIPULATIONS IN RADIOACTIVITY USAGE. PAGES 147-205 DESCRIBE UNDERWATER AND OUTER-SPACE USAGES. CHAPTERS DESCRIBE PRINCIPLES OF REMOTE MANIPULATION DEVICES (50 PG), REMOTE VIEWING TV AND SHIELD-WINDOWS (16 PG), FUEL-HANDLING AND REACTOR-REFUELING DEVICES (34 PG), AND REMOTE-CONTROL VEHICLES FOR NUCLEAR ACCIDENT RECOVERY. INCLUDES 21 PAGES ON SLI RECOVERY OPERATIONS.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS

*INCIDENT, RECOVERY FROM + *REMOTE MANIPULATING AND VIEWING + INCIDENT, SL 1 + REACTOR, POWER

17-25987 ALSO IN CATEGORY 6

COSTNER RA + CRAMER EN + SCOTT RL

REACTOR OPERATOR STUDY HANDBOOK VOLUME III - REACTOR PHYSICS

OAK RIDGE NATIONAL LABORATORY

ORNL-TM-2034, VOL. III +. 222 PAGES, 51 FIGURES, JUNE 1968

A SELF-TEACHING (PROGRAMMED INSTRUCTION) MANUAL COVERING NEUTRON REACTIONS, DESCRIPTION OF REACTORS, REACTIVITY AND REACTOR PERIOD, FUEL BURNUP, XENON- AND SAMARIUM-POISONING EFFECTS, TEMPERATURE EFFECTS, AND NEUTRON FLUX DISTRIBUTION. EACH SECTION CONTAINS BACKGROUND MATERIAL FOR UNDERSTANDING, EXAMPLE TO CLARIFY UNDERSTANDING, AND QUESTION FOR SELFTESTING. MATERIAL IS PRESENTED IN FORM OF PARAGRAPHS, AND IN FOLLOWING PARAGRAPHS, A BLANK MAY BE LEFT FOR STUDENT TO FILL IN WITH THE MAIN WORD OR IDEA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*PROCEDURES AND MANUALS + *REACTOR PHYSICS + *STAFFING, TRAINING, QUALIFICATION + FLUX DISTRIBUTION + FUEL BURNUP + NEUTRON INTERACTION + REACTIVITY EFFECT + REACTOR DESCRIPTION + REACTOR, RESEARCH + SAMARIUM + TEMPERATURE REACTIVITY EFFECT + XENON

17-26005 ALSO IN CATEGORY 1

FUEL CLADDING FAILURE

USAEC, DIVISION OF OPERATIONAL SAFETY

ROE 68-7 +. 2 PAGES, AEC BULLETIN, OPERATING EXPERIENCES, REACTOR SAFETY, MAY 27, 1968

ALUMINUM-CLAD, 168-G U235, FLAT-PLATE, ETR-TYPE ELEMENTS WERE NORMALLY USED TO 200,000 MWD/T. SPENT ELEMENTS WERE NORMALLY STORED IN CADMIUM-LINED HOLSTERS INSIDE THE REACTOR VESSEL. A CHANGE REQUIRED STORAGE IN THE STORAGE POOL, WITH ONLY FILTRATION FOR TREATMENT. A LOW-BURNUP ELEMENT (5 R AT CONTACT), EXAMINED BEFORE REPLACEMENT, HAD A BLISTER COMPLETELY THROUGH THE 0.015-IN. CLAD. ALTHOUGH CORROSION WAS NOTED ON ALL 11 ELEMENTS STORED (SOME FOR AS LONG AS 13 MONTHS) THIS WAS THE ONLY DEFECT.

USAEC, DIVISION OF OPERATIONAL SAFETY, WASHINGTON, D.C. 20545

*COOLANT QUALITY + *FAILURE, CLADDING + *FUEL STORAGE + ALUMINUM + COOLANT PURIFICATION SYSTEM + FAILURE, ADMINISTRATIVE CONTROL + REACTOR, AEC OWNED + REACTOR, RESEARCH

17-26300

REACTOR ENGINEERING DIVISION ANNUAL REPORT

ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS

ANL-7290 +. 234 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1967

TOPICS DISCUSSED ARE (1) EBR-II PLANT IMPROVEMENTS AND EXPERIMENTAL SUPPORT, (2) AARR TITLE-1 DESIGN AND SUPPORTING RESEARCH, (3) EBWR REPAIRS AND REACTOR KINETICS, (4) NUCLEAR ROCKET PROGRAM, (5) FAST-REACTOR R AND D, (6) LIQUID-METAL HEAT-TRANSFER PROGRAM, (7) MAGNETOHYDRODYNAMICS, (8) REACTOR SAFETY RESEARCH PROGRAM COVERING COOLANT DYNAMICS, REACTOR CONTROL AND STABILITY, FUEL MELTDOWN STUDIES, AND CONTAINMENT, AND (9) FEASIBILITY STUDY OF ASSS, USING 10,000-MW SODIUM-COOLED FAST BREEDER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26300 *CONTINUED*

*R AND D PROGRAM + *REVIEW + AARR (RR) + CONTAINMENT, GENERAL + EBR 1 AND 2 (RE) +
FLOW THEORY AND EXPERIMENTS + FUEL MELTDOWN + NUCLEAR ROCKET + REACTOR CONTROL + REACTOR STABILITY +
REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR + REACTOR, RESEARCH + REPORT, OPERATIONS

17-26301

SPENT FUEL MONITOR - SAFEGUARD AGAINST LOADING ERROR
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
ANL-7290 +. 3 PAGES, FIGURE, PAGES 13-15 OF THE REACTOR ENGINEERING DIVISION ANNUAL REPORT, APRIL 1967

BRIEFLY DESCRIBES A GAMMA SCANNING DEVICE TO DIFFERENTIATE BETWEEN A SPEND AND REPROCESSED
ELEMENT FOR EBR-II DURING REFUELING OPERATIONS. GAMMA CHAMBER WILL BE RAISED OR LOWERED 60
IN. TO OBTAIN RADIATION PROFILE (THAT FOR A SPENT UNIT WILL BE TYPICALLY COSINE IN SHAPE).
EVERY UNIT IS TO BE SCANNED BEFORE TRANSFER INTO REACTOR. TOO HIGH A FUEL BURNUP COULD LEAD
TO FUEL FAILURE. CONCEPTUAL DESIGN COMPLETED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151 \$3.00 COPY, \$0.65 MICROFICHE

*FUEL BURNUP + *INSTRUMENTATION, FUEL SCANNING + *REFUELING + EBR 1 AND 2 (RE) + FUEL ELEMENT +
FUEL HANDLING + GAMMA + INSTRUMENTATION, RADIATION MONITORING + REACTOR, AEC OWNED + REACTOR, BREEDER +
REACTOR, LMCR + SODIUM + SYSTEM DESCRIPTION

17-26305

ALSO IN CATEGORY 15

RADIOGRAPHY EXPOSURE AT GREEN BAY X-RAY SERVICE INC.
GREEN BAY X-RAY SERVICE INC., HARBOR BEACH, MICHIGAN
3 PAGES, TWX TO AEC DIVISION OF COMPLIANCE FROM R.G. GALLAGHER, OCTOBER 9, 1967

REPORTS THAT A RADIOGRAPHER AND HIS ASSISTANT MAY HAVE RECEIVED A WHOLE-BODY DOSE OF 5 TO 20 R
AND POSSIBLY UP TO 10,000 R TO THE HAND OF ONE MAN FROM AN UNRETRACTED 64-CURIE IRIIDIUM-192
SOURCE. DOSIMETERS OF BOTH INDIVIDUALS WERE OFF SCALE, INDICATING GREATER THAN 1-R EXPOSURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26306

ALSO IN CATEGORY 15

COBALT 60 RADIOGRAPHY SOURCE DROPPED INTO GULF OF MEXICO
GLOBAL X-RAY AND TESTING CORPORATION
1 PAGE, TWX TO AEC DIVISION OF COMPLIANCE FROM I. ST ROMAIN, JUNE, 1966

GLOBAL X-RAY AND TESTING CO. REPORTS THAT A 7.8-CURIE CO-60 SOURCE WAS DROPPED INTO THE GULF
OF MEXICO 50 MILES SOUTH OF LEESVILLE, LA. DEPTH OF WATER WAS 150 FT. AN UNSUCCESSFUL
ATTEMPT WAS MADE TO RETRIEVE THE SOURCE WITH A LARGE MAGNET. THE CRANK AND SOURCE TUBE HAD
BEEN REMOVED FOR TRANSFER TO A NEW LOCATION. WHEN RADIOGRAPHER WAS READY FOR NEXT EXPOSURE,
HE NOTICED PIGTAIL WAS GONE. DOSE WAS 10 MR FOR 3 DAYS WORK.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + OCEAN AND SEA

17-26307

ALSO IN CATEGORY 15

RADIOGRAPHY EXPOSURE AT AVONDALE SHIPYARDS INC.
AVONDALE SHIPYARDS
1 PAGES, TWX TO AEC DIVISION OF COMPLIANCE FROM J.K. MCCUE, APRIL 7, 1967

RADIOGRAPHER RECEIVED ESTIMATED EXPOSURE OF 6 REMS WHEN AN IRIIDIUM SOURCE STUCK IN THE CABLE.
DOSIMETER DID NOT INDICATE A DOSE. TWO FILM BADGES ARE TO BE PROCESSED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, EQUIPMENT + INCIDENT, NONREACTOR

17-26308

ALSO IN CATEGORY 15

OVEREXPOSURE TO RADIOGRAPHER
GENERAL DYNAMICS CORP., GROTON, CONNECTICUT
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(9), PAGE 27 (FEBRUARY 26, 1968)

A RADIOGRAPHER RECEIVED A CALCULATED DOSE OF 14.5 REMS GAMMA WHILE PERFORMING OPERATIONS WITH
A 96-CURIE IR-192 SOURCE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + RADIOGRAPHY

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26309 ALSO IN CATEGORY 15

ONEIL RW

FAILURE TO SURVEY RESULTS IN OVEREXPOSURES TO RADIOGRAPHERS

BOSTON NAVAL SHIPYARD, BOSTON, MASSACHUSETTS

2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(9), PAGE'S 27-28 (FEBRUARY 26, 1968)

A RADIOGRAPHER AND 2 ASSISTANTS WERE EXPOSED TO A 7.2-CURIE SOURCE WHEN IT FAILED TO RETURN TO ITS SHIELD AND A SURVEY WAS NOT MADE. TWO MEN RECEIVED THEIR DOSE WHILE PERFORMING RADIOGRAPHY, THE THIRD WHILE RETURNING THE TUBE, WHICH CONTAINED THE UNSHIELDED SOURCE, TO STORAGE. INCIDENT DISCOVERED WHEN ANOTHER RADIOGRAPHER SURVEYED THE STORAGE ROOM. ESTIMATED EXPOSURES ARE 2.2 REMS, 800 MILLIREMS, AND A POSSIBLE MAXIMUM OF 230 REMS TO THE THIRD MAN.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + INCIDENT, NONREACTOR

17-26310 ALSO IN CATEGORIES 11 AND 15

U.S. TESTING CO. CITED FOR NON-COMPLIANCE IN RADIOGRAPHY OPERATIONS

UNITED STATES ATOMIC ENERGY COMMISSION

4 PAGES, LETTER TO U.S. TESTING CO. FROM E.R. PRICE, NOVEMBER 10, 1965

NONCOMPLIANCE ITEMS INCLUDE PERSONNEL FAILING TO WEAR DOSIMETERS AND BADGES, INADEQUATE PERSONNEL MONITORING RECORDS, PERFORMING RADIOGRAPHY WITHOUT OPERABLE SURVEY INSTRUMENTS, UNQUALIFIED PERSONNEL ACTING AS RADIOGRAPHERS, ASSISTANTS HAD NOT RECEIVED COPIES OF OPERATING AND EMERGENCY PROCEDURES, SURVEILLANCE INADEQUATE TO PREVENT UNAUTHORIZED ENTRY INTO HIGH RADIATION AREAS, SURVEY INSTRUMENTS WERE NOT CALIBRATED EVERY 3 MONTHS, IMPROPER UTILIZATION LOOP, AND COMPANY FAILURE TO REPORT AN EMPLOYEE OVEREXPOSURE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, OPERATOR ERROR + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY

17-26311 ALSO IN CATEGORY 15

OVEREXPOSURE TO FILM BADGE WHILE CALIBRATING INSTRUMENTS

U.S. ARMY, FORT MCPHERSON

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM G.L. GALLIER, MARCH 25, 1965

A FILM-BADGE REPORT INDICATED AN EXPOSURE OF 41 REMS (BETA). INVESTIGATION REVEALED THAT EXPOSURE WAS TO FILM BADGE ONLY AND OCCURRED EITHER WHEN OPERATOR PERFORMING INSTRUMENT CALIBRATION LEFT HIS BADGE ON THE TABLE NEXT TO THE SOURCE FOR AN INDEFINITE TIME, OR WHEN HE LEANED OVER THE CALIBRATOR WHILE ITS PORT WAS OPEN AND THE BADGE WAS ON HIS BELT OVER THE FRONT OF THE RIGHT HIP.

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*FAILURE, OPERATOR ERROR + *INSTRUMENTATION CALIBRATION + *MONITOR, RADIATION, PERSONNEL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY

17-26312 ALSO IN CATEGORY 15

AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS

UNITED STATES ATOMIC ENERGY COMMISSION

2 PAGES, LETTER TO FOSTER WHEELER CORPORATION FROM E.R. PRICE, NOVEMBER 6, 1963

AN AEC INSPECTION ON AUGUST 29, 1963, RESULTED IN A CITATION FOR (1) PERMITTING EMPLOYEES TO PERFORM RADIOGRAPHY BEFORE COMPLETING THE TRAINING COURSE, (2) FAILING TO INCLUDE IN REPORTS OF RADIATION EXPOSURE TO FORMER EMPLOYEES THE STATEMENTS THAT THE REPORT WAS FURNISHED UNDER PROVISIONS OF AEC REGULATIONS AND SHOULD BE PRESERVED FOR FUTURE REFERENCE, AND (3) FAILING TO LABEL A SOURCE CONTAINER.

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17-26314 ALSO IN CATEGORY 15

CITATION FOR NONCOMPLIANCE TO RADIOGRAPHY REGULATIONS

UNITED STATES ATOMIC ENERGY COMMISSION

3 PAGES, LETTER TO RADIOLOGICAL TESTING LAB FROM L.D. LOW, MARCH 6, 1968

AEC CITED COMPANY FOR FAILING TO (1) SURVEY UNRESTRICTED AREAS, (2) MAINTAIN RECORDS OF SURVEYS, (3) POST RADIATION AREAS, (4) PERFORM ADEQUATE SURVEYS AFTER EXPOSURES, (5) DIRECTLY SURVEY TO PROTECT AGAINST UNAUTHORIZED ENTRY DURING OPERATIONS, (6) PREVENT UNAUTHORIZED PERSONNEL FROM PERFORMING RADIOGRAPHY, AND (7) POST THE VEHICLE USED FOR TRANSPORTING SOURCE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26314 *CONTINUED*
AND EXPOSURE DEVICE. AEC STATED THAT IMPROVEMENTS WERE NEEDED IN MANAGEMENT.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + SOURCE, RADIATION

17-26315 ALSO IN CATEGORY 15
RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
PARKER INDUSTRIAL X-RAY CORP., NEW HAVEN, CONNECTICUT
1 PAGE, LETTER TO AEC DIVISION STATE AND LICENSEE RELATIONS FROM P.J. ROSENBAUM, NOVEMBER 30, 1964

COMPANY RESPONSE TO AEC CITATION IS THAT THE AREA MONITOR FOR THE RADIOGRAPHY ROOM HAS BEEN REPAIRED. COMPANY DISAGREES WITH AEC RECOMMENDATION FOR CALIBRATION OF THE SURVEY METER AND REQUESTS AEC TO INDICATE IF THE CALIBRATION POINTS ARE SUGGESTED OR MANDATORY.

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*PERSONNEL PROTECTIVE DEVICE + *RADIOGRAPHY + INSPECTION AND COMPLIANCE + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, RADIATION MONITORING

17-26316 ALSO IN CATEGORY 15
RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
1 PAGE, LETTER TO PARKER INDUSTRIAL X-RAY LABORATORY FROM E.R. PRICE, JANUARY 4, 1965

AEC AGAIN REQUESTS THAT COMPANY SPECIFY STEPS TAKEN TO ENSURE THAT RADIOGRAPHY WILL BE CONDUCTED IN ROOM ONLY WHEN IT IS EQUIPPED WITH AN OPERABLE CONTROL DEVICE. ALSO, THE SURVEY INSTRUMENT SHOULD BE CALIBRATED BY CHECKING AT LEAST TWO POINTS ON THE SCALE. THIS WILL BE A REQUIREMENT WHEN THE LICENSE IS RENEWED.

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*INSTRUMENTATION CALIBRATION + *INSTRUMENTATION, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + INSPECTION AND COMPLIANCE + RADIOGRAPHY

17-26317 ALSO IN CATEGORY 15
RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
PARKER INDUSTRIAL X-RAY, NEW HAVEN, CONNECTICUT
1 PAGE, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM P.J. ROSENBAUM, JANUARY 11, 1965

COMPANY RESPONSE TO AEC CITATION FOR LACK OF OPERABLE RADIATION CONTROL DEVICE IN RADIOGRAPHY ROOM STATED THAT (1) DOOR TO ROOM IS EQUIPPED WITH A BAR ACROSS IT TO PREVENT ACCIDENTAL ACCESS, (2) AN AREA MONITOR MONITORS THE RADIATION LEVEL NEAR THE ENTRANCE TO THE ROOM WHENEVER RADIOGRAPHY IS PERFORMED IN THE ROOM, AND (3) IF THE PILL FAILS TO RETURN TO THE POT WHEN THE SAFE LIGHT FLASHES, THE AREA MONITOR WOULD INDICATE THIS FACT WHEN THE DOOR IS OPENED. THE MONITOR IS CONSIDERED AS A CONTROL.

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*INSTRUMENTATION, RADIATION MONITORING + INSPECTION AND COMPLIANCE + PERSONNEL PROTECTIVE DEVICE + RADIOGRAPHY

17-26318 ALSO IN CATEGORY 15
RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
2 PAGES, LETTER TO PARKER INDUSTRIAL X-RAY LABORATORY FROM E.R. PRICE, MARCH 23, 1965

CLARIFIES STATEMENTS MADE BY COMPANY CONCERNING THE CONTROL DEVICE (AREA MONITOR). REGULATIONS STATE THAT THE DEVICE SHALL EITHER CAUSE THE RADIATION LEVEL TO BE REDUCED WHEN AREA ENTRY OCCURS OR SHALL ENERGIZE A CONSPICUOUS OR AUDIBLE ALARM SUCH THAT THE INDIVIDUAL ENTERING AND THE LICENSEE ARE MADE AWARE OF THE ENTRY. COMPANY CONSIDERS THE AREA MONITOR AS A CONTROL, AND IT WAS REPAIRED AND OPERATING WITHIN A WEEK AFTER INSPECTION FOUND IT INOPERATIVE.

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*INSPECTION AND COMPLIANCE + *INSTRUMENTATION, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + MONITOR, RADIATION, AREA + RADIOGRAPHY

17-26319 ALSO IN CATEGORY 15
OVEREXPOSURE TO RADIOGRAPHER - SOURCE NOT CONNECTED TO CABLE
GENERAL DYNAMICS CORP., CONVAIR
2 PAGES, MEMORANDA ON OVEREXPOSURE, AUGUST 7, 1964

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26319 *CONTINUED*

ON AUGUST 6, 1964, RADIOGRAPHER RECEIVED A DOSE OF 3.8 REMS. AFTER AN EXPOSURE, THE SOURCE WAS RETRACTED, BUT THE LIGHT INDICATING THAT THE SOURCE WAS SAFELY STORED WAS NOT RECEIVED. THE EXPOSURE DEVICE WAS OUTSIDE A TANK, WHILE THE SOURCE TUBE WAS INSIDE. WHEN THE RADIOGRAPHER FOUND HIS DOSIMETER WAS OFF SCALE, IT WAS DISCOVERED THAT THE SOURCE WAS NOT ATTACHED TO THE OPERATING CABLE. CORRECTIVE ACTION INCLUDED 3 DAYS SUSPENSION WITHOUT PAY AND A REVIEW OF THE INCIDENT AND CORRECT PROCEDURES WITH ALL RADIOGRAPHERS.

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*FAILURE, OPERATOR ERROR + INCIDENT, NONREACTOR + PERSONNEL EXPOSURE, RADIATION + RADIOGRAPHY + SOURCE, RADIATION

17-26320 ALSO IN CATEGORY 15

OVEREXPOSURE TO RADIOGRAPHERS

SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS

1 PAGE, TEX TO AEC DIVISION OF COMPLIANCE REGION IV FROM D.C. CHEATHAM, MAY 26, 1966

A MONTHLY DOSIMETRY REPORT SHOWED THAT EXPOSURES TO TWO INDIVIDUALS WERE 42 AND 3.5 REMS, APPARENTLY TO COLLIMATED BEAMS. A INVESTIGATION IS UNDERWAY.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR

17-26321 ALSO IN CATEGORY 15

AEC CITATION FOR NONCOMPLIANCE WITH RADIOGRAPHY PROCEDURES

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.

2 PAGES, LETTER TO GLOBAL X-RAY AND TESTING CORP. FROM E.R. PRICE, DECEMBER 1, 1965

AN AEC INSPECTION IN OCTOBER 1965 RESULTED IN CITATION FOR (1) POSSESSING A SOURCE NOT AUTHORIZED BY LICENSE AND (2) USING A SOURCE IN ANCHORAGE, ALASKA, CONTRARY TO LICENSE.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + SOURCE, RADIATION

17-26325 ALSO IN CATEGORY 15

CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.

2 PAGES, LETTER TO PIPEWELD X-RAY CORPORATION FROM E.R. PRICE, JANUARY 28, 1965

AEC INSPECTIONS RESULTED IN CITATIONS FOR (1) NOT PROVIDING RADIOGRAPHERS WITH COPIES OF AEC LICENSE, (2) ALLOWING OPERATIONS BY 3 RADIOGRAPHERS WHO WERE UNABLE TO READ A SURVEY METER CORRECTLY, (3) FAILURE OF RADIOGRAPHERS TO PERFORM RADIATION SURVEY AFTER EXPOSURES, AND (4) EMPLOYEES NOT KNOWING AEC REGULATIONS.

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*INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + STAFFING, TRAINING, QUALIFICATION

17-26326 ALSO IN CATEGORY 15

RADIOGRAPHY EXPOSURE AT GENERAL DYNAMICS CORP.

GENERAL DYNAMICS CORP., GROTON, CONNECTICUT

3 PAGES, LETTER TO AEC DIVISION OF LICENSES FROM W. GORVINE, APRIL 4, 1967

A RADIOGRAPHER RECEIVED A DOSE OF 3.51 REMS WHEN THE SOURCE WAS NOT FULLY RETRACTED INTO ITS SHIELD. BOTH THE RADIOGRAPHER AND ASSISTANT STATED THAT THE STORED LIGHT WAS ON, INDICATING RETRACTION. A SURVEY WAS MADE FROM THE REAR AND SIDE BUT NOT IN FRONT OF THE DEVICE. THE DEVICE WAS LOCKED AND MOVED TO A NEW POSITION. A SECOND ASSISTANT DISCOVERED THE CONDITION WHEN HE NOTED THAT HIS SURVEY METER WAS READING 5 MR/HR.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26328 ALSO IN CATEGORY 15

AEC CITATION FOR NONCOMPLIANCE WITH RADIOGRAPHY REGULATIONS

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.

4 PAGES, LETTER TO SARNIA INSPECTION COMPANY, LTD. FROM E.R. PRICE, OCTOBER 1, 1965

AN INSPECTION IN JUNE 1965 RESULTED IN CITATIONS FOR FAILING TO (1) LIMIT RADIATION LEVEL AT SURFACE OF SOURCE DEVICE, (2) SURVEY AFTER EXPOSURES, (3) POST RADIATION AREAS, (4) MAINTAIN

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26328 *CONTINUED*

UTILIZATION LOGS, (5) MAINTAIN RECORDS OF RECEIPT AND TRANSFER OF BYPRODUCT MATERIAL, (6) RECORD DOSIMETER DOSES, (7) PERFORM QUARTERLY INVENTORIES OF BY-PRODUCT MATERIAL, (8) PERFORM INSTRUMENT CALIBRATIONS, (9) PERFORM LEAK TESTS, (10) KEEP PERSONNEL-MONITORING RECORDS, (11) KEEP RECORDS OF SURVEYS CONDUCTED AT SITE, AND (12) KEEP RECORDS OF PERSONNEL TRAINING.

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17-26329 ALSO IN CATEGORY 15

FAILURE TO USE SURVEY METER RESULTS IN OVEREXPOSURE TO RADIOGRAPHER
SCOPE INSPECTION CO., INC., HOUSTON, TEXAS

2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM D. THOMAS, MAY 11, 1967

ON APRIL 23, 1967, RADIOGRAPHER RECEIVED A WHOLE-BODY DOSE OF 6.1 REMS AND A CALCULATED DOSE OF 162 REMS TO THE LEFT HAND. SOURCE FAILED TO RETURN TO CAMERA, AND RADIOGRAPHER DID NOT USE SURVEY METER. WHEN FILM WAS PROCESSED, HE BECAME AWARE THAT THE SOURCE WAS STILL IN THE SNORKEL. HE GOT SURVEY METER, CUT PLASTIC SNORKEL, AND REPLACED THE SOURCE IN THE CAMERA.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26330 ALSO IN CATEGORY 15

OVEREXPOSURE TO SUPERVISORS DURING RECOVERY OF EXPOSED SOURCE
U.S. NAVY, PORTSMOUTH NAVAL SHIPYARD, PORTSMOUTH, NEW HAMPSHIRE

3 PAGES, LETTER TO DIVISION OF MATERIALS LICENSING FROM W.C. HUSHING, FEBRUARY 10, 1965

AT 3 AM ON JANUARY 13, 1965, A RADIOGRAPHER NOTIFIED HIS SUPERVISOR OF DIFFICULTIES IN RETRACTING A 108-CURIE SOURCE. THE SUPERVISOR AND ASSOCIATE SUPERVISOR RECEIVED OVEREXPOSURES RETURNING THE SOURCE TO THE PROJECTOR (FAILED TO SURVEY THE AREA PROPERLY). ALSO, THE SUPERVISOR TOOK OFF HIS JACKET CONTAINING HIS FILM BADGE DURING THE OPERATION. DOSES WERE 3 AND 3.124 REMS. HAND EXPOSURE WAS ESTIMATED AT 6 REMS. CAUSE OF INCIDENT - RADIOGRAPHER FAILED TO CONNECT THE SOURCE TUBE TO THE PROJECTOR.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM

17-26332 ALSO IN CATEGORY 15

RUST INHIBITOR CAUSES OVEREXPOSURE

U.S. ARMY, U.S. ARMY NUCLEAR DEFENSE LABORATORY, EDGEWOOD ARSENAL, MARYLAND

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM E.G. WRIGHT, MAY 29, 1967

DURING A REMOTE HYDRAULIC TRANSFER OF A 700-CURIE CO-60 SOURCE THROUGH TUBING, IT STUCK BECAUSE OF BUILDUP OF DECOMPOSED RUST INHIBITOR ON THE SOURCE. THE RADIATION-AREA SUPERVISOR RECEIVED A DOSE IN EXCESS OF 5 R RETURNING THE SOURCE TO THE SHIELD. HE WAS NOT AWARE OF THE CORRECT OPERATING PROCEDURES FOR THE SURVEY METER AND FAILED TO NOTE THAT BATTERIES WERE LOW, RESULTING IN A DECEPTIVELY LOW READING. THE USE OF THE RUST INHIBITOR WAS DISCONTINUED AND ADDITIONAL TRAINING GIVEN TO OPERATIONAL PERSONNEL.

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*FAILURE, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + *REMOTE MANIPULATING AND VIEWING + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26333 ALSO IN CATEGORY 15

RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES

NATIONAL TANK COMPANY, TULSA, OKLAHOMA

2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM F.L. SILVERS, JUNE 12, 1967

ON MARCH 12, 1967, A RADIOGRAPHER RECEIVED A DOSE OF 4550 MR (APPARENTLY FAILED TO SURVEY AND SOURCE DID NOT RETRACT). COMPANY RESPONSE TO AEC CITATION - (1) CALIBRATED AND OPERABLE SURVEY INSTRUMENTS WILL BE AVAILABLE AND USED AFTER EACH EXPOSURE, (2) APOLOGIZED FOR NOT INCLUDING EXPOSURE INFORMATION IN PREVIOUS LETTER, (3) LOG SHEET IMPROVED, (4) RADIOGRAPHERS INSTRUCTED TO MAKE SURVEYS AT BEGINNING AND END OF EACH SHIFT (IN ADDITION TO OTHER SURVEYS REQUIRED BY PROCEDURES), AND (5) A NEW SURVEY INSTRUMENT WITH AUDIBLE-SIGNAL ATTACHMENT WAS PURCHASED.

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CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26336 ALSO IN CATEGORY 15
RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
SINCO TESTING INC., PORT HURON, MICHIGAN
6 PAGES, LETTER TO AEC, WASHINGTON, D. C., OCTOBER 17, 1966

ON SEPT. 26, 1966, AEC CITED COMPANY FOR 33 DEFICIENCIES. COMPANY RESPONSE - (1) RECORDS NOW ARE ON FILE FOR INSTRUMENT CALIBRATIONS, QUALIFICATION RECORDS OF RADIOGRAPHERS, AND SOURCE LEAK TESTS, (2) STORAGE OF SOURCE IN UNLOCKED CAMERA OCCURRED BECAUSE OF SHORTAGE OF STORAGE CONTAINERS (THE SOURCE HAD DECAYED AND WAS READY TO BE SHIPPED TO SUPPLIER, AND THE LOCK WAS BEING REPAIRED), (3) RADIOGRAPHERS HAVE BEEN INSTRUCTED TO RECHARGE DOSIMETERS DAILY, AND (4) UNPOSTED AREAS HAVE BEEN POSTED.

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17-26337 ALSO IN CATEGORY 15
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
SCOPE INSPECTION CO., INC., HOUSTON, TEXAS
4 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM D. THOMAS, AUGUST 2, 1967

ON APRIL 27, 1967, RADIOGRAPHER RECEIVED A DOSE OF 6.1 REMS WHILE RETURNING A SOURCE TO SAFE WHICH HAD STUCK IN SNORKEL TUBE. COMPANY RESPONDED TO CITATION THAT (1) ALL EMPLOYEES HAD BEEN NOTIFIED OF INCIDENT AND THAT THE INDIVIDUAL HAD BEEN DISCHARGED (WHICH DID MORE GOOD THAN A WEEK OF LECTURES), (2) RETRAINING OF ALL RADIOGRAPHERS STARTED, (3) IF UNAUTHORIZED PERSONS VISIT EXPOSURE AREAS, RADIOGRAPHY WILL CEASE, (4) WEEKLY UNANNOUNCED INSPECTION AT ALL OF JOB SITES ARE NOW BEING MADE.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + FAILURE, OPERATOR ERROR + RADIOGRAPHY

17-26338 ALSO IN CATEGORY 15
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
SARNIA INSPECTION COMPANY, SARNIA, ONTARIO
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM T. ARNESEN, OCTOBER 26, 1965

AN AEC INVESTIGATION IN JUNE 1965, AND A CITATION FOR DEFICIENCIES, RESULTED IN COMPANY RESPONDING THAT (1) CRACKS SEEMINGLY DEVELOP OVERNIGHT IN THE LEAD-SHIELDED CAMERAS, RESULTING IN DOSE RATES IN EXCESS OF 50 MR/HR (ALL CAMERAS WILL BE REPLACED WITH THOSE USING DEPLETED URANIUM), (2) OPERATORS HAVE BEEN INSTRUCTED TO USE SURVEY METERS AFTER EXPOSURES, (3) SIGNS WILL BE POSTED DURING EXPOSURES. RECORD-KEEPING DEFICIENCIES AT THE ORANGE, TEXAS, OFFICE HAVE BEEN CORRECTED.

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*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + *INSPECTION AND COMPLIANCE + *STORAGE CONTAINER + RADIOGRAPHY + SOURCE, RADIATION

17-26339
RADIOGRAPHY SOURCE LOST FOR TWO DAYS
PITTSBURGH TESTING LAB, PITTSBURGH, PENNSYLVANIA
6 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H. F. HEDDERICH, SEPTEMBER 2, 1966

ON JULY 26, 1966, A 14-CURIE IR-192 SOURCE WAS LOST FROM AN EXPOSURE DEVICE. WHILE BEING CARRIED FROM ONE AREA TO ANOTHER THE LOCK SNAPPED OPEN AND THE SOURCE FELL OUT. ON JULY 28, THE SOURCE WAS FOUND NEAR THE WALK AREA. THE MAXIMUM EXPOSURE FOR THE INCIDENT AND RECOVERY WAS 76 MILLIREMS.

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*SOURCE, RADIATION, LOST + INCIDENT, NONREACTOR + RADIOGRAPHY

17-26340 ALSO IN CATEGORY 15
RADIATION EXPOSURE TO EXPERIENCED RADIOGRAPHERS
U.S. NAVY, PUGET SOUND NAVAL SHIPYARD, BREMERTON, WASHINGTON
4 PAGES, MEMORANDUM OF RADIATION EXPOSURE INCIDENT, SEPTEMBER 6, 1967

RADIOGRAPHER B, WITH 5 YEARS EXPERIENCE, ASSUMED THAT SOURCE HAD BEEN RETRACTED WHEN CRANKING BECAME DIFFICULT. ACTUALLY, MORE EFFORT WAS NEEDED ON LAST TURN TO RETRACT SOURCE AROUND AN S CURVE IN SHIELD. RADIOGRAPHER A, WITH 10 YEARS EXPERIENCE, SURVEYED FROM REAR AND OBTAINED NORMAL READINGS SINCE SOURCE WAS SHIELDED BY CAMERA. NEITHER OBSERVED THAT STORAGE LIGHT WAS

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26340 *CONTINUED*

NOT INDICATING THAT SOURCE HAD BEEN RETRACTED. RADIOGRAPHER A RECEIVED A DOSE OF 3500 MR, AND B 290 MR.

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*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + RADIOGRAPHY

17-26341

RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES

MATERIALS TESTING LAB, CHICAGO, ILLINOIS

2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM W.R. WINTERS, MARCH 22, 1966

COMPANY RESPONSE INCLUDED - (1) LICENSE IS TO BE MODIFIED TO ELIMINATE REQUIREMENT FOR A CONTROL DEVICE SINCE EXPOSURE ROOMS ARE TO BE UNDER CONSTANT SURVEILLANCE. (2) THE CALIBRATION OF SURVEY METERS AT REGULAR INTERVALS WAS RE-EMPHASIZED. (3) DAILY RECORDING OF DOSIMETER READINGS ARE NOW BEING MADE. (4) PERFORMANCE OF SURVEYS AFTER EXPOSURES WAS RE-EMPHASIZED.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + INSTRUMENTATION CALIBRATION + RADIOGRAPHY

17-26342

ALSO IN CATEGORY 15

RESPONSE TO AEC CITATION FOR INFRACTION OF SOURCE-HANDLING PROCEDURES

ATOMIC ENERGY OF CANADA LTD., OTTAWA, CANADA

2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM G.E. MCCULLUM, JUNE 16, 1966

COMPANY RESPONSE INCLUDED - (1) WORKERS DID NOT WEAR DOSIMETERS BECAUSE THEY WERE UNABLE TO ZERO THEM AFTER THE CHARGER WAS DAMAGED. IN FUTURE FIELD TRIPS, EACH PERSON WILL HAND CARRY A CHARGER. (2) ALL FIELD PERSONNEL ARE NOW EQUIPPED WITH AN AUDIBLE PERSONNEL MONITOR AND FILM BADGES FOR HEAD MONITORING.

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*INSPECTION AND COMPLIANCE + *INSTRUMENTATION, RADIATION MONITORING + *MONITOR, RADIATION, PERSONNEL + FAILURE, INSTRUMENT + FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + RADIOGRAPHY

17-26344

ALSO IN CATEGORY 15

RADIOGRAPHY SOURCE - LOST AND FOUND

SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS

1 PAGE, LETTER TO SCHLUMBERGER WELL SERVICES FROM K.N. THOMAS, OCTOBER 16, 1967

A SOURCE WAS PLACED ON THE BUMPER OF A TRUCK PARKED NEXT TO A SECOND TRUCK IN WHICH EQUIPMENT CALIBRATIONS WERE BEING PERFORMED. THE DRIVER DROVE OFF, NOT KNOWING THAT THE SOURCE WAS ON THE BUMPER OF HIS TRUCK, NOR DID HE KNOW THAT IT HAD FALLEN OFF ALONG THE WAY. THE SOURCE WAS FOUND SHORTLY THEREAFTER IN A DITCH BY ONE OF SEVERAL SEARCH PARTIES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR

17-26345

ALSO IN CATEGORY 15

RADIOGRAPHY SOURCE ABANDONED IN OKLAHOMA WELL

SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS

2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM O.C. CHEATHAM, SEPTEMBER 21, 1967

ON SEPT. 12, 1967, A 1.5-CURIE CS-137 SOURCE STUCK IN A WELL IN OKLAHOMA. FISHING OPERATIONS CONTINUED UNTIL SEPT. 18, WHEN IT WAS DETERMINED THAT THE SOURCE WAS CLEAR OF THE CENTER OF THE WELL AND THAT A 4-1/2-IN. CASING COULD BE RUN TO THE PRODUCING ZONE BELOW. TWENTY FEET OF CEMENT WAS SPOTTED BELOW AND ABOVE THE SOURCE, WHICH WAS AT A DEPTH OF 3520 FEET, AND THE SOURCE WAS ABANDONED.

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*RADIOGRAPHY + *SOURCE, RADIATION, LOST

17-26346

ALSO IN CATEGORY 15

RADIOGRAPHY SOURCE LOST IN PACIFIC OCEAN

SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM O.C. CHEATHAM, AUGUST 6, 1965

ON AUGUST 1, 1965, A 1.5-CURIE CS-137 SOURCE WAS LOST IN A STANDARD OIL CO. OF CALIFORNIA WELL 12 MILES OFF THE COAST OF OREGON. THE SOURCE HAD 4 CONTAINING SHELLS, OF WHICH TWO WERE PRESSURE TESTED AT 25,000 PSI. THE 12,000-FT WELL WAS ABANDONED AS A DRY HOLE. THE BOTTOM

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26346 *CONTINUED*

200 FT WAS PLUGGED WITH CEMENT CONTAINING JUNK IRON.

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*OCEAN AND SEA + *RADIOGRAPHY + *SOURCE, RADIATION, LOST

17-26347 ALSO IN CATEGORY 15

RADIOGRAPHY SOURCE LOST IN 4,186 FT. WELL

SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM D.C. CHEATHAM, JUNE 17, 1965

ON JUNE 7, 1965, A 1-CURIE CS-137 SOURCE STUCK AT THE BOTTOM OF A 4186-FT WELL IN WEST VIRGINIA. RETRIEVAL EFFORTS WERE DISCONTINUED 5 DAYS LATER. THE BOTTOM 50 FT OF THE WELL WAS FILLED WITH CEMENT AND JUNK IRON TO PRECLUDE REENTRY. THE SOURCE MATERIAL HAD 5 CONTAINING SHELLS, OF WHICH ONE WAS PRESSURE TESTED AT 25,000 PSI. FRESH-WATER ZONES IN THE VICINITY ARE AT DEPTHS NO GREATER THAN 100 FT FROM THE SURFACE.

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*RADIOGRAPHY + *SOURCE, RADIATION, LOST

17-26350 ALSO IN CATEGORY 15

RADIOGRAPHY SOURCE FALLS APART

RADIATION PRODUCTS, BURLINGTON, MASSACHUSETTS

2 PAGES, LETTER TO DIRECTOR DIVISION OF MATERIALS LICENSING FROM R.J. PREST, MARCH 24, 1967

A 10-CURIE IRIIDIUM-192 SOURCE FELL APART WHILE BEING USED BY WALWORTH CO., GREENSBURG, PA. RETRIEVAL OF THE 5 PELLETS WAS ACCOMPLISHED WITH MINOR CONTAMINATION AND PERSONNEL EXPOSURES OF 280 AND 5 MR. STEPS WERE TAKEN BY THE FABRICATOR TO EXAMINE AND IMPROVE THE QUALITY OF THE CAPSULE WELDS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, FABRICATION ERROR + *SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION

17-26351 ALSO IN CATEGORY 15

RADIOGRAPHY INCIDENT - CARELESS ATTITUDE TOWARD RADIATION RESULTS IN TERMINATION

PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, OCTOBER 24, 1964

THE RADIOLOGICAL SAFETY COORDINATOR DISCOVERED THAT A RADIOGRAPHER HAD EXCEEDED HIS QUARTERLY EXPOSURE LIMIT, ACCORDING TO A PHONE CALL FROM THE FILM-BADGE PROCESSOR. RADIOGRAPHER COULD NOT EXPLAIN BUT ADMITTED THAT HIS DOSIMETER HAD GONE BEYOND RANGE ON ONE OCCASION. HE WAS TERMINATED BECAUSE OF CARELESS ATTITUDE TOWARD RADIATION SAFETY, FAILING TO RECORD THE FACT THAT HIS DOSIMETER HAD GONE BEYOND RANGE. FAILING TO REPORT THE OVEREXPOSURE, AND LAZINESS IN FORWARDING A STATEMENT CONCERNING THE EXPOSURE.

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*ADMINISTRATIVE CONTROL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + RADIATION SAFETY AND CONTROL

17-26352 ALSO IN CATEGORY 15

RADIOGRAPHY INCIDENT - CHANGING HANDS DURING SOURCE RETRIEVAL RESULTS IN EXPOSURE

PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R.G. GALLAGHER, OCTOBER 21, 1964

RADIOGRAPHER RECEIVED BODY DOSE OF 3.1 R AND HAND DOSE OF 3.9. AT THREE AM, AFTER MAKING AN EXPOSURE, THE RADIOGRAPHER WAS CRANKING THE SOURCE BACK TOWARD THE STORAGE CONTAINER AND CHANGED HANDS DURING THE CRANKING, INVERTING THE SOURCE DRIVE MECHANISM. THE SOURCE WENT BACK DOWN THE TUBE BELOW A THICK CONCRETE FLOOR WHERE IT WAS SHIELDED FROM THE SURVEY METER. WHEN THE METER READING DROPPED BACK TO NORMAL, HE ASSUMED THAT THE SOURCE WAS BACK IN THE SAFE AREA SURVEY.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26353 ALSO IN CATEGORY 15

RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS

PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

6 PAGES, LETTER TO E.R. PRICE, AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM H.F. HEDDERICH, AUGUST 7, 1964

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26353 *CONTINUED*

EXPLANATIONS GIVEN FOR EACH OF 8 VIOLATIONS AT THE ALABAMA BRANCH AND 5 VIOLATIONS AT THE PITTSBURGH BRANCH. ALABAMA BRANCH DENIES (1) NOT INSTRUCTING EMPLOYEES ON HAZARDS AND PRECAUTIONS TO MINIMIZE EXPOSURES, AND (2) USING AN UNAUTHORIZED CONTROL CABLE IN AN EXPOSURE DEVICE. PENNSYLVANIA BRANCH DENIES (1) FAILURE TO MAKE SURVEYS IN UNRESTRICTED AREAS AND (2) ALLOWING RADIATION LEVELS ON SURFACE OF STORAGE CONTAINER TO EXCEED LIMITS. THE CONTAINER WAS RECEIVED THE SAME DAY THE INSPECTOR ARRIVED. HOWEVER, ITS INADEQUACY HAD BEEN ANTICIPATED, AND SPECIAL CONTAINERS HAD BEEN CONSTRUCTED, WHICH WERE BEING PAINTED. THE CONTAINER IN QUESTION WAS SHOWN TO THE INSPECTOR TO VERIFY THEY HAD ANTICIPATED ITS INADEQUACY.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + *STORAGE CONTAINER + FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + SOURCE, RADIATION

17-26355 ALSO IN CATEGORY 15

RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES

PIPEWELD X-RAY CORPORATION, PERRYSBURG, OHIO

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM C. EARLE, JR., FEBRUARY 14, 1966

COMPANY RESPONSE TO CITATIONS - (1) RADIOGRAPHERS DID NOT HAVE A COPY OF THE AEC LICENSE BECAUSE OF OVERSIGHT. (2) INABILITY OF 3 RADIOGRAPHERS TO READ A SURVEY METER CORRECTLY WAS CAUSED BY EMPLOYEES BECOMING EXCITED AND HIGHLY NERVOUS WHEN CONFRONTED BY AN AEC REPRESENTATIVE AND FAILING TO CHECK THE METER-SCALE SETTING. (3) THOSE WHO FAILED TO SURVEY AFTER EXPOSURES WERE FINED AND REINSPECTED. EMPLOYEES WERE REINSTRUCTED IN REQUIREMENTS OF AEC REGULATIONS AND COMPANY OPERATING MANUAL.

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*INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + SURVEY, RADIATION, GENERAL

17-26356 ALSO IN CATEGORY 15

RESPONSE TO AEC RADIOGRAPHY CITATION

PIPEWELD X-RAY CORPORATION, PERRYSBURG, OHIO

5 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM C. EARLE, JR., JANUARY 30, 1967

IN THE FUTURE, PERSONNEL WILL SIGN A STATEMENT THAT THEY HAVE RECEIVED INSTRUCTION ON COMPANY RADIOGRAPHY PROCEDURES. PERSON HAVING COPY OF RADIOGRAPHERS TEST QUESTIONS AND ANSWERS HAD GOTTEN AN OLDER RADIOGRAPHER TO WRITE THEM OUT FROM MEMORY TO ASSIST HIM IN STUDYING TO CHANGE HIS CLASSIFICATION (REPRESENTED LESS THAN 1/2 OF TEST QUESTIONS). RECURRING VIOLATIONS - FAILURE TO SURVEY AFTER EXPOSURE AND RECORD KEEPING OCCUR BECAUSE AEC DID NOT DIRECT THE CITATIONS TO THE RADIOGRAPHER BUT TO THE COMPANY. ADVOCATES THAT AEC LICENSE (NOT COMPANY) INDIVIDUAL SO THAT THREAT OF REVOCATION WOULD ELIMINATE RADIOGRAPHER LAXITY IN FOLLOWING PROCEDURES.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + RADIATION SAFETY AND CONTROL + STAFFING, TRAINING, QUALIFICATION

17-26357 ALSO IN CATEGORY 15

RADIOGRAPHY OVEREXPOSURES FOR CALENDAR QUARTER

PIPEWELD X-RAY CORP., PERRYSBURG, OHIO

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM C. EARLE, JR., JULY 22, 1964

REPORTS THAT SIX RADIOGRAPHERS RECEIVED EXPOSURES FOR QUARTER EXCEEDING 1.25 REMS. MAXIMUM WAS 2.25 REMS. ONE RADIOGRAPHER HAD BEEN LEAVING HIS CLOTHES (AND BADGE) ON A STEAM RADIATOR AT NIGHT. ANOTHER OVERDOSE WAS ATTRIBUTED TO INACCURATE FILM-BADGE READINGS BECAUSE OF A PARTIALLY OBLITERATED FILM.

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*FAILURE, ADMINISTRATIVE CONTROL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, OPERATOR ERROR

17-26359 ALSO IN CATEGORY 15

LOOSE SCREW ON RADIOGRAPHY EQUIPMENT RESULTS IN EXPOSURES

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, NEW JERSEY

3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E.P. ANDERSON, NOVEMBER 15, 1963

FIVE INDIVIDUALS RECEIVED RADIATION EXPOSURES - 1.2 R, 1.2, 280 MR, 130 MR, 90 MR - WHEN AN ALLEN SET-SCREW ON THE SOURCE DISCONNECT WORKED LOOSE AND CAUSED THE SOURCE TO STICK IN THE SOURCE TUBE ABOUT 2 FT OUT FROM THE SHIELD. THE SOURCE WAS REMOVED BY CUTTING OFF THE OUTBOARD END OF THE SOURCE TUBE AND PLACING THE OPEN END, CONNECTED TO THE CAMERA, INTO A LEAD BALL. THE SOURCE WAS THEN CRANKED OUT INTO THE LEAD BALL AND DISCONNECTED FROM THE OPERATING CABLE. ALL SUPERVISORS WERE INSTRUCTED TO PERIODICALLY CHECK THE DISCONNECTS.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26359 *CONTINUED*
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*INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, RECOVERY FROM +
SOURCE, RADIATION

17-26362 ALSO IN CATEGORY 15
LEAKING RADIOGRAPHY SOURCE CONTAMINATES EQUIPMENT
NATIONAL TANK COMPANY, TULSA, OKLAHOMA
2 PAGES, LETTER TO E.R. PRICE, AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM F.L. SILVERS, JUNE 25,
1965

A RADIOGRAPHIC CAMERA AND SOURCE TUBE WERE FOUND TO BE CONTAMINATED FROM A LEAKING IRIIDIUM
SOURCE. INTERCHANGING OF SOURCE TUBES HAD ALSO CONTAMINATED A COBALT SOURCE.

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*CONTAMINATION + *RADIOGRAPHY + *SOURCE, RADIATION + INCIDENT, NONREACTOR

17-26364 ALSO IN CATEGORY 15
RADIOGRAPHY OVEREXPOSURE DUE TO FAILURE TO SURVEY
MATERIALS TESTING LAB, EAST HARTFORD, CONNECTICUT
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM F.L. LENT, JULY 26, 1965

A RADIOGRAPHER RECEIVED A DOSE OF 1.74 REMS AS A RESULT OF FAILURE TO SURVEY AFTER COMPLETING
AN EXPOSURE. THE SOURCE HAD NOT RETRACTED TO THE STORED POSITION IN THE CONTAINER. THE
INCIDENT WAS DISCUSSED WITH ALL COMPANY RADIOGRAPHERS, AND AN AUDIBLE RADIATION ALARM WAS
INSTALLED IN THE EXPOSURE ROOM.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR +
SOURCE, RADIATION + SURVEY, RADIATION, GENERAL

17-26365 ALSO IN CATEGORY 15
INCIDENT INVOLVING 3000 CURIE CO-60 THERAPY SOURCE
LUTHERAN GENERAL HOSPITAL, PARK RIDGE, ILLINOIS
2 PAGES, LETTER TO DIVISION OF MATERIALS LICENSING FROM F.L. HUSSEY, M.D., MARCH 23, 1966

A 3000-CURIE COBALT-60 SOURCE WAS DROPPED ONTO THE TREATMENT ROOM FLOOR OF THE LUTHERAN
GENERAL HOSPITAL WHILE BEING TRANSFERRED FROM ITS SHIPPING CONTAINER INTO A THERAPY MACHINE.
BARRICADES AND SIGNS WERE POSTED UNTIL REMOTE-HANDLING EQUIPMENT COULD BE OBTAINED. THE
FOLLOWING EVENING THE SOURCE WAS RECOVERED. NO CONTAMINATION RESULTED. (EXPOSURE DOSES NOT
GIVEN.)

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*RADIOLOGY + *REMOTE MANIPULATING AND VIEWING + *SOURCE, RADIATION + INCIDENT, HUMAN ERROR +
INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + RADIATION SAFETY AND CONTROL + RADIOGRAPHY

17-26366 ALSO IN CATEGORY 15
CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
UNITED STATES ATOMIC ENERGY COMMISSION
2 PAGES, LETTER TO PIPEWELD X-RAY CORPORATION FROM E.R. PRICE, JANUARY 13, 1967

CITED FOR (1) ALLOWING RADIOGRAPHY BY PERSONS NOT INSTRUCTED IN PROCEDURES NOR SHOWN USE OF
DEVICES, (2) POOR RECORD KEEPING, AND (3) FAILURE TO SURVEY AFTER EXPOSURES. AEC NOTED THAT
ONE RADIOGRAPHER HAD A COPY OF THE QUESTIONS AND ANSWERS TO THE COMPANY'S RADIOGRAPHY
EXAMINATION. ITEMS 2 AND 3 ARE VIOLATIONS WHICH HAVE BEEN CITED IN PREVIOUS INSPECTIONS, AND
THE REASON FOR THEIR RECURRENCE SHOULD BE IDENTIFIED.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR

17-26368 ALSO IN CATEGORIES 3 AND 15
FIRE CONSUMES TRUCK TRANSPORTING RADIOGRAPHY SOURCE
LANE-WELLS, HOUSTON, TEXAS
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM J.C. WILSON, AUGUST 29, 1966

A FIRE CONSUMED A TRUCK TRANSPORTING A 1-CURIE CESIUM SOURCE. WHEN THE FIRE WAS EXTINGUISHED,
THE SOURCE WAS FOUND FLOATING ON THE MOLTEN LEAD FROM THE SHIELD. THE SOURCE WAS RETRIEVED,
UNDAMAGED, AND PLACED ON A LID OF A TOOL BOX. WHILE WAITING FOR A RADIOLOGICAL ASSISTANCE
TEAM CALLED BY A HIGHWAY PATROLMAN ON THE SCENE, THE PATROLMAN PICKED UP THE SOURCE AND HELD
IT FOR 1 MIN. HE RECEIVED A DOSE OF 100 MILLIREMS WHOLE BODY AND 10 REMS TO HANDS. OTHER

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26368 *CONTINUED*
EXPOSURES WERE MINIMAL.

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*FIRE + *RADIOGRAPHY + *TRANSPORTATION AND HANDLING + INCIDENT, NONREACTOR +
PERSONNEL EXPOSURE, RADIATION + SOURCE, RADIATION

17-26370 ALSO IN CATEGORY 15
RADIOGRAPHY SOURCE DROPPED INTO KAW RIVER
H.R. INSPECTION SERVICE, SHAWNEE, KANSAS
1 PAGE, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM H.W. ROGERS, APRIL 12, 1964

WHILE MAKING EXPOSURES ON A BRIDGE BEING BUILT OVER THE KAW RIVER, A GUST OF WIND BLEW A
WELDERS SCAFFOLD OVER, KNOCKING A CAMERA AND SOURCE INTO 5 FT OF WATER. THE SOURCE
GUIDE-TUBE BROKE, AND THE SOURCE DISCONNECTED FROM THE CONTROL CABLE. THE SOURCE WAS
RETRIEVED WITH A ROPE AND MAGNET. MAXIMUM PERSONNEL EXPOSURE WAS 1.25 MILLIREMS. A SAFETY
CHAIN ON THE CAMERA WILL BE USED FOR FUTURE EXPOSURES.

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*RADIOGRAPHY + *SOURCE, RADIATION, LOST + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + RIVER, GENERAL

17-26371 ALSO IN CATEGORY 15
RADIOGRAPHY EXPOSURE AT GENERAL DYNAMICS CORP.
GENERAL DYNAMICS CORPORATION, GROTON, CONNECTICUT
4 PAGES, LETTER TO AEC DIVISION OF LICENSING FROM W. GORVINE, JULY 20, 1965

RADIOGRAPHER RECEIVED A DOSE OF 4.2 REMS, AS INDICATED BY A FILM BADGE WORN ON HIS LAPEL.
CALCULATIONS INDICATED A DOSE OF 9.6 REMS TO THE BODY MIDSECTION. THE SOURCE WAS NOT
COMPLETELY RETRACTED AFTER AN EXPOSURE. DISCOVERY OF THE UNSAFE CONDITION WAS MADE BY A
RADIATION AUDITOR DURING A ROUTINE SURVEY, WHO THEN ALERTED THE RADIOGRAPHER THAT THE CONTROL
LIGHTS ON THE DEVICE WERE INDICATING THAT THE SOURCE WAS NOT RETRACTED. THE CAUSE WAS
ATTRIBUTED TO FAILURE TO FOLLOW PROCEDURES AND MAKE PROPER SURVEYS.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR +
SOURCE, RADIATION

17-26372 ALSO IN CATEGORY 15
RADIOGRAPHY EXPOSURE AT CONSOLIDATED X-RAY SERVICE CORP.
CONSOLIDATED X-RAY SERVICE CORPORATION, DALLAS, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM J.E. WRIGHT, DEC. 17, 1965

((LETTER) AT MIDNIGHT ON DECEMBER 4, 1965, FOLLOWING AN EXPOSURE, THE SOURCE DID NOT RETURN TO
THE CAMERA. AN ASSISTANT RADIOGRAPHER COILED THE SNORKLE WITH THE END CONTAINING THE SOURCE
ABOUT 2 FT FROM HIS HAND, WALKED TO A DITCH, THEN SET UP FOR ANOTHER EXPOSURE. AFTER WALKING
OUT OF THE RADIATION FIELD, IT WAS DISCOVERED THAT THE SOURCE WAS NOT SHIELDED. COPIES OF A
COMPILATION OF INCIDENTS WERE SENT TO ALL EMPLOYEES TO EMPHASIZE NECESSITY OF PROPER SURVEYS.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR +
SOURCE, RADIATION

17-26373 ALSO IN CATEGORY 15
RADIOGRAPHY INCIDENT - SOURCE FELL APART
CONAM INSPECTION, INC., TULSA, OKLAHOMA
2 PAGES, LETTER TO E.R. PRICE (AEC) FROM L.E. COOMBS, SEPTEMBER 30, 1966

SURVEY METER INDICATED THAT SOURCE HAD NOT RETRACTED. THE SOURCE TUBE WAS DISCONNECTED AND
SHAKEN SO THE LOOSE SOURCE COULD BE RETRIEVED WITH TONGS. THE SOURCE HAD BECOME UNSCREWED
AND FIVE IRIIDIUM PELLETS FELL OUT ONTO THE GROUND. THE EARTH WAS SCOOPED UP AND PELLETS
LOCATED. CONTAMINATED DIRT WAS SHIPPED TO LOUISIANA FOR DISPOSAL, AND SOURCE SUPPLIER WAS
NOTIFIED SO ACTION COULD BE TAKEN TO PREVENT A RECURRENCE.

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*INCIDENT, EQUIPMENT + *INCIDENT, RECOVERY FROM + *RADIOGRAPHY + SOURCE, RADIATION

17-26374 ALSO IN CATEGORY 15
RADIOGRAPHY EXPOSURE AT CONAM INSPECTION, INC.
CONAM INSPECTION COMPANY
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM L.E. COOMBS, JULY 31, 1967

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26374 *CONTINUED*

RADIOGRAPHER PERFORMING ROUTINE MAINTENANCE ON EXPOSURE DEVICE REMOVED 3 SCREWS FROM CAMERA, WHICH PERMITTED SOURCE TO DISLODGE FROM SHIELDED POSITION. SOURCE WAS RETURNED BUT WENT BETWEEN LEAD CONTAINER AND OUTSIDE ALUMINUM CASE. SURVEY METER WAS ON TOP OF EXPOSURE DEVICE (PARTIALLY SHIELDED FROM SOURCE), INDICATING SOURCE WAS IN PROPER PLACE. WITH THE SHIELD AND SOURCE IN THE TRUCK, RADIOGRAPHER AND HELPER DROVE 13 HR TO RETURN TO CONAM FACILITY, WHERE THE UNSHIELDED SOURCE WAS DISCOVERED IMMEDIATELY. FILM BADGE OF ONE READ 24.5 MR. DRIVER OF TRUCK WAS NOT WEARING BADGE. ESTIMATED RANGE OF EXPOSURES WAS 15 R TO 300 R.

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*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26375 ALSO IN CATEGORY 15

RADIOLOGIST QUARTERLY DOSE EXCESSIVE
SAINT FRANCIS HOSPITAL, TULSA, OKLAHOMA
1 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM J.E. KAUTH M.D., MARCH 19, 1968

RADIOLOGIST WAS HOLDING PATIENTS WHILE PORTABLE FILMS WERE TAKEN. QUARTERLY DOSE WAS 1874 MILLIREMS. YEARLY DOSE FOR 1967 WAS 6723 MILLIREMS.

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*FAILURE, OPERATOR ERROR + *RADIOLOGY + PERSONNEL EXPOSURE, RADIATION + RADIOGRAPHY

17-26376 ALSO IN CATEGORY 15

CITATION FOR DEFICIENCY IN RADIOGRAPHY OPERATIONS
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM H.F. HEDDERICH, FEBRUARY 23, 1965

COMPANY RESPONSES TO CITATIONS RESULTING FROM INVESTIGATION DEC. 7. THE NATURE AND EXTENT OF EXPOSURE WAS BECAUSE WE COULD NOT HONESTLY EVALUATE THE EXTENT OF EXPOSURE IN THE ALLOTTED TIME, AND (2) FAILURE TO PERFORM SIX UNANNOUNCED INSPECTIONS IN THE THIRD QUARTER WAS OVERSIGHT BY FORMER EMPLOYEE, AND PERFORMANCE OF ALL SIX WITHIN TWO WEEKS WAS DUE TO CHANGE IN PERSONNEL AND NEED TO MEET REQUIREMENT.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + STAFFING, TRAINING, QUALIFICATION

17-26377 ALSO IN CATEGORY 15

RECOVERY OF UNCOUPLED SOURCE - PLAN MINIMIZED PERSONNEL EXPOSURE
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, DECEMBER 8, 1964

ON NOV. 9, 1964, AT 3/30 AM, A RADIOGRAPHER NOTICED THAT THE CRANK HANDLE OF RADIOGRAPHY EXPOSURE DEVICE WAS WORKING TOO FREELY. AN INTERMEDIATE CONNECTION BETWEEN TWO LENGTHS OF SOURCE TUBE HAD WORKED LOOSE. THE SOURCE HAD RUN OUT OF THE TUBE AT THAT POINT, AND THE CONTROL CABLE HAD EXTENDED BEYOND THE GEAR WHEEL. THE PIGTAIL ALSO BECAME UNCOUPLED WHILE OUTSIDE THE SOURCE TUBE. THE SUPERVISOR, RADIOGRAPHER, AND RADIATION SAFETY OFFICER FORMULATED A PLAN. THE RSO, WHILE STANDING BEHIND STEEL COLUMN AND USING 8-FT HANDLING RODS, MANIPULATED SOURCE AND RETURNED IT TO THE EXPOSURE DEVICE. MAXIMUM EXPOSURE WAS 250 MR.

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*INCIDENT, RECOVERY FROM + *RADIOGRAPHY + INCIDENT, NONREACTOR + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SOURCE, RADIATION

17-26378 ALSO IN CATEGORY 15

FILM BADGE REPORT OF RADIOLOGIST AT MILWAUKEE HOSPITAL
MILWAUKEE HOSPITAL, MILWAUKEE, WISCONSIN
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM J.R. CAMERON, MARCH 19, 1964

SUBSEQUENT TO EXTENSIVE REMODELING OF THE X-RAY DEPARTMENT, A RADIOLOGICAL PHYSICIST SURVEYED THE DEPARTMENT AND RECOMMENDED REPORTING THE QUARTERLY FILM-BADGE READINGS FOR 1962 AND 1963 BECAUSE HOSPITAL HAD A BY-PRODUCT LICENSE. OVEREXPOSURES BELIEVED TO BE DUE TO HEAVY FLUOROSCOPIC WORK LOAD. READINGS WERE 0.32 REM, 1.269, 1.404, 0.45, 2.125, 1.587, 0.581, 0.216.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOLOGY + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL + RADIOGRAPHY + SOURCE, RADIATION + X-RAY

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26379 ALSO IN CATEGORY 15
OVEREXPOSURE TO THERAPY TECHNICIAN
U.S. ARMY, WALTER REED ARMY MEDICAL CENTER
8 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R. NYSTROM, JR., JANUARY 19, 1967

A FILM-BADGE REPORT INDICATED THAT A RADIATION-THERAPY TECHNICIAN HAD RECEIVED AN EXPOSURE OF 15.3 REMS GAMMA AND 4.93 BETA FOR THE PERIOD 6 NOV. THROUGH 3 DEC. 1966. ON ONE OCCASION THE TECHNICIAN WAS REQUIRED TO ASSIST A PATIENT FROM THE TREATMENT TABLE WHEN THE 1850-CURIE COBALT-60 SOURCE FAILED TO RETRACT. A DOSE OF 3.3 REMS WAS ATTRIBUTED TO THIS INCIDENT. WHEN AND HOW THE ADDITIONAL DOSAGE WAS ACQUIRED COULD NOT BE DETERMINED. A COMMITTEE DECLARED THE THERAPY UNIT UNSAFE, SHUT IT DOWN FOR REPLACEMENT, AND RECOMMENDED THAT TECHNICIAN BE RETURNED TO DUTY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOLOGY + FAILURE, EQUIPMENT + INCIDENT, EQUIPMENT + INCIDENT, NONREACTOR + RADIOGRAPHY + SOURCE, RADIATION

17-26380 ALSO IN CATEGORY 15
SEQUENCE OF EVENTS LEADS TO OVEREXPOSURE
U.S. NAVY
5 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E. FARY, DECEMBER 17, 1965

RADIOGRAPHS WERE BEING MADE OF A SUBMARINE UNDERGOING OVERHAUL IN DRYDOCK. ALL WORKMEN HAD LEFT FOR LUNCH. ROPE BARRICADES AND WARNING SIGNS HAD BEEN SET UP, A 4-MIN. EXPOSURE STARTED, AND THE 2 RADIOGRAPHERS WERE ON GUARD TO PREVENT ENTRY INTO THE RADIATION AREA. NO ANNOUNCEMENT OF THE RADIOGRAPHY WAS MADE BECAUSE THE INTERCOM WAS NOT WORKING. THE LIGHTS IN THE EXPOSURE AREA WENT OUT FOR TRANSFER TO ANOTHER POWER SOURCE. AN OFFICER ON AN INSPECTION TOUR PROCEEDED FROM ANOTHER DIRECTION IN A DARKENED PASSAGEWAY, FELT THE SIGN BUT COULDN'T TELL WHAT IT SAID, WENT UNDER THE ROPE BARRICADE, NOTICED THE EXPOSURE HEAD, TOUCHED IT AND WAS THEN OBSERVED BY THE RADIOGRAPHERS, WHO WARNED HIM OUT OF THE RADIATION AREA. DOSE WAS 5 REMS WHOLE-BODY, AND 350 TO FINGERTIPS OF LEFT HAND.

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*FAILURE, SEQUENTIAL + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + RADIATION SAFETY AND CONTROL

17-26381 ALSO IN CATEGORY 15
CLUSS RD
OVEREXPOSURE TO RADIOGRAPHER DURING STORAGE OF SOURCE
U.S. NAVY, MARE ISLAND SHIPYARD
3 PAGES, LETTER TO AEC DIVISION OF MATERIALS LICENSING FROM CHIEF OF BUREAU OF SHIPS, APRIL 14, 1965

ON MARCH 10, 1965, A RADIOGRAPHER RECEIVED AN ESTIMATED DOSE OF 46.6 REMS TO THE LEFT HAND AND 400 MREM WHOLE BODY. A PROJECTOR WITH SOURCE HAD BEEN DAMAGED WHEN A TRANSFER WAGON OVERTURNED. TWO BOLTS HOLDING THE CONTROL BOX TO THE PROJECTOR WERE BROKEN, AND UNKNOWN TO THE OPERATORS, THE THREADS OF THE REMAINING TWO BOLTS WERE STRIPPED. THE PROJECTOR WAS BEING RETURNED TO STORAGE, AND, WHILE SUSPENDED FROM A CRANE, THE WEIGHT OF THE CABLES CAUSED THE CONTROL BOX, PIGTAIL, AND SOURCE TO PULL FREE. THE RADIOGRAPHER PICKED UP THE PIGTAIL AND RETURNED THE SOURCE TO THE PROJECTOR.

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*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

17-26382 ALSO IN CATEGORY 15
FARY EJ
INADEQUATE SURVEY RESULTS IN OVEREXPOSURE TO RADIOGRAPHER
U.S. NAVY
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM COMMANDER OF SAN FRANCISCO BAY NAVAL SHIPYARD, JULY 7, 1965

DURING THE MIDNIGHT TO 8 AM SHIFT ON JUNE 10, 1964, A RADIOGRAPHERS HELPER RECEIVED A DOSE OF 12.5 REMS, THE RADIOGRAPHER 0.09. AFTER AN EXPOSURE, THE SOURCE DID NOT COMPLETELY RETURN TO THE SHIELD, AND ON INADEQUATE SURVEY FAILED TO REVEAL THE NARROW RADIATION BEAM. THE CONNECTOR OF THE SHIELDING NOZZLE WAS MISALIGNED, WHICH COULD CAUSE THE SOURCE TO HANG IN THE PARTIALLY SHIELDED POSITION. THE SURVEY METER HAD A RESPONSE LAG TIME WHEN SWITCHED FROM OFF TO ON, WHICH MAY HAVE CONTRIBUTED TO INADEQUATE SURVEY.

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*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26383 ALSO IN CATEGORY 15
OVEREXPOSURE TO RADIOGRAPHERS
U.S. NAVY, PHILADELPHIA NAVAL SHIPYARD
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R.A. MOUNT, NOVEMBER 18, 1965

ON NOVEMBER 2, 1965, TWO RADIOGRAPHERS RECEIVED OVEREXPOSURES OF 2.5 AND 3.5 REMS WHEN THEY TRIED TO RETURN THE SOURCE TO THE SHIELD. THEY HAD SUPPOSEDLY CONNECTED THE SOURCE CABLE TO THE DRIVE CABLE.

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*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

17-26384 ALSO IN CATEGORY 15
RESPONSE TO AEC CITATION FOR NONCOMPLIANCE IN RADIOGRAPHY OPERATIONS
UNITED STATES TESTING COMPANY, HOBOKEN, N. J.
5 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM A. L. BRASSELL, NOVEMBER 26, 1965

PERSONNEL CHANGES RESULTED IN RELAXATION OF EMPLOYEE TRAINING. SHORTAGES OF DOSIMETERS RECTIFIED BY PURCHASE OF OTHERS, FILM BADGES NOW ASSIGNED TO PERSONNEL, RECORD-KEEPING SYSTEM WAS REVISED, MONTHLY EQUIPMENT INVENTORY STARTED TO ENSURE THAT PERSONNEL WILL HAVE SURVEY METERS AND THAT REGULAR CALIBRATION IS PERFORMED. RETRAINING PROGRAM GIVEN TO ALL RADIOGRAPHERS AND ASSISTANTS, ALL WORKERS WERE ISSUED COPIES OF EMERGENCY PROCEDURES, RADIATION SAFETY OFFICER NOW REVIEWS DAILY THE UTILIZATION LOG.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, ADMINISTRATIVE CONTROL + *FAILURE, OPERATOR ERROR + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY

17-26385 ALSO IN CATEGORY 15
CONTAMINATION FROM LEAKING RADIOGRAPHY SOURCE
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA
2 PAGES, LETTER TO AEC, WASHINGTON, D.C. FROM H. T. SCHULZE, SEPTEMBER 30, 1966

AFTER FILM WAS FOUND FOGGED WHILE STORED NEXT TO THE SOURCE TUBES AND CONTROL CABLES, CONTAMINATION FROM A LEAKING IRIIDIUM-192 SOURCE WAS FOUND ON THE PLANT FLOORS, SOURCE STORAGE PIGS. ALSO, TRUCKS PARKED IN THE BACK OF THE PLANT WERE CONTAMINATED TO 5-10 MR/HR BY DIRECT READING. A TARPULIN IN THE TRUNK OF A WORKMANS PRIVATE CAR CONTAINED ACTIVITY UP TO 100 C/SECOND. A SINGLE IRIIDIUM PARTICLE WAS FOUND IN THE DRIVEWAY, WHICH READ 1300 MR/HR. HEALTH PHYSICIST RECOMMENDED THAT CABLES BE SURVEYED EACH TIME THEY ARE REMOVED FROM THE SHIELDED CONTAINER TO PREVENT SUCH INCIDENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CONTAMINATION + *FAILURE, EQUIPMENT + *RADIOGRAPHY + *SOURCE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

17-26386 ALSO IN CATEGORY 15
FORGETFULNESS RESULTS IN OVEREXPOSURE TO RADIOGRAPHER
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM H. T. SCHULZE, NOVEMBER 2, 1967

AFTER PERFORMING 15 EXPOSURES, RADIOGRAPHER SURVEYED IN THE USUAL MANNER TO ASCERTAIN THAT SOURCE WAS IN THE SAFE POSITION, BUT THIS ONE TIME HE FORGOT TO PUSH THE KEY-OPERATED LOCK IN, WHICH WOULD LOCK THE SOURCE IN THE EXPOSURE DEVICE. DURING THE TRANSFER TO ANOTHER LOCATION, THE CRANK CAUGHT ON AN OBSTRUCTION AND FORCED THE SOURCE TO AN EXPOSED POSITION. WHILE SETTING UP FOR THE NEXT EXPOSURE HIS FILM BADGE IN THE SHIRT POCKET WAS 3 FT FROM THE 90-CURIE SOURCE. HIS LEFT THIGH WAS 6 TO 12 IN. AWAY. FILM BADGE READ 8.8 REMS. ESTIMATED DOSE TO THIGH WAS 70 REMS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26387 ALSO IN CATEGORY 15
RESPONSE TO AEC CITATION FOR NONCOMPLIANCE IN RADIOGRAPHY PROCEDURES
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA
3 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM C. W. BRITZIUS, JANUARY 22, 1968

AEC COMPLIANCE CITED FOUR ITEMS OF NONCOMPLIANCE - (1) RADIOGRAPHER FAILED TO LOCK EXPOSURE DEVICE AFTER EXPOSURE, AND FAILED TO REPORT DISCHARGE OF DOSIMETER, (2) SURVEY WAS NOT MADE TO DETERMINE EXTENT OF DOSE RECEIVED BY RADIOGRAPHER, (3) AEC NOT NOTIFIED IMMEDIATELY OF

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26387 *CONTINUED*

EXPOSURE INCIDENT, AND (4) STORAGE OF MATERIAL AT PLACE NOT SPECIFIED BY LICENSE. COMPANY RESPONSE - (1) ITEM REVIEWED WITH ALL RADIOGRAPHERS, (2) SURVEY TECHNIQUES WERE REVIEWED AND RADIOGRAPHERS INSTRUCTED TO LEAVE SURVEY METERS ON AT ALL TIMES, (3) FAILED TO MARK ENVELOPE CONTAINING BADGE, SO THAT RESULTS OF READING WERE DELAYED, (4) COMPANY MOVED 2 BLOCKS AWAY AND NEGLECTED TO INFORM AEC.

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*FAILURE, ADMINISTRATIVE CONTROL + *INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR + RADIATION SAFETY AND CONTROL

17-26388 ALSO IN CATEGORY 15

FAILURE TO SURVEY RESULTS IN OVEREXPOSURE TO RADIOGRAPHER

VESTER J. THOMPSON, JR., INC., MOBILE, ALABAMA

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM V. J. THOMPSON, JR., JULY 1, 1965

RADIOGRAPHER RECEIVED A QUARTERLY DOSE OF 1820 MR, OF WHICH 1050 WAS RECEIVED IN ONE EXPOSURE AS A RESULT OF FAILING TO SURVEY TO ENSURE THE RETURN OF A SOURCE TO A SAFE POSITION. THE OVEREXPOSURE AND CAUSE WERE DISCUSSED WITH ALL THE EMPLOYEES, AND THE RADIOGRAPHER WAS RELIEVED OF HIS DUTIES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26389 ALSO IN CATEGORY 15

RADIATION DAMAGE TO HANDS DISCOVERED 2 WEEKS AFTER EXPOSURE

TECHNICAL OPERATIONS RESEARCH, BURLINGTON, MASSACHUSETTS

7 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E. T. CLARKE, APRIL 16, 1965

THE RIGHT HANDS OF TWO MEN BECAME SWOLLEN AND TENDER 2 WEEKS AFTER AN ESTIMATED EXPOSURE OF 250 R GAMMA AND 1000 RODS BETA. TO DISLODGE IRRADIATED IRIIDIUM PELLETS ADHERING TO AN ALUMINUM SPOOL BY CORROSION, THE MEN STOOD BEHIND A LEAD SHIELD AND TOOK TURNS FOR 10 MIN RAPPING THE CAPSULE CORE AGAINST THE INNER WALL OF A LEAD CONTAINER. TEN-INCH-LONG TWEEZERS WERE USED, BUT THE HANDS WERE IMMEDIATELY ABOVE THE ACTIVITY. NEITHER MAN WORE FILM BADGES OR DOSIMETERS. FUTURE HANDLING TO BE DONE UNDER SURVEILLANCE OF RADIATION SAFETY OFFICER.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + CORROSION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26390 ALSO IN CATEGORY 15

RADIATION EXPOSURE IS QUESTIONABLE

WARD W. SPARROW HOSPITAL, LANSING, MICHIGAN

2 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM J. C. SPENCER M.D., JANUARY 14, 1965

A FILM-BADGE REPORT FOR THE PERIOD 10-26-64 THROUGH 11-8-64 INDICATED THAT ONE EMPLOYEES BADGE WAS TOO DARK TO READ. DARKENING OF THE FILM IN THE BADGE TO THAT DEGREE REQUIRES AN EXPOSURE OF 500 TO 1000 R. INVESTIGATION AND QUESTIONING OF THE EMPLOYEE FAILED TO PROVIDE AN EXPLANATION. THE EMPLOYEE IS WELL, AND BLOOD COUNTS ARE NORMAL. THE FILM BADGE MAY HAVE BEEN DEFECTIVE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR

17-26391 ALSO IN CATEGORY 15

RADIOGRAPHY INCIDENT AT SINCO TESTING INC.

SINCO TESTING INC., PORT HURON, MICHIGAN

4 PAGES, LETTER TO AEC DSLR FROM A. SAUCIER, OCTOBER 3, 1966

ON JULY 7, 1966, A RADIOGRAPHER RECEIVED AN ESTIMATED DOSE OF 4000 R TO THE SKIN OF HIS HANDS. WHILE ATTEMPTING TO DISCONNECT A SOURCE FROM THE CONTROL CABLE, HE JERKED IT FROM THE STORAGE CONTAINER. THE 27-CURIE SOURCE LANDED IN HIS HAND AND MADE CONTACT FOR 1 SEC.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26392 ALSO IN CATEGORY 15

THIRD DEGREE BURNS SUSTAINED FROM RADIOGRAPHY INCIDENT

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26392 *CONTINUED*
PITTSBURGH TESTING LAB, BIRMINGHAM, ALABAMA
2 PAGES, LETTER TO AEC DIV. OF LICENSING AND REGULATION, APRIL 7, 1964

A 47.7-CURIE COBALT-60 SOURCE BECAME UNCOUPLED AND JAMMED IN THE RADIOGRAPHY SOURCE TUBE 1 FOOT FROM THE STORAGE CONTAINER. AN ATTEMPT TO RECTIFY THE MALFUNCTION RESULTED IN ONE RADIOGRAPHER RECEIVING THIRD-DEGREE BURNS ON THREE FINGERS OF HIS LEFT HAND. FILM BADGE, WORN ON HIS BELT, READ 3.45 R. THE OTHER RADIOGRAPHER RECEIVED AN ESTIMATED DOSE TO THE HANDS OF 1000 RADS, AND 2.05 RADS WHOLE BODY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY + FAILURE, EQUIPMENT + INCIDENT, NONREACTOR + SOURCE, RADIATION

17-26393 ALSO IN CATEGORY 15
FLUOROSCOPIC RADIATION EXPOSURE AT MILWAUKEE HOSPITAL
MILWAUKEE HOSPITAL, MILWAUKEE, WISCONSIN
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS, MAY 22, 1964

A TECHNICIANS FILM-BADGE EXPOSURES FOR 2 QUARTERS OF 1963 WERE 2.125 AND 1.587 REMS AS A RESULT OF IMPROPER SHIELDING ON A NEW FLUOROSCOPIC UNIT. CORRECTIVE ACTION INCLUDED PROPER SHIELDING, WEARING OF HEAVY LEAD APRONS FOR ALL FLUOROSCOPY, AND USE OF MORE TECHNICIANS TO LESSEN INDIVIDUAL EXPOSURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIOLOGY

17-26394 ALSO IN CATEGORY 15
LOST SOURCE USED FOR DENSITY GAUGE
THE SHERWIN-WILLIAMS CO., CHICAGO, ILLINOIS
1 PAGE, LETTER TO AEC DIV. OF COMPLIANCE FROM W. A. STARKOVICH, APRIL 2, 1968

IN EARLY DEC. 1967, COMPANY DISCOVERED THAT A 50-MILLICURIE CESIUM-137 SEALED SOURCE (PART OF A DENSITY GAUGE) WAS MISSING BUT FAILED TO NOTIFY AEC UNTIL MARCH 26, 1968. DURING THE INTERIM, AN EXTENSIVE SEARCH WAS MADE. ONE EMPLOYEE STATED THAT HE REMEMBERED CLEANING UP THE AREA AND HAD THROWN THE MATERIAL IN THE WASTE DUMPSTER. THE COMPANY WAS CITED FOR FAILURE TO NOTIFY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIOGRAPHY + *SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

17-26408
DICKERMAN CE
HIGHLIGHTS OF THE AIX CONFERENCE ON FAST REACTOR SAFETY
3 PAGES, 35 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 11(1), PAGES 1-3 (WINTER, 1967-1968)

VERY BRIEF SUMMARY OF TOPICS DISCUSSED. MUCH ATTENTION DEVOTED TO DESCRIBING AND CALCULATING TRANSIENT SODIUM BOILING AND EXPULSION BY VAPORIZATION. SESSION ON OPERATING EXPERIENCE INCLUDED FOLLOWING - (1) DOUNREAY - NAK LEAK WAS IN ONE OF 24 LINKS BETWEEN PRIMARY COOLANT CIRCUIT AND THE REACTOR VESSEL, (2) RAPSDODIE - PROBLEMS IN STARTUP INCLUDED THERMAL-STRESS DIFFICULTIES IN ORIGINAL DESIGN, (3) BR-5 - EXTENSIVE OXIDE PLUGGING EXPERIENCED AFTER EXPOSURE OF DRAINED CORE TO AIR, GAS ENTRAPMENT, AND LEAKS IN HEAT EXCHANGER, (4) FERMI - PARTIAL MELTDOWN DUE TO OBJECT IN INLET PLENUM BRIEFLY COVERED.

*OPERATING EXPERIENCE + BOILING + DOUNREAY (TR) + FERMI (LMFBR) + FLOW BLOCKAGE + FUEL MELTDOWN + LEAK + MAIN COOLING SYSTEM + MATHEMATICAL TREATMENT + REACTOR STARTUP EXPERIENCE + REACTOR, LMCR + REACTOR, TEST + SODIUM + STRESS + THERMAL MECHANICAL EFFECT

17-26409
SKAARDAL RC
OPERATIONAL PROBLEMS AND SOLUTIONS
10 PAGES, 10 FIGURES, 3 TABLES, 13 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 11(1), PAGES 17-26 (WINTER, 1967-1968)

DISCUSSES CASES OF COMPONENT FAILURES REPORTED AT 1967 CONFERENCE HELD BY REACTOR OPERATIONS DIV. OF ANS. HYDRIDING OF ZR PROCESS TUBES IN HANFORD PRODUCTION REACTOR HAS OCCURRED AT RATE OF 25 TO 30 PPM/YEAR AT LOW TEMPERATURES. CAUSE NOT DETERMINED. BOWING OF ALUMINUM SHIM RODS AT ORR FROM FAST-NEUTRON DAMAGE WAS MEASURED. HEAT-EXCHANGER-TUBE VIBRATIONS AT HFBR LOCALIZED TO U BENDS. MODIFICATION MADE TO LIMIT SHELL-SIDE VELOCITIES TO ONE-HALF. TUNSTEN CARBIDE SEAL FAILURE ON CIRCULATION PUMP AT BIG ROCK POINT AND REPAIR EXPERIENCE COVERED.

*OPERATING EXPERIENCE + BIG ROCK POINT (BWR) + CHEMICAL REACTION + CONTROL ROD BURNUP + CORE COMPONENTS + DAMAGE + FAILURE, EQUIPMENT + FAST NEUTRON + HANFORD (PR) + HEAT EXCHANGER + HFBR (RR) + HYDRIDE + MAINTENANCE AND REPAIR + MODIFICATION, SYSTEM OR EQUIPMENT + ORR (RR) + PUMP + REACTOR, PRODUCTION +

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26409 *CONTINUED*
REACTOR, RESEARCH + SEAL + TUBING + VIBRATION + ZIRCALOY

17-26412 ALSO IN CATEGORY 9
PASHOS TJ
CONTROL MATERIALS SYMPOSIUM
4 PAGES, 2 TABLES, 8 REFERENCES, NUCLEAR APPLICATIONS, 4(6), PAGES 394-432 (JUNE, 1968)

SUMMARIZES FIVE PAPERS PRESENTED AT THE JUNE 1966 ANS MEETING. TOPICS ARE - (1) MATERIALS FOR CONTROL OF WATER-COOLED POWER REACTORS, (2) USE OF LANTHANID OXIDE ABSORBERS IN PWR, (3) CONTROL BLADES PER HFBR, (4) PERFORMANCE OF BORON-CONTAINING RODS IN WATER-COOLED POWER REACTORS, AND (5) PERFORMANCE OF AG-IN-CD IN PWR.

*MATERIAL + *REACTOR CONTROL + BORON + CADMIUM + CONTROL ROD + DYSPROSIUM + EUROPIUM + INDIUM + LANTHANUM + OPERATING EXPERIENCE + REACTOR, BWR + REACTOR, PWR + SILVER

17-26515 ALSO IN CATEGORIES 18 AND 1
QUESTIONNAIRE ON PROPOSED WATER-REACTOR SAFETY SCHOOL
IDAHO OPERATIONS OFFICE, AEC
16 PAGES, LETTER FROM W. L. GINKEL, JULY 1, 1968

PROPOSED SCHOOL (AT NRTS, IDAHO) WOULD PROVIDE 9- TO 12-WEEK SESSIONS (RUNNING SUCCESSIVELY FOR FOUR YEARS) TO DISSEMINATE (WITH REDUCED TIME LAG) THE LATEST REACTOR-SAFETY TECHNOLOGY AND PHILOSOPHY TO INDUSTRY, UNIVERSITIES, AND GOVERNMENT. CURRICULUM COULD BE LIFTED ALMOST DIRECTLY FROM THE WATER-REACTOR ACCIDENT TREE AND WOULD INCLUDE BASIC PHENOMENA AND ANALYTICAL TECHNIQUES. SYLLABUS INCLUDES - BACKGROUND (6 HR), NATURE OF REACTOR SAFEGUARDS (24 HR), HISTORY OF ACCIDENTS (6 HR), REACTOR SAFEGUARDS (24 HR), REGULATORY AND R-AND-D FUNCTIONS (6 HR), ACCIDENT ANALYSIS (48 HR), QUALITY ASSURANCE (12 HR), CLASS PROJECTS (66 HR), AND SUMMATION SESSIONS (28 HR). TUITION - \$2000-\$4000.

AVAILABILITY - R. F. MAKEUS, EDUCATION OFFICER, USAEC, IDAHO OPERATIONS OFFICE, P. O. BOX 2108, IDAHO FALLS, IDAHO 83401

*SAFETY PROGRAM + *STAFFING, TRAINING, QUALIFICATION + NRTS + REACTOR, BWR + REACTOR, PWR + REACTOR, WATER

17-26533
PEACH BOTTOM MONTHLY OPERATIONS REPORT NO. 26
PHILADELPHIA ELECTRIC COMPANY, PHILADELPHIA
21 PAGES, APRIL 1968, DOCKET 50-171, TYPE--HTGR, MFG.--G.A., AE--BECHTEL

FAILED FUEL ELEMENT C05.05 REMOVED FROM CORE, AS WAS ELEMENT E05.05, WHICH APPEARED TO BE CRACKED, BUT SUBSEQUENT HOT-CELL EXAMINATION SHOWED IT WAS NOT. MISSING VIEWING-DEVICE-REFLECTOR SEARCH UNSUCCESSFUL. PSC (FT. ST. VRAIN) TYPE UNPURGED FUEL ELEMENT LOADED IN POSITION A11.11. ALL 90 DEMONSTRATION TFSTs WERE COMPLETED, WITH 5 DISCREPANCIES REMAINING, ALL OF WHICH INVOLVE FUEL-HANDLING EQUIPMENT.

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

*REPORT, OPERATIONS + FAILURE, FUEL ELEMENT + PEACH BOTTOM 1 (HTGR) + REACTOR, HTGR + TEST, SYSTEM OPERABILITY

17-26564 ALSO IN CATEGORY 2
COMMENTS ON THE PROPOSED NUCLEAR POWER PLANT ON THE HUDSON RIVER OPPOSITE THE SARATOGA NATIONAL HISTORICAL PARK, AS REQUESTED BY AEC LETTER MARCH 20, 1968.
DIVISION OF REACTOR LICENSING, AEC
8 PAGES, LETTER TO G. T. SEABORG, AEC. MAY 27, 1968. DOCKET 50-300. TYPE--BWR, MFG--G.E., AE--STONE + WEBSTER

REPORT CONCLUDES THAT MASS AND SCALE OF STRUCTURES WOULD HAVE A SIGNIFICANT ADVERSE VISUAL IMPACT AND WOULD MATERIALLY DETRACT FROM INTERPRETATION OF THE EVENTS EMBODIED BY THE PARK. REFERRING TO SECT. 106 OF NATIONAL HISTORICAL PRESERVATION ACT OF 1966 (REQUIRING AEC TO TAKE INTO ACCOUNT EFFECT ON NATIONAL-REGISTER PROPERTIES), COUNCIL CONCLUDES AEC SHOULD NOT ISSUE A CONSTRUCTION PERMIT UNLESS THERE IS NO FEASIBLE ALTERNATIVE SITE, AND THEN WITH ALL POSSIBLE PLANNING TO MINIMIZE ADVERSE (VISUAL) EFFECT. CRITERIA INCLUDED.

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

CONSTRUCTION PERMIT PROCESS + EASTON (BWR) + REACTOR, BWR + SITING, REACTOR

17-26565
III L-54 LICENSE CHANGED TO POSSESSION ONLY
DIVISION OF REACTOR LICENSING, AEC
13 PAGES, AMENDMENT 8 TO FACILITY LICENSE R-3, LETTER TO R. V. MOLER FROM D. J. SKOVHOLT. JUNE 26, 1968.
DOCKET 50-1.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26565 *CONTINUED*

UNTIL FUEL RADIOACTIVITY DECAYS AND IT CAN BE RETURNED TO AEC, FUEL WILL BE STORED IN STAINLESS-STEEL REACTOR VESSEL. CALCULATIONS SHOW THAT WITHOUT RECOMBINATION, RADIOLYSIS WOULD HAVE PRODUCED A PRESSURE INCREASE OF 68 IN. (HG) IN A SYSTEM DESIGNED FOR 600 IN. OBSERVATION OF ONLY 0.1 IN. INDICATES RECOMBINATION RATE EQUALS PRODUCTION RATE. NO UO₂ PRECIPITATION HAS BEEN OBSERVED EVEN WHEN H₂O₂ PRODUCTION WAS GREATER. CONTROL-ROD DRIVES ARE DISCONNECTED, AND MECHANICAL BLOCKS PREVENT MANUAL LIFTING OR RODS.

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

*DECOMMISSIONING + RADIOLYTIC GAS + REACTOR, RESEARCH + SAFETY EVALUATION + TECHNICAL SPECIFICATIONS

17-26566

VESR REVERTS TO POSSESSION ONLY STATUS

GENERAL ELECTRIC COMPANY

17 PAGES, AMENDMENT 1 TO FACILITY LICENSE DR-10. FROM LETTER TO B. D. WILSON FROM P. A. MORRIS. JUNE 17, 1968. DOCKET 50-183.

FACILITY IS NOT DISMANTLED BECAUSE PORTIONS WILL BE USED FOR TESTS AND EXPERIMENTS. FUEL HAS BEEN TRANSFERRED ELSEWHERE, HEAT TRANSFER SYSTEM DRAINED. ONLY RADIATION DANGER IS FROM CONTAMINATION IN HIGH-RADIATION AREAS SECURED AND POSTED. GETR PERSONNEL WILL CONTROL AREA.

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

*DECOMMISSIONING + REACTOR, INTERNAL SUPERHEAT + SAFETY EVALUATION + TECHNICAL SPECIFICATIONS + VESR (ISR)

17-26569

CLARK RH + CARSON JF

BAWTR OPERATING REPORT FOR PERIOD OCT 1967 THRU MARCH 1968

BABCOX AND WILCOX COMPANY, LYNCHBURG, VIRGINIA

BAW-337 +. 9 PAGES, FIGURES, TABLES, 7 REFERENCES, MAY, 1968, DOCKET NO. 50-200.

CAUSES OF SCRAMS - (1) THE NO.-1 SAFETY-ROD MAGNET HAD HIGH LEAKAGE CURRENT WHICH ALLOWED ROD TO RELEASE ON MINOR POWER FLUCTUATIONS. (2) THREE SCRAMS RESULTED FROM LOSS OF FLOW INDICATION, CAUSED BY MOISTURE OR FOREIGN MATTER IN COMPRESSED AIR SUPPLY. (3) A PERIOD SCRAM OCCURRED WHILE SUBCRITICAL DUE TO RANDOM NOISE IN CIRCUITS. ***SEVEN POWER REDUCTIONS OCCURRED, FIVE WERE DUE TO OPERATOR ERRORS (FAILURE TO RANGE INSTRUMENTS, USE PROPER SETTINGS, AND ADJUST SHIMS PROPERLY). TWO WERE CAUSED BY SWITCHING TRANSIENTS DURING TESTS. PRESENTS RESULTS OF CONTAINMENT LEAK TESTS, SAFETY-ROD DROP TESTS, AND EQUIPMENT MALFUNCTIONS AND MODIFICATIONS.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/PAGE)

*SCRAM, REAL + CONTAINMENT INTEGRITY + FAILURE, INSTRUMENT + FAILURE, OPERATOR ERROR + FAILURE, SCRAM MECHANISM + MODIFICATION, SYSTEM OR EQUIPMENT + NOISE + REACTOR, RESEARCH + REPORT, OPERATIONS SUMMARY + TEST, LEAK RATE

17-26570

ALSO IN CATEGORY 9

CLARK RH + CARSON JF

EQUIPMENT MALFUNCTIONS AND MODIFICATIONS

COMBUSTION ENGINEERING, INC.

BAW-337 +. 2 PAGES, FROM THE BABCOCK + WILCOX TEST REACTOR LICENSE TR-4 EIGHTH REPORT TO THE ATOMIC ENERGY COMMISSION DIVISION OF REACTOR LICENSING, MAY, 1968, DOCKET NO. 50-30

SMALL PLASTIC TUBES SUPPLYING N₂-HE TO A DETECTOR EXPERIMENT CAME IN CONTACT WITH HEATER WIRES OF ANOTHER EXPERIMENT. THE GAS-SUPPLY VALVES WERE CLOSED BEFORE INCIDENT, SO ONLY GAS IN TUBES ESCAPED. SOME INCREASE IN CONTAINMENT PARTICULATE MONITOR WAS NOTED. ***NUMEROUS SCRAMS HAVE BEEN CAUSED BY SHORT-TERM POWER INTERRUPTIONS OF FLUCTUATIONS INITIATED BY A QUICK-ACTING SCRAM RELAY. IN THE PRIMARY PUMP CIRCUIT THERE IS A SECOND RELAY WHICH SERVES SAME PURPOSE BUT IS SLOWER ACTING. THE QUICK-ACTING RELAY IS LESS SAFE SINCE IT CREATES NEED FOR MORE STARTUPS AND WAS PROVIDED WITH DELAY OF 1 TO 2 SEC.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST. WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*FAILURE, DESIGN ERROR + ACCIDENT, LOSS OF POWER + ELECTRIC POWER, NORMAL + EXPERIMENT, GENERAL + INCIDENT, EQUIPMENT + INSTRUMENTATION, RELAY + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR SAFETY SYSTEM + REACTOR, RESEARCH + REPORT, OPERATIONS SUMMARY + SCRAM, SPURIOUS

17-26571

ALSO IN CATEGORY 11

ORL COMMENTS ON REPAIR OF FINAL TWO STUB TUBES

DIVISION OF REACTOR LICENSING, AEC

2 PAGES, LETTER TO J. E. LOGAN, JERSEY CENTRAL P + L CO. FROM LETTER TO J. E. LOGAN FROM P. A. MORRIS. DOCKET 50-219. TYPE--BWR, MFG--G.E., AE--BURNS + ROE

RESULTS AND DISCUSSIONS GIVE US A BASIS TO CONCLUDE THAT THE TWO REMAINING UNTOUCHED STUB TUBES CAN BE REPAIRED. THEY SHOULD BE CAREFULLY MEASURED AND GIVEN DYE-PENETRANT TESTS BEFORE AND AFTER REMOVING ALL FIELD WELDS. ***WE ARE STUDYING NEED FOR A SURVEILLANCE PROGRAM OF SENSITIZED SS MATERIAL. YOU SHOULD HAVE ADEQUATE CLAD AND UNCLAD STUB-TUBE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26571 *CONTINUED*

MATERIAL (FREE OF 308LSS WELD METAL). ***PERMISSION TO REPAIR TUBES DOES NOT IMPLY APPROVAL OF PROPOSED REPAIR WORK.

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

*WELDING + CONTAINMENT PENETRATION, PIPE + FAILURE, PRESSURE VESSEL + OYSTER CREEK 1 (BWR) + PIPING + PRESSURE VESSEL + REACTOR, BWR + STEEL, STAINLESS + SURVEILLANCE PROGRAM

17-26588

ESCAPE OF LUBRICATING OIL INTO THE EBOR PRIMARY SYSTEM AND SUBSEQUENT CLEANUP
GENERAL DYNAMICS CORP., SAN DIEGO, CALIFORNIA
GA-7802 +. 55 PAGES, JANUARY 10, 1967

GIVES A VERY DETAILED DISCUSSION OF THE CLEANUP PROCEDURES USED TO REMOVE 56 GAL OF OIL FROM THE PRIMARY SYSTEM. FAILURE OF A MAIN HELIUM BLOWER SHAFT-SEAL ALLOWED LUBRICATING OIL TO ENTER SYSTEM. MATERIALS USED INCLUDED TURCO 4324-OR DETERGENT, A THINNER, AMMONIA, AND HYDRAZINE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FAILURE, EQUIPMENT + *INCIDENT, RECOVERY FROM + *SEAL + CONTAMINATION + COOLANT QUALITY + DECONTAMINATION + DECONTAMINATION + EBOR (GCR) + LUBRICATION + MAIN COOLING SYSTEM + REACTOR, GCR

17-26589

ALSO IN CATEGORIES 18 AND 5

BANNELLA, R
BEHAVIOR OF GARGILIANO REACTOR CORE IN SIMULATED CYCLE AT INCREASED POWER
ENTE NAZIONALE PER L ENERGIA ELETTRICA, ROME, ITALY
EURAC-1956 + EUR-3766 +. 38 PAGES, SPECIAL REPORT NO. 4, CONTRACT 101-63-11-RDI, NOVEMBER, 1966

USING PLANT COMPUTER, POWER OF 620 MWT (122.46% OF RATED POWER OF 506.3 MWT) WAS STUDIED. RESULTS INDICATE CORE CAN OPERATE AT THAT LEVEL WITHOUT EXCEEDING THE LIMIT OF THERMAL FLUX OR BURNOUT RATIO. HOWEVER, IMPROVEMENT IN FUEL ELEMENT REQUIRED. THE PURPOSE OF STUDY WAS TO FIND THE SHAPE OF LIMITING FUEL PARAMETERS - OTHER COMPONENTS ARE DISREGARDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*PERFORMANCE LIMIT + *REACTOR POWER + *THEORETICAL INVESTIGATION + EURATOM + GARIGLIANO (BWR) + HEAT TRANSFER ANALYSIS + POWER UPRATING + REACTOR, BWR

17-26590

ALSO IN CATEGORY 5

FRESHLEY MD + GOLDSMITH S
OPERATING EXPERIENCE WITH PLUTONIUM FUELS IN PRTR
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-1204 +. 31 PAGES, AUGUST 25, 1967

BASIC FUEL-ELEMENT DESIGN IS DESCRIBED. HIGH-POWER-DENSITY FUEL IRRADIATIONS WERE SATISFACTORY. IRRADIATED UO₂-PUO₂ FUEL SPECIMEN WERE RADIOGRAPHED 48 HR AFTER SHUTDOWN. HIGH CONCENTRATIONS OF FISSION PRODUCTS WERE OBSERVED ON INNER SURFACES AND CRACKS BUT DISAPPEARED WITH TIME. FURTHER STUDIES UNDERWAY. GAS-RELEASE AND PRESSURE-BUILDUP STUDIES DISCUSSED (MOSTLY A DISCUSSION OF PRESENT PROGRAM).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FUEL BURNUP + *IRRADIATION TESTING + *PLUTONIUM DIOXIDE + *URANIUM DIOXIDE + FUEL ELEMENT + OPERATING EXPERIENCE SUMMARY + PRTR (TR) + REACTOR, TEST

17-26591

ALSO IN CATEGORY 6

SAXTON PLUTONIUM PROJECT. QUARTERLY PROGRESS LETTER FOR THE PERIOD ENDING MARCH 31, 1967
WESTINGHOUSE ELECTRIC CORP., ATOMIC POWER DIVISION, PITTSBURG, PA.
EURAC-1826 +. 17 PAGES, MAY, 1967

PROGRESS REPORT. A DISCREPANCY EXISTS BETWEEN CALCULATED AND OBSERVED JUST-CRITICAL BORON CONCENTRATION. SOURCE OF ERROR IN ANALYSIS WAS FAILURE TO INCLUDE EFFECTS OF NONUNIFORM AXIAL DEPLETION AND DIFFERENCES IN FISSION PRODUCT CROSS SECTION. ***THE HOT-CELL VENTILATION SYSTEM WAS MODIFIED, AND DESTRUCTIVE EXAMINATION OF PELLETIZED RODS WILL BEGIN WHERE CELL ALPHA-CONTAINMENT SYSTEM IS OPERATIONAL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

*FUEL BURNUP + *PLUTONIUM + ALPHA EMITTER + CHEMICAL SHIM + COMPARISON, THEORY AND EXPERIENCE + EXAMINATION + FUEL, PELLET TYPE + HOT CELL + HOT CELL + MODIFICATION, SYSTEM OR EQUIPMENT + REACTIVITY EFFECT, ANOMALOUS + REACTOR PHYSICS + REACTOR, PWR + REPORT, OPERATIONS + SAXTON (PWR) + THEORETICAL INVESTIGATION

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26592

RESEARCH PROGRAM FOR THE GARIGLIANO NUCLEAR PLANT
ENTE NAZIONALE PER L ENERGIA ELETTRICA, ROME, ITALY
EURAE-1958 + EUR-3767 +. 10 PAGES, REPORT NO. 14, JULY 1-OCTOBER 31, 1967, NOVEMBER 1, 1967

PROGRESS REPORT ON PROGRAM TO DETERMINE POWER-LIMITING FEATURES OF GARIGLIANO. A CALCULATION CODE WAS PREPARED TO PROCESS DATA FROM CORE WIRE IRRADIATION. COMPUTER CALCULATIONS CONFIRMED POSSIBILITY OF OPERATING CORE AT 620 MWt.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*POWER UPGRATING + *R AND D PROGRAM + COMPUTER PROGRAM + DATA PROCESSING + FLUX DISTRIBUTION + GARIGLIANO (BWR) + IRRADIATION TESTING + PERFORMANCE LIMIT + REACTOR, BWR + REPORT, OPERATIONS ANALYSIS + SENN

17-26616

APPLICATION FOR EXTENSION OF PEACH BOTTOM 1 TEMPORARY LICENSE EXPIRATION DATE
PHILADELPHIS ELECTRIC COMPANY
11 PAGES, LETTER TO P. A. MORRIS, DRL. FROM LETTER TO P. A. MORRIS FROM V. P. MCDEVITT. JUNE 19, 1968. DOCKET 50-171. TYPE--HTGR, MFG--G.A., AE--BECHTEL

POINTS OUT THAT FULL-POWER OPERATION WAS ACHIEVED IN MAY 1967, AND ON JAN. 11, 1968, PLANT HAD ACCUMULATED 168.8 FULL-POWER DAYS BEFORE FIRST EXTENDED SHUTDOWN. PLANT HAS JUST RETURNED TO FULL POWER ON MAY 6, 1968, AND MAIN COOLING SYSTEM ACTIVITY HAS INCREASED TWICE TO NEW EQUILIBRIUM VALUES. REQUESTS LICENSE DPR-12 BE EXTENDED 17 MONTHS TO CONTINUE EVALUATION OF FUEL-ELEMENT PERFORMANCE AND OF THE HIGHER THAN EXPECTED STEAM-GENERATOR-SHELL TEMPERATURES.

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

*FAILURE, FUEL ELEMENT + *HIGH TEMPERATURE + *STEAM GENERATOR + OPERATING LICENSE PROCESS + PEACH BOTTOM 1 (HTGR) + REACTOR, HTGR

17-26617

YEARLY REPORT OF FACILITY CHANGES
UNIVERSITY OF KANSAS
2 PAGES, LETTER TO DRL, FROM LETTER TO DIR., DRL FROM RUSSELL B. MESLER. JUNE 18, 1968. DOCKET 50-148.

NO CHANGES TO FACILITY OR PROCEDURES HAVE BEEN MADE IN THE LAST YEAR THAT ARE AS DESCRIBED IN THE SAFETY-ANALYSIS REPORT. CURRENT MEMBERSHIP IN COMMITTEES ON RADIATION SOURCES AND ON NUCLEAR REACTOR LISTED. ***ALL 30 INNER, AL-CLAD CONCRETE BEAM-PORT PLUGS WERE DRILLED WITH 1/8-IN. HOLES TO RELIEVE ANY INTERNAL PRESSURE. FIVE HAD PRESSURE. FUEL AND CONTROL-ROD INSPECTION SHOWED NOTHING SUSPICIOUS.

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

*BEAM HOLE + *PRESSURE, INTERNAL + *SHIELDING + CONCRETE + FAILURE, EQUIPMENT + REACTOR, RESEARCH + REPORT, OPERATIONS SUMMARY + SAFETY REVIEW

17-26618

ALSO IN CATEGORY 14
CLARIFICATION OF A-41 RELEASE CONCENTRATION
WASHINGTON STATE UNIVERSITY
1 PAGE, LETTER TO DRL, FROM LETTER TO DIR., DRL FROM HAROLD W. DODGEN. JUNE 14, 1968. DOCKET 50-27.

THE NOV. 14, 1966, SAFETY ANALYSIS (PG 46-50) CONCLUDED THAT CONTINUOUS RELEASE OF AR-41 AT $1.5 \times 10^{(MINUS 5TH)}$ MICROCURIE/CC WOULD NOT VIOLATE 10 CFR 20. WE REQUESTED AUTHORIZATION TO RELEASE AR -41 AT A CONCENTRATION THAT WOULD PRODUCE A YEARLY AVERAGE OF $1.5 \times 10^{(MINUS 5TH)}$ WHEN CONTROLLED AND KEPT TO A MINIMUM CONSISTENT WITH EXPERIMENTAL PROGRAMS. AS A RESULT OF AMENDMENT 3 (JULY 12, 1967), WE UNDERSTAND THAT WE ARE AUTHORIZED TO RELEASE AR-41 AT A YEARLY AVERAGE CONCENTRATION OF $1.5 \times 10^{(MINUS 5TH)}$ MICROCURIE/ML.

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

*ARGON + *MAXIMUM PERMISSIBLE CONCENTRATION (MPC) + *SOURCE, CONTINUOUS + POWER UPGRATING + REACTOR, RESEARCH + REPORT, SAR + STACK + TECHNICAL SPECIFICATIONS + TRIGA (RR)

17-26619

GENERAL POLICY ON OPERATING DURING A LABOR STRIKE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
2 PAGES, LETTER TO H. L. PRICE, AEC DIRECTOR OF REGULATION. JUNE 25, 1968. DOCKET 50-29. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

NORMAL COMPLEMENT AT ROWE IS 66. THIRTY NINE IN IBEW INCLUDE 10 CONTROL-ROOM OPERATORS, 10 AUX. OPERATORS, AND 19 OTHERS. THE NORMAL OPERATION STAFF IS 5 SRO AND 10 RO. AT PRESENT, 10 SRO AND 2 RO ARE NOT IN IBEW. ***DURING A STRIKE, THERE WILL BE SAME NUMBER OF PEOPLE (5)

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26619 *CONTINUED*

ON SHIFT WITH A MINIMUM OF 3 LICENSED, AT LEAST 2 SRO. REMAINDER WILL BE THOROUGHLY FAMILIAR WITH PLANT. TWO HIGHER SUPERVISORY PERSONNEL WITH SRO WILL ALTERNATE 12-HR SHIFTS. ELEVEN SUPERVISORY AND PROFESSIONAL PERSONNEL WILL BE AVAILABLE FROM MAINTENANCE AND HP STAFF.

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

*STAFFING, TRAINING, QUALIFICATION + AFL-CIO + REACTOR, PWR + YANKEE (PWR)

17-26620

DRL APPROVES YANKEE POLICY ON OPERATION DURING LABOR STRIKE
DIVISION OF REACTOR LICENSING, AEC

1 PAGE, LETTER R. J. COE, YANKEE AEC. JULY 5, 1968. DOCKET 50-29. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

GENERAL POLICY ADOPTED BY YANKEE FOR USE IN LABOR STRIKE (SEE LETTER OF JUNE 25, 1968) APPEARS SATISFACTORY FOR TEMPORARY OPERATION. RECONSIDERATIONS MAY BE NECESSARY IF EXTENSIVE OVERTIME RESULTS OR NORMAL MAINTENANCE CANNOT BE ACCOMPLISHED EFFECTIVELY. WE UNDERSTAND THAT YOUR NUCLEAR-SAFETY AUDIT AND REVIEW COMMITTEE WILL CONTINUOUSLY REVIEW AND APPRAISE OPERATION DURING A STRIKE.

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

*STAFFING, TRAINING, QUALIFICATION + AFL-CIO + REACTOR, PWR + YANKEE (PWR)

17-26621

ALSO IN CATEGORY 6

CORE VII STARTUP REACTIVITY EFFECTS

CONNECTICUT YANKEE ATOMIC POWER COMPANY

10 PAGES, 2 FIGURES, 2 TABLES, OPERATION REPORT 89 FOR MAY, 1968. FROM A LETTER TO DRL FROM W. P. JOHNSON. JUNE 24, 1968. DOCKET 50-29. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

CORE-VII PHYSICS TESTS WERE COMPLETED AND REACTOR BROUGHT TO POWER MAY 1, AMMONIA ADDITION (6.45 PPM IN THE MAIN COOLANT GAVE A PH OF 6.04) GAINED 0.7% DK/K, COMPARED WITH STARTUPS WITH UNADJUSTED PH. FOUR DAYS LATER, AMMONIA FEED WAS STOPPED, AND IT WAS APPARENT THAT A REACTIVITY GAIN WAS OCCURRING. ON MAY 8, MIXED-BED RESINS REMOVED THE AMMONIA, CANCELLING THE REACTIVITY GAIN OF 0.2% DK/K. COOLANT PH HAS SINCE AVERAGED 5.3, AND REACTIVITY DEPLETION IS 0.157 PPM PER MWD/MTV AT 1200 PPM. RADIATION EXPOSURE FOR MAY AVERAGED 175 MREM, WITH THE MAXIMUM AT 451. THE OUTAGE LASTED 39 DAYS.

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

*PERSONNEL EXPOSURE, RADIATION + *PH REACTIVITY EFFECT + CHEMICAL SHIM + FUEL BURNUP + FUEL HANDLING + MAINTENANCE AND REPAIR + REACTOR, PWR + REFUELING + REPORT, OPERATIONS + YANKEE (PWR)

17-26622

BARCELO H

PROGRAM OF INSTRUCTION FOR PRNC REACTOR OPERATORS (ACADEMIC PLAN)

PUERTO RICO WATER NUCLEAR CENTER

PRNC-17 +. 28 PAGES, JUNE, 1968

PROVIDES SCOPE NOTES AND LECTURE OUTLINES FOR 6-MONTH COURSE. (1) MATHEMATICS, 71 HR, 7 PG. (2) PHYSICS, 61 HR, 4 PG. (3) NUCLEAR ENGINEERING, 66 HR, 6 PG. (4) ELECTRO-MECHANICAL ENGINEERING, 96 HR, 6 PG. (5) HEALTH PHYSICS AND CHEMISTRY, 39 HR, 3 PG. (6) PLANT INFORMATION, 21 HR, 2 PG.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*STAFFING, TRAINING, QUALIFICATION + REACTOR, POOL TYPE + REACTOR, RESEARCH

17-26644

ALSO IN CATEGORY 15

SIVINTSEV YV

RADIATION SAFETY IN NUCLEAR REACTORS

640 PAGES, REFERENCES, MOSCOW, ATOMIZDAT, 1967, IN RUSSIAN

THE STANDARDS FOR RADIATION SAFETY IN NUCLEAR REACTORS ARE REVIEWED IN DETAIL. THE MAXIMUM PERMISSIBLE RADIATION LEVELS ARE OUTLINED. METHODS USED FOR THE DOSIMETRY OF EXTERNAL RADIATION AND THE SHIELDING NECESSARY ARE GIVEN. THE RETENTION OF FISSION PRODUCTS IN THE FUEL AND PRIMARY COOLANT OF NUCLEAR REACTORS IS DISCUSSED. THE PRECAUTIONS REQUIRED FOR RADIOACTIVE GASES AND AEROSOLS IN REACTORS ARE DESCRIBED. METHODS USED FOR MEASURING THE INTERNAL RADIATION OF REACTORS ARE GIVEN.

*RADIATION SAFETY AND CONTROL + MAXIMUM PERMISSIBLE DOSE (MPD) + REACTOR, BWR + REACTOR, POWER + REACTOR, PWR + USSR

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26737 ALSO IN CATEGORY 13
CONSTRUCTION OF RADIOCHEMISTRY LABORATORY IN REACTOR LABORATORY
UNIVERSITY OF TEXAS
5 PAGES, 3 FIGURES, LETTER TO E. R. PRICE, DSLR. FROM A LETTER TO EBER R. PRICE FROM S. J. GAGE. JUNE 11, 1968. DOCKET 50-192.

(RESPONSE TO LETTER OF MAY 17, 1968). ROOM WILL BE USED FOR RADIOCHEMICAL SEPARATIONS IN TRACE ANALYSIS WITH NEUTRON-ACTIVATION TECHNIQUES. ROOM WILL CONTAIN TERMINUS OF THE PNEUMATIC (RABBIT) TRANSFER SYSTEM, A FUME HOOD, A GLOVE BOX, AND STORAGE. OUTSIDE AIR IS DRAWN DIRECTLY INTO ROOM AND EXHAUSTED FROM GLOVE BOX AND FUME HOOD TO A 30-FT STACK. GLOVE-BOX DUCT HAS A FILTER.

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

GLOVE BOX + IRRADIATION FACILITY + RADIOISOTOPE + REACTOR, RESEARCH + VENTILATION SYSTEM

17-26738
REPORT ON FUEL TRANSFER INCIDENT 4 JAN 1968
AMES LABORATORY
4 PAGES, 1 TABLE, LETTER TO P. A. MORRIS, DRL. FROM LETTER TO P. A. MORRIS FROM GLENN MURPHY. JUNE 26, 1968. DOCKET 50-116.

LOW-POWER CORE WAS BEING REPLACED BY HOT CORE IN STORAGE PIT. AFTER 4 COLD ELEMENTS WERE TAKEN TO STORAGE, THE FIRST HOT ELEMENT FELL OUT OF THE TRANSFER CASK INTO THE FUEL BOX WHEN THE CASK DOOR WAS OPENED. FUEL ELEMENT END WAS NICKED, BUT NEITHER CONTAMINATION NOR RADIATION WAS EXCESSIVE, AND IT WAS RETURNED TO STORAGE. ***INCIDENT WAS RECONSTRUCTED WHEN (A) HOLD-DOWN SCREW WAS NOT TIGHT AGAINST THE ELEMENT LIFTING ATTACHMENT, (B) WINCH CABLES ALLOWED TO SLACKEN BY RESTING CASK ON ITS DOOR, (C) CABLES AND ELEMENT PICKUP ROTATED INTO THE UNLOCKING DIRECTION.

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

*ACCIDENT, REFUELING + *FUEL HANDLING MACHINE + FAILURE, FUEL ELEMENT + OPERATING EXPERIENCE + REACTOR, RESEARCH

17-26739 ALSO IN CATEGORY 9
CONTROL ROD STARTERS WITHDRAWN
UNIVERSITY OF CALIFORNIA, LOS ANGELES
1 PAGE, LETTER TO D. J. SKOVHOLT. LETTER TO D. J. SKOVHOLT FROM CRAIG B. SMITH. JUNE 26, 1968. DOCKET 50-142.

DURING THE 19 JUNE 1968 PRESTART CHECKOUT, CONTROL BLADE NO. 1 DID NOT RETURN TO THE DOWN POSITION WHEN DROPPED. WHATEVER IS INHIBITING MOTION IS NOT IN THE DRIVE. WE HAVE REMOVED THE FUEL AND ARE UNSTACKING THE GRAPHITE CENTER ISLAND TO LOCATE THE DIFFICULTY.

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

ARGONAUT (TNG) + FAILURE, SCRAM MECHANISM + REACTOR, RESEARCH

17-26740 ALSO IN CATEGORY 9
MARK F TRIGA CONTROL ROD STICKS
GENERAL DYNAMICS, GENERAL ATOMIC DIVISION
2 PAGES, LETTER TO D. J. SKOVHOLT, DRL. FROM LETTER TO D. J. SKOVHOLT FROM E. CREUTZ. JUNE 28, 1968. DOCKET 50-163.

ON MAY 29, DURING A ROUTINE PULSE AT THE MARK F, THE SHIM ROD STOPPED 3 IN. SHORT OF FULL INSERTION FOLLOWING THE ROUTINE SCRAM. SHUTDOWN MARGIN WAS \$1.27 WITH THIS ROD FULL OUT. 50% OF THE SUBSEQUENT TEST DROPS SHOWED ROD STOPPED 3 IN. SHORT, IN 50% ROD FELL FULLY DOWN. AFTER ADJACENT ELEMENTS WERE CHECKED FOR INTERFERENCE, ROD DROPPED FREELY. REACTOR RETURNED TO SERVICE JUNE 7 AFTER DISCUSSION WITH COMPLIANCE. EXACT CAUSE NOT RESOLVED, BUT MOST PROBABLE CAUSE WAS IMPROPERLY SEATED ELEMENT OR TEMPORARY FOREIGN OBJECT IN THE DASH POT.

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

*FAILURE, SCRAM MECHANISM + FUEL ELEMENT + FUEL HANDLING + OBSTRUCTION + REACTOR, PULSED + REACTOR, RESEARCH + SAFETY REVIEW + TEST, SYSTEM OPERABILITY + TRIGA (RR)

17-26741 ALSO IN CATEGORY 9
SIX MONTHS OPERATIONS SUMMARY JAN TO JUN 19, 1968
UNIVERSITY OF TEXAS
3 PAGES, LETTER TO P. A. MORRIS, DRL. FROM LETTER TO P. A. MORRIS FROM S. J. GAGE. JUNE 20, 1968, DOCKET 50-192.

TWO FUEL ELEMENTS WERE ADDED AND POWER LEVEL INCREASED TO 250 KW ON APRIL 2. AN 8400-CURIE

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26741 *CONTINUED*

CO-60 SOURCE WAS INSTALLED IN THE REACTOR-POOL IRRADIATOR. A 4-IN.-DIA, PORTABLE, VERTICAL BEAM TUBE WAS INSTALLED AFTER REACTOR COMMITTEE DETERMINED IT DID NOT INVOLVE A TECH.-SPEC. CHANGE OR AN UNREVIEWED SAFETY QUESTION. THE LOWER END RESTS ON THE GRAPHITE REFLECTOR, AND THE UPPER END EMERGES NEAR THE BRIDGE, WITH A BEAM CATCHER REDUCING BRIDGE RADIATION TO LESS THAN 50 MR/HR AT 250 KW. FOLLOWING COMPLIANCE SUGGESTIONS, AN ELECTRONIC TEST CIRCUIT WAS ADDED TO THE POWER CHANNEL, WHICH ALLOWS CHECKOUT OF ALL COMPONENTS EXCEPT UCIC. JUNE 11 LETTER SENT DESCRIBING SMALL RADIOCHEMISTRY LABORATORY.

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

*BEAM HOLE + *TEST, SYSTEM OPERABILITY + COBALT + INSPECTION AND COMPLIANCE + INSTRUMENTATION, POWER RANGE + NEUTRON + POWER UPGRATING + RADIATION SAFETY AND CONTROL + RADIOGRAPHY + REACTOR, RESEARCH + REPORT, OPERATIONS SUMMARY + SAFETY REVIEW + SHIELDING + SOURCE, RADIATION + TRIGA (RR)

17-26742 ALSO IN CATEGORIES 11 AND 3

ERR COLD HYDROTEST AT 240 PSIG.

RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINNESOTA

COO-651-60 +. 25 PAGES, 3 FIGURES, 4 TABLES, RURAL COOPERATIVE POWER ASSOCIATION'S ELK RIVER REACTOR SIXTY-SEVENTH MONTHLY OPERATING REPORT, MAY, 1968 DOCKET NO. 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR HAS NOT OPERATED SINCE JANUARY. A 240-PSIG COLD HYDROTEST WITH SR-85 DISPERSED IN THE PRIMARY SYSTEM WAS TERMINATED AFTER 7 DAYS, WITH NO SR-85 FOUND IN CAVITY WATER. RUPTURE DISK RUPTURE ON FUEL SHIPPING CASK WAS TRACED TO ALCONOX SOLUTION USED IN DECONTAMINATION AT SRL. APPENDIX A -DESCRIBES 240-PSIG HYDROTEST AND RESULTS. APPENDIX B -PROCEDURE FOR 1000-PSIG HYDROTEST AT 300 F, USING SR-85 AND RB-86.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C. (\$0.25 CENTS/PAGE)

*MAIN COOLING SYSTEM + *TEST, PROOF + CORROSION + DECONTAMINATION + ELK RIVER (BWR) + FAILURE, EQUIPMENT + FAILURE, PRESSURE VESSEL + PRESSURE RELIEF + PRESSURE VESSEL + PRESSURE, INTERNAL + PROCEDURES AND MANUALS + REACTOR, AEC OWNED + REACTOR, BWR + REPORT, OPERATIONS + RUBIDIUM + SHIPPING CONTAINER + STRONTIUM + TRACER, RADIOACTIVE

17-26743 ALSO IN CATEGORIES 11 AND 1

ELK RIVER TECHNICAL SUPPORT CONTRACT, REACTOR VESSEL LEAKS

RURAL COOPERATIVE POWER ASSOCIATION

COO-651-57 +. 22 PAGES, 5 FIGURES, FEBRUARY, 1968, DOCKET NO. 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR SHUT DOWN ENTIRE MONTH BECAUSE RCPA AND AGC CONTRACTUAL NEGOTIATIONS WERE IN PROGRESS REGARDING THE TECHNICAL-SUPPORT SUBCONTRACTOR (TECHNICAL SPECIFICATIONS REQUIRE THERE BE ONE). ***REACTOR CAVITY WATER, WHICH HAD ACCUMULATED AT ABOUT 1 GAL/DAY IN THE LAST THREE MONTHS, ACCUMULATED AT ABOUT 250 ML/DAY, MAINLY DUE TO CONDENSATION. CAVITY DRAIN SAMPLES WERE MAINLY NA-24, BUT CAVITY VENT SAMPLES HAD LESS RB-88 THAN CONTAINMENT AIR.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*FAILURE, PRESSURE VESSEL + *LEAK RATE + *SAFETY REVIEW + ELK RIVER (BWR) + REACTOR, AEC OWNED + REACTOR, BWR + REPORT, OPERATIONS + SAMPLING + TECHNICAL SPECIFICATIONS

17-26744

POWER UPGRATING OF KSU TRIGA MARK II

DIVISION OF REACTOR LICENSING, AEC

20 PAGES, PROPOSED AMENDMENT 3 TO KANSAS STATE U LICENSE. FROM LETTER TO W. R. KIMEL FROM D. J. SKOVHOLT. JUNE 26, 1968. DOCKET 50-188.

RAISES ALLOWABLE POWER FROM 100 KW TO 250 AND ALLOWS \$2.00 PULSING. ***PROVIDES A COMPLETE SET OF TECHNICAL SPECIFICATIONS. OPERATION AT 280 KW ALLOWED TO TEST FULL-POWER SAFETY CIRCUITS. PULSES THAT EXCEED 250 MW REQUIRE SAFEGUARDS-COMMITTEE INVESTIGATION AND TEMPORARY CESSATION OF PULSATION. SEMIANNUAL \$1.00 PULSES WILL CHECK PEAK POWER AND FUEL TEMP.

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

*POWER UPGRATING + *TECHNICAL SPECIFICATIONS + REACTOR, PULSED + REACTOR, RESEARCH + SAFETY EVALUATION + TRIGA (RR)

17-26745

ANNUAL OPERATION REPORT OF AGN 201 JUNE 1 1967 TO MAY 31, 1968

TEXAS A AND M COLLEGE

5 PAGES, LETTER TO DRL, FROM LETTER TO P. A. MORRIS FROM R. G. COCHRAN. JUNE 14, 1968. DOCKET 50-59

REACTOR WAS OPERATED 35.5 HR FOR 4 COURSES. SUBCRITICAL TANK LEAK WAS REPAIRED. LEAKS IN CORRODED CHANNELS 1 AND 3 CANISTERS WERE FIXED BY REPLACEMENT WITH A PLASTIC CANISTER. ON THE ADVICE OF COMPLIANCE, RG 58/U COAXIAL CABLE IN CHANNEL 1 WAS REPLACED BY RG 59/U TO GIVE A HIGHER VOLTAGE RATING WITHOUT CHANGING PERFORMANCE. SAFETY-REVIEW COMMITTEE APPROVED A SECOND FISSION PLATE FOR THE SUBCRITICAL TANK.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-26745 *CONTINUED*

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

*CORROSION + AGN (TNG) + BEAM HOLE + ELECTRICAL CONDUCTION + INSPECTION AND COMPLIANCE +
INSTRUMENTATION, POWER RANGE + REACTOR, TRAINING + REPORT, OPERATIONS SUMMARY + SAFETY REVIEW

17-26746 ALSO IN CATEGORY 6

PULSTAR DOPPLER COEFFICIENT WITH A GRAPHITE REFLECTOR
WESTERN NUCLEAR RESEARCH CENTER

4 PAGES, 2 FIGURES, LETTER TO D. J. SKOVHOLT, DRL, FROM LETTER TO D. J. SKOVHOLT FROM P. T. BURNETT. JUNE
21, 1968. DOCKET 50-57.

AS REQUIRED IN LICENSE CHANGE 30, SEVEN PULSES WERE MADE AT 4 DIFFERENT REACTIVITIES WITH FOUR
GRAPHITE ELEMENTS ALONG ONE SIDE OF THE 4X5 CORE. THE COEFFICIENT WAS OBTAINED BY DIVIDING
THE PROMPT REACTIVITY INSERTED BY THE TEMPERATURE RISE FROM A PREVIOUSLY PUBLISHED CURVE OF
FUEL TEMP. VS ENERGY DENSITY (WNY-20). THE 7 POINTS FELL WITHIN 10% OF A CURVE OF DK/DEG F
VS AV. FUEL TEMP. PLOTTED FOR WATER REFLECTOR. ON JUNE 2, THE REVISED STEADY-STATE CORE
SHOWED A REACTIVITY LOSS OF 0.00581 DK AND A TEMP. RISE OF 245 F ON GOING TO 1.25 MW. THIS
DOPPLER COEFFICIENT IS 97% OF THE WATER-REFLECTED VALUE, AND WE CONCLUDE THAT THE GRAPHITE
HAS NOT CHANGED THE COEFFICIENT.

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

*DOPPLER COEFFICIENT + *MEASUREMENT, REACTIVITY + *REFLECTOR + COMPARISON, THEORY AND EXPERIENCE +
GRAPHITE + PULSTAR (RR) + REACTOR, PULSED + REACTOR, RESEARCH

17-26790

REPLACEMENT OF HEAT EXCHANGER
RHODE ISLAND ATOMIC ENERGY COMMISSION

1 PAGE, LETTER TO DRL, JANUARY 30, 1968. DOCKET 50-193.

CHANGE 3, APRIL 14, 1967, TO THE TECHNICAL SPECIFICATIONS ALLOWED US TO REPLACE THE ALUMINUM
HEAT-EXCHANGER. ALSO REPLACED THE ALUMINUM SHELL WITH A STAINLESS-STEEL SHELL. TO AVOID
CONFUSION, PLEASE CHANGE OUR TECHNICAL SPECIFICATIONS, PERHAPS IN THE PENDING CHANGE FOR
HIGHER-POWER OPERATION.

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

*ALUMINUM + *CORROSION + *HEAT EXCHANGER + *MODIFICATION, SYSTEM OR EQUIPMENT + OPERATING EXPERIENCE +
REACTOR, RESEARCH + STEEL, STAINLESS

17-26794

SCHEDULE FOR INFORMATION NEEDED FOR INDIAN POINT 1 LONG TERM LICENSE
CONSOLIDATED EDISON COMPANY OF NEW YORK

2 PAGES, LETTER TO P. A. MORRIS, DRL, FROM LETTER TO P. A. MORRIS FROM A. N. ANDERSON. DOCKET 50-3.
TYPE--PWR, MFG--R+W, AE--CON ED

IT APPEARS IMPOSSIBLE TO PREPARE THE REQUESTED INFORMATION BEFORE PROVISIONAL LICENSE
EXPIRATION DATE, SO, IN SEPT, 1968 WE WILL APPLY FOR AN EXTENSION. WE PLAN ON THE FOLLOWING
SCHEDULE - SEPT. 1 (FACILITY INFORMATION), NOV. 1 (COMPARISON WITH CURRENT CRITERIA), JAN.
15, 1969 (ANALYSES OF TOPICS OF SPECIAL INTEREST TO ACRS), AND FEB. 15 (TECHNICAL
SPECIFICATIONS AND BASES). AT A LATER DATE, FORMAL SUBMITTALS WOULD BE PRESENTED ON THE
BASIS OF INFORMAL SUBMITTALS.

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

*RESPONSE TIME + INDIAN POINT 1 (PWR) + OPERATING LICENSE PROCESS + REACTOR, PWR

17-26930 ALSO IN CATEGORY 9

MODIFICATION OF ROD DRIVE CONTROL CIRCUITS
UNIVERSITY OF MISSOURI

2 PAGES, 1 FIGURE, LETTER TO E M HOWARD, DRL, TAKEN FROM A LETTER TO E. M. HOWARD, DRL FROM D. RAY. MAY
27, 1968. DOCKET 50-123.

PROPOSED MODIFICATION PLACES AUXILIARY CONTACTS OF THE WITHDRAW SWITCH IN THE ROD-DRIVE
CONTROL CIRCUITS SO THAT BOTH THE RELAY K9 MUST BE ENERGIZED AND EITHER GANG OR INDIVIDUAL
WITHDRAW SWITCH CLOSED FOR THE ROD TO WITHDRAW. WE AWAIT YOUR COMMENTS BEFORE MAKING THE
MODIFICATIONS.

AVAILABILITY - PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C.

*CONTROL ROD DRIVE + *INSTRUMENTATION, SWITCH + ACCIDENT, CONTROL ROD WITHDRAWAL + CONTROL SYSTEM +
FAILURE, DESIGN ERROR + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR, RESEARCH

17-27129

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27129 *CONTINUED*

VON DER HAROT P

DEVELOPMENT AND IN-PILE PERFORMANCE OF SOME BR2 IRRADIATION RIGS

CENTRE D ETUDE DE L ENERGIE NUCLEAIRE, MOL, BELGIUM

EUR-3626E +. 50 PAGES, 13 FIGURES, 6 TABLES, REFERENCES, AUGUST 1, 1967

SUMMARIZES THE DEVELOPMENT AND PERFORMANCE OF SEVERAL INSTRUMENTED AND UNINSTRUMENTED IRRADIATION DEVICES. NO DETAILED DESCRIPTION. EXPERIMENTS INCLUDE IRRADIATION TESTING OF UO2 RODS IN NAK AND DIRECTLY IN REACTOR COOLANT, AND TESTING OF GRAPHITE, GRAPHITE-B4C, AND STEEL.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*IN PILE EXPERIMENT + *IRRADIATION TESTING + BELGIUM + BR 2 (RR) + GRAPHITE + NAK + REACTOR, RESEARCH + STEEL + URANIUM DIOXIDE

17-27130

BLUMBERG R + HISE EC

MSRE DESIGN AND OPERATIONS REPORT - PART X - MAINTENANCE EQUIPMENT AND PROCEDURES

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

ORNL-TM-910 +. 80 PAGES, 25 FIGURES, JUNE, 1968

MAINTENANCE IS BASED ON REPLACEMENT OF ANY FAILED COMPONENT WITH AN INTERCHANGEABLE SPARE. LITTLE EFFORT MADE TO EFFECT IN-PLACE REPAIR. SYSTEM UTILIZES LONG-HANDLED TOOLS OPERATED THROUGH A MOVABLE SHIELD. FOR TRANSFERS AND SETUP TASKS, A CRANE IS OPERATED REMOTELY FROM A SHIELDED CONTROL ROOM. COMPONENTS TOOLS AND METHODS ARE DESCRIBED. DETAILED PROCEDURES ARE LISTED IN SECTION 3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*MAINTENANCE AND REPAIR + *MAINTENANCE, REMOTE + *REMOTE MANIPULATING AND VIEWING + MSRE (RE) + PROCEDURES AND MANUALS + REACTOR, MOLTEN SALT

17-27141

FOSTER, JS

EARLY OPERATIONS AT DOUGLAS POINT

ATOMIC ENERGY OF CANADA LTD.

3 PAGES, 5 FIGURES, NUCLEAR ENGINEERING, 13(145), PAGES 513-515 (JUNE, 1968)

DISCUSSES FAILURES RESULTING IN 9 MONTHS OF LOST TIME IN 1967. TWO MONTHS ATTRIBUTED TO HOLE IN CALANDRIA TUBE, CAUSED BY ROTATION AND VIBRATION OF BOOSTER CONTROL ROD BECAUSE A BOOSTER JOINT LOCKING TAB BROKE. LOCKING MECHANISM LATER MODIFIED. ***SEVEN MONTHS DOWNTIME REQUIRED FOR REPAIR AND MODIFICATION OF PRIMARY COOLANT PUMPS. PUMP DAMAGE CAUSED BY VARIETY OF REASONS, INCLUDING IMPROPER DESIGN OF LUBRICATING SYSTEM, LARGE CLEARANCE IN MOTOR BEARINGS, CLOSE CLEARANCES BETWEEN FLYWHEEL AND HOUSING, ETC. TO MINIMIZE HEAVY-WATER LOSS, BOILER ROOM WAS SEALED TO ELIMINATE VENTILATION SYSTEM EXHAUSTING LEAKAGE OUT THE STACK.

*FAILURE, SCRAM MECHANISM + *PUMP + *TUBING + CANADA + CANDU (HWR) + CONTROL ROD + DAMAGE + FAILURE, DESIGN ERROR + FAILURE, EQUIPMENT + HEAVY WATER + LUBRICATION + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR, HWR + SEAL + VENTILATION SYSTEM

17-27142

SCOTT RL

CURIUM DECONTAMINATION OF WATER COOLED REACTORS

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE

2 PAGES, 7 REFERENCES, NUCLEAR SAFETY, 9(4), PAGES 322-323 (JULY-AUGUST, 1968)

CURIUM CONTAMINATION OF PRIMARY COOLANT SYSTEMS OCCURRED IN 1967 AT ORNL HIGH FLUX ISOTOPE REACTOR AND BELGIUMS DR-2. SOME CURIUM PLATED OUT ON THE PIPING. LANTHANUM WAS ADDED TO THE SYSTEM, WHICH CHANGED THE STATE OF THE CURIUM SO THAT THE SUSPENDED MATERIAL WAS REMOVED BY DEMINERALIZERS AND THAT WHICH HAD PLATED OUT WAS RELEASED FROM THE PIPE WALLS AND SUBSEQUENTLY REMOVED BY DEMINERALIZERS.

*CURIUM + *DECONTAMINATION + *MAIN COOLING SYSTEM + BELGIUM + BR 2 (RR) + COOLANT CHEMISTRY + COOLANT PURIFICATION SYSTEM + HFIR (FTR) + ION EXCHANGE + LANTHANUM + PIPING + REACTOR, AEC OWNED + REACTOR, FLUX TRAP + REACTOR, RESEARCH

17-27143

ALSO IN CATEGORY 6

TAXELIUS TG

QUARTERLY TECHNICAL REPORT, SPERT PROJECT, JANUARY, FEBRUARY, MARCH 1967

PHILLIPS PETROLEUM COMPANY, ATOMIC ENERGY DIVISION, IDAHO FALLS

IDO-17260 +. 46 PAGES, 36 FIGURES, 5 TABLES, 18 REFERENCES, FEBRUARY, 1968

IN (SPERT-III OXIDE CORE KINETICS PROGRAM) TESTS DEMONSTRATED THAT AS REACTOR PERIOD BECOMES SHORTER, POWER LEVEL DECREASES MORE ABRUPTLY AFTER REACHING ITS PEAK BECAUSE OF INCREASED EFFECT OF DOPPLER COEFF. SPERT-IV CDC SUBASSEMBLY TEST PROGRAM - TRANSIENT TESTS WITH PERIODS DOWN TO 3 MILLISEC WERE PERFORMED ON FUEL RODS MODIFIED TO IMPROVE WATERTIGHT

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27143 *CONTINUED*

INTEGRITY. POSITIVE REACTIVITY FEEDBACK HAS BEEN OBSERVED FROM FAILURE OF WATERLOGGED FUEL, INCREASING CORE ENERGY RELEASE. FIVE RODS RUPTURED DURING TRANSIENTS. PBA - TESTS ON FUEL-ROD CONCEPT CONFIRM ABILITY TO MEET DESIGN REQUIREMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*REACTOR KINETICS + *REACTOR STABILITY + *TESTING + COMPARISON, THEORY AND EXPERIENCE + FAILURE, FUEL ELEMENT + FAILURE, FUEL ELEMENT WATERLOGGING + FUEL ELEMENT + INTEGRITY + MODIFICATION, SYSTEM OR EQUIPMENT + PBF (S-RR) + R AND D PROGRAM + REACTIVITY EFFECT, ANOMALOUS + REACTOR TRANSIENT + REACTOR, SAFETY RESEARCH + SPERT 3 (S-RR) + SPERT 4 (S-RR)

17-27145

GUPPY WH + MASCHKE GC
NUCLEAR PLANT TRAINING

COMMONWEALTH EDISON COMPANY, CHICAGO ILLINOIS + GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
4 PAGES, 3 TABLES, POWER ENGINEERING, 72(7), PAGES 38-41 (JULY, 1968)

DESCRIBES THE SIMULATOR BUILT BY GE LOCATED ADJACENT TO DRESDEN FOR TRAINING BWR OPERATOR TRAINEES. NINETY % OF THE SYSTEMS HAVE BEEN MODELED IN REAL TIME. THE 12-WEEK PROGRAM CONSISTS OF 112 HR OF CONTROL-ROOM DUTY, 145 VIDEO-TAPED LECTURES, 100 SYSTEMS STUDIES INSIDE DRESDEN, 86 HR OF STUDY, 13 QUIZZES, 16 FINAL EXAMS, 8 ORAL EXAMS. CENTER HAS 13 FULL-TIME GE OPERATIONS PERSONNEL WITH 4 TRAINEES PER INSTRUCTOR, WHICH PERMITS CONSIDERABLE MAN-TO-MAN DISCUSSION. PURPOSE IS TO PROVIDE OPERATOR WITH KNOWLEDGE TO PASS AEC LICENSE EXAM ON DRESDEN-2. OPERATORS FROM OTHER UTILITIES WILL ONLY HAVE TO LEARN DETAILS OF THEIR OWN PLANTS.

*COMPUTER, DIGITAL + *SIMULATION + *STAFFING, TRAINING, QUALIFICATION + DRESDEN 2 (BWR) + OPERATION + REACTOR, BWR

17-27286

ALSO IN CATEGORY 10

PHILLIPS JL

MINIMIZING THE HAZARDS ASSOCIATED WITH THE USE OF THE DOUNREAY FAST REACTOR AS AN IRRADIATION FACILITY
UKAEA, DOUNREAY WORKS

23 PAGES, 7 FIGURES, 3 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST NUCLEAR REACTORS, SEPTEMBER, 1967

REVIEWS EXPERIENCE WITH OPERATION AND EXPERIMENTS. POWER-COEFFICIENT MEASUREMENTS BRIEFLY CONSIDERED. COOLANT IMPURITIES DURING INITIAL OPERATION INTERFERED WITH CONTROL-ROD-DRIVE MECHANISM. A HEAT-EXCHANGER-TUBE LEAK, DUE TO DEFECTIVE MANUFACTURING, RESULTED IN ADDITIONAL TUBE CORROSION AND OXIDATION DEPOSITS. MORE-SENSITIVE METHODS ARE NEEDED TO DETECT VERY SMALL LEAK RATES. AN AIRLOCK IN FUEL SUPPLY TO ONE DIESEL, AND AN ELECTRICAL FAULT IN ALTERNATOR OF ANOTHER, RESULTED IN SCRAM. WHEN A DIESEL FAILED WITH AN OPEN CIRCUIT FUSE TO SETBACK RELAY, SCRAM OCCURRED. ALSO DISCUSSES FUEL BURNUP AND ELEMENT DESIGN, PLUS EXPERIENCE AND REVIEW TECHNIQUE FOR IRRADIATION EXPERIMENTS.

AVAILABILITY - J.L. PHILLIPS, DOUNREAY EXPERIMENTAL REACTOR ESTABLISHMENT

*OPERATING EXPERIENCE SUMMARY + COMPARISON, THEORY AND EXPERIENCE + CONTROL ROD DRIVE + COOLANT QUALITY + CORROSION + DOUNREAY (TR) + FAILURE, SEQUENTIAL + FAILURE, SIMULTANEOUS + FAILURE, TUBING + FUEL BURNUP + GENERATOR, ENGINE + HEAT EXCHANGER + IRRADIATION TESTING + LEAK RATE + OBSTRUCTION + POWER COEFFICIENT + REACTOR, TEST + SAFETY REVIEW + SCRAM, REAL

17-27287

LIQUID HYDROGEN SPILL DURING TRANSFER OPERATION

UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

3 PAGES, SERIOUS ACCIDENTS, USAEC, ISSUE NO. 286, FEBRUARY 8, 1968

WHEN A LIQUID-HYDROGEN-TRAILER BAYONET FITTING FAILED, VAPOR SPRAY ENVELOPED THE HAND SHUTOFF VALVE. EMERGENCY-TRAINED PERSONNEL WEARING PROTECTIVE CLOTHING CLOSED VALVE. CONCLUSIONS - (1) WORKING IN MIDST OF CRYOGENIC SPILL IS HIGHLY HAZARDOUS. (2) TANK SHOULD HAVE AN ACCESSIBLE AUXILIARY SHUTOFF VALVE. (3) RE-EXAMINE EMERGENCY PROCEDURES. ***NO SERIOUS CONSEQUENCES EXCEPT THAT EMERGENCY PERSONNEL SUFFERED MINOR FROST BITE OF FEET WHEN SHOES BECAME FROZEN TO WATER-WETTED REAR DECK OF TRAILER. ***LOOSE HOSE-FLANGE CONNECTION ALLOWED COLD FLUID TO LEAK THROUGH FLUOROCARBON-LUBRICATED BAYONET SEAL, SHRINKING BUNA-N O-RING SEAL, PERMITTING LIQUID HYDROGEN LEAKAGE TO ATMOSPHERE.

USAEC, DIVISION OF OPERATIONAL SAFETY, WASHINGTON, D.C. 20545

*ACCIDENT, NONNUCLEAR + *SAFETY PRINCIPLES AND PHILOSOPHY + CRYOGENICS + EMERGENCY PROCEDURE + FAILURE, EQUIPMENT + FAILURE, SEQUENTIAL + HYDROGEN + INDUSTRIAL SAFETY + SEAL

17-27288

ALSO IN CATEGORY 13

FIRE AND EXPLOSION SENSITIVITY OF METAL - HALOGENATED SOLVENT SYSTEMS

UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

5 PAGES, 1 TABLE, 9 REFERENCES, HEALTH AND SAFETY INFORMATION, USAEC, ISSUE NO. 263, MAY 6, 1968

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27288 *CONTINUED*

FIRE HAZARDS OF METALS, PARTICULARLY IN FINELY DIVIDED FORM, ARE STRONGLY INFLUENCED BY WIDE NUMBER OF VARIABLES. HALOGENATED-SOLVENT REACTIVITY CONSIDERABLY MODIFIED BY TEMPERATURE, MOISTURE, CONTAMINANTS, ACIDITY, STABILIZERS, ETC. GIVES RESULTS OF 60 IMPACT TESTS ON TEN DIFFERENT KINDS OF METALLIC POWDERS OR GRANULES (AL, MG, TI, BA, LI, BE, B) AND SIX SOLVENTS (FREONS, CCL₄, TRI- AND PERCHLOROETHYLENE, TRICHLOROETHANE). REFERENCES TO OTHER HAZARDOUS SYSTEMS INCLUDED.

USAEC, DIVISION OF OPERATIONAL SAFETY, WASHINGTON, D.C. 20545

*FABRICATION + *FUEL CONVERSION + *FUEL ELEMENT + *SAFETY PRINCIPLES AND PHILOSOPHY + CHEMICAL REACTION + DECONTAMINATION + EXPLOSION + FIRE + HALOGEN + INDUSTRIAL SAFETY + METAL + TEST, BENCH

17-27289

GRAHAM WW + WALKER DM

SAFETY ANALYSIS REPORT FOR THE 5 MW GEORGIA TECH RESEARCH REACTOR

GEORGIA INSTITUTE OF TECHNOLOGY

GT-NE-7 +. 194 PAGES, 45 FIGURES, TABLES, REFERENCES, DECEMBER, 1967

REPORT SUPPORTS REQUEST FOR LICENSE CHANGE TO PERMIT POWER UPGRATING FROM 1 MW TO 5 MWT. REACTOR IS CP-5 TYPE, HEAVY-WATER MODERATED AND COOLED. FUEL IS CURVED AL-U ALLOY PLATES, CONTROL RODS ARE FLAT HOLLOW BLADES OF CD CLAD WITH AL. THERE ARE 41 VERTICAL EXPERIMENT FACILITIES, 10 HORIZONTAL BEAM PORTS, 7 ADDITIONAL HORIZONTAL EXPERIMENT TUBES, A THERMAL COLUMN, AND A BIOMEDICAL IRRADIATION FACILITY. THE MCA IS A LOSS OF COOLANT WITH COMPLETE CORE MELTDOWN, RESULTING IN A THYROID DOSE OF 300 REMS IN 2 HR 164 FT FROM CONTAINMENT VESSEL, AND 25 REMS EXTERNAL DOSE IN 2 HR AT 70 FT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*REPORT, SAR + ACCIDENT, LOSS OF COOLANT + ACCIDENT, MAXIMUM CREDIBLE (MCA) + DOSE + FUEL MELTDOWN + OFF SITE + POWER UPGRATING + REACTOR DESCRIPTION + REACTOR, HWR + REACTOR, RESEARCH

17-27294

STEAM GENERATOR BOTTOM HEAD COOLING UNIT MODIFICATION

PHILADELPHIA ELECTRIC COMPANY

24 PAGES, 2 FIGURES, TABLE, PEACH BOTTOM MONTHLY OPERATIONS REPORT NO. 27, MAY, 1968, DOCKET NO. 50-171, TYPE--HTGR, MFG--G.A., AE--BECHTEL

(PGS 20-24) DURING INITIAL RISE TO POWER IN EARLY 1967, STEAM GENERATOR GAS-EXIT AND BOTTOM-HEAD TEMPERATURES WERE HIGHER THAN EXPECTED. INTERNAL BAFFLING AND AN EXTERNAL COOLING SYSTEM WERE ADDED, BUT HIGH TEMPERATURES AT FULL POWER CONTINUED. SHIPPING LUGS WERE REMOVED (THOUGHT TO BE CONDUCTING HEAT FROM SHROUD TO SHELL). IN MAY 1968, THE LIMITING STEAM-GENERATOR TEMPERATURE WAS REACHED AT 78% POWER. THE RADIATION BAFFLE WAS REMOVED AND THE INSULATION-SKIRT RETAINER WAS LOWERED 10 IN., PERMITTING INCOMING COOLANT TO CONTACT THE VESSEL IN THE AREA OF THE HOT SPOT. TEMP. LIMIT NOW AT 94% OF POWER. FULL POWER CAN NOW BE ACHIEVED BY INCREASING HELIUM FLOW AND REDUCING HELIUM AND STEAM TEMPERATURES.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C.

*AUXILIARY COOLING SYSTEM + *FLOW DISTRIBUTION + *MODIFICATION, SYSTEM OR EQUIPMENT + *STEAM GENERATOR + COOLING, GENERAL + FAILURE, DESIGN ERROR + HEAT TRANSFER + HIGH TEMPERATURE + PEACH BOTTOM 1 (HTGR) + REACTOR, HTGR + REPORT, OPERATIONS + TECHNICAL SPECIFICATIONS + TEMPERATURE GRADIENT

17-27331

ALSO IN CATEGORIES 16 AND 15

TURNER DB

WORKBOOK OF ATMOSPHERIC DISPERSION ESTIMATES

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO

PHS-999-AP-26 +. 84 PAGES, FIGURES, TABLES, 1967

THIS WORKBOOK PRESENTS METHODS OF PRACTICAL APPLICATION OF THE BINOMIAL CONTINUOUS PLUME DISPERSION MODEL TO ESTIMATE CONCENTRATIONS OF AIR POLLUTANTS. ESTIMATES OF DISPERSION ARE THOSE OF PASQUILL AS RESTATED BY GIFFORD. EMPHASIS IS ON THE ESTIMATION OF CONCENTRATIONS FROM CONTINUOUS SOURCES FOR SAMPLING TIMES OF 10 MIN. SOME OF THE TOPICS DISCUSSED ARE DETERMINATION OF EFFECTIVE HEIGHT OF EMISSION, EXTENSION OF CONCENTRATION ESTIMATES TO LONGER SAMPLING INTERVALS, INVERSION BREAK-UP FUMIGATION CONCENTRATIONS, AND CONCENTRATIONS FROM AREA, LINE, AND MULTIPLE SOURCES. TWENTY-SIX EXAMPLE PROBLEMS AND THEIR SOLUTIONS ARE GIVEN. SOME GRAPHICAL AIDS TO COMPUTATION ARE INCLUDED.

AVAILABILITY - D.B. TURNER, AIR RESOURCES FIELD RESEARCH OFFICE, ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION, U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO

*HEALTH PHYSICS TRAINING + *METEOROLOGY + *STAFFING, TRAINING, QUALIFICATION + ATMOSPHERIC POLLUTION + METEOROLOGICAL SUPPORT + REACTOR, POWER + REACTOR, RESEARCH

17-27334

AEC DEVELOPS BASIC TEXT AND COURSE FOR INDUSTRIAL RADIOGRAPHERS

UNITED STATES ATOMIC ENERGY COMMISSION

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27334 *CONTINUED*
2 PAGES, AEC PRESS RELEASE L-169, JULY 25, 1968

THE AEC AND OFFICE OF EDUCATION HAVE PUBLISHED A 3-VOLUME TEXT FOR TRAINING INDUSTRIAL RADIOGRAPHERS. (OE 84036) INDUSTRIAL RADIOGRAPHY MANUAL, \$1.25, (OE 84035) INDUSTRIAL RADIOGRAPHY STUDENT GUIDE AND LABORATORY EXERCISES, \$0.55. (OE 84034) INDUSTRIAL RADIOGRAPHY INSTRUCTOR GUIDE, \$0.40. ***TEXT IS DESIGNED FOR AN 80-HR BASIC COURSE FOR HIGH SCHOOL GRADUATES AND WAS WRITTEN BY H.D. RICHARDSON OF LOUISIANA STATE U.

USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*RADIOGRAPHY + *STAFFING, TRAINING, QUALIFICATION

17-27338
SELECTED YANKEE OPERATING EXPERIENCE
YANKEE ATOMIC ELECTRIC COMPANY
6 PAGES, FIGURES, TABLES, LETTER FROM W. P. JOHNSON TO DRL, YANKEE OPERATION REPORT 90, JUNE 1968, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

LOAD VARIED BETWEEN 175.6 AND 181 MWE AS RIVER TEMPERATURE VARIED FROM 55 TO 45 F. MONTHLY ROD EXERCISE SHOWED RODS 17, 21, AND 22 HAVE DIFFICULTY IN OUTWARD MOVEMENT. FIRST AIR CHARGE SHOWED A CONTAINMENT LEAK RATE OF 0.047%/DAY, BUT SECOND CHARGE SHOWS 0.024%/DAY. REACTIVITY DEPLETION OF 0.8% DK/K PER 1000 MWD/MTU AND 0.152 PPM BORON PER MWD/MTU CONTINUES. PH AVERAGES 5.3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*REPORT, OPERATIONS + CHEMICAL SHIM + CONTAINMENT, HIGH PRESSURE + CONTROL ROD + FUEL BURNUP + LEAK RATE + OBSTRUCTION + REACTOR, PWR + YANKEE (PWR)

17-27340
PROPOSED HUMBOLDT BAY FULL TERM LICENSE
PACIFIC GAS AND ELECTRIC COMPANY
OPERATING LICENSE DPR-7 +. 95 PAGES, FIGURES, TABLES, 12 REFERENCES, JULY 22, 1968, DOCKET NO. 50-133, TYPE--BWR, MFG--G.E., AE--BECHTEL

BASIS FOR DRL SAFETY EVALUATION WAS (1) CONTAINMENT LEAK RATE TESTING REQUIREMENTS, (2) REACTIVITY TRANSIENT EFFECTS, (3) PROTECTION AGAINST TSUNAMIS, (4) EMERGENCY CORE COOLING, (5) ELECTRIC POWER RELIABILITY, (6) PRIMARY SYSTEM INSPECTION AND SURVEILLANCE, (7) MANAGEMENT AND ORGANIZATION PERFORMANCE, (8) OPERATING HISTORY. ***LEAK RATE TESTING EVERY TWO YEARS APPROVED. ROD DRIVE THIMBLE SUPPORT INSTALLED. NO SYSTEM OF ORGANIZATION DEGRADATION, BUT TECH SPECS REVISED TO ASSURE LONG TERM ASSURANCE OF TECHNICAL COMPETENCE. FAILED SS FUEL WAS REPLACED WITH ZIRC-CLAD FUEL. FLOW ANOMALIES HAVE NOT RECURRED AFTER REPLACING ADMIRALTY METAL FEEDWATER HEATERS WITH SS TUBES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*SAFETY EVALUATION + *TECHNICAL SPECIFICATIONS + ACRS + FAILURE, FUEL ELEMENT + OPERATING LICENSE PROCESS + REACTOR, BWR + STAFFING, TRAINING, QUALIFICATION + SURFACE FILM DEPOSIT

17-27341
PROPOSED TECHNICAL SPECIFICATIONS
JERSEY CENTRAL POWER AND LIGHT COMPANY
57 PAGES, FIGURES, TABLES, AMENDMENT 17, TECHNICAL SPECIFICATIONS FOR OYSTER CREEK POWER PLANT UNIT NO. 1, SEPTEMBER 18, 1967, DOCKET NO. 50-219, TYPE--BWR, MFG--G.E., AE--BURNS + ROE

NEW STYLE. LIMITS POWER ACCORDING TO COOLANT FLOW AND FEEDWATER TEMP. PROVIDES STACK GASEOUS RELEASE RATE LIMITS OF 0.6 (AVERAGE ANNUAL), 2 (NOT TO EXCEED 48 HR IN ANY 7 CONSECUTIVE DAYS, AND 8 CURIES/SEC (NOT TO EXCEED 15 MIN IN ANY HOUR). SURVEILLANCE STANDARDS DIVIDED INTO 2 GROUPS - CONTINUOUSLY OPERATING EQUIPMENT AND ENGINEERED SAFETY FEATURES (PERIODIC PERFORMANCE TESTS).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

OYSTER CREEK 1 (BWR) + REACTOR, BWR + TECHNICAL SPECIFICATIONS

17-27343 ALSO IN CATEGORY 9
REPORT ON SLOW RELEASE TIME OF SHIM ARM NO. 4
NATIONAL BUREAU OF STANDARDS
5 PAGES, LETTER TO P.A. MORRIS, DRL FROM R.S. CARTER, JULY 19, 1968, DOCKET NO. 50-184

ON JULY 11, THIS CLUTCH WAS FOUND SLIPPING DURING SPECIAL ROD DROP TESTS AND HAD A 230 MSEC RELEASE TIME INSTEAD OF 150-160. THE CLUTCH PLATE HUB HAD BEEN ASSEMBLED WITH MINIMAL CLEARANCE FROM ITS SUPPORT BRACKET. NEAR FULL OUT, THE COMPRESSED SCRAM SPRING REDUCED THIS CLEARANCE.

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27343 *CONTINUED*

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FAILURE, SCRAM MECHANISM + CONTROL ROD DRIVE + NBS + OPERATING EXPERIENCE + REACTOR, RESEARCH + RESPONSE TIME

17-27344 ALSO IN CATEGORY 9

SELECTED SAN ONOFRE OPERATING EXPERIENCE
SOUTHERN CALIFORNIA EDISON

13 PAGES, SEMI-ANNUAL OPERATING REPORT NO. 2, JULY 22, 1968, DOCKET NO. 50-206, TYPE--PWR, MFG--WEST.,
AE--BECHTEL

FIVE SHUTDOWNS WERE MADE (LEAKING PRIMARY COOLANT, TWO ELECTRICAL CABLE FAILURES, CONTROL ROD CYCLE MALFUNCTION, CONTROL ROD F-10 FOUND BOTTOMED BY REVERSED POLARITY OF THE MOVABLE GRIPPER COIL). RADWASTE RELEASE LINE CHECK VALVE FAILED, SPILLING WATER. ***TESTS SHOWED FLOW STRATIFICATION IN REACTOR COOLANT COLD LEG GIVES A HIGH DELTA T OF 5.3 F (FULL POWER). PH REACTIVITY EFFECT IS ABOUT 0.35 PERCENT/PH UNIT AT PH 6.4. POWER COEFF. VS ROD POSITION DATA TAKEN. BORON DILUTION HAS BEEN 2.1 PPM/FULL POWER DAY, VS 2.9 PREDICTED. 65 SPECIFIC DESIGN CHANGES LISTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FAILURE, EQUIPMENT + *FLOW DISTRIBUTION + *PH REACTIVITY EFFECT + *POWER COEFFICIENT + ACCIDENT, CONTROL ROD WITHDRAWAL + FAILURE, SCRAM MECHANISM + FUEL BURNUP + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, TEMPERATURE + REACTOR, PWR + REPORT, OPERATIONS SUMMARY + SAN ONOFRE (PWR) + VALVE + WASTE DISPOSAL, LIQUID

17-27345

PROPOSED TECH SPEC CHANGE 17- CHLORIDE CONCENTRATION

FIRST ATOMIC TRANSPORT, INC., HOBOKEN, NEW JERSEY

7 PAGES, 2 FIGURES, LETTER TO P.A. MORRIS, DRL FROM R.O. MEHANN, APRIL 10, 1968, DOCKET NO. 50-238,
TYPE--PWR, MFG--B+W, AE--G.G. SHARP

TO REQUIRE SULFITE TREATMENT AND BLOWDOWN WHEN CHLORIDES EXCEED 1 PPM, BUT ALLOW 48 HR TO RETURN BELOW 1 PPM. SHUTDOWN MANDATORY IF LEVEL EXCEEDS 100 PPM OR IF LEVEL EXCEEDS 5 PPM AND SOURCE NOT SHUT OFF IN 2 HR. ***CURRENT MANDATORY SHUTDOWN IMPOSES A 10 HR DELAY BEFORE TREATMENT CAN BEGIN, WHICH WOULD BE ADEQUATE TO REDUCE A 368 PPM LEVEL TO 5. THE EXCESS SULFITE PRECLUDES THE OXYGEN NECESSARY TO DAMAGE THE STEAM GENERATOR TUBES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ADDITIVE + *LEAK + *MAIN COOLING SYSTEM + CHLORIDE + COOLANT CHEMISTRY + EMERGENCY PROCEDURE + NS SAVANNAH (PWR) + REACTOR, PWR + STEAM GENERATOR + STRESS CORROSION + TECHNICAL SPECIFICATIONS + TURBINE

17-27346

DAIRYLAND TAKES OVER LACROSSE BWR

UNITED STATES ATOMIC ENERGY COMMISSION

PROVISIONAL OPERATING AUTHORIZATION OPRA-6 +. 49 PAGES, 2 FIGURES, 1 TABLE, JULY 12, 1968, DOCKET NO. 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

TRANSFERS AUTHORIZATION FROM ALLIS CHALMERS TO DAIRYLAND POWER CORP., PROVIDING A-C FILES A REPORT ON THE 28 DAY POWER RUN. OLD STYLE TECHNICAL SPECIFICATIONS CONTINUED WITH A FEW CLARIFICATIONS AND MINOR CHANGES. ACRS REVIEW NOTED NECESSITY FOR MAINTAINING CONTINUITY AND COMPETENCE IN THE SMALL STAFF.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*SAFETY EVALUATION + *TECHNICAL SPECIFICATIONS + LACROSSE (BWR) + OPERATING LICENSE PROCESS + REACTOR, BWR + STAFFING, TRAINING, QUALIFICATION

17-27347

SELECTED LACROSSE OPERATING EXPERIENCE

ALLIS-CHALMERS MFG. CO., BETHESDA, MARYLAND

ACNP-68507 +. 61 PAGES, FIGURES, TABLES, ELEVENTH MONTHLY OPERATIONAL REPORT ON THE LACROSSE BOILING WATER REACTOR COVERING THE MONTH OF MAY 1968, DOCKET NO. 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

SHIELDING SURVEY, IN-CORE FLUX MEASUREMENTS, AND NOISE ANALYSIS COMPLETED AT 25% POWER. ON MAY 30, TWO STEAM INLET AND ONE OUTLET VALVES OF SHUTDOWN CONDENSER FAILED TO OPEN DURING THEIR TEST. ***REACTOR WATER LEVEL INDICATORS IN THE CONTROL ROOM SHOWS VOIDED LEVEL (AT 38 MWTH) IS 28 IN. HIGHER THAN UNVOIDED LEVEL (6 IN. DUE TO VOIDS AND 22 DUE TO STANDPIPE TEMP. BEING COOLER THAN REACTOR WATER). RESPONSE TO TURBINE TRIP, STEAM VALVE CLOSURE, RECIRCULATION FLOW CHANGES, INCLUDING RECIRC. PUMP TRIP, WERE GOOD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27347 *CONTINUED*
\$3.00 COPY, \$0.65 MICROFICHE

*FAILURE, EQUIPMENT + *TEST, PLANT RESPONSE + INSTRUMENTATION, ABNORMAL INDICATION + INSTRUMENTATION, IN CORE + INSTRUMENTATION, LIQUID LEVEL DETECTION + LACROSSE (BWR) + NOISE ANALYSIS + REACTOR STARTUP EXPERIENCE + REACTOR, BWR + REPORT, OPERATIONS + SHIELDING + SHUTDOWN COOLING SYSTEM + VALVE

17-27433
PROPOSED OYSTER CREEK TECHNICAL SPECIFICATION
JERSEY CENTRAL POWER AND LIGHT COMPANY
78 PAGES, FIGURES, TABLES, AMENDMENT 23 TO APPLICATION FOR REACTOR CONSTRUCTION PERMIT AND OPERATING LICENSE, OCTOBER 30, 1967, DOCKET NO. 50-219, TYPE--BWR, MFG--G.E., AE--BURNS + ROE

PREPARED ACCORDING TO NEW FORMAT. MAJOR SECTIONS ARE - (2) SAFETY LIMITS AND SETPOINTS, 8 PG. (3) LIMITING CONDITIONS FOR OPERATION, 36 PG. (4) SURVEILLANCE REQUIREMENTS, 21 PG. (5) DESIGN FEATURES, 3 PG. (6) ADMINISTRATIVE CONTROLS, 7 PG.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*TECHNICAL SPECIFICATIONS + OYSTER CREEK 1 (BWR) + REACTOR, BWR

17-27434
HUMBOLDT BAY PROPOSED FINAL OPERATING LICENSE AND TECHNICAL SPECIFICATIONS
PACIFIC GAS AND ELECTRIC COMPANY
56 PAGES, FIGURES, TABLES, ADDENDUM A (REVISED LICENSE) TO AMENDMENT 27, AND ADDENDUM G (TECHNICAL SPECIFICATIONS) TO PROPOSED CHANGE 22, JUNE 5, 1968, DOCKET NO. 50-133, TYPE--BWR, MFG--G.E., AE--BECHTEL

CHANGES HAVE BEEN AGREED WITH DRL EXCEPT WE BELIEVE THAT OFF-SITE POWER EXPERIENCE HAS BEEN HIGHLY RELIABLE. OUR VIEW IS THAT SHUTTING DOWN THE REACTOR ON LOSS OF OFF-SITE POWER WOULD EXPOSE THE PLANT TO POTENTIAL PROBLEMS WHICH CAN OCCUR DURING A SHUTDOWN, WITH SLIGHT ADDITIONAL SAFETY BENEFIT OF OFF-SITE POWER BACKING UP HIGHLY REDUNDANT ON-SITE EMERGENCY POWER.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H. ST., WASHINGTON, D. C., (\$0.25 CENTS/PG.)

*TECHNICAL SPECIFICATIONS + HUMBOLDT BAY (BWR) + OPERATING LICENSE PROCESS + REACTOR, BWR

17-27435 ALSO IN CATEGORY 1
SAFETY GUIDELINES FOR HIGH ENERGY ACCELERATOR FACILITIES
UNITED STATES ATOMIC ENERGY COMMISSION
TID-23992 +. 33 PAGES, 1967

FOR ORGANIZATION AND REVIEW OF SAFETY PROGRAMS IN ACCELERATOR LABORATORIES. TO BE CONSIDERED BY MANAGEMENT IN DEVELOPING POLICIES AND STANDARDS. SECTIONS INCLUDE (I) MANAGEMENT SAFETY GUIDELINES, 2 PG. (II) BUILDING AND FACILITY GUIDELINES, 4 PG. (III) EXPERIMENTAL EQUIPMENT, 9 PG. (IV) OPERATING PROCEDURES, 17 PG. ***IN MOST CASES, ADVICE IS RENDERED IN SHORT, SEPARATE ITEMS. (E.G., DESIGN AND TEST PRESSURES FOR ... SHOULD BE SPECIFIED. PRESSURE GAGES ... IN PLACES WHERE SYSTEMS MAY BE ISOLATED BY VALVES).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*ACCELERATOR + *SAFETY REVIEW + ADMINISTRATIVE CONTROL + DESIGN CRITERIA + OPERATING EXPERIENCE SUMMARY + RADIATION SAFETY AND CONTROL + SAFETY PRINCIPLES AND PHILOSOPHY

17-27474 ALSO IN CATEGORIES 10 AND 11
SAFETY EVALUATION FOR PROPOSED 115 MWTH PEACH BOTTOM OPERATION
PHILADELPHIA ELECTRIC COMPANY
19 PAGES, NOVEMBER 14, 1966, DOCKET 50-171, TYPE--HTGR, MFG--G.A., AE--BECHTEL

EXCESS REACTIVITY (0.20 INSTEAD OF 0.15 DUE TO CARBON DENSITY AND THORIUM ABSORPTION CROSS SECTION OVERESTIMATE) WAS ADJUSTED WITH LUMPED BURNABLE POISON TO GIVE AN 0.06 SHUTDOWN MARGIN. LIMITS ON REACTIVITY AND FLUX ANOMALIES WILL BE SET. AFTER 1965 CABLE FIRE (WELDING SLAG INITIATION, CHIMNEY EFFECT), CO2 SYSTEM EXTENDED TO CABLE AREAS, REROUTED TO INCREASE INDEPENDENCE, SMOKE DETECTORS INSTALLED, AND FIREPROOF COVERS AND FIRE STOPS INSTALLED. HELIUM LEAKAGE IS 10-20 TIMES DESIRED 0.2 LB/DAY. CONTROL ROD DRIVE BALLS ARE NOW 100 PERCENT TESTED AFTER FAILURES FROM INTERNAL DEFECTS. A LARGER CONTAINMENT VACUUM RELIEF IS PROVIDED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*OPERATING EXPERIENCE SUMMARY + *SAFETY EVALUATION + CONTAINMENT PENETRATION, ELECTRICAL + CONTAINMENT VACUUM BREAKER + CROSS SECTION + ELECTRICAL CONDUCTION + EXAMINATION + FAILURE, SCRAM MECHANISM + FIRE + INDEPENDENCE + PEACH BOTTOM 1 (HTGR) + POWER UPGRATING + REACTIVITY EFFECT, ANOMALOUS + REACTOR, HTGR + SHUTDOWN MARGIN + THORIUM

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27478
HUMBOLDT BAY LATEST TECHNICAL SPECIFICATION
PACIFIC GAS AND ELECTRIC COMPANY
66 PAGES, FIGURES, TABLES, JUNE 7, 1968, DOCKET 50-133, TYPE--BWR MFG--G.E., AE--BECHTEL

AS-REVISED COPY OF JUNE 7, 1968. NO INDICATION OF REVISIONS MADE OR REASONS FOR REVISED COPY.
STILL IN OLD FORMAT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*TECHNICAL SPECIFICATIONS + HUMBOLDT BAY (BWR) + REACTOR, BWR

17-27494 ALSO IN CATEGORIES 5 AND 9
WYLIE RD
TENSILE AND IMPACT PROPERTIES OF ELK RIVER REACTOR CONTROL ROD MATERIAL. FINAL REPORT
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
SWRI-1228-55 +. 21 PAGES, FIGURES, 5 REFERENCES, FEB. 19, 1965

THE BORON STAINLESS STEEL SPECIMENS WHICH WERE REMOVED FROM THE ELK RIVER REACTOR DURING THE SHUT DOWN IN EARLY NOVEMBER 1964 WERE TESTED AT SOUTHWEST RESEARCH INSTITUTE. BOTH SUBSIZE TENSILE AND IMPACT SPECIMENS WERE INCLUDED IN THE SURVEILLANCE PROGRAM. AN ESTIMATE OF THE FLUX LEVEL WAS MADE BY ALLIS CHALMERS AS 1.3 X 10¹² (20TH) NVT THERMAL AS OF AUGUST 31, 1964. THIS CORRESPONDS TO APPROXIMATELY 0.22 ATOM PERCENT BURN-UP. THE DUCTILITY OF THE SPECIMENS WAS MEASURED AS 1-2% ELONGATION WHICH WAS BELOW THE 3.4% REQUIRED BY THE TECHNICAL SPECIFICATIONS. A LITERATURE REVIEW INDICATED THAT THE MEASURED DUCTILITY WAS IN THE RANGE OF THE OTHER TEST DATA AVAILABLE ON BORON STAINLESS STEELS WITH APPROXIMATELY 2% B.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151

*CONTROL ROD + *IMPACT PROPERTY + *TENSILE PROPERTY + ELK RIVER (BWR) + EXPERIMENT, GENERAL + MATERIAL + REACTOR, BWR + SURVEILLANCE PROGRAM

17-27504 ALSO IN CATEGORY 11
SELECTED LACROSSE OPERATING EXPERIENCE
ALLIS-CHALMERS, BETHESDA, MARYLAND
ACNP-68508 +. 11 PAGES, FIGURES, TABLES, JUNE 1968, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

REACTOR NOT OPERATED WHILE CONTAINMENT LEAK RATE DETERMINED TO BE 0.6% PER 24 HR AT 52 PSIG. 95% OF THIS WAS LEAKAGE THROUGH INTERNAL VENT HEADER 4 IN. VALVE AND THROUGH SHUTDOWN CONDENSER 1 IN VENT VALVE. THEY WILL BE REPAIRED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*CONTAINMENT, HIGH PRESSURE + *TEST, LEAK RATE + CONTAINMENT PENETRATION, PIPE + CONTAINMENT REFERENCE MEASURING SYSTEM + LACROSSE (BWR) + REACTOR, BWR + REPORT, OPERATIONS

17-27576 ALSO IN CATEGORY 5
HBWR QUARTERLY PROGRESS REPORT, JULY TO SEPTEMBER 1966
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-69 +. 102 PAGES, 34 FIGURES, 12 TABLES, 16 REFERENCES, NOVEMBER 1966

THIS QUARTERLY PROGRESS REPORT IS THE TWENTY-SECOND FROM THE OECD HALDEN REACTOR PROJECT TO RECEIVE GENERAL DISTRIBUTION, AND COVERS ACTIVITIES WITHIN THE THREE YEAR JOINT PROGRAM COMMENCED ON 1 JANUARY 1964. THE PROGRAM COMPRISES FUEL IRRADIATION AND DEVELOPMENT OF IN-CORE INSTRUMENTATION. OTHER PROGRAM ITEMS ARE BURNUP AND STABILITY STUDIES AND WATER-CHEMISTRY EXPERIMENTS. THE REPORT DOES NOT INTEND TO GIVE A SUMMARY OF ALL ACTIVITIES WITHIN THE OECD HALDEN REACTOR PROJECT BUT RATHER CONCENTRATE ON ITEMS OF GENERAL INTEREST ABOUT THE DEVELOPMENTS AT THE HALDEN BOILING WATER REACTOR.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*ACCIDENT ANALYSIS + *HEAT TRANSFER + *REACTOR TEST FACILITY + CHEMICAL REACTION + FISSION PRODUCT RELEASE, GENERAL + FUEL BURNUP + OECD

17-27584 ALSO IN CATEGORY 9
KINZER JE + PARK TA + CHANDLER EM
OPERATING EXPERIENCE WITH A MINIATURIZED NEUTRON FLUX SENSOR
ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA
1 PAGE, 2 FIGURES, 1 REFERENCE, ANS TRANSACTION 11(1), PAGE 336, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE ADIT NEUTRON FLUX SENSOR, WAS DESIGNED TO MEET THE CONTINUING NEED FOR VERY SMALL DYNAMIC SENSORS. THE BASIC APPROACH MEASUREMENT OF FISSION-PRODUCED TEMPERATURE, HAS BEEN MODIFIED

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27584 *CONTINUED*

TO INCREASE OUTPUT SIGNAL AND DECREASE PHYSICAL SIZE WHILE MAINTAINING SIMPLICITY. PROTOTYPE MODELS HAVE BEEN 0.083 IN. IN DIAMETER. SINCE THE TYPE OF FISSIONABLE MATERIAL USED MAY BE CHOSEN TO MATCH THE NEUTRON FLUX ENVIRONMENT OF INTEREST, THIS TYPE OF FLUX SENSOR IS APPLICABLE TO BOTH FAST AND THERMAL FLUX MEASUREMENTS. ADDITIONALLY, THE RELIABILITY AND RELATIVELY LONG LIFE OF THERMOCOUPLES AND THE FACT THAT THE ONLY INSTRUMENTATION REQUIRED IS THE STANDARD THERMOCOUPLE RECORDER, MAKE THE ADIT FLUX SENSORS ATTRACTIVE FOR IN-CORE DATA ACQUISITION.

*INSTRUMENTATION, IN CORE + *INSTRUMENTATION, NUCLEAR + FLUX, INTEGRATED + OPERATING EXPERIENCE

17-27585 ALSO IN CATEGORY 9

KINZER JE + BABBE EL
OPERATING EXPERIENCE WITH A MINIATURIZED PRESSURE SENSOR
ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA
1 PAGE, 3 FIGURES, 2 REFERENCES, ANS TRANSACTIONS 11(1), PAGE 337, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13 1968

THE ADIT (ADVANCED DEVELOPMENT IRRADIATION TECHNIQUES) PRESSURE SENSOR OPERATES MUCH LIKE A DIAPHRAGM ACTUATED PRESSURE SWITCH. TWO SYMMETRICAL BELLOWS JOINED BY A COUPLING DISK FORM A FORCE BALANCE SYSTEM PLUS A DOUBLE SEAL AGAINST FISSION GAS. AN ON-OFF ELECTRICAL CONTACT, MADE BY A PLATINUM-TIPPED THERMOCOUPLE, INDICATES WHEN THE BALANCING GAS IS IN EQUILIBRIUM WITH THE PRESSURE BEING MEASURED. THIS THERMOCOUPLE MAKES THE DEVICE A COMBINATION PRESSURE-TEMPERATURE SENSOR AND CAN BE USED TO CORRECT FOR TEMPERATURE CHARACTERISTICS OF THE BELLOWS SYSTEM.

*INSTRUMENTATION, PRESSURE + CHALK RIVER + INSTRUMENTATION, TEMPERATURE + OPERATING EXPERIENCE + TEST, INSTRUMENT RESPONSE

17-27595 ALSO IN CATEGORIES 9 AND 5

HARRIGAN PM + MATTEL J + TOTH WL
OPTICAL, LIGHTING, AND PHOTOGRAPHIC EQUIPMENT FOR THE ENRICO FERMI ATOMIC POWER PLANT REPAIR PROGRAM
POWER REACTOR DEVELOPMENT COMPANY + ATOMIC POWER DEVELOPMENT ASSOCIATES
1 PAGE, 1 FIGURE, ANS TRANSACTIONS 11(1), PAGE 358, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

A MELTDOWN OF TWO CORE SUBASSEMBLIES REQUIRED THE USE OF VERY LONG OPTICAL INSTRUMENTS AND LIGHTING EQUIPMENT FOR THE PURPOSE OF INSPECTION OF THE CORE AND REACTOR COMPONENTS. BECAUSE LITTLE INFORMATION WAS AVAILABLE ON THE DESIGN OF SUITABLE VIEWING AND LIGHTING EQUIPMENT FOR USE IN SODIUM REACTOR ENVIRONMENTS, MUCH DEVELOPMENTAL WORK AND TESTING HAD TO BE DONE TO PROVIDE SUITABLE EQUIPMENT. MUCH DEVELOPMENT WAS REQUIRED TO PROVIDE LIGHTING EQUIPMENT WITH ADEQUATE LAMP LIFE AND MANEUVERABILITY. THE USE OF PHOTOGRAPHY THROUGH THE VIEWING INSTRUMENTS WAS NOT SUCCESSFUL INITIALLY, BUT IMPROVEMENTS BOTH IN TECHNIQUE AND EQUIPMENT LED TO REMARKABLY GOOD RESULTS IN THE LATTER PART OF THE PROGRAM.

*INSTRUMENTATION, IN CORE + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT DESIGN + FERMI (LMFBR) + INSTRUMENTATION; SURVEILLANCE + MAINTENANCE AND REPAIR + MAINTENANCE, REMOTE + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR

17-27596 ALSO IN CATEGORIES 9 AND 5

DUFFY JG + MATTE J + RYAN JD + WARBERG HS
OBJECT RETRIEVAL TOOLS FOR THE ENRICO FERMI ATOMIC POWER PLANT REPAIR PROGRAM
ATOMIC POWER DEVELOPMENT ASSOCIATES, INC., DETROIT, MICHIGAN
3 PAGES, 2 FIGURES, ANS TRANSACTIONS 11(1), PAGES 358-360, 1968 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY AND CANADIAN NUCLEAR ASSOCIATION, TORONTO, CANADA, JUNE 10-13, 1968

THE METHOD OF RETRIEVING FROM THE BOTTOM OF THE FERMI REACTOR AN OBJECT THAT CAUSED A MELTDOWN INVOLVED PROCEDURES AND TOOLS WHICH ARE UNIQUE AND COULD HAVE APPLICATION IN FUTURE PROBLEMS. TOOLS WERE DEVELOPED TO CUT THE OBJECT INTO PIECES SMALL ENOUGH TO BE REMOVED UPWARD THROUGH THE SUPPORT PLATE. SEVERAL GRIPPERS FOR THIS PURPOSE WERE ALSO DEVELOPED. SIMULTANEOUSLY, SPECIAL TOOLS WERE DEVELOPED TO REMOVE THE OBJECT INTACT VIA THE SODIUM INLET PIPE.

*INSTRUMENTATION, IN CORE + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT DESIGN + FERMI (LMFBR) + MAINTENANCE AND REPAIR + MAINTENANCE, REMOTE + REACTOR, BREEDER + REACTOR, FAST + REACTOR, LMCR

17-27615 ALSO IN CATEGORIES 18 AND 2

ACRS REPORT ON ZION 1 AND 2
U.S. ATOMIC ENERGY COMMISSION
8 PAGES, LETTER TO G.T. SEABORG (AEC PRESS RELEASE L-178), AUGUST 24, 1969, DOCKETS 50-295/304, TYPE--PWR, MFG--WEST., AE--SGT + LUNDY

ZION IS LARGEST REACTOR TO DATE IN A RELATIVELY HIGH POPULATION DENSITY. REACTOR CAVITY FLOODING FOLLOWING A LONGITUDINAL SPLIT IN THE REACTOR VESSEL MAY BE INSTALLED FOLLOWING STUDY OF VESSEL FAILURE PROBABILITY FROM THERMAL SHOCK FOLLOWING CORE FLOODING ACTION. CONTROL AND SAFETY SIGNALS SHOULD BE INDEPENDENT. CONTAINMENT SPRAY SHOULD HAVE A FULL TEST. *** IN 3 PAGES OF REMARKS BY OKRENT, HE DISCUSSES VESSEL SPLIT PROBLEM. RECOMMENDS (FOR HIGH POPULATION DENSITIES) ADDITIONAL DESIGN CONSERVATISM AND QUALITY ASSURANCE, WELL DEFINED R AND D FOR SAFETY ISSUES NOT RESOLVED AT CONSTRUCTION PERMIT STAGE, EXTRA MARGIN IN ENGINEERED

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27615 *CONTINUED*

SAFETY FEATURES IN LIEU OF A DEMONSTRATION UNDER ACCIDENT CONDITIONS, AND MORE STUDY TO REDUCE PROBABILITY OF SMALL ACCIDENTAL RELEASES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, PRESSURE VESSEL + ACRS + CONTAINMENT SPRAY + CORE REFLOODING SYSTEM + REACTOR, PWR + REPORT, PSAR + REVIEW + SAFETY MARGIN + TEST, PREOPERATIONAL + TEST, PROOF + THERMAL MECHANICAL EFFECT + ZION 1 AND 2 (PWR)

17-27616 ALSO IN CATEGORIES 6 AND 9

SELECTED SHIPPINGPORT OPERATING EXPERIENCE

BETTIS ATOMIC POWER LABORATORY

WAPD-MRP-122 +. 14 PAGES, PAGES 6, 20-41 AND 43 OF PRESSURIZED WATER REACTOR (PWR) PROJECT. TECHNICAL PROGRESS REPORT, JULY 22, OCTOBER 20, 1967

(PAGE 6) NH₄OH ADDITION AND DEGASIFICATION RATES INCREASE DRASTICALLY WITH COOLANT PH ABOVE 10.3. (PAGE 20-41) POWER LIMITS FOR VARIOUS CONTROL ROD PROGRAMS PAST 10,000 EFPH WERE CALCULATED. FOR VARIOUS LOAD SWINGS, XENON BURNOUT RATES AND AXIAL PEAK/AV NEUTRON FLUXES WERE MEASURED AND COMPARED WITH TURBO-ZIP CALCULATIONS. ON THE RETURN TO 100 MWE ON AUGUST 21, XENON OSCILLATION SET IN, GIVING +-9 IN. CONTROL ROD MOTION. OPERATIONAL DETECTORS LOCATED AT CORE MIDHEIGHT WERE IN PHASE WITH ROD BANK MOTION, WHILE TEST CHAMBERS ABOVE THE CORE WERE OUT OF PHASE. OPERATING LIMITS FOR PEAK SINGLE CHANNEL NUCLEAR INSTRUMENT READINGS WERE CALCULATED, AS WAS A CONTROL ROD PROGRAM. (PAGE 43) COMPUTER PROGRAM MO 795 WAS PLACED INTO PRODUCTION. MO 795 PERFORMS ALL FUEL ELEMENT PERFORMANCE LIMITS CALCULATIONS FOR CORE 2, INCLUDING MAXIMUM PERMISSIBLE SINGLE CHANNEL, NUCLEAR INSTRUMENT READINGS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONTROL ROD PROGRAM + *FUEL ELEMENT + *INSTRUMENTATION, ABNORMAL INDICATION + *PERFORMANCE LIMIT + *XENON OSCILLATION + COMPUTER PROGRAM + COOLANT CHEMISTRY + POWER DISTRIBUTION + REACTOR, PWR + REPORT, OPERATIONS ANALYSIS + SHIPPINGPORT (PWR)

17-27617

SHIPPINGPORT SEED 2 CORROSION IN PROOF TEST. TECHNICAL PROGRESS REPORT OCT. 21, TO JAN. 26, 68

BETTIS ATOMIC POWER LABORATORY

WAPD-MRP-123 +. 3 PAGES, 1 FIGURE, PAGES 12, 45-46 IN TECHNICAL PROGRESS REPORT FOR THE PERIOD OCTOBER 21, 1967 TO JANUARY 26, 1968. PRESSURIZED WATER REACTOR (PWR) PROJECT

FIBER OPTIC INSPECTION OF THE CLAD OF SEED 2 ASSEMBLIES FOUND RAISED AREAS OF EXCESSIVE GRAY AND WHITE CORROSION PRODUCT. TESTS SHOWED THIS WAS A SUPERFICIAL LOCAL CARBON CONTAMINATION (RESIDUE OF MASKING TAPE ADHESIVE ON COPPER SPACERS USED DURING SUBASSEMBLY WELDING) WHICH PROTECTED THOSE AREAS OF CLAD FROM THE PICKLING SOLUTION. EXTENDED CORROSION TEST IN STEAM AND IN WATER INDICATED NORMAL BEHAVIOR AFTER INITIAL EXPOSURE. THE AREAS ARE RAISED 0.0038 IN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CORROSION + *FAILURE, FABRICATION ERROR + *FUEL ELEMENT + *SURFACE FILM DEPOSIT + CLADDING + EXAMINATION + FABRICATION + REACTOR, PWR + REPORT, OPERATIONS ANALYSIS + SHIPPINGPORT (PWR) + ZIRCALOY

17-27618 ALSO IN CATEGORY 6

SHIPPINGPORT REACTOR PHYSICS

BETTIS ATOMIC POWER LABORATORY

WAPD-MRP-123 +. 16 PAGES, FIGURES, PAGES 21-36 OF TECHNICAL PROGRESS REPORT FOR THE PERIOD OCTOBER 21, 1967 TO JANUARY 26, 1968, PRESSURIZED WATER REACTOR (PWR) PROJECT

FOLLOWING THE 4TH 100% POWER DEMONSTRATION ON NOVEMBER 19, XENON BURNOUT AT PEAK XENON AT 72% POWER WAS ESTIMATED AT 0.0000026 DK/SEC BASED ON A TEST AT 63%. FLUX WIRES AT 100% POWER SHOWED THE AXIAL FLUX UNDER ESTIMATED IN THE LOWER AND OVER ESTIMATED IN THE UPPER PORTION OF THE CORE (TURBO-ZIP CODE). INCLUSION OF AN AXIALLY VARIABLE MODERATOR TEMP. GAVE BETTER FLUX SHAPES, BETTER ROD POSITION PREDICTIONS AND RESULTANT BETTER POWER SHAPES AND FUEL DISTRIBUTIONS. THE FUEL DISTRIBUTION WITH AND W/O THIS CORRECTION DIVERGES WITH BURNUP, BEING 4% DIFFERENT AT 7700 EFPH.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*COMPARISON, THEORY AND EXPERIENCE + *COMPUTER PROGRAM + *FUEL BURNUP + *POWER DISTRIBUTION + FLUX DISTRIBUTION + REACTOR, PWR + SHIPPINGPORT (PWR) + XENON

17-27619

ALSO IN CATEGORIES 14 AND 15

WATER POLLUTION CONTROL--TECHNICAL TRAINING PROGRAM--BULLETIN OF COURSES

U.S. DEPARTMENT OF THE INTERIOR

66 PAGES, FROM CLEAN WATER, BULLETIN OF COURSES, JULY 1968 TO JUNE 1969

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27619 *CONTINUED*

DESCRIBES 27 SHORT COURSES (1-2 WEEKS, GIVEN AT VARIOUS REGIONAL CENTERS IN 1968-69) IN THE GENERAL AREAS OF CHEMISTRY (4), MICROBIOLOGY (7), AND ENGINEERING AND WASTE TREATMENT (13). NONE SEEM SLANTED AT RADIATION OR AT POWER STATIONS, BUT SOME OF THE INTRODUCTORY BIOLOGY AND ECOLOGY COURSES SEEM GENERALLY APPLICABLE.

*ECOLOGICAL CONSIDERATION + *STAFFING, TRAINING, QUALIFICATION + *WASTE DISPOSAL, LIQUID + THERMAL POLLUTION

17-27621 ALSO IN CATEGORY 9

LACROSSE OPERATIONS OCT 1967

ALLIS-CHALMERS, BETHESDA, MARYLAND

ACNP-67534 +. 20 PAGES, FIGURES, TABLES, OCTOBER 1967, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

NO REACTOR OPERATION BECAUSE TESTS AND MODIFICATIONS WERE COMPLETED FOR POWER OPERATION. A ROD FAILED TO WITHDRAW AFTER A SCRAM DUE TO A PIECE OF A PHENOLIC BACKUP RING PLUGGING THE HYDRAULIC OIL DISCHARGE ORIFICE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, SCRAM MECHANISM + LACROSSE (BWR) + REACTOR, BWR + REPORT, OPERATIONS

17-27622

LACROSSE DIFFICULTY WITH PUMPS AND VALVES

ALLIS-CHALMERS, BETHESDA, MARYLAND

ACNP-68500 +. 20 PAGES, FIGURES, TABLES, DECEMBER 1967, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

FORCED CIRCULATION PUMP ROTOVOLVES FAILED TO CLOSE SEVERAL TIMES (COOLING THE LOOP FROM 577 F TO 450 F IN SEVERAL MINUTES) BECAUSE LEATHER CUPS ON THE HYDRAULIC ACTUATOR PISTONS WERE HARDENED AND SPLIT. VARIOUS DIFFICULTIES (AIR BINDINGS, PRESSURE CONTROLLER SENSITIVITY, SEAL WATER TEMP. TOO LOW) AFFECTED THE SEAL WATER INJECTION TO THE MAIN PUMP SEALS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *PUMP + *VALVE + LACROSSE (BWR) + MAIN COOLING SYSTEM + REACTOR, BWR + REPORT, OPERATIONS

17-27709 ALSO IN CATEGORIES 5 AND 12

SAXTON-LOSS OF COOLANT ACCIDENT PREVENTION AND PROTECTION

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

150 PAGES, FIGURES, TABLES, JUNE, 1968, DOCKET 50-146, TYPE--PWR, MFG--WEST., AE--GILBERT ASSOC.

RESPONDS TO DEC. 1966, DRL REQUEST FOR REANALYSIS WITH MODERN TECHNIQUES. SYSTEMS WILL LIMIT CLAD MELT TO LESS THAN 3 PER CENT OF CLAD AREA FOR A DOUBLE ENDED COOLANT LINE RUPTURE. NO EVIDENCE OF REACTOR VESSEL OR STEAM GENERATOR LEAKS. SAFETY VALVE LEAKS HAVE BEEN SHOWN BY BORIC ACID CRYSTALS. ***PAST VISUAL AND RADIOGRAPH INSPECTIONS HAVE BEEN GOOD, BUT A SPECIFIC INSPECTION PROGRAM WILL BE REPEATED EVERY 5 YEARS. MODIFICATIONS TO BE MADE INCLUDE BETTER ISOLATION BETWEEN BUILDING COMPARTMENTS, RECIRC. PUMP PRESSURE INDICATORS, RELAY REDUNDANCE IN SAFETY INJECTION SYSTEMS, AND TO PREVENT A SINGLE FAILURE FROM CLOSING INJECTION ISOLATION VALVE. APPENDIX D DESCRIBES COMPUTER PROGRAMS USED (FLASH, CHICK-KIN, LOCTA-R2).

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*ACCIDENT ANALYSIS + *ACCIDENT, LOSS OF COOLANT + CORE REFLOODING SYSTEM + EXAMINATION + LEAK + MODIFICATION, SYSTEM OR EQUIPMENT + PIPING + PLANT PROTECTIVE SYSTEM + PRESSURE RELIEF + PRESSURE VESSEL + REACTOR, PWR + SAXTON (PWR) + SURVEILLANCE PROGRAM + TEST, NONDESTRUCTIVE

17-27827 ALSO IN CATEGORIES 1 AND 11

MANUAL OF LECTURE NOTES - REACTOR SAFETY COURSE NO. 7

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY, WARRINGTON, LANCASHIRE

200 PAGES, FIGURES, TABLES, REFERENCES, SEPTEMBER 23, 1968

NINE SECTIONS. (I) INTRODUCTION, 5 LECTURES. (II) FISSION PRODUCT RELEASE, 5 LECTURES. (III) CONTAINMENT ENGINEERING, 7 LECTURES. (IV) CONTROL AND INSTRUMENTATION, 7 LECTURES. (V) GAS COOLED REACTORS, 11 LECTURES. (VI) WATER REACTORS, 12 LECTURES. (VII) GENERAL, 5 LECTURES. (VIII) FAST REACTORS, 7 LECTURES. (IX) SITING AND EMERGENCY PROCEDURES, 4 LECTURES. NEW LECTURES APPEAR TO BE (7) ASSESSMENT OF ENVIRONMENTAL HAZARDS FROM FISSION PRODUCT RELEASES. (8A) FISSION PRODUCT BEHAVIOR IN LIQUID COOLED REACTORS. (10A) CONTAINMENT OF FISSION PRODUCTS WITHIN FUEL ELEMENTS. (24A) METHODS AND PROBLEMS IN REACTOR ASSESSMENTS. (40) PROBABILITY TECHNIQUES APPLIED TO WATER REACTORS.

AVAILABILITY - AUTHORITY HEALTH AND SAFETY BRANCH, U.K.A.E.A., 11 CHARLES II STREET, LONDON, S. W.1.

*SAFETY ANALYSIS + *SAFETY REVIEW + FISSION PRODUCT RETENTION + FUEL ELEMENT + PARTITION COEFFICIENT + PROBABILITY + REACTOR, GCR + REACTOR, HTGR + REACTOR, LMFBR + REACTOR, WATER + SAFETY PRINCIPLES AND PHILOSOPHY + UNITED KINGDOM

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27838

YANKEE OPERATION REPORT 91 - JULY 1968

YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASS.

YA-2662 +. 6 PAGES, AUGUST 20, 1968, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

WORK ON THE INCORE FLUX WIRE SYSTEM REQUIRED MORE ENTRY INTO CONTAINMENT. TRITIATED AIR WAS REDUCED FROM .71 TO 0.08 CURIES/CC BY DISPERSING STEAM INTO THE VAPOR CONTAINER. REACTOR SHUTDOWN ONE DAY TO REPLACE A MAIN PC PUMP SEAL. ONSTARTUP A SEVERE WATER HAMMER CAME FROM PARTIAL FLOODING OF A HEATER SHELL (BY DRAWING HOT WATER FROM NO. 1 HEATER THRU A COMMON DRAIN LINE). VAPOR CONTAINER LEAKAGE WAS 0.030%/DAY. FUEL BURNUP WAS 0.152 PPM BORON PER MWD/MTU.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FUEL BURNUP + *THERMAL MECHANICAL EFFECT + AIRBORNE RELEASE + CONTAINMENT, HIGH PRESSURE + INSTRUMENTATION, IN CORE + MAINTENANCE AND REPAIR + REACTOR, PWR + REPORT, OPERATIONS + TEST, LEAK RATE + TRITIUM + YANKEE (PWR)

17-27839

SAFE WITHDRAWS LICENSE APPLICATION TO REFUEL N.S. SAVANNAH

U.S. ATOMIC ENERGY COMMISSION

2 PAGES, NOTICE OF WITHDRAWAL OF FACILITY LICENSE APPLICATION, JULY 26, 1968, DOCKETS 50-314/238, TYPE--PWR, MFG--B+W, AE--G.G. SHARP

DOCKET 50-314 IS CLOSED BY A JUNE 1968 REQUEST BY SAFE, INC., AND FAST, INC., REQUESTING RENEWAL OF FAST OPERATING LICENSE TO JUNE 30, 1971 AND AUTHORITY TO REFUEL THE SHIP.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C., 20545 (\$0.25 CENTS/COPY)

*FUEL HANDLING + *OPERATING LICENSE PROCESS + NS SAVANNAH (PWR) + REACTOR, MARITIME + REACTOR, PWR

17-27840

ALSO IN CATEGORIES 1 AND 18

EVSR TECHNICAL SPECIFICATION - SECTION IX - G OPERATIONAL PRINCIPLES AND REQUIREMENTS

GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

PAGE 37 OF AMENDMENT 11 (TECHNICAL SPECIFICATION) TO THE EVSR LICENSE APPLICATION JUNE 7, 1963, DOCKET 50-183

IF IT IS DISCOVERED THAT A SYSTEM IS INOPERABLE OR DOES NOT MEET ITS SPECIFIED CONDITIONS OF OPERATION WHILE IN AN OPERATING MODE WHERE THE SYSTEM IS REQUIRED BY THESE TECHNICAL SPECIFICATIONS TO BE OPERABLE OR TO MEET PARTICULAR CONDITIONS OF OPERATION, IMMEDIATE STEPS WILL BE TAKEN TO CORRECT THE CONDITION PROMPTLY OR TO PLACE THE REACTOR IN A MODE FOR WHICH OPERABILITY OF THE PARTICULAR SYSTEM IS NOT REQUIRED. SUCH PERIODS OF OPERATION AS FALL UNDER THE REQUIREMENTS OF THIS PARAGRAPH WILL NOT BE CONSIDERED A VIOLATION OF THESE TECHNICAL SPECIFICATIONS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *TECHNICAL SPECIFICATIONS + EMERGENCY PROCEDURE + INCIDENT, EQUIPMENT + REACTOR, INTERNAL SUPERHEAT + REACTOR, POWER + REACTOR, RESEARCH + SAFETY PRINCIPLES AND PHILOSOPHY, + EVSR (ISR)

17-27842

ALSO IN CATEGORIES 6 AND 9

LEAD PLATE SHIFT TO CORE ADDS 0.168% REACTIVITY

PENNSYLVANIA STATE UNIVERSITY

3 PAGES, ATOMIC ENERGY CLEARINGHOUSE, 14(35), PAGES 12-14 (AUGUST 26, 1968)

(LETTER TO DRL, AUG. 9) ON JULY 24, THE REACTOR OPERATOR WAS OBSERVING XENON BEHAVIOR AND PLOTTING ROD POSITION VS TIME. HE NOTED A 37 UNIT REG ROD WITHDRAWAL IN A FEW SECONDS, A SLIGHT LOG INCREASE, AND A 10 C FUEL TEMP. DECREASE. REACTOR WAS SHUT DOWN. CAUSE WAS A THICK LEAD PLATE (MOUNTED BETWEEN CORE AND THERMAL COLUMN) WHICH HAD SWUNG TOWARD THE CORE AS NYLON ROPES SAGGED. LEAD ADDED 0.084% AND REFLECTED MORE NEUTRONS TOWARD THE SERVOCHAMBER, CAUSING A 40 KW POWER DECREASE, WITH THIS FUEL COOLING ADDING 0.084%.

*INSTRUMENTATION, ABNORMAL INDICATION + *OPERATOR ACTION + BEAM HOLE + CONTROLLER + INCIDENT, EQUIPMENT + INSTRUMENTATION, POWER RANGE + LEAD + POWER COEFFICIENT + REACTIVITY EFFECT + REACTIVITY EFFECT, ANOMALOUS + REACTOR POWER + REACTOR, RESEARCH + REFLECTOR + TRIGA (RR)

17-27843

INCREASED POOL LEAK RATE

UNIVERSITY OF VIRGINIA

1 PAGE, ATOMIC ENERGY CLEARINGHOUSE, 14(35), PAGE 15 (AUGUST 26, 1968)

(LETTER, AUG. 8) THE WATER LOSS RATE HAS BEEN 200-400 GAL/DAY BUT INCREASED IN JULY TO 600-800 GAL/DAY. THOUGH THERE IS NO EXTERNAL PHYSICAL EVIDENCE, SOME OF THE WATER ENDS UP IN

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27843 *CONTINUED*

THE POND AND IS RELEASED ONLY AFTER MONITORING. OPERATION TERMINATED AS OF AUG. 7 TO FIND AND REPAIR THE LEAK. *** (ADDED NOTE) - POOL LINER IS AN EPOXY RESIN, APPLIED IN 1960.

*LEAK + FAILURE, EQUIPMENT + FUEL STORAGE + REACTOR, POOL TYPE + REACTOR, RESEARCH + STEEL LINER

17-27844

HALLAM DECOMMISSIONING EXPERIENCE

CONSUMERS PUBLIC POWER DISTRICT

69 PAGES, FIGURES, TABLES, HNP MONTHLY RETIREMENT REPORT 21, APRIL 1968, DOCKET 115-3, TYPE--LMR, MFG--A.I., AE--BECHTEL

RESIDUAL SODIUM IN REACTOR VESSEL AND MAIN LOOP WAS REACTED WITH STEAM IN A NITROGEN ATMOSPHERE. INTERMEDIATE HEAT EXCHANGE 3A WAS SHIPPED TO IDAHO, AND THE OTHER STEAM GENERATORS AND PUMPS WERE PREPARED FOR SHIPMENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CHEMICAL REACTION + *SODIUM + DECOMMISSIONING + HALLAM (LMR) + HEAT EXCHANGER + MAIN COOLING SYSTEM + REACTOR, LMCR + REPORT, OPERATIONS

17-27845

ALSO IN CATEGORIES 9 AND 18

DRL QUESTIONS ON NINE MILE POINT CONTROL RODS

U.S. ATOMIC ENERGY COMMISSION

2 PAGES, LETTER TO M.H. PRATT FROM P.A. MORRIS, AUGUST 13, 1968, DOCKET 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

COMPLIANCE SAYS DESIGN MODIFICATIONS HAVE BEEN MADE TO CONTROL ROD DRIVE HYDRAULIC LINE PENETRATION IN CONTAINMENT. THIS SHOULD BE REPORTED WITH BASES AND SAFETY EVALUATION. ASKS FOR SPECIFIC INFORMATION ON WELD REPAIR BETWEEN STUB TUBES AND ROD DRIVE HOUSINGS, (1) BASES FOR CONTOURING SHOP WELDS, (2) FIELD WELDS DEPOSIT OF METAL ON SIDE OF TUBES, AND (3) PLANS FOR CLEANING AND HYDROTESTING VESSEL, PLUS DETAILED RECORDS OF DYE CHECKS PRIOR TO HYDROTEST.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CONTAINMENT PENETRATION, PIPE + *WELDING + CONTROL ROD DRIVE + INSPECTION AND COMPLIANCE + NINE MILE POINT (BWR) + PRESSURE VESSEL + REACTOR, BWR + TEST, NONDESTRUCTIVE

17-27846

TORREY PINES TRIGA I LICENSE EXTENDED TO MAY 2, 1968

U.S. ATOMIC ENERGY COMMISSION

2 PAGES, AMENDMENT 16 TO LICENSE R-38, JULY 29, 1968, DOCKET 50-89

UPON AN APPLICATION DATED MAR. 27, 1968, AND AMENDED JULY 18, 1968, THE OPERATING LICENSE IS AMENDED TO EXTEND ITS EXPIRATION DATE TO MAY 2, 1968

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*OPERATING LICENSE PROCESS + REACTOR, RESEARCH + TRIGA (RR)

17-27854

BINFORD FT + COLE TE + CRAMER EN

THE HIGH FLUX ISOTOPE REACTOR - A FUNCTIONAL DESCRIPTION

OAK RIDGE NATIONAL LABORATORY

ORNL-3572 (REV. 2) VOL. 1A AND 1B +. 401 PAGES, FIGURES, TABLES, REFERENCES, MAY 1968

VOL. 1A IS THE TEXT, AND 1B CONTAINS THE 163 ILLUSTRATIONS. THE REVISION (AS OF JANUARY 1968) IS TO BRING THE PREVIOUS DESCRIPTION UP TO DATE FOLLOWING OPERATION AND ESTABLISHING ACTUAL VALUES. NO OPERATING HISTORY GIVEN, NOR IS SYSTEM PERFORMANCE DISCUSSED. ***HFIR IS A 100 MWTH RESEARCH REACTOR WHOSE CENTRAL FLUX TRAP IS USED TO PRODUCE TRANSURANUM ISOTOPES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 COPY, \$0.65 MICROFICHE

*REACTOR DESCRIPTION + HFIR (FTR) + REACTOR, FLUX TRAP + REACTOR, RESEARCH + TRANSURANUM PROGRAM

17-27855

ALSO IN CATEGORIES 14 AND 15

TRAINING COURSES - NATIONAL CENTER FOR RADIOLOGICAL HEALTH

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PHS-PUB-1633 REV. +. 33 PAGES, JULY 1968

SIXTY-SIX 1 OR 2 WEEK PRESENTATIONS AT VARIOUS REGIONAL CENTERS IN FY 1969 WILL BE MADE OF ONE OR MORE OF THE 16 COURSES AVAILABLE. AMONG THOSE OF INTEREST ARE - BASIC RADIOLOGICAL HEALTH, RADIOLOGICAL HEALTH FOR NURSES, TWO FOR X-RAY PROTECTION, OCCUPATIONAL RADIATION PROTECTION, REACTOR SAFETY AND HAZARDS EVALUATION, MANAGEMENT OF RADIATION ACCIDENTS,

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27855 *CONTINUED*

OPERATIONAL ASPECTS OF RADIATION ACCIDENTS, OPERATIONAL ASPECTS OF RADIATION SURVEILLANCE, MEASUREMENT OF AIRBORNE RADIOACTIVITY, CHEMICAL AND GAMMA SPECTROSCOPY ANALYSIS OF RADIONUCLIDES, AND RADIUM HAZARDS AND CONTROL.

AVAILABILITY - U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, CENTER FOR RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND

*HEALTH PHYSICS TRAINING + *STAFFING, TRAINING, QUALIFICATION + RADIATION INJURY, TREATMENT OF + RADIOLOGICAL ASSISTANCE + RADIUM + REACTOR, POWER + REACTOR, RESEARCH + SURVEY, RADIATION, ENVIRONMENTAL + X-RAY

17-27856 ALSO IN CATEGORIES 15 AND 1
TRAINING MANUAL - MANAGEMENT OF RADIATION ACCIDENTS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
150 PAGES, FIGURES, TABLES, 39 REFERENCES, SEPTEMBER 12, 1966

A SET OF COURSE NOTES FOR 29 LECTURES IN THE GENERAL SUBJECT AREAS OF - I, RADIATION ACCIDENT CONTROL PLANNING AND RESPONSE (4). II, TYPES OF ACCIDENTS (5). III, RADIATION CONTAMINATION MONITORING (3). IV, EVALUATION AND CONTROL OF ACCIDENTAL EXPOSURE (7). V, NUCLEAR REACTOR HAZARDS (6). MEDICAL ASPECTS OF RADIATION ACCIDENTS (4). ***FOR USE IN A ONE WEEK COURSE PRESENTED BY NCRH.

AVAILABILITY - DIVISION OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND 20852

*STAFFING, TRAINING, QUALIFICATION + HEALTH PHYSICS TRAINING + RADIATION INJURY, TREATMENT OF + RADIATION SAFETY AND CONTROL + RADIOLOGICAL ASSISTANCE + SURVEY, RADIATION, EMERGENCY

17-27898
CITATION FOR RADIOGRAPHY NONCOMPLIANCE
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(34), PAGE 18, (AUGUST 19, 1968)

(COMPLIANCE LETTER, JUNE 6) A FEB. 68 INSPECTION REVEALED ITEMS OF NONCOMPLIANCE - (1) DIRECT SURVEILLANCE WAS NOT DONE TO PROTECT AGAINST UNAUTHORIZED ENTRY TO AN EXPOSED 25-CURIE IR-192 SOURCE AT JOHN HANCOCK BLDG., CHICAGO. (2) HIGH RADIATION AREA WAS NOT POSTED. (3) SAFETY PLUG WAS NOT INSERTED AFTER USAGE. (4) RECORDS OF SURVEYS WERE NOT MAINTAINED. (PTL REPLY, JULY 18) WE HOPE THESE ITEMS WILL NOT HAPPEN AGAIN. OUR RAD SAFETY COORDINATOR HAS SENT A LETTER TO ALL RADIOGRAPHERS.

*INSPECTION AND COMPLIANCE + *RADIOGRAPHY + FAILURE, OPERATOR ERROR

17-27902 ALSO IN CATEGORIES 18 AND 1
RAMEY JT
THE PQDS OF NUCLEAR POWER PLANT LICENSING
ATOMIC ENERGY COMMISSION
37 PAGES, 14 REFERENCES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

REVIEWS HISTORY OF REGULATORY PROCESS, THEN CONCENTRATES ON (1) DEVELOPMENT OF MANAGEMENT KNOW-HOW, BY UPGRADING UTILITY PERSONNEL AND HIRING NEW GRADUATES. (2) THE AEC LICENSING PROCESS, TOO LITTLE PREPARATION BY UTILITIES IN A RACE TO GET THEIR PAPERWORK IN FIRST. (3) PUBLIC UNDERSTANDING OF NUCLEAR POWER, DISQUIETING RESULTS OF A FEW UTILITIES WHO DID NOT DO THEIR HOMEWORK WELL, SHOULD EXPECT OUTAGES DURING INITIAL OPERATION. (4) ENGINEERING STANDARDS AND QUALITY ASSURANCE. AMONG PROBLEMS MENTIONED WERE OPTIMUM CONSTRUCTION SCHEDULING, BACK FIT. APPENDIX A IS AEC PROGRAM FOR TRAINING UTILITY STAFF AND MANAGEMENT.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE, NEW YORK, N.Y. 10022

*CONSTRUCTION PERMIT PROCESS + *REACTOR, POWER + *STAFFING, TRAINING, QUALIFICATION + QUALITY CONTROL + RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REGULATION, AEC

17-27903 ALSO IN CATEGORY 18
RAMEY JT
APPENDIX A, AEC PROGRAM FOR TRAINING UTILITY MANAGEMENT AND STAFF
ATOMIC ENERGY COMMISSION
2 PAGES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

IN VIEW OF CONTINUING RAPID GROWTH OF NUCLEAR POWER, AND UTILITIES NOT HAVING PRIOR NUCLEAR EXPERIENCE, AEC URGES UTILITIES DEVELOP TECHNICAL AND MANAGERIAL INHOUSE CAPABILITY. RESPONSIBILITY RESTS WITH INDUSTRY. OPERATOR TRAINING NOT A PROBLEM, EXCEPT FOR PROPER TYPE REACTOR TO GAIN EXPERIENCE ON. AEC ACTIONS INCLUDE (A) ESTABLISHMENT OF SUGGESTED STANDARDS OF TECHNICAL COMPETENCE, (B) DESCRIPTION OF A NUCLEAR TRAINING AND ORIENTATION PROGRAM, (C) STRENGTHENING FACILITIES FOR OPERATOR TRAINING, (D) REEMPHASIS OF EXISTING WORK EXPERIENCE TRAINING PROGRAM AT AEC SITES. (E) EXPANSION OF UNIVERSITY COURSES.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE., NEW YORK, N.Y. 10022

*STAFFING, TRAINING, QUALIFICATION + ADMINISTRATIVE CONTROL + REACTOR, BWR + REACTOR, POWER +

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27903 *CONTINUED*
REACTOR, PWR + SAFETY REVIEW

17-27904 ALSO IN CATEGORIES 18 AND 1
JOSLIN M
SOME OBSERVATIONS ON THE REGULATORY PROCESS
ATOMIC ENERGY COMMISSION
7 PAGES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

NEWS OF FAILURES ALERTS THE OTHER FELLOW TO PROFIT BY THE EXPERIENCE OF OTHERS. DISCUSSES EVOLUTION OF UTILITY-REGULATORY RELATIONS. AVOID DEPENDENCE ON SUPPLIER, UTILITY IS ALONE RESPONSIBLE TO AEC. DRESDEN 3 WAS GIVEN EXTENSIVE CORE COOLING SYSTEMS, WHICH COULD HAVE BEEN DONE AT LOWER COST IF THOUGHT OUT IN ADVANCE. URGES UTILITIES TO EDUCATE AEC ON SPECIAL FEATURES OF UTILITY ECONOMICS. NOTES NEED FOR UTILITIES OWN EXPERTS AND TOP MANAGEMENT INVOLVEMENT. CONSIDERS MOST SIGNIFICANT FOR UNBIASED COOPERATION.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE., NEW YORK, N.Y. 10022

*OPERATING EXPERIENCE SUMMARY + *REGULATION, AEC + CODES AND STANDARDS + CORE SPRAY + DRESDEN 3 (BWR) + ECONOMICS + INFORMATION RETRIEVAL + STAFFING, TRAINING, QUALIFICATION

17-27984
REED GA
STAFFING AND TRAINING FOR NUCLEAR POWER
WISCONSIN MICHIGAN POWER COMPANY
6 PAGES, POWER, 112(5), PAGES 88-91 (MAY 1968)

DESCRIBES POINT BEACH PROGRAM. PURCHASE OF UNIT 1 (454 MWE PWR) DEC. 1965 REQUIRED A 15 PERCENT INCREASE (64) IN EMPLOYEES, FEW HAD TOP LEVEL PLANT LEADERSHIP RIGHT AWAY, AND OPERATIONS CREW IN 1968. IN MAY 1966, A PROJECT OFFICE WAS STAFFED AND ORGANIZATION CHART DETERMINED, AND TOP LEVEL LEADERSHIP HIRED WITH NUCLEAR EXPERIENCE. IN SPRING 1967, UTILITY EMPLOYEES AND OUTSIDERS WERE SOLICITED (300 APPLICATIONS RECEIVED, DUE TO MASSIVE NAVY NUCLEAR PROGRAM), AND OPERATIONS CREW SELECTED AND TRAINING STARTED. (TRAINING DESCRIBED). ***STAFFING AND TRAINING IS A CUSTOM JOB, WHERE EACH POSITION AND EACH EMPLOYEE MUST BE EVALUATED. EMPLOYING EX-NAVY EXPERIENCED PERSONNEL HELPS. YOUNG GRADUATE ENGINEERS WERE HIRED WHO RESPOND TO CHALLENGE.

*OPERATING EXPERIENCE SUMMARY + *STAFFING, TRAINING, QUALIFICATION + POINT BEACH 1 AND 2 (PWR) + REACTOR, MILITARY + REACTOR, POWER + REACTOR, PWR

17-27985
EDUCATIONAL PROGRAMS AND FACILITIES IN NUCLEAR SCIENCE AND ENGINEERING
OAK RIDGE ASSOCIATED UNIVERSITIES + UNITED STATES ATOMIC ENERGY COMMISSION
101 PAGES, SEPTEMBER 1968

A LISTING OF 261 EDUCATIONAL INSTITUTIONS (GIVING ADDRESS, CONTACT PERSON, DEGREE GRANTED IN NUCLEAR FIELD, GRAD STUDENT APPOINTMENTS AVAILABLE, SPECIAL FACILITIES AND PROGRAMS) TAKING 73 PAGES, 13 PAGES OF A SUMMARY TABULATION OF THE SAME INFORMATION, AND 3 PAGES ON SPECIAL FELLOWSHIP PROGRAMS.

AVAILABILITY - OAK RIDGE ASSOCIATED UNIVERSITIES, OAK RIDGE, TENNESSEE

*STAFFING, TRAINING, QUALIFICATION

17-27986
UTILITY INDUSTRY PARTICIPATES IN AEC WORK EXPERIENCE PROGRAM
UNITED STATES ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE L-207 +. 2 PAGES, SEPTEMBER 4, 1968

IN 1958-68, 265 INDUSTRY REPRESENTATIVES FROM 180 ORGANIZATION HAVE SPENT AN AVERAGE OF 100 DAYS EACH IN THE PROGRAM. ABOUT HALF CAME FROM THE ELECTRICAL UTILITY INDUSTRY. AEC FACILITIES ARE AVAILABLE TO SUPPLEMENT INDUSTRIAL FACILITIES IN MEETING TRAINING REQUIREMENTS CAUSED BY RECENT SURGE IN NUMBER OF POWER REACTORS. PAST USES HAVE BEEN IN SUCH DIVERSE SUBJECTS AS RADIATION PROTECTION PROCEDURES, FUEL FABRICATION TECHNOLOGY, REACTOR OPERATIONS, EVALUATION OF UTILITY PLANT CONCEPTS, AND CHEMICAL REPROCESSING. ***CONTACT DIVISION OF INDUSTRIAL PARTICIPATION, USAEC, WASHINGTON, D.C., 20545.

*STAFFING, TRAINING, QUALIFICATION + FUEL REPROCESSING + HEALTH PHYSICS TRAINING + REACTOR, AEC OWNED + USAEC

17-27987 ALSO IN CATEGORY 1
WORK EXPERIENCE PROGRAM
UNITED STATES ATOMIC ENERGY COMMISSION
6 PAGES, CHAPTER 7604 FROM THE AEC MANUAL, FEBRUARY 20, 1964

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27987 *CONTINUED*

PROVIDES FOR SPECIALIZED WORK EXPERIENCE AT AEC OWNED FACILITIES BY NON-AEC PERSONNEL ENGAGED IN CIVILIAN APPLICATIONS OF ATOMIC ENERGY. OUTLINES AEC RESPONSIBILITIES (DIV. INDUSTRIAL PARTICIPATION, DIV. LABOR RELATIONS, FIELD OFFICES). ASSIGNMENTS INTENDED FOR THOSE ALREADY GENERALLY EDUCATED/TRAINED, NOT FOR BASIC INSTRUCTION OR EXPERIENCE, OR FOR THESIS WORK, OR FOR FACULTY OR FOREIGN NATIONALS, OR FOR TEMPORARY STAFF INCREASE OF CONTRACTORS. NO CHARGES. ***ANNEX A (AGREEMENT BETWEEN CONTRACTORS AND PARTICIPANTS). ALL EXPENSES PAID BY TRAINEES COMPANY, INCLUDING INDEMNIFICATION OF TRAINEES LIABILITY.

*STAFFING, TRAINING, QUALIFICATION + USAEC

17-27988 ALSO IN CATEGORY 10

WALSH EM

EDUCATION - WHO IS SNAGGING THE LINES

VIRGINIA POLYTECHNIC INSTITUTE

4 PAGES, ELECTRICAL WORLD, 170(7), PAGES 73-77 (AUGUST 12, 1968)

SUMMARIZES A SURVEY BY VPI ENERGY RESEARCH GROUP ON THE STATUS OF ELECTRICAL POWER IN 82 OF 130 U.S. UNIVERSITY CURRICULA IN THE EAST AND MIDWEST. TABLES SHOW LECTURE AND LAB HOURS GRAD AND UNDERGRAD, EQUIPMENT, FACULTY NUMBER, AND COMMUNICATION QUALITY WITH UTILITIES. ***69 REQUIRED A POWER COURSE FOR ALL EE MAJORS, 37 HAVE NO POWER COURSE TAUGHT AS AN ELECTIVE. ONLY 7 HAVE UNDERGRADUATE FELLOWSHIPS PROVIDED BY UTILITIES, ONLY 20 COOP WITH UTILITIES. 69 OFFER GRADUATE EE, BUT ONLY 27 GIVE GRADUATE COURSES IN POWER. 72 OF 163 EE THESES IN PROGRESS ARE IN POWER. ONLY 12 REPORTED GOOD COMMUNICATION WITH UTILITIES. OF 34 SAYING COMMUNICATION WAS NEGLIGIBLE, THE MAJORITY HAVE POWER ORIENTED TEACHER ON THEIR STAFFS.

*STAFFING, TRAINING, QUALIFICATION + ELECTRICAL CONDUCTION + REACTOR, POWER

17-27989 ALSO IN CATEGORIES 18 AND 1

NUCLEAR TRAINING PROGRAMS

BABCOCK AND WILCOX

TRG-68-68 +. 65 PAGES, 3 FIGURES, AUGUST 1968

DESCRIBES B AND W SERVICES AND FACILITIES AT THEIR LYNCHBURG, VA., TRAINING CENTER (CLASSROOMS, PWR SIMULATORS, POOL REACTOR). PROGRAMS AVAILABLE TO ALL UTILITY PERSONNEL INCLUDE, AT MANAGEMENT (2 DAY SEMINAR) AND STAFF LEVEL (48 LECTURE HOURS), PLANT OPERATION LEVEL (5 PHASES - THEORY 3 MO., PWR OBSERVATION 3 MO., PWR TECHNOLOGY 2 MO., PWR OPERATION AT POOL REACTOR AND SIMULATOR 3 MO., AND ON JOB TRAINING AT TECHNICAL STAFF PROGRAMS (I AND C FAMILIARIZATION, BAILEY 855 COMPUTER FAMILIARIZATION, WATER AND RADIOCHEMISTRY, MAINTENANCE, SIMULATOR SIMULATES 83 FAULTS. SUGGESTED PERSONNEL QUALIFICATIONS LISTED.

AVAILABILITY - BABCOCK AND WILCOX, NUCLEAR TRAINING CENTER, P.O. BOX 1260, LYNCHBURG, VA. 24505

*STAFFING, TRAINING, QUALIFICATION + REACTOR, PWR + SIMULATION

17-27990 ALSO IN CATEGORY 15

AEC SPECIAL FELLOWSHIPS IN HEALTH PHYSICS

OAK RIDGE ASSOCIATED UNIVERSITIES

45 PAGES, SEPTEMBER 1966

DESCRIBES WHO MAY APPLY AND TYPE OF PROGRAM, TENURE, CONDITIONS, FEES AND STIPENDS (6 PAGES). DESCRIBES COURSES AND REQUIREMENTS AT 14 APPROVED UNIVERSITIES (29 PAGES). DESCRIBES 8 AEC LOCATIONS WHERE 3 MONTHS APPLIED HEALTH PHYSICS TRAINING IS GIVEN (6 PAGES).

AVAILABILITY - OAK RIDGE ASSOCIATED UNIVERSITIES, OAK RIDGE, TENNESSEE

*HEALTH PHYSICS TRAINING + USAEC

17-27991 ALSO IN CATEGORY 1

AEC SPECIAL FELLOWSHIPS IN NUCLEAR SCIENCE AND ENGINEERING

OAK RIDGE ASSOCIATED UNIVERSITIES

36 PAGES, SEPTEMBER 1966

DESCRIBES WHO MAY APPLY AND TYPE OF PROGRAMS, TENURE, CONDITION, FEES AND STIPENDS (6 PAGES). OTHER PAGES LIST 66 PARTICIPATING SCHOOLS, GIVING FELLOWSHIP ADVISOR, DEGREES OFFERED, AND AREAS OF EMPHASIS.

AVAILABILITY - OAK RIDGE ASSOCIATED UNIVERSITIES, OAK RIDGE, TENNESSEE

*STAFFING, TRAINING, QUALIFICATION + USAEC

17-27992 ALSO IN CATEGORY 1

ENGINEERING MANPOWER NEEDS OF THE INVESTOR OWNED ELECTRIC UTILITY INDUSTRY

EDISON ELECTRIC INSTITUTE

EEI-PUB-68-27 +. 52 PAGES, FIGURES, TABLES, FEBRUARY 1968

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-27992 *CONTINUED*

REPORT OF COMMITTEE FORMED IN 1966. RECOMMENDS (1) UTILITIES REINSPECT NEEDS, AS INDUSTRY UNDERESTIMATES NEEDS. IN 5 YEARS 15-20 PERCENT OF ENGINEERS HIRED WILL BE MS. (2) UTILITIES SHOULD REPORT 10-20 SCHOOLS OF EXCELLENCE. (3,4) BETTER COMMUNICATION AND SUPPORT OF SCHOOLS. (5,6) UTILIZE TECHNICIAN EMPLOYEES BETTER, AND RECRUIT HIGH SCHOOL GRADUATES. ***APPENDICES PROVIDE MANPOWER SURVEY, UNIVERSITY DEGREE PRODUCTION, AND AN ANALYSIS OF ONE UTILITIES NEEDS. ***UTILITY ESTIMATES ARE FOR 1100 ENGINEERS/YEAR AND 75 MS/YEAR (10 NUCLEAR POWER). COMMITTEE ESTIMATES ARE 2500-5000/YEAR (7-14 PERCENT OF CURRENT GRADUATE ENGINEER RATE), AND 40/YEAR MS NUCLEAR ENGINEERING.

AVAILABILITY - EDISON ELECTRIC INSTITUTE, 750 THIRD AVE., NEW YORK, N.Y. 10017

*STAFFING, TRAINING, QUALIFICATION + REACTOR, POWER

17-27993

TECHNICIAN EDUCATION YEARBOOK
236 PAGES, 1967

LISTS 1024 INSTITUTIONS IN THE U.S. BY STATES, GIVING CONTACT PERSONS AND LISTING 2 YEAR CURRICULA (NOT COURSES) OFFERED. ALSO HAS A FEW 2 PAGE ARTICLES ABOUT DIFFERENT CURRICULA AND ABOUT EDUCATIONAL PROBLEMS. ***ELEVEN ARE LISTED AS HAVING A NUCLEONICS CURRICULA, TWELVE AS HAVING RADIATION TECHNOLOGY, AND TWENTY-ONE AS HAVING A COMBUSTION POWER TECHNOLOGY CURRICULA (USUALLY INTERNAL COMBUSTION). MOST SEEM TO HAVE ONE OR MORE ELECTRONICS AND MECHANICAL ENGINEERING OPTIONS.

*STAFFING, TRAINING, QUALIFICATION

17-27994

KOVNER EA
TRAINING NUCLEAR TECHNICIANS AT OLD DOMINION COLLEGE
4 PAGES, PAGES 129-132 OF TECHNICIANS EDUCATION YEARBOOK, 1967

SUMMARIZES STARTUP (1962), INITIAL ACCEPTANCE, CURRICULUM, AND EQUIPMENT FOR A 2 YEAR PROGRAM (NUCLEAR OPTION IN THE ELECTRONIC ENGINEERING TECHNOLOGY CURRICULUM). IN THE LAST 2 SEMESTERS, 6 COURSES (20 SEMESTER HOURS) TREAT NUCLEONICS, NUCLEAR INSTRUMENTATION, REACTOR TECHNOLOGY, AND POWER PLANTS.

*STAFFING, TRAINING, QUALIFICATION + OPERATING EXPERIENCE SUMMARY

17-27996

ALSO IN CATEGORIES 18 AND 1
SCHUMAN SD
DESCRIPTION WESTINGHOUSE REACTOR OPERATOR TRAINING PROGRAM
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
WCAP-7170 +. 45 PAGES, FEBRUARY 1968

INTENDED FOR CONTRACTED PWR STAFF TRAINING. INCLUDES SELECTION HELP (APTITUDE TEST FOR 24 PERSONNEL, ADMINISTERED 6 MONTHS BEFORE START OF TRAINING RESULTING IN SELECTION OF 6 SUPERVISORS, 6 SHIFT SUPERVISORS, AND 10 OPERATORS). PHASE I (11 WEEKS BASIC LECTURE WITH POOL REACTOR OPERATION AT WREC), PHASE II (24 WEEKS SAXTON PWR OPERATING EXPERIENCE AND LICENSE EXAM), PHASE III (6 WEEKS LECTURE SERIES AT WAPD), PHASE IV (ONE YEAR ON-SITE TRAINING FOR OPERATOR LEVEL MATERIAL). LESSON OUTLINES GIVEN FOR EACH LECTURE.

AVAILABILITY - S. D. SCHUMAN, WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER DIVISION, PENN CENTER SITE, P. O. BOX 355, PITTSBURGH, PA. 15230

*STAFFING, TRAINING, QUALIFICATION + REACTOR, POWER + REACTOR, PWR + SAXTON (PWR)

17-27997

ALSO IN CATEGORIES 18 AND 1
COMMENTS FROM BRIEFING CONFERENCE ON NUCLEAR POWER, SEPT. 3-6, 1968
YANKEE ATOMIC ELECTRIC CO.
15 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(37), PAGE 8-11 AND 19-29, (SEPTEMBER 9, 1968)

(ROGER COE) - INNUMERABLE ECONOMIC FORECASTS BUT LITTLE HINDSIGHT INFORMATION. DISCUSSED YANKEE, CONN. YANKEE, AND HUMBOLDT BAY ECONOMICS. (JAMES T. RAMEY) - NOT LIKELY TO SEPARATE REGULATORY FUNCTION FROM AEC FOR AT LEAST 5 YEARS. EVOLUTION EXPECTED. (JOHN B. ANDERSON) - DETAILED DISCUSSION OF LEGISLATIVE BILLS ON SITING, THERMAL EFFECTS, SMALL UTILITY PARTICIPATION, PRACTICAL VALUE. (H. L. PRICE) - SUGGESTED APPROVING A NUCLEAR STEAM SUPPLY SYSTEM OUTSIDE THE CONSTRUCTION PERMIT PROCESS. (P. A. MORRIS) - CONSTRUCTION PERMIT TAKE 12.4 MONTHS BECAUSE OF 12 TECHNICAL AND 4 GENERAL ITEMS NOT SPECIFICALLY TREATED IN PSAR. (R. LOWENSTEM) - LICENSING DELAYS COST APPLICANT ONE MILLION \$/MONTH. HE ADVISES APPLICANT TO PLAN ON 18 MONTHS FOR A CONSTRUCTION PERMIT, ONE YEAR FOR OPERATING LICENSE AFTER FILING FSAR (WHICH TAKES 6 MONTHS TO PREPARE).

AEC QUESTION + CONGRESSIONAL ACTIVITY + CONSTRUCTION PERMIT PROCESS + ECONOMICS + OPERATING LICENSE PROCESS + REACTOR, POWER + REACTOR, WATER + REGULATION, AEC + REPORT, PSAR + REPORT, SAR + RESPONSE TIME

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-28001
WAITE DA
PILOT PROGRAM FOR TRAINING RADIATION AND NUCLEAR TECHNICIANS
OKLAHOMA STATE UNIVERSITY, STILLWATER, OKLAHOMA
2 PAGES, TECHNICAL EDUCATION NEWS 27(3), PAGES 13 AND 14 (APRIL 1968)

SHORT DESCRIPTION OF OKLAHOMA STATE UNIVERSITY PROGRAM, FUNDED BY USPHS, TO PROVIDE A 2 YEAR ASSOCIATE DEGREE PROGRAM. PROVIDES 35 COLLEGE HOURS IN 2 YEARS (MOSTLY ON RADIOLOGICAL HEALTH), COMPARED WITH THE USUAL 24-28 HOUR MAJOR IN A 4 YEAR COURSE. GRADUATES ARE NOW WORKING. MOST EMPLOYERS GIVE THEM A CHANCE TO WORK TOWARD A BS OR MS WHILE ON THE JOB.

*STAFFING, TRAINING, QUALIFICATION + HEALTH PHYSICS TRAINING

17-28002 ALSO IN CATEGORY 6
NUCLEAR PHYSICS MADE VERY, VERY EASY
USAEC + NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NTO-T-0026 +. 81 PAGES, 27 FIGURES, 6 TABLES, JULY 1968

INTENDED TO INTRODUCE BASIC REACTOR PRINCIPLES TO VARIOUS GROUPS OF NONNUCLEAR NERVA TEST OPERATIONS PERSONNEL. SECTIONS ARE ATOMIC PHYSICS (19 PAGES), NUCLEAR PHYSICS (25 PAGES), AND REACTOR PHYSICS (33 PAGES). ***TREATMENT IS QUITE BASIC AND READABLE. COVERS USUAL GROUNDS. NOT RESTRICTED TO A PARTICULAR TYPE, EXCEPT REACTOR EQUATIONS IMPLY MODERATION.

*REACTOR PHYSICS + *STAFFING, TRAINING, QUALIFICATION + NERVA PROGRAM + REACTOR, POWER + REACTOR, SPACE

17-28003 ALSO IN CATEGORIES 1 AND 13
AEC PLANS REVISION OF RADIOISOTOPE LICENSING PROCEDURES
U.S. ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE IN-866 +. 3 PAGES, APRIL 29, 1968

REVISIONS PROPOSED TO 10CFR33 WOULD BE ALONG LINES OF PRESENT BROAD LICENSES (TYPE A - INSTITUTIONS ALLOWED TO POSSESS LARGE MULTI-CURVE QUANTITIES. RADIOLOGICAL SAFETY OFFICER AND AN ISOTOPE SAFETY COMMITTEE REQUIRED.). ADDED WOULD BE TYPE B (INSTITUTION MAY POSSES UP TO 10,000 TIMES THE QUANTITY WHICH 10CFR20 WOULD ALLOW TO BE INHALED BY ONE PERSON IN ONE YEAR, MUST HAVE A QUALIFIED RADIOLOGICAL SAFETY OFFICER AND ADMINISTRATIVE PROCEDURES FOR CONTROLLING USAGE) AND TYPE C (INDIVIDUAL USER MUST HAVE SCIENTIFIC BACKGROUND AND RADIATION PROTECTION TRAINING, MAY POSSES UP TO 100 TIMES THE QUANTITY WHICH 10 CFR 20 WOULD ALLOW ONE PERSON TO INHALE IN ONE YEAR). ***COMMENT REQUESTED ON FEDERAL REGISTER PUBLICATION OF APRIL 30, 1968.

*RADIOISOTOPE + *REGULATION, AEC + APPLICATION FOR AEC LICENSE

17-28004 ALSO IN CATEGORIES 1 AND 13
HOW TO GET A LICENSE TO USE RADIOISOTOPES
U.S. ATOMIC ENERGY COMMISSION
35 PAGES, JULY 1967

BRIEFLY REVIEWS (FOR AN APPLICANT WITHOUT PRIOR KNOWLEDGE) THE OBJECTIVES AND REQUIREMENTS OF THE REGULATORY PROGRAM, PLUS THE SAFETY RESPONSIBILITIES OF THE USER. A STARTING POINT FOR FURTHER INFORMATION. ***REVIEWS RADIOISOTOPE LICENSING, STATE REGULATION, AEC SAFETY STANDARDS AND REGULATIONS, QUALIFYING FOR A SPECIFIC LICENSE, RESPONSIBILITY OF LICENSEES. APPENDICES INCLUDE RULES AND REGULATIONS, INSTRUCTION SHEETS, AND SAMPLE APPLICATION/LICENSE REFERENCES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402

*RADIOISOTOPE + *REGULATION, AEC + APPLICATION FOR AEC LICENSE + GUIDE

17-28009
THOMPSON TJ + HILBERRY NE
MITS THOMPSON FORESEES SERIOUS SHORTAGE OF NUCLEAR ENGINEERS
2 PAGES, NUCLEONICS WEEK, 9(36), PAGES 6-7 (SEPT. 5, 1968)

T. J. THOMPSON AND N. E. HILBERRY POINT OUT THIS YEAR 600 NUCLEAR ENGINEERS GRADUATED, 120 WITH SKILLS FOR NUCLEAR POWER CAREERS, BUT THE MAJORITY WERE INTERESTED IN R AND D . . . ONLY A HANDFUL HIRED BY UTILITIES. THE 1970 CROP WILL BE HALF THAT UNLESS UTILITIES APPRECIATE THEIR NEEDS, WHICH ARE 200-300 RIGHT AWAY. OPERATOR-LEVEL TRAINING CANNOT POSSIBLY PROVIDE DEPTH OF KNOWLEDGE NEEDED, WHICH EXTENDS INTO REACTOR PHYSICS, HEAT TRANSFER AND ECONOMICS. EEI TASK FORCE REPORT SUGGESTS SAME UNDERESTIMATION.

*STAFFING, TRAINING, QUALIFICATION + REACTOR, BWR + REACTOR, POWER + REACTOR, PWR

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-28010 ALSO IN CATEGORY 6
THE STARTUP TEST PROGRAM FOR THE CONNECTICUT YANKEE YANKEE REACTOR
CONNECTICUT YANKEE ATOMIC POWER COMPANY, HADDAM
NYO-3250-11 +. 37 PAGES, FIGURES, TABLES, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

REPORTS WORK DURING MONTH OF JULY 1967. FUEL LOADED WITH WATER AT 2650 PPM BORON, THEN BORON DILUTED SLOWLY TO GO CRITICAL. ZERO POWER MEASUREMENTS WERE MADE AT 10 MWTH. AGREEMENT ON COLD TOTAL EXCESS REACTIVITY AND WORTHS OF GROUPS AB WAS EXCELLENT WITH PREDICTION, BUT THE HOT WORTH OF CD WAS LOW BY 0.035 REACTIVITY %. MEASUREMENTS MADE OF SINGLE ROD WORTHS (FOR STUCK AND EJECTED RODS) AGREED WELL WITH PREDICTIONS. DIFFERENTIAL BORON WORTH CURVE IS STEEPER THAN EXPECTED, PERHAPS BECAUSE RODS ARE IN CORE. TEMPERATURE COEFFICIENTS TAKEN BY USING BORON CHANGES IS ALSO STEEPER THAN PREDICTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, \$3.00 CPY, \$0.65 MICROFICHE

*CONTROL ROD WORTH + *REACTOR STARTUP TESTING + COMPARISON, THEORY AND EXPERIENCE + HADDAM NECK (PWR) + REACTIVITY, EXCESS + REACTOR, PWR

17-28011 ALSO IN CATEGORY 11
THIRTEENTH MONTHLY OPERATIONAL REPORT ON THE LA CROSSE BOILING WATER REACTOR COVERING THE MONTH OF JULY 1968
ALLIS-CHALMERS, BETHESDA, MARYLAND
ACNP-68509 +. 16 PAGES, JULY 1968, DOCKET 115-5, TYPE--BWR + MFG--A.C., AE--SGT + LUNDY

REACTOR SHUT DOWN. SHUTDOWN CONDENSER SHOWED NO HELIUM LEAKAGE DESPITE 3 DAYS AT 55 PSIG, BOTH COLD AND AT 230 F. ***A BENT FEEDWATER PIPE HANGER INDICATED THAT THE PIPE MOVED MORE THAN THE 1/16 IN. PREDICTED. CALCULATIONS WILL BE REDONE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20545

COMPARISON, THEORY AND EXPERIENCE + LACROSSE (BWR) + PIPING + REACTOR, BWR + REPORT, OPERATIONS + STEAM GENERATOR + STRESS ANALYSIS + TEST, LEAK RATE + THERMAL MECHANICAL EFFECT + TUBING

17-28029 ALSO IN CATEGORY 13
MILES FW
ION-EXCHANGE-RESIN SYSTEM FAILURES IN PROCESSING ACTINIDES
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
13 PAGES, 3 TABLES, 72 REFERENCES, NUCLEAR SAFETY 9(5), PAGES 393-406 (SEPT.-OCT. 1968)

SEVEN INSTANCES OF ION-EXCHANGE-RESIN SYSTEM FAILURES HAVE BEEN REPORTED IN NUCLEAR WORK SINCE JUNE 26, 1962, AND FIVE STUDIES HAVE BEEN MADE OF THE THERMAL STABILITY OF NITRATE-FORM RESINS. ALL INSTANCES APPARENTLY INVOLVED THE SELF-IGNITION OF NITRATE-FORM RESINS (WITH BOTH AROMATIC AND ALIPHATIC MATRICES) IN STRONG (MORE THAN 7N) NITRIC ACID IN THE PRESENCE OF SOME AMOUNT OF HEAT. TWO GROUPS OF PRECAUTIONARY MEASURES ARE SUGGESTED - (1) THOSE ASSOCIATED WITH THE CHEMISTRY OF RESINS, SUCH AS MAXIMUM OPERATING TEMPERATURE AND IONIC LOADING LIMITS, AND (2) THOSE COMMON TO CHEMICAL PROCESSING, SUCH AS PRESSURE-RELIEF DEVICES AND ADEQUATE RULES CONCERNING PROCEDURAL CHANGES.

*ACCIDENT ANALYSIS + *FUEL CONVERSION + *FUEL REPROCESSING + *ION EXCHANGE + *RADIOISOTOPE + *RESIN + CURIUM + NEPTUNIUM + PLUTONIUM + THORIUM + URANIUM

17-28030
LEAK RATE TESTS OF LACBWR SHUTDOWN CONDENSER
ALLIS-CHALMERS
3 PAGES, LETTER TO P.A. MORRIS, DRL, AUGUST 30, 1968, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

JULY-AUGUST TESTS FOLLOWED FINDING ACTIVITY ON THE SHELL SIDE IN MAY. TESTS WITH A HELIUM-AIR MIXTURE AND A MASS SPECTROMETER PROBE WERE MADE OF WELDS AND TUBES - (1) COLD AND 55 PSIG, (2) 230 F AND 15 PSIG, (3) COLD AND 50 PSIG. LEAKAGE WAS LESS THAN 0.001 CC/SEC. THE 95 PSIG AIR TEST VALUE REPORTED AS 0.24 CC/SEC WAS ACTUALLY THE HIGHEST OBTAINED, AND EVEN THEN LESS THAN 1/10TH THAT PERMITTED BY TECH. SPECS. ***CONDENSER WILL BE RETURNED TO SERVICE AND SHELL SIDE SAMPLED MONTHLY OR AFTER CONDENSER OPERATION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

FAILURE, TUBING + HEAT EXCHANGER + LACROSSE (BWR) + REACTOR, BWR + REPORT, OPERATIONS ANALYSIS + SHUTDOWN COOLING SYSTEM + TEST, LEAK RATE

17-28033 ALSO IN CATEGORY 12
PARTIAL INOPERABILITY OF SAFETY INJECTION SYSTEM
SOUTHERN CALIFORNIA EDISON COMPANY
3 PAGES, LETTER TO P.A. MORRIS, DRL, SEPTEMBER 6, 1968, DOCKET 50-206, TYPE--PWR, MFG--WEST., AE--BECHTEL

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-28033 *CONTINUED*

ON AUG. 27, 1968, CALIBRATION SHOWED BOILER FEED PUMP SPEED SWITCHES WERE MADE UP AT 2800 AND 3800 RPM RESPECTIVELY, INSTEAD OF 3200. SPEED SWITCHES ENSURE UNBORATED WATER FLUSHED OUT BEFORE SAFETY INJECTION BEGINS. A 23 CU. FT. DILUTION WAS ANALYZED IN THE FSAR, IT WOULD HAVE BEEN ADDED HERE. ***SAFETY INJECTION FLOW COMPARATOR DID NOT CLOSE ONE INJECTION VALVE 850 C ON A HIGH FLOW RATE TEST. A BLOCKING DIODE WAS INSTALLED IN THE COMMON GROUND LEG OF THE AUCTIONEERING RELAYS, AND ALL THREE VALVES WORKED PROPERLY. ***EACH CONDITION HAD BEEN ANALYZED IN FSAR. NEITHER WOULD HAVE PREVENTED SAFETY INJECTION SYSTEM FROM WORKING.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CORE REFLOODING SYSTEM + *FAILURE, COMPONENT + *SHUTDOWN SYSTEM, SECONDARY + INSTRUMENTATION CALIBRATION + INSTRUMENTATION, FLOW + PUMP + REACTOR, PWR + SAN ONOFRE (PWR) + SET POINT

17-28034 ALSO IN CATEGORY 11

ELK RIVER OPERATING EXPERIENCE

RURAL COOPERATIVE POWER ASSOCIATION

COO-651-63 +. 41 PAGES, FIGURES, TABLES, JULY 1968, DOCKET 115-1, TYPE--BWR, MFG-A.C., AE--SGT + LUNDY

REACTOR NOT OPERATED BECAUSE PRIMARY SYSTEM LEAK RATE TESTS CONTINUED USING SR-85 AND RB-86 TRACERS. WHEN RB-86 WAS INJECTED INTO PRIMARY SYSTEM WITH 1100 PSIG STEAM, THE REACTOR CAVITY WATER COLLECTION RATE INCREASED FROM 1500 TO 2100 ML/HR, BUT RB-86 NOT FOUND. STEAM WAS INJECTED INTO REACTOR CAVITY TO FLUSH OUT ANY TRACER DEPOSITED, CONDENSATE SHOWED BOTH RB AND SR TRACERS. ***PROCEDURES GIVEN FOR PERSONNEL AND FOR EMERGENCY AIR LOCK LEAK RATE TESTS. CONTAINMENT VESSEL WILL BE LEAK RATE TESTED NEXT. SHIELD BLOCKS ARE BEING REMOVED FOR VISUAL INSPECTION OF THE VESSEL BOTTOM.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*TEST, LEAK RATE + CONTAINMENT AIR LOCK + ELK RIVER (BWR) + FAILURE, PRESSURE VESSEL + PRESSURE VESSEL + REACTOR, BWR + REPORT, OPERATIONS + TRACER, RADIOACTIVE

17-28049 ALSO IN CATEGORIES 13 AND 7

FILTER FAILURE AT WEST VALLEY PLANT

NUCLEAR FUEL SERVICES, INC., WEST VALLEY, N. Y.

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(38), PAGE 29 AND 30, (SEPT. 16, 1968), DOCKET NO. 50-201

(TWX TO COMPLIANCE) ON SEPT. 4, 1968, ONE FILTER OF 30 IN THE MAIN VENTILATION FILTER BANK FAILED. 1-2% OF THE FILTER WAS DISCHARGED FROM THE STACK AND FELL ON TO ROOF. PROBABLE CAUSE WAS FILTER PRESSURE DROP, AT UPPER OPERATING LIMIT. HIGH PRESSURE DROP ALARM IS BEING REDUCED 18%, AND LOW PRESSURE DROP ALARM IS ADJUSTED TO INCREASE SENSITIVITY TO SINGLE FILTER FAILURE. NOT A REPORTABLE INCIDENT BECAUSE ANALYSIS OF ADJACENT FILTER AND STACK SAMPLER INDICATE 11% OF MONTHLY ALLOWANCE DISCHARGED. SURVEY OF SITE PERIMETER DID NOT SHOW RADIATION INCREASE ABOVE BACKGROUND.

*FILTER, DAMAGED + *PRESSURE DROP + AIRBORNE RELEASE + FUEL REPROCESSING + INCIDENT, EQUIPMENT + NFS + STACK + VENTILATION SYSTEM

17-28050 ALSO IN CATEGORIES 13 AND 7

NFS SHUTDOWN TO EVALUATE FILTER FAILURE

NUCLEAR FUEL SERVICES, INC., WEST VALLEY, N. Y.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(38), PAGE 30, (SEPT. 16, 1968), DOCKET NO. 50-201

(LETTER TO NFS, SEPT. 6, 1968) CONFIRMS SEPT. 6 PHONE CALL THAT WEST VALLEY PLANT OPERATION WILL NOT BE RESUMED UNTIL THE FOLLOWING IS REVIEWED BY AEC - (1) AMOUNT OF RADIOACTIVITY RELEASED FROM STACK SEPT. 4, 1968, (2) NFS EVALUATION, INCLUDING PROBABLE CAUSE AND CORRECTIVE ACTION, (3) INFORMATION REQUESTED IN APRIL 2, 1968, LETTER, INCLUDING IMMEDIATE WARNING OF ABNORMAL CONDITIONS IN VENTILATION AND OFFGAS SYSTEMS. ITEMS 1 AND 2 ARE NECESSARY TO CONFIRM TECH.-SPEC. REQUIREMENTS MET (PARAGRAPHS 4.1.1, 7.1.2.2 AND 7.1.7.3).

*AIRBORNE RELEASE + *FILTER, DAMAGED + FUEL REPROCESSING + INCIDENT, EQUIPMENT + INSPECTION AND COMPLIANCE + NFS + OFF GAS + STACK + VENTILATION SYSTEM

17-28167 ALSO IN CATEGORY 13

CORRESPONDENCE RELATIVE TO NFS OFFGAS FILTERS

NUCLEAR FUEL SERVICES, INC.

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 14 AND 15, (SEPT. 23, 1968), DOCKET NO. 50-201

(SEPT. 10) MARCH 1968 DOG FILTER FAILURE WAS DUE TO MOISTURE WEAKENING PLYWOOD CASING. (SEPT. 11 TWX) PROVIDES INTERIM TECHNICAL SPECIFICATIONS ON FILTER RESISTANCE AND PRESSURE DROP. (SEPT. 14 TWX) SPECS. CANNOT BE MET WITHOUT EXTENSIVE SHUTDOWN AND REDESIGN OF PLANT. (SEPT. 16 TWX) INTERPRETATIONS SUPPLIED BY NFS OF AEC SEPT. 13 TWX. (SEPT. 16 TWX) AEC NOT AWARE OF NFS SEPT. 14 TWX DURING MEETING OF SEPT. 14. CONFIRM ORAL AGREEMENTS. (SEPT. 17 TWX) DML AGREES NFS MAY OPERATE ACCORDING TO AEC SEPT. 13 SPECIFICATIONS INTERPRETED BY NFS SEPT. 16 TWX.

*FILTER, HIGH EFFICIENCY + *PRESSURE DROP + *TECHNICAL SPECIFICATIONS + FAILURE, ADMINISTRATIVE CONTROL + FILTER, DAMAGED + FUEL REPROCESSING + INSPECTION AND COMPLIANCE + NFS + OFF GAS

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-28168

POOL LEAK TO BE REPAIRED

UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE, VA.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 20, (SEPT. 23, 1968), DOCKET 50-62

(LETTER, SEPT. 6) REPORT DESCRIBES PLANS TO REPAIR POOL LEAK BY REPLACING CURRENT EPOXY RESIN LINING MATERIAL (FARBOCOAT 73). ANALYZES ASSOCIATED HAZARDS.

*MAINTENANCE AND REPAIR + *RESIN + *STEEL LINER + COATING, SURFACE + FAILURE, GENERAL + FUEL STORAGE + LEAK + REACTOR, POOL TYPE + REACTOR, RESEARCH

17-28169

ALSO IN CATEGORY 12

BAWTR REACTOR HEADER FAILS TO DROP ON LOSS OF FLOW

BABCOCK + WILCOX CO., LYNCHBURG, VA.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 19, (SEPT. 23, 1968), DOCKET NO. 50-200

(LETTER, SEPT. 9) FAILURE CAUSED BY 3 HEADER GUIDE RODS BROKEN, WHICH PREVENTED THEIR ALIGNING THE HEADER AND CAUSED IT TO BIND. THESE BROKE DUE TO REPEATED LOADINGS. WE WILL SHUT DOWN UNTIL TECH.-SPEC. APPROVAL OF OPERATION WITH HEADER LOCKED UP. (HEADER IS APPARENTLY FLAPPER VALVE OPENING ON LOW FLOW).

ACCIDENT, LOSS OF FLOW + ENGINEERED SAFETY FEATURE + FAILURE, EQUIPMENT + REACTOR, POOL TYPE + REACTOR, TEST + TECHNICAL SPECIFICATIONS

17-28170

ALSO IN CATEGORIES 13 AND 14

ALTERNATIVE IN REDUCING BUTTERMILK CREEK RADIOACTIVITY

NUCLEAR FUEL SERVICES, INC.

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(39), PG 19 AND 20, (SEPT. 23, 1968), DOCKET NO. 50-201

(LETTER, SEPT. 9) DESCRIBES ALTERNATIVES - (1) PIPING WASTE DIRECTLY TO CATTARAUGUS CREEK WOULD NOT MEET INTENT OF REDUCING DISCHARGE. (2) DEEP WELL DISPOSAL WOULD ALSO TAKE CARE OF TRITIUM. A CONTRACTOR IS NOW INVESTIGATING. (3) SHALE FRACTURING DEMONSTRATION WELL WILL BE COMPLETED BY ORNL AT NFS IN 1969. TIME SCHEDULE IS DIFFICULT TO PREDICT.

FUEL REPROCESSING + NFS + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, LIQUID

17-28171

ALSO IN CATEGORY 13

CONTAMINATION DUE TO POWER FAILURE AND LOOSE STOPPER

3M COMPANY, ST. PAUL, MINN.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(39), PAGE 26, (SEPT. 23, 1968)

(LETTER TO COMPLIANCE AUG. 14) ON THE MORNING OF JULY 24, ALL HOOD FANS WERE NOT WORKING DUE TO A POWER FAILURE DURING THE NIGHT. IN CHECKING MODULE 107N, A SMALL BRASS BOTTLE CONTAINING 50 CURIES OF SR-90 WAS MOVED, AND ITS LOOSE TOP NOTED. HIS GLOVE AND SHOE COVERS WERE CONTAMINATED, AND THE HOOD WAS CONTAMINATED TO 2R/HR. TWO EMPLOYEES DRESSED IN FULL ANTI-C SUITS WITH RESPIRATORS SPENT 25 MIN CLEANING UP THE HOOD. A SAMPLER SHOWED THEY WERE EXPOSED TO 14.1 MICROC/ML AIR, GIVING A TECHNICAL OVEREXPOSURE OF 14.7 MPC. URINALYSIS SHOWED NEGATIVE RESULTS. NO CORRECTIVE ACTION IS CONTEMPLATED, ELECTRICAL FAILURES MUST BE EXPECTED.

*CONTAMINATION + *FAILURE, SIMULTANEOUS + *STRONTIUM + ACCIDENT, LOSS OF POWER + AIRBORNE RELEASE + FAILURE, OPERATOR ERROR + GLOVE BOX + INHALATION + PERSONNEL EXPOSURE, RADIATION + PERSONNEL PROTECTIVE DEVICE + RADIOISOTOPE

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-25342
PREOPERATIONAL AND STARTUP TESTS
MILLSTONE POINT CO.
24 PAGES, 1 TABLE, PAGE B-1 THROUGH B-24 OF APPENDIX B TO MILLSTONE POINT SAFETY ANALYSIS REPORT, VOL. 3,
MAY 2, 1968, DOCKET 50-245, TYPE--BWR, MFG--G.E., AE--EBASCO

RELATIVE SEQUENCE, POWER LEVELS AND CONDITIONS, AND SINGLE-PARAGRAPH SUMMARIES OF (I) PREOPERATIONAL TESTS, 8 PG. (II) OPEN VESSEL TESTS, (III) HEATUP TESTS, (IV) POWER TESTS, AND (V) WARRANTY TESTS. MILLSTONE PERSONNEL WILL CONDUCT TESTS, WITH THE TEST PROGRAM UNDER THE RESPONSIBLE TECHNICAL DIRECTION OF GE.

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

*TEST, PLANT RESPONSE + *TEST, PREOPERATIONAL + MILLSTONE POINT (BWR) + REACTOR STARTUP TESTING + REACTOR, BWR + REPORT, SAR

18-25882
BELL STATION PSAR VOL I
NEW YORK STATE ELECTRIC + GAS CORPORATION
80 PAGES. MARCH 1968. DOCKET 50-319.

A 2436-MWTH 1866-MWE GROSS CURRENT, STANDARD BWR SIMILAR TO COOPER OR EASTON BUT WITH A STEEL-LINED REINFORCED-CONCRETE DRY WELL AND TORUS, AND 50 F HOTTER (420 F) FEEDWATER TEMP. LOCATED ON LAKE CAYUGA, 40 M SW OF SYRACUSE, NEXT TO 270-MWE MILLIKEN STATION. OPERATIONAL MAY 1973. *** VOL. I INCLUDES SECTION II (SITE AND ENVIRONS), III (REACTOR CORE), IV (REACTOR COOLANT SYSTEM), VI (CONTAINMENT), VI (ENGINEERED SAFEGUARDS).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

BELL (BWR) + REACTOR, BWR + REPORT, PSAR

18-25883 ALSO IN CATEGORIES 2 AND 16
BELL PSAR SECTION II, STATION SITE AND ENVIRONS
NEW YORK STATE ELECTRIC + GAS CORPORATION
100 PAGES, 17 FIGURES, 12 TABLES. PAGE II-1-1 THRU II-6-2. MARCH 1968. DOCKET 50-319.

INCLUDES PRELIMINARY (JAN. 68) REPORTS ON METEOROLOGY (B.E. DETHIER) AND LIMNOLOGY OF CAYUGA LAKE AND INTERRELATIONS WITH NUCLEAR POWER PLANT (J. F. STORR). ***NOCTURNAL DRAINAGE WIND FLOWS UP RIVER FROM ITHACA (13 MILES AWAY) TOWARD THE SITE. ON-SITE TOWER BEING INSTALLED. ***EXTENSIVE MIXING OF WATER EXPECTED. A SURVEY IS BEING MADE, BASED ON FOSSIL PLANT DISCHARGE. A HATCHERY FOR TROUT AND COHO SOLUTION IS PLANNED TO USE THE THERMAL ENRICHMENT PROVIDED BY CONDENSER DISCHARGE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*LAKE + *THERMAL POLLUTION + BELL (BWR) + DIFFUSION + ON SITE WORK + REACTOR, BWR + REPORT, PSAR + TOPOGRAPHY

18-25884 ALSO IN CATEGORIES 5 AND 17
BELL PSAR SECT 3.3.7 DESCRIPTION OF CORE ANALYSIS
NEW YORK STATE ELECTRIC + GAS CORPORATION
85 PAGES, 20 FIGURES, 5 TABLES, PAGE III-3-5 THRU -7. MARCH 1968 50-319.

A COMPUTER PROGRAM (UNSPECIFIED) IS USED TO ANALYZE THE THERMAL AND HYDRAULIC CHARACTERISTICS OF THE CORE AS A WHOLE. OUTPUT AND INPUT DISCUSSED BRIEFLY. RECENT MODIFICATIONS IN CORE DESIGN AND IN THERMAL HYDRAULIC EVALUATION TECHNIQUES ALLOW HIGHER FEEDWATER TEMP. WITHOUT ENCROACHING ON THERMAL MARGINS. THE ITEMS AND THEIR EFFECT ON INLET SUBCOOLING (BTU/LB) MCHFR ARE - (1) INLET ENTHALPY NOW BASED ON 1920 PSIA DOME PRESSURE, RATHER THAN 1050 INLET (+4/+0.06). (2) CORE BYPASS FLOW NOW ESTABLISHED AS 7% (-/+0.03). (3) CORE MIDPLANE PRESSURE OF 1035 NOW USED INSTEAD OF INLET PRESSURE (-/-0.02). (4) ZIRCONIUM SPACER TEST DATA (-/-0.02). ***THE NET EFFECT, WHEN FEEDWATER INCREASED TO 420 F, IS TO INCREASE SUBCOOLING 0.3 BTU/LB AND MCHFR BY 0.02.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*ANALYTICAL MODEL + *COMPUTER PROGRAM + *SUBCOOLING + BELL (BWR) + COMPARISON, THEORY AND EXPERIENCE + HEAT FLUX, CRITICAL + HEAT TRANSFER, BOILING + REACTOR, BWR + REPORT, PSAR + SAFETY MARGIN

18-25885 ALSO IN CATEGORY 11
BELL PSAR SECTION V STATION CONTAINMENT SYSTEMS
NEW YORK STATE ELECTRIC + GAS CORPORATION

CATEGORY 19
SAFETY ANALYSIS AND DESIGN REPORTS

18-25885 *CONTINUED*

65 PAGES, 5 FIGURES, 2 TABLES, PAGE V-1-1 THRU V-3-6. MARCH 1968. DOCKET 50-319.

THE SUPPRESSION CHAMBER AND DRY WELL ARE NOW STEEL-LINED REINFORCED-CONCRETE PRESSURE VESSELS. THE DRY WELL WILL CONSIST OF VERTICAL CYLINDERS AND TRUNCATED CONES TO RETAIN THE LIGHT-BULB SHAPE, WHILE THE SUPPRESSION CHAMBER CONSISTS OF A TORUS WITH A SQUARE CROSS SECTION. OTHERWISE, SYSTEMS ARE AS BEFORE. DRY-WELL DESIGN IS FOR 62 PSIG/300 F, AND POOL IS 62 PSIG/220 F. THE CONCRETE WILL BE 6 FT THICK, AND THE LINER NOT LESS THAN 0.25 IN. DESIGN LEAK RATE IS 0.5% VOLUME/DAY AT 62 PSIG. AIR CONDITIONING WILL KEEP AIR AT 135 F (MAX., 150 F) AND 40% REL. HUMIDITY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

*CONCRETE + *CONTAINMENT, PRESSURE SUPPRESSION + *STEEL LINER + BELL (BWR) + MODIFICATION, SYSTEM OR EQUIPMENT + REACTOR, BWR + REPORT, PSAR

18-25903 ALSO IN CATEGORIES 5 AND 12

BRAY AP + IANNI P + MURRAY JL

GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 40 PAGES, 5 FIGURES, 4 TABLES, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY (MAR. 14, 1967) INDICATED THAT ADDITIONAL TESTING OR ANALYSIS WAS REQUIRED. THE TEST OR ANALYSIS PROGRAM IS DESCRIBED FOR THE FOLLOWING - (1) EFFECTS OF FUEL-ROD FAILURE ON ECCS PERFORMANCE, (2) EFFECTS OF FUEL-BUNDLE FLOW BLOCKAGE, (3) VERIFICATION OF FUEL-DAMAGE-LIMIT CRITERION, (4) EFFECTS OF CLADDING TEMPERATURE AND MATERIAL ON ECCS PERFORMANCE, (5) CLOSURE OF MAIN-STEAM-LINE ISOLATION VALVE, (6) TESTS OF DIESEL-GENERATOR PERFORMANCE, (7) STEAM-LINE-BREAK ACCIDENT, AND (8) DEPRESSURIZATION PERFORMANCE OF HPCI SYSTEM.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ENGINEERED SAFETY FEATURE + *R AND D PROGRAM + ACCIDENT, LOSS OF COOLANT + ACCIDENT, STEAM LINE RUPTURE + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CONTAINMENT ISOLATION + CORE SPRAY + FLOW BLOCKAGE + FUEL ELEMENT + GENERATOR, ENGINE + PERFORMANCE LIMIT + SYSTEM OPERABILITY IN ACCIDENT

18-25904 ALSO IN CATEGORIES 12 AND 5

EFFECTS OF FUEL ROD FAILURE ON ECCS PERFORMANCE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 4 PAGES, PAGES 2-1 THROUGH 2-5 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY VOICED CONCERN FOR EFFECT ON HEAT-TRANSFER EFFECTIVENESS OF ECCS RESULTING FROM FUEL-CLAD BULGING OR PERFORATION IN LOSS-OF-COOLANT ACCIDENTS. ANALYTICAL AND EXPERIMENTAL PROGRAMS TO RESOLVE THE CONCERN ARE DESCRIBED. FAILURE TEMPERATURES, WITH SINGLE ROD TESTS HAVING GAS-PLENUM PRESSURES FROM 130 TO 1500 PSIG, WERE 1348 TO 1732 F. NIN-ROD-BUNDLE TESTS SHOWED THAT GROSS FLOW BLOCKAGE DOES NOT OCCUR AS A RESULT OF MULTI-ROD PERFORATIONS. FULL-SIZE HEATER-BUNDLE TESTS WILL BE PERFORMED. ANALYSIS TO BE MADE OF WORST CONFIGURATION OF FLOW PATH AND INCLUDE RADIATION EFFECTS ON CHANNFI WALLS PROGRESS TO BE COMPLETED IN 1969.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT, LOSS OF COOLANT + *SYSTEM OPERABILITY IN ACCIDENT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CORE SPRAY + EMERGENCY COOLING CONSIDERATIONS + FAILURE, CLADDING + FLOW BLOCKAGE + PERFORMANCE LIMIT + REACTOR, BWR + SYSTEM CAPABILITY + TEST, PROOF

18-25905 ALSO IN CATEGORY 5

EFFECTS ON FUEL BUNDLE FLOW BLOCKAGE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 4 PAGES, 1 TABLE, PAGES 3-1 THROUGH 3-3 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS REVIEW OF BROWNS FERRY VOICED CONCERN ABOUT FISSION-PRODUCT RELEASE, HIGH PRESSURE, AND SEQUENTIAL FUEL-ELEMENT FAILURE RESULTING FROM INLET-COOLANT-ORIFICE BLOCKAGE. PROGRAM TO RESOLVE CONCERN EARLY IN 1969 IS DESCRIBED. THE TWO ASPECTS TO BE INVESTIGATED ARE (1) BOILOUT AND HEATUP FOLLOWING PARTIAL OR COMPLETE FLOW BLOCKAGE AND (2) WATER EXPULSION AND PRESSURE-RISE EFFECTS DUE TO OVERHEATING AND REENTRY OF WATER TO THE OVERHEATED PORTION.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT, CONSEQUENCES + *FLOW BLOCKAGE + ACCIDENT, LOSS OF FLOW + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FAILURE, FUEL ELEMENT + FAILURE, SEQUENTIAL + FLOW ORIFICE + FLOW THEORY AND EXPERIMENTS + R AND D PROGRAM + REACTOR, BWR

18-25906 ALSO IN CATEGORY 5

VERIFICATION OF FUEL DAMAGE LIMIT CRITERION

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-25906 *CONTINUED*

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 6 PAGES, 3 TABLES, PAGES 4-1 THROUGH 4-6 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS THAT TESTS INCLUDE HEAT-GENERATION RATES IN EXCESS OF THOSE CALCULATED FOR WORST TRANSIENT AND FUEL BURNUPS. GE STATES LIMIT OF 28 HW/FT (CORRESPONDING TO 1% PLASTIC STRAIN) IS ADEQUATELY SUPPORTED BY 6 TO 7 YEARS OF DEVELOPMENT PROGRAMS AND EXPERIENCE. SEVEN HEAVILY (1400 PPM) HYDRIDED ZIRCALOY-CLAD RODS OPERATING WITH CENTERLINE MELTING WERE TESTED IN GETR AT HEAT-GENERATION RATES UP TO 22 KW/FT, WITH CLAD STRAINS UP TO 0.6%. NO DETRIMENTAL EFFECTS. TABLES SUMMARIZE PRODUCT-FUEL AND DEVELOPMENT-FUEL IRRADIATION EXPERIENCE, LISTING EXPOSURE, HEAT FLUX, PEAK GENERATION RATE, AND TIME IN CORE.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CENTERLINE MELTING + *FUEL BURNUP + *OPERATING EXPERIENCE SUMMARY + *PERFORMANCE LIMIT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FAILURE, CLADDING + FUEL ELEMENT + FUEL INTEGRITY + HYDRIDE + IRRADIATION TESTING + REACTOR, BWR + ZIRCALOY

18-25907

ALSO IN CATEGORY 5

EFFECTS OF CLADDING TEMPERATURE AND MATERIALS ON ECCS PERFORMANCE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 4 PAGES, PAGES 5-1 THROUGH 5-4 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS TESTING ECCS EFFECTIVENESS AT FUEL TEMPERATURES HIGHER THAN THOSE USED TO DATE. TESTS HAVE BEEN MADE WITH PEAK TEMPERATURES OF 2400 F. GE RESPONDS THAT TESTS WILL BE EXTENDED AFTER DEVELOPING A ZIRCALOY-CLAD ELECTRICAL HEATER AND SUITABLE INSTRUMENTATION FOR USE AT TEMPERATURE IN EXCESS OF 2500 F. TEST PROGRAM IS DESCRIBED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CLADDING + *CORE REFLOODING SYSTEM + *CORE SPRAY + *HIGH TEMPERATURE + *SYSTEM OPERABILITY IN ACCIDENT + *TEST, PROOF + ACCIDENT, LOSS OF COOLANT + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + EMERGENCY COOLING CONSIDERATIONS + FUEL ELEMENT + INSTRUMENTATION, TEMPERATURE + REACTOR, BWR + STEEL, STAINLESS + ZIRCALOY

18-25908

ALSO IN CATEGORIES 12 AND 11

CLOSURE OF MAIN STEAM LINE ISOLATION VALVE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 7 PAGES, 2 FIGURES, PAGES 6-1 THROUGH 6-7 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

DESCRIBES THE TEST PROGRAM TO DEMONSTRATE THE PERFORMANCE CAPABILITY OF A FULL-SIZE MAIN-STEAM ISOLATION VALVE CLOSING UNDER STEAM AND TWO-PHASE-MIXTURE FLOW CONDITIONS CALCULATED FOR AN EXTERNAL STEAM-LINE BREAK. THE VALVE DESIGN IS A Y TYPE AND USES AN AIR-CYLINDER OPERATOR AND CLOSING SPRINGS. TESTS WILL BE CONDUCTED FOR A RANGE OF SIMULATED BREAK SIZES AND STEAM QUANTITIES.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*CONTAINMENT ISOLATION + *SYSTEM CAPABILITY + *TEST, PROOF + *VALVE + ACCIDENT, STEAM LINE RUPTURE + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + FLOW, TWO PHASE + LEAK + REACTOR, BWR + RESPONSE TIME + SYSTEM OPERABILITY IN ACCIDENT

18-25909

ALSO IN CATEGORIES 12 AND 10

TESTS OF DIESEL GENERATOR PERFORMANCE

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 3 PAGES, PAGES 7-1 THROUGH 7-3 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL 1968

ACRS RECOMMENDED TESTING GENERATORS UNDER SIMULATED EMERGENCY CONDITIONS. GE RESPONDED THAT TESTS WILL BE CONDUCTED AT THE MANUFACTURERS PLANT TO CONFIRM ADEQUACY WITH RESPECT TO START TIMES, SYNCHRONIZATION, AND SIMULATED LOADING. TESTS (FOR SINGLE DIESEL) ON STARTING RELIABILITY, START TIMES, AND SIMULATED LOAD-CARRYING CAPABILITY WERE ALMOST COMPLETE. TESTS OF STARTING AND SYNCHRONIZING TWO OR MORE DIESELS ARE BEING PLANNED FOR 1968. SITE TESTS WILL BE CONDUCTED AND INTEGRATED WITH SPECIFIC PROJECTS.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*GENERATOR, ENGINE + *RELIABILITY, COMPONENT + *SYSTEM CAPABILITY + *TEST, SYSTEM OPERABILITY + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + ELECTRIC POWER, SHUTDOWN + EMERGENCY POWER, ELECTRIC + REACTOR, BWR + SYSTEM OPERABILITY IN ACCIDENT

18-25910

ALSO IN CATEGORIES 5 AND 11

REEVALUATION OF STEAM LINE BREAK ACCIDENT

ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

APED-5608 +. 2 PAGES, PAGES 8-1 THROUGH 8-2 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-25910 *CONTINUED*
PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS RECOMMENDS IN JUNE 15, 1967, VERMONT YANKEE REVIEW FURTHER EVALUATION OF FUEL CLAD TEMPERATURES FOLLOWING A STEAM-LINE BREAK. GE WILL DEVELOP AN IMPROVED ANALYTICAL MODEL, AND ANALYSIS WILL BE COMPLETED IN FALL OF 1968, BASED ON STEAM-LINE-ISOLATION-VALVE CLOSURE IN 3-10 SEC.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*ACCIDENT ANALYSIS + *ACCIDENT, STEAM LINE RUPTURE + ACCIDENT MODEL + ACCIDENT, CONSEQUENCES + ACRS + AEC QUESTION + BROWNS FERRY (BWR) + CONTAINMENT ISOLATION + REACTOR, BWR + RESPONSE TIME

18-25911 ALSO IN CATEGORY 12
DEPRESSURIZATION PERFORMANCE OF HPCT SYSTEM
ATOMIC POWER EQUIPMENT DEPARTMENT, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
APED-5608 +. 5 PAGES, 3 FIGURES, PAGES 9-1 THROUGH 9-5 OF THE GENERAL ELECTRIC COMPANY ANALYTICAL AND EXPERIMENTAL PROGRAMS FOR RESOLUTION OF ACRS SAFETY CONCERNS, APRIL, 1968

ACRS STATES (OCT. 12, 1967, PEACH BOTTOM 2 AND 3 REPORT) THAT THE FILM CONDENSATION COEFFICIENT USED TO PREDICT THE DEPRESSURIZATION PERFORMANCE OF THE HPCT SYSTEM IS BASED ON EXTRAPOLATION OF AVAILABLE HEAT-TRANSFER DATA AND SHOULD BE SUBSTANTIATED BY EXPERIMENTS. TEST PROGRAM TO BE COMPLETED IN LATE 1968 IS DESCRIBED. SUBCOOLED WATER WILL BE INJECTED INTO A CONSTANT-VOLUME, HIGH-PRESSURE, STEAM-WATER SYSTEM. DEPRESSURIZATION RATE, MASS FLOW RATE, ETC., WILL BE MEASURED.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM

*BLOWDOWN + *CORE SPRAY + *HEAT TRANSFER COEFFICIENT + *SYSTEM CAPABILITY + ACCIDENT, LOSS OF COOLANT + ACRS + AEC QUESTION + PEACH BOTTOM 2 AND 3 (BWR) + REACTOR, BWR + SYSTEM OPERABILITY IN ACCIDENT + TEST, PROOF

18-25935 ALSO IN CATEGORY 17
MACPHERSON RE
FAST REACTOR SAFETY CONFERENCE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
8 PAGES, TABLE, REFERENCE, NUCLEAR SAFETY, 9(3), PAGES 202-209 (MAY-JUNE, 1968)

BRIEFLY SUMMARIZES THE SESSIONS COVERING (1) CORE MELTDOWN ACCIDENTS, (2) SODIUM BOILING AND SUPERHEATING, (3) INCIDENTS IN REACTORS, AND (4) SAFETY. MALFUNCTIONS IN THE BRS WERE (1) FUEL-ELEMENT LEAKS CAUSED BY HEATER SHORTING, PLUS AIR IN LEAKAGE CAUSING MASSIVE SODIUM OXIDE PLUGGING, AND (2) REACTIVITY PERTURBATIONS DUE TO ENTRAINMENT OF ARGON BY THE SODIUM STREAM. ***PLUGGING OF SUBASSEMBLIES BY OXIDE HAS BEEN DETECTED PRIMARILY BY THE EFFECT ON PRIMARY FLOW. A PANEL DISCUSSION SHOWED THAT ATTENTION IS SWITCHING FROM THE LARGE, LESS PROBABLE ACCIDENT TO THE SMALLER, MORE FREQUENT ACCIDENTS WHICH AFFECT PLANT USE.

*REACTOR, FAST + *SAFETY PRINCIPLES AND PHILOSOPHY + ACCIDENT ANALYSIS + ACCIDENT, MAXIMUM CREDIBLE (MCA) + COOLANT QUALITY + FLOW BLOCKAGE + INCIDENT, GENERAL + REACTOR, LMCR + REVIEW + SODIUM

18-26082
SEFOR SUPPLEMENT 17
GENERAL ELECTRIC CO., SAN JOSE, CALIFORNIA
220 PAGES, FIGURES, TABLES, MAY 1968, DOCKET NO. 50-231

RESPONDS TO DRL QUESTIONS OF MAY 3, 1968, REGARDING FACILITY DESIGN, CONTAINMENT, PHYSICS, REACTOR VESSEL, INSTRUMENTATION, REFLECTOR-CONTROL SYSTEM, REFUELING CELL, SAFETY ANALYSES, AND ENVIRONS AND RADIOLOGICAL EFFECTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, \$3.00 COPY, \$0.65 MICROFICHE

AEC QUESTION + REACTOR, LMCR + REPORT, SAR + SEFOR (RE)

18-26101
POINT BEACH AMENDMENT 4
WISCONSIN ELECTRIC POWER COMPANY, MILWAUKEE, WISCONSIN
5 PAGES, TABLES, JUNE 6, 1968, DOCKET NO. 50-301, TYPE--PWR, MFG--WEST., AE--BECHTEL

PROVIDES COST DATA IN RESPONSE TO DRL QUESTIONS OF MAY 27, 1968. TOTAL COST IS \$58.65 MILLION FOR NUCLEAR PLANT, \$2.989 MILLION FOR TRANSMISSION PLANT, AND \$15.59 MILLION FOR INITIAL CORE. CASH REQUIREMENTS FOR 1968-72 LISTED.

AVAILABILITY--CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151 \$3.00 COPY, \$0.65 MICROFICHE

*ECONOMICS + POINT BEACH 1 AND 2 (PWR) + REPORT, PSAR

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-26302
ARGONNE ADVANCED RESEARCH REACTOR
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS
ANL-7290 +. 92 PAGES, 48 FIGURES, 14 TABLES, 6 REFERENCES, PAGES 27-119 OF THE REACTOR ENGINEERING
DIVISION ANNUAL REPORT, APRIL 1967

DISCUSSES IN DETAIL THE TITLE-1 DESIGN, CORE DEVELOPMENT, STRESS ANALYSIS, VESSEL MATERIAL,
FLOW STUDIES, CORROSION AND COMPATIBILITY OF MATERIALS, AND SYSTEM TRANSIENTS. DOES NOT
REFLECT DESIGN REVISION TO USE HFIR FUEL ELEMENTS OF U308-ALUMINUM CERMET.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151 \$3.00 COPY, \$0.65 MICROFICHE

*R AND D PROGRAM + *REACTOR DESCRIPTION + AARR (IRR) + CORROSION + FLOW THEORY AND EXPERIMENTS +
PRESSURE VESSEL + REACTOR TRANSIENT + STRESS ANALYSIS

18-26515 ALSO IN CATEGORIES 17 AND 1
QUESTIONNAIRE ON PROPOSED WATER-REACTOR SAFETY SCHOOL
IDAHO OPERATIONS OFFICE, AEC
16 PAGES, LETTER FROM W. L. GINKEL, JULY 1, 1968

PROPOSED SCHOOL (AT NRTS, IDAHO) WOULD PROVIDE 9- TO 12-WEEK SESSIONS (RUNNING SUCCESSIVELY FOR
FOUR YEARS) TO DISSEMINATE (WITH REDUCED TIME LAG) THE LATEST REACTOR-SAFETY TECHNOLOGY AND
PHILOSOPHY TO INDUSTRY, UNIVERSITIES, AND GOVERNMENT. CURRICULUM COULD BE LIFTED ALMOST
DIRECTLY FROM THE WATER-REACTOR ACCIDENT TREE AND WOULD INCLUDE BASIC PHENOMENA AND
ANALYTICAL TECHNIQUES. SYLLABUS INCLUDES - BACKGROUND (6 HR), NATURE OF REACTOR SAFEGUARDS
(24 HR), HISTORY OF ACCIDENTS (6 HR), REACTOR SAFEGUARDS (24 HR), REGULATORY AND R-AND-D
FUNCTIONS (6 HR), ACCIDENT ANALYSIS (48 HR), QUALITY ASSURANCE (12 HR), CLASS PROJECTS (66
HR), AND SUMMATION SESSIONS (28 HR). TUITION - \$2000-\$4000.

AVAILABILITY - R. F. MAKEUS, EDUCATION OFFICER, USAEC, IDAHO OPERATIONS OFFICE, P. O. BOX 2108, IDAHO
FALLS, IDAHO 83401

*SAFETY PROGRAM + *STAFFING, TRAINING, QUALIFICATION + NRTS + REACTOR, BWR + REACTOR, PWR + REACTOR, WATER

18-26563
PRAIRIE ISLAND 1 AND 2 CONSTRUCTION PERMIT
NORTHERN STATES POWER COMPANY
6 PAGES, CONSTRUCTION PERMITS CPPR-45 AND -46. LETTER TO D. R. MCELROY FROM P. A. MORRIS. JUNE 26, 1968.
DOCKET 50-282 AND 50-306. TYPE--PWR, MFG--WEST., AE--PIONEER SERV.

ALLOWS CONSTRUCTION OF TWO 1650-MW TH PWRs LOCATED NW OF RED WING, MINNESOTA.

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

*CONSTRUCTION PERMIT PROCESS + PRAIRIE ISLAND 1 AND 2 (PWR) + REACTOR, PWR

18-26586 ALSO IN CATEGORY 5
TWISTED TAPE BOILING WATER REACTOR
ALIGENIE ELEKTRICITAETS-GESELLSCHAFT, FRANKFURT AM MAIN, WEST GERMANY
EUR-3651 +. 109 PAGES, REFERENCES, FINAL REPORT, JULY 1965-SEPTEMBER, 1966, SOCIETE NATIONALE D ETUDE ET
DE CONSTRUCTION DE MOTEURS D AVIATION, SURESNES (FRANCE), SEPTEMBER 15, 1967

AN OUT-OF-PILE EXPERIMENT WAS CONDUCTED ON A 9-ROD TWISTED-TAPE BUNDLE. NO FRETTING CORROSION
WAS OBSERVED. THERMAL TESTS WERE PERFORMED, AND A ROD SURFACE TEMPERATURE RISE WAS DETECTED
AT THE OUTLET BUT COULD NOT BE CORRELATED WITH THE LOCATION OF BURNOUT. DISCUSSES PARAMETRIC
AND ECONOMIC STUDIES, PLUS FABRICATION OF A PROTOTYPE FUEL BUNDLE.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*HEAT TRANSFER AUGMENTATION + *R AND D PROGRAM + BURNOUT HEAT FLUX + CORROSION + ECONOMICS + EURATOM +
FLOW THEORY AND EXPERIMENTS + FRANCE + GERMANY + HEAT TRANSFER EXPERIMENT +
OUT OF PILE LOOPS AND EXPERIMENTS + REACTOR, BWR

18-26589 ALSO IN CATEGORIES 17 AND 5
BANNELLA, R
BEHAVIOR OF GARGILIANO REACTOR CORE IN SIMULATED CYCLE AT INCREASED POWER
ENTE NAZIONALE PER L ENERGIA ELETTRICA, ROME, ITALY
EURAE-1956 + EUR-3766 +. 38 PAGES, SPECIAL REPORT NO. 4, CONTRACT 101-63-11-RDI, NOVEMBER, 1966

USING PLANT COMPUTER, POWER OF 620 MWT (122.46% OF RATED POWER OF 506.3 MWT) WAS STUDIED.
RESULTS INDICATE CORE CAN OPERATE AT THAT LEVEL WITHOUT EXCEEDING THE LIMIT OF THERMAL FLUX
OR BURNOUT RATIO. HOWEVER, IMPROVEMENT IN FUEL ELEMENT REQUIRED. THE PURPOSE OF STUDY WAS
TO FIND THE SHAPE OF LIMITING FUEL PARAMETERS - OTHER COMPONENTS ARE DISREGARDED.

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-26589 *CONTINUED*

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA
22151, \$3.00 COPY, \$0.65 MICROFICHE

*PERFORMANCE LIMIT + *REACTOR POWER + *THEORETICAL INVESTIGATION + EURATOM + GARIGLIANO (BWR) +
HEAT TRANSFER ANALYSIS + POWER UPRATING + REACTOR, BWR

18-26623

ZION AMENDMENT 10-FINANCIAL QUALIFICATION
CONSOLIDATED EDISON COMPANY OF NEW YORK

6 PAGES, JULY 3, 1968. DOCKET 50-295 AND 50-304. TYPE--PWR, MFG--WEST., AE--SGT + LUNDY

PROVIDES REVISED PSAR PAGES FOR VOL. V TO GIVE DIRECT-COST BREAKDOWN FOR ZION 1 AND 2 AND TO
REVIEW BOND SALES FOR COMMONWEALTH EDISON

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

ECONOMICS + REACTOR, BWR + REPORT, PSAR + ZION 1 AND 2 (PWR)

18-26768

ALSO IN CATEGORY 11

RITTER GH

MATERIAL SURVEILLANCE FOR REACTOR VESSEL STUB TUBES

JERSEY CENTRAL POWER + LIGHT CO., MORRISTOWN, N. J.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(29), PAGE 33, (JULY 15, 1968), DOCKET NO. 50-219, TYPE--BWR,
MFG--G.E., AE--BURNS + ROE

(TWX, JULY 5) REGARDING THE SUGGESTION ON PG 2 OF THE JUNE 25 DRL LETTER, WE ARE UNABLE TO
DETERMINE ANY MEANINGFUL INFORMATION (WHICH COULD RESULT FROM PLACING UNCLAD STUB-TUBE
SPECIMENS INSIDE THE VESSEL) BECAUSE THE MATERIAL IS NOW CLAD WITH 308L (MORE RESISTANT TO
INTERGRANULAR CORROSION) AND WOULD NOT BE EXPOSED TO ACTUAL OPERATING CONDITIONS (THERMAL
GRADIENTS, PRESSURE, AND RESIDUAL STRESSES). WE ARE PROCEEDING WITH THE REPAIR ASSUMING THAT
THE PROGRAM WILL NOT BE REQUIRED. MATERIAL SAMPLES ARE AVAILABLE.

*PIPING + *SURVEILLANCE PROGRAM + FAILURE, PIPE + OYSTER CREEK 1 (BWR) + REACTOR, BWR

18-26966

ALSO IN CATEGORY 6

FLUHARTY RG + SIMPSON FB + RUSSELL GJ + MORRIS RH

A PROPOSAL FOR A REPETITIVELY PULSED TEST FACILITY (RPTF)

IDAHO NUCLEAR CORP., IDAHO FALLS

IN-1149 +. 119 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1967

STUDY TO BE COMPLETED BY JULY 1968, DESIGN BY 1971, AND CONSTRUCTION COMPLETION IN 1973.
REACTOR IS A SMALL PLUTONIUM REACTOR (3 TO 10 MW AVERAGE POWER) PULSED BY ROTATING FUEL OR A
CHARGED-PARTICLE NEUTRON SOURCE AT 0 TO 200 PULSES/SEC, WITH POWER PEAKS OF 3000 MW,
PRODUCING NEUTRON FLUX INTENSITY PEAKS OF 10(18TH). ***DESCRIBES REACTOR USEFULNESS AS A
RESEARCH TOOL AND PROGRAM TO DESIGN AND BUILD IT. APPENDIX (A) REVIEWS GENERAL PROPERTIES OF
REPETITIVELY PULSED SYSTEMS, (F) MODERATOR OPTIMIZATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151,
\$3.00 COPY, \$0.65 MICROFICHE

*DESIGN STUDY + *IRRADIATION FACILITY + PLUTONIUM + REACTOR KINETICS + REACTOR, PULSED

18-26972

SALEM AMENDMENT 9

PUBLIC SERVICE ELECTRIC AND GAS

AMENDMENT 9 TO SALEM LICENSE APPLICATION, (DOCKET 50-272 AND 50-311), TYPE--PWR, MFG--WEST., AE--PUBLIC
SERVICE OF N.J. MAY 21, 1968.

PROVIDES REVISED PSAR PAGES AND ANSWERS SEVERAL ORAL QUESTIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA,
22151, \$3.00 COPY, \$0.65 MICROFICHE

AEC QUESTION + REACTOR, PWR + REPORT, PSAR + SALEM 1 AND 2 (PWR)

18-27103

U. OF MO. RESEARCH REACTOR FACILITY HAZARDS SUMMARY REPORT

UNIVERSITY OF MISSOURI, COLUMBIA, MISSOURI

360 PAGES, FIGURES, TABLES, REFERENCES, JULY 1, 1965

DESCRIBES REACTOR WHICH USES U-AL ALLOY FUEL CLAD WITH AL, POWER OF 5 MWT, WITH A 1.5-IN. FLUX
TRAP IN CENTER OF CORE, BE REFLECTOR, AND REFLECTOR CONTROLLED WITH 4 BORAL PLATES. ONE
STAINLESS-STEEL PLATE IS USED AS REGULATING ROD. CONTAINMENT IS POURED CONCRETE WALLS. THE
MCA IS BOILING AND EXPULSION OF STEAM AND WATER, RESULTING IN 10% MELTDOWN AND PARTIAL

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27103 *CONTINUED*

FISSION-PRODUCT RELEASE. DOSAGE WITHOUT IODINE RETENTION BY POOL WATER FOR 2 HR AT 1000 FT IS 0.008 REM DIRECT GAMMA, 0.011 REM CLOUD GAMMA, 1.73 REMS TO THYROID.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. (\$0.25 CENTS/PAGE)

*REPORT, SAR + ACCIDENT, MAXIMUM CREDIBLE (MCA) + DOSE + OFF SITE + REACTOR DESCRIPTION + REACTOR, FLUX TRAP

18-27104

ADDENDUM NO. 1 HAZARDS SUMMARY REPORT
UNIVERSITY OF MISSOURI, COLUMBIA, MISSOURI
135 PAGES, 19 FIGURES, 3 TABLES, FEBRUARY, 1966

ANSWERS 23 AEC QUESTIONS RECEIVED IN LETTER JAN. 5, 1966, AS A RESULT OF APPLICATION FOR UTILIZATION FACILITY LICENSE. ***INDICATES LICENSE SHOULD BE REVISED SO THAT INITIAL FUEL INVENTORY WILL INCLUDE NINE RATHER THAN EIGHT 775-G U-235 ELEMENTS TO PERMIT ONE SPARE. ALSO REQUESTS AUTHORIZATION TO POSSESS UP TO 80 G OF PU-239 AS SEALED NEUTRON SOURCES.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/PAGE)

*AEC QUESTION + *TECHNICAL SPECIFICATIONS + REACTOR, FLUX TRAP + REPORT, SAR

18-27296

ALSO IN CATEGORY 1
BOLSA ISLAND PROJECT CANCELLED
SOUTHERN CALIFORNIA EDISON CO.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 2, (JULY 29, 1968)

AN OFFICIAL AEC STATEMENT SAYS THAT ALTERNATE PLANS FOR A NUCLEAR POWER AND DESALTING PLANT FOR SOUTHERN CALIFORNIA ARE BEING EXAMINED BECAUSE ALL PARTICIPANTS AGREE THAT THE BOLSA ISLAND PROJECT IS NOT ECONOMIC AT \$765 MILLION. PARTICIPANTS AGREED THAT CONCEPT SHOULD BE CONTINUED AND WILL EXPLORE MEANS TO RECONSTITUTE IT ON A MORE ECONOMIC BASIS.

*ECONOMICS + BOLSA ISLAND + REACTOR, DESALINATION

18-27297

ALSO IN CATEGORY 11
OXIDATION OF PRESTRESSING TENDONS AT ROBINSON 2
CAROLINA POWER + LIGHT CO., RALEIGH, N. C.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 27, (JULY 29, 1968), DOCKET 50-261, TYPE--PWR, MFG--WEST., AE--EBASCO

(LETTER, JULY 16) AN UNANTICIPATED MINOR AMOUNT OF OXIDATION WAS FOUND ON THE LOWER SECTION OF VERTICAL PRESTRESSING TENDONS SURFACES. TENDONS ARE SATISFACTORY, BUT CORROSION PROTECTION WILL BE IMPROVED. ATTACHED REPORT DESCRIBES WORK TO DETERMINE CAUSES OF CORROSION, TO VERIFY THAT TENDONS ARE STILL SATISFACTORY, AND TO DESCRIBE THE IMPROVED CORROSION PROTECTION.

*CONCRETE, PRESTRESSED + *CORROSION + *STEEL + CONTAINMENT CONSTRUCTION + CONTAINMENT, CORROSION PROTECTION + OPERATING EXPERIENCE + REACTOR, PWR + ROBINSON 2 (PWR)

18-27298

ALSO IN CATEGORY 11
CONTAINMENT VESSEL CRACKS MAY EXIST AT MILLSTONE
MILLSTONE POINT CO., HARTFORD, CONN.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 28, (JULY 29, 1968), DOCKET 50-245, TYPE--BWR, MFG--G.E., AE--EBASCO

(LETTER, JULY 17) REQUESTS DATA ON 26 ITEMS. COMPLIANCE STATES THAT CRACKS HAVE BEEN FOUND IN WELDS ON INSERT PLATES ON CONTAINMENT VESSELS SIMILAR TO MILLSTONE VESSEL. WE UNDERSTAND THAT YOU BELIEVE THAT SIMILAR CRACKS ARE NOT PRESENT. WE LACK DETAILED INFORMATION TO SUPPORT YOUR POSITION AND THEREFORE REQUEST A DETAILED REPORT.

*CONTAINMENT LINER + *FAULT + *WELDS + MILLSTONE POINT (BWR) + OPERATING EXPERIENCE + REACTOR, BWR

18-27299

ALSO IN CATEGORY 2
SEISMICITY OF VERMONT YANKEE
VERMONT YANKEE NUCLEAR POWER CORP.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(31), PAGE 29 AND 30, (JULY 29, 1968), DOCKET 50-271, TYPE--BWR, MFG--G.E., AE--EBASCO

(LETTER, JULY 10) YOUR LETTER OF MAR. 8, 1968, HAS NOT CLEARED UP MY CONCERN REGARDING SEISMICITY OF VERMONT YANKEE, 4 MILES AWAY. YOUR EXPLANATION OF COMPATIBILITY (BETWEEN NO VERIFIED RECORD OF SEISMIC ACTIVITY WITHIN 45 MILES, AND NO DEMONSTRABLE CONTROLS) IS A PLAY ON WORDS, A DISTINCTION WITHOUT A DIFFERENCE. IT MATTERS NOT WHERE CONTROLS MAY CONCENTRATE EFFECTS IF (AS HAPPENED IN MY HOME 4 MILES AWAY) AN EARTHQUAKE EFFECT IS VIOLENT ENOUGH TO CRACK WALLS AND CEILINGS AND TO CAUSE DOOR TO SPRING OPEN SUDDENLY FOR A LONG TIME THEREAFTER. WHAT PROGRESS HAS BEEN MADE ON PROVIDING ACRS WITH INTERIM GUIDELINES FOR

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27299 *CONTINUED*
REACTOR DESIGN AGAINST EARTHQUAKES.

*EARTHQUAKE ENGINEERING + ACRS + EARTHQUAKE RECORDS + RADIATION, PUBLIC EDUCATION/ACCEPTANCE +
REACTOR, BWR + VERMONT YANKEE (BWR)

18-27333
BILLURIS G + PFLASTERER R + WOLFE B
THE SEFOR EXPERIMENTAL PROGRAM AND ITS INFLUENCE ON REACTOR DESIGN
GENERAL ELECTRIC COMPANY, SUNNYVALE, CALIFORNIA
37 PAGES, 3 FIGURES, 2 TABLES, 19 REFERENCES, FROM THE INTERNATIONAL CONFERENCE ON THE SAFETY OF FAST
NUCLEAR REACTORS, SEPTEMBER, 1967

PRIMARYLY A DESCRIPTION OF ROD OSCILLATOR AND STEP REACTIVITY (NEAR \$1) TESTS, THE FEATURES
INCORPORATED INTO SEFOR AND ITS DATA ACQUISITION SYSTEM, AND THE APPROACH TO ENSURE SAFETY
DURING TRANSIENT TESTS.

*DOPPLER COEFFICIENT + *OSCILLATOR, REACTIVITY + DATA PROCESSING + IN CORE MEASUREMENT + R AND D PROGRAM +
REACTOR, FAST + SAFETY REVIEW + SEFOR (RE)

18-27342
FINANCIAL QUALIFICATIONS
YANKEE ATOMIC POWER COMPANY, BOSTON, MASSACHUSETTS
58 PAGES, FIGURES, TABLES, AMENDMENT 13 TO THE LICENSE APPLICATION FOR THE MAINE YANKEE ATOMIC POWER
STATION, JULY 16, 1968, DOCKET NO. 50-309, TYPE--PWR, MFG--G.E., AE--STONE + WEBSTER

UPDATES THE LICENSE APPLICATION ITSELF, SHOWING OWNERSHIP AND COST DETAILS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

MAINE YANKEE (PWR) + REPORT, PSAR

18-27428 ALSO IN CATEGORY 11
SECTION I - REACTOR VESSEL
NIAGARA MOHAWK POWER CORP.
30 PAGES, 11 FIGURES, 10 TABLES, 3 REFERENCES, PAGE I-1 THROUGH I-30 OF NINE MILE POINT FSAR VOL. IV
(EXHIBIT D-2), SEPTEMBER 1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

INCLUDES APPLICABILITY OF FORMAL CODES AND PERTINENT CERTIFICATIONS, DESIGN ANALYSIS,
INSPECTION AND TEST REPORT SUMMARY (MULTIPLE CRACKING OF WELD AT NOZZLE WAS TRACED TO EXCESS
MANGANESE IN WIRE AND FLUX USED), AND SURVEILLANCE PROGRAM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*FAULT + *PRESSURE VESSEL + *WELDS + CODES AND STANDARDS + EXAMINATION + NINE MILE POINT (BWR) + NOZZLE +
REACTOR, BWR + REPORT, SAR + STRESS ANALYSIS + SURVEILLANCE PROGRAM

18-27429 ALSO IN CATEGORY 11
SECTION II - PRESSURE SUPPRESSION CONTAINMENT
NIAGARA MOHAWK POWER CORP.
14 PAGES, 12 FIGURES, 14 TABLES, 3 REFERENCES, PAGES II-1 THROUGH II-14 OF NINE MILE POINT FSAR VOL. IV
(EXHIBIT D-2), SEPTEMBER 1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

PROVIDES APPLICABILITY OF FORMAL CODES AND PERTINENT CERTIFICATIONS, DESIGN ANALYSIS, AND
INSPECTION AND TEST REPORT SUMMARY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CONTAINMENT, PRESSURE SUPPRESSION + CODES AND STANDARDS + CONTAINMENT DESIGN + EXAMINATION +
MISSILE GENERATION AND PROTECTION + NINE MILE POINT (BWR) + REACTOR, BWR + REPORT, SAR + STRESS ANALYSIS

18-27430 ALSO IN CATEGORY 12
SECTION III - ENGINEERED SAFEGUARDS
NIAGARA MOHAWK POWER CORP.
21 PAGES, 21 FIGURES, 8 REFERENCES, 18 TABLES, PAGES III-1 THROUGH III-21 OF NINE MILE POINT FSAR VOL. IV
(EXHIBIT D-2) SEPTEMBER 1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

DESCRIBES CONTAINMENT AND CORE SPRAY SEISMIC ANALYSIS AND STRESS REPORT, CONTAINMENT SPRAY
SYSTEM, (CONDENSATION EFFECTIVENESS, SPRAY NOZZLE TESTS), AND VENDOR TESTS AND CERTIFICATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27430 *CONTINUED*

*ENGINEERED SAFETY FEATURE + CORE SPRAY + EARTHQUAKE ENGINEERING + EXAMINATION +
HEAT TRANSFER, CONDENSATION + NINE MILE POINT (BWR) + NOZZLE + REACTOR, BWR + REPORT, SAR +
STRESS ANALYSIS + TEST, COMPONENT

18-27431

SECTION IV - EXHIBITS

NIAGARA MOHAWK POWER CORP.

30 PAGES, FIGURES, TABLES, NINE MILE POINT FSAR VOL. IV (EXHIBIT D-2), SEPTEMBER 1967, DOCKET NO. 50-220,
TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

IN ESSENCE, A SERIES OF CHEMICAL ANALYSES, V-NOTCH IMPACT TEST DATA, WELD REPORTS, WELDING
PROCEDURES, ULTRASONIC AND DYE PENETRANT TEST SPECIFICATIONS, MAGNETIC PARTICLE AND HYDROTEST
PROCEDURES (ALL FURNISHED BY COMBUSTION ENGINEERING ON THE REACTOR VESSEL), AND A CERTIFIED
STRESS REPORT ON THE NINE MILE POINT CONTAINMENT VESSEL (BY CHICAGO BRIDGE AND IRON).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CONTAINMENT DESIGN + EXAMINATION + NINE MILE POINT (BWR) + REACTOR, BWR + REPORT, SAR + STRESS ANALYSIS +
TEST, NONDESTRUCTIVE + WELDING

18-27432

ALSO IN CATEGORY 11

SECTION V - CONTAINMENT DESIGN REVIEW

NIAGARA MOHAWK POWER CORP.

9 PAGES, 4 REFERENCES, PAGES V-1 THROUGH V-9 OF NINE MILE POINT FSAR VOL. IV (EXHIBIT D-2), SEPTEMBER
1967, DOCKET NO. 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

REVIEW OF CB AND I CONTAINMENT ASME STRESS REPORT AND OF NOZZLE EXTENSION BELLOWS BY TEMP.
FLEX. TMR CONCLUDES ANALYSIS IS ADEQUATE FOR FUNCTION BUT NOT ADEQUATE TO ESTABLISH ASME III
REQUIREMENTS BECAUSE OF INTERPRETATION OF PARAGRAPH N-414. DISAGREEMENT IS IN STRESS
DISCONTINUITY REGIONS AT VESSEL OPENINGS, WHERE CB AND I USED FORMULA (ALLOWABLE WHERE ONLY
PRESSURE STRESS OCCURS) WHILE TMR BELIEVES AN ANALYSIS IS NEEDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151
\$3.00 COPY, \$0.65 MICROFICHE

*CODES AND STANDARDS + *CONTAINMENT DESIGN + *REVIEW + CONTAINMENT EQUIPMENT HATCH +
CONTAINMENT PENETRATION, PIPE + CONTAINMENT, PRESSURE SUPPRESSION + NINE MILE POINT (BWR) + REACTOR, BWR +
REPORT, SAR + STRESS ANALYSIS

18-27475

ALSO IN CATEGORY 10

ACRS REPORT ON MAINE YANKEE

AEC, DIVISION OF REACTOR LICENSING

4 PAGES, LETTER TO G.T. SEABORG, USAEC, JULY 19, 1968, DOCKET 50-309, TYPE--PWR, MFG--G.E., AE--STONE +
WEBSTER

ACRS APPROVES CONSTRUCTION, CALLING ATTENTION TO PREVIOUS STATEMENTS ON LARGE WATER COOLED
POWER REACTORS. ACRS BELIEVES OFF-SITE ELECTRICAL POWER SUPPLY TO ENGINEERED SAFEGUARDS
SHOULD BE MODIFIED SO NO SINGLE FAILURE WILL PREVENT POWER AVAILABILITY. SUGGESTS REGULATORY
STAFF REVIEW CONTROL ROD DRIVE POWER SUPPLY SINCE DESIGN NOT COMPLETED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*ACRS + *ELECTRIC POWER, ALTERNATE + *EMERGENCY POWER, ELECTRIC + MAINE YANKEE (PWR) + REACTOR, PWR +
REPORT, PSAR + REVIEW

18-27479

AMENDMENT 1 TO QUAD CITIES CONSTRUCTION PERMIT

COMMONWEALTH EDISON COMPANY, IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

CPPR 23 + 24 +. 9 PAGES, JULY 18, 1968, DOCKET 50-254/265, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

CHANGE ONLY REFLECTS OWNERSHIP CHANGE TO 75 PERCENT BY COMMONWEALTH EDISON AND 25 PERCENT BY
IOWA-ILLINOIS GAS AND ELECTRIC CO.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

CONSTRUCTION PERMIT PROCESS + QUAD CITIES 1 AND 2 (BWR) + REACTOR, BWR

18-27488

ALSO IN CATEGORY 5

HEALZER JM + HENCH JE + JANSSEN E + LEVY S

DESIGN BASIS FOR CRITICAL HEAT FLUX CONDITION IN BOILING WATER REACTORS

GENERAL ELECTRIC, SAN JOSE, CALIF.

APED-5286 +. 50 PAGES, FIGURES, TABLES, 11 REFERENCES, SEPTEMBER 1966, DOCKETS 50-259/260, TYPE--BWR,
MFG--G.E., AE--TVA

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27488 *CONTINUED*

A NEW DESIGN BASIS FOR PREDICTING THE CRITICAL HEAT FLUX IN BOILING WATER REACTORS WAS DEVELOPED. THE DESIGN BASIS IS FORMULATED UPON EXTENSIVE TESTS WITH MULTIROD GEOMETRIES WHICH ACCURATELY DUPLICATE THE REACTOR FUEL ASSEMBLY FLOW CONDITIONS. THE TEST RESULTS WERE EMPLOYED TO FORMULATE LIMIT LINES WHICH FALL BELOW THE EXPERIMENTAL DATA. AN ANALYTICAL MODEL TO PREDICT LOCAL FLOW AND STEAM QUALITY IN COMPLEX GEOMETRIES WAS ALSO DEVELOPED. THE MODEL WAS APPLIED TO THE REACTOR FUEL ASSEMBLIES AND TO THE MULTIROD TEST SECTIONS TO SHOW THAT THE TEST SECTIONS SATISFACTORILY MOCKUP THE IN-REACTOR BEHAVIOR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C., 20545 (\$0.25 CENTS/COPY)

*HEAT FLUX, CRITICAL + BROWNS FERRY (BWR) + REACTOR, BWR

18-27502 ALSO IN CATEGORIES 10 AND 11

ACRS REPORT ON RANCHO SECO
UNITED STATES ATOMIC ENERGY COMMISSION
3 PAGES, LETTER TO G.T. SEABORG, USAEC, JULY 19, 1968, DOCKET 50-312, TYPE--PWR, MFG--B.W, AE--BECHTEL

ACRS APPROVES CONSTRUCTION, CALLING ATTENTION TO PREVIOUS STATEMENTS ON LARGE WATER COOLED POWER REACTORS. SUGGESTS FURTHER ANALYSIS OF FAST FLUX DAMAGE TO REACTOR VESSEL, AND ADEQUACY OF VESSEL SURVEILLANCE PROGRAM. ACRS REITERATES BELIEF CONTROL AND PROTECTION INSTRUMENTATION SHOULD BE INDEPENDENT OF COMMON FAILURE MODES. APPLICANT AND REG. STAFF SHOULD REVIEW FOR SYSTEMATIC, NONRANDOM CONCURRENT FAILURES OF REDUNDANT DEVICES NOT CONSIDERED IN THE SINGLE FAILURE CRITERION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C., 20545 (\$0.25 CENTS/COPY)

*ACRS + *FAILURE, SIMULTANEOUS + *PLANT PROTECTIVE SYSTEM + *PRESSURE VESSEL + *REVIEW + BRITTLE FRACTURE + RANCHO SECO (PWR) + REACTOR, PWR + REPORT, PSAR + SINGLE FAILURE CRITERION + SURVEILLANCE PROGRAM

18-27503

BROWNS FERRY 3 CONSTRUCTION PERMIT
TENNESSEE VALLEY AUTHORITY
CONSTRUCTION PERMIT CPPR-48 +. 3 PAGES, JULY 3, 1968, DOCKET 50-296, TYPE--BWR, MFG--G.E., AE--TVA

AUTHORIZES CONSTRUCTION OF A 3293-MWTH BWR, COMPLETION DATE FEB.-OCT. 1972

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/COPY)

*CONSTRUCTION PERMIT PROCESS + BROWNS FERRY 3 (BWR) + REACTOR, BWR

18-27562

COOK AMENDMENT 2
INDIANA + MICHIGAN ELECTRIC COMPANY
300 PAGES, FIGURES, TABLES, AMENDMENT 2 (VOL. IV OF PSAR) TO COOK LICENSE APPLICATION, JUNE 6, 1968, DOCKET 50-315/316

ANSWERS 65 DRL QUESTIONS (IN A LETTER OF MAY 22, 1968), PROVIDES SUPPLEMENTARY INFORMATION (BASED ON DISCUSSIONS WITH AEC STAFF IN APRIL AND MAY), AND PROVIDES CORRECTED PSAR PAGES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, \$3.00 COPY, \$0.65 MICROFICHE

AEC QUESTION + COOK 1 AND 2 (PWR) + REACTOR, PWR + REPORT, PSAR

18-27614 ALSO IN CATEGORIES 10 AND 9

DRL QUESTIONS EMERGENCY SIGNALS AND POWER
U.S. ATOMIC ENERGY COMMISSION
3 PAGES, LETTER TO M. H. PRATT FROM P. A. MORRIS, JULY 31, 1968, DOCKET 50-220, TYPE--BWR, MFG--G.E., AE--NIAGARA MOHAWK

DRL ASKS 7 SPECIFIC QUESTIONS. (1) ABILITY OF OFFSITE POWER, WITH A FAULT IN OUTSIDE SYSTEM, TO SAFELY SHUTDOWN PLANT. (2) ABILITY OF OFFSITE POWER TO SATISFY CRITERION 39 DESPITE 2 MIN DISCONNECT DELAY. (3) DC POWER FOR SWITCHYARD. (4) DESIGN AGAINST ELECTRICAL CABLE FIRE. (5) CONSEQUENCES OF LOSS OF STATION AIR OR INSTRUMENT AIR. (6) DIESEL START FROM SIGNALS OTHER THAN LOW VOLTAGE, E.G., UPON COOLANT INJECTION. (7) DISCUSS ADEQUACY OF CORE SPRAY ACTUATION SIGNALS. DISCUSS LACK OF DIVERSITY FOR ISOLATION VALVE ACTUATION.

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

*PLANT PROTECTIVE SYSTEM + ACCIDENT, LOSS OF POWER + AEC QUESTION + ELECTRICAL CONDUCTION + FIRE + NINE MILE POINT (BWR) + PNEUMATIC SYSTEM + REACTOR, BWR

18-27615 ALSO IN CATEGORIES 17 AND 2

ACRS REPORT ON ZION 1 AND 2

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27615 *CONTINUED*
U.S. ATOMIC ENERGY COMMISSION
8 PAGES, LETTER TO G.T. SEABORG (AEC PRESS RELEASE L-178), AUGUST 24, 1968, DOCKETS 50-295/304, TYPE--PWR,
MFG--WEST., AE--SGT + LUNDY

ZION IS LARGEST REACTOR TO DATE IN A RELATIVELY HIGH POPULATION DENSITY. REACTOR CAVITY FLOODING FOLLOWING A LONGITUDINAL SPLIT IN THE REACTOR VESSEL MAY BE INSTALLED FOLLOWING STUDY OF VESSEL FAILURE PROBABILITY FROM THERMAL SHOCK FOLLOWING CORE FLOODING ACTION. CONTROL AND SAFETY SIGNALS SHOULD BE INDEPENDENT. CONTAINMENT SPRAY SHOULD HAVE A FULL TEST. *** IN 3 PAGES OF REMARKS BY OKRENT, HE DISCUSSES VESSEL SPLIT PROBLEM. RECOMMENDS (FOR HIGH POPULATION DENSITIES) ADDITIONAL DESIGN CONSERVATISM AND QUALITY ASSURANCE, WELL DEFINED R AND D FOR SAFETY ISSUES NOT RESOLVED AT CONSTRUCTION PERMIT STAGE, EXTRA MARGIN IN ENGINEERED SAFETY FEATURES IN LIEU OF A DEMONSTRATION UNDER ACCIDENT CONDITIONS, AND MORE STUDY TO REDUCE PROBABILITY OF SMALL ACCIDENTAL RELEASES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, PRESSURE VESSEL + ACRS + CONTAINMENT SPRAY + CORE REFLOODING SYSTEM + REACTOR, PWR + REPORT, PSAR + REVIEW + SAFETY MARGIN + TEST, PREOPERATIONAL + TEST, PROOF + THERMAL MECHANICAL EFFECT + ZION 1 AND 2 (PWR)

18-27620 ALSO IN CATEGORIES 16 AND 5
RUSSELVILLE SUPPLEMENT 6 - TORNADO ANALYSIS
ARKANSAS POWER AND LIGHT COMPANY
8 PAGES, 12 REFERENCES, PAGES 1-8 OF SUPPLEMENT 6 TO THE APPLICATION FOR RUSSELVILLE LICENSES (DOCKET 50-313) JULY 11, 1968

PROVIDES REVISED PSAR PAGES AND (RESPONDING TO INFORMAL DRL QUESTIONS) JUSTIFICATION OF TORNADO DESIGN CRITERIA AND BEHAVIOR OF SPENT FUEL POOL DURING TORNADO. DESCRIBES BEST OBSERVATIONAL DATA FOR WIND VELOCITY (USE 300 MPH BROAD FRONT WIND INSTEAD OF 200 MPH VORTEX), PRESSURE DROP (1.7 PSI/4 SEC), WATER LOSS FROM POOLS AND WELLS (2 FT MOUND OF WATER APPEARS FROM LOW PRESSURE, SPRAY AND SUCKING DISPLACE WATER, SURVEY REQUESTED IN PILGRIM STATION REVIEW WILL BE COMPLETED SEPT. 1968 BUT SO FAR RESULTS NEGATIVE), AND MISSILES (ONLY LIGHT WEIGHT MISSILES WOULD REACH REFUELING FLOOR 50 FT ABOVE GRADE, MISSILES FROM REFUELING FLOOR ARE MOSTLY SIDING AND HAND CARTS).

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*DESIGN CRITERIA + *DESTRUCTIVE WIND + *FUEL STORAGE + BIBLIOGRAPHY + CONTAINMENT DESIGN + MISSILE GENERATION AND PROTECTION + PRESSURE TRANSIENT + PRESSURE, SUBATMOSPHERIC + REACTOR, PWR + REPORT, PSAR

18-27745
BROWNS FERRY 3 AMENDMENT 4
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA, TENNESSEE
33 PAGES, FIGURES, TABLES, APRIL 5, 1968, DOCKET NO. 50-296, TYPE--BWR, MFG--G.E., AE--TVA

INFORMATION IN RESPONSE TO AEC COMMENTS OF MARCH 28, 1968, INCLUDES (2) PUMP NPSH FOLLOWING LOSS OF COOLANT ACCIDENT, (3) WATERLIGHT SEALING OF SAFETY FEATURE PUMP ROOMS, (4) DIFSEL GENERATOR LOADS, OPERATION AND LOAD REJECTION, (5) SEISMIC DESIGN OF THE TORUS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*AEC QUESTION + BROWNS FERRY 3 (BWR) + REACTOR, BWR + REPORT, PSAR

18-27832
BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2 PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME I
CAROLINA POWER + LIGHT COMPANY
450 PAGES, FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

TWO 2436 MWTH/847 MWE BWRs 18 MILES S OF WILMINGTON, N. C., ON CAPE FEAR, FOR 1973 AND 74 OPERATION. 105% TURBINE BYPASS AND SCRAM OF 10% OF THE RODS IMPROVES LOAD REJECTION. VOLUME I CONTAINS SECT. II (SITE AND ENVIRONS), III (REACTOR CORE), IV (REACTOR COOLANT SYSTEM), V (PLANT STRUCTURE AND CONTAINMENT), AND VI (ENGINEERED SAFETY FEATURE).

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

BRUNSWICK (BWR) + REACTOR, BWR + REPORT, PSAR + SITING, REACTOR

18-27833 ALSO IN CATEGORIES 2 AND 16
BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2, PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME III
CAROLINA POWER + LIGHT COMPANY
275 PAGES, FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

FOUR APPENDICES - (A) GEOLOGICAL ANALYSIS, FOUNDATION ENGINEERING, SEISMIC DESIGN CRITERIA, SEISMIC DESIGN RESPONSE SPECTRA, PRELIMINARY MARINE BIOLOGY AND OCEANOGRAPHY, STORM TIDES, AND WILMINGTON 1959-63 WINDIF WIND DIFFUSION STUDY. THEN FOLLOWS THE USUAL - (B) JET PUMP DEVELOPMENT, (C) CORE SPRAY TEST PROGRAM, AND (D) COMPARATIVE EVALUATION WITH AEC DESIGN

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27833 *CONTINUED*

CRITERIA (A LISTING OF APPROPRIATE PSAR SECTIONS FOR EACH CRITERIA).

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

*AEC DESIGN CRITERIA + *EARTHQUAKE ENGINEERING + BRUNSWICK (BWR) + REACTOR, BWR + REPORT, PSAR

18-27834 ALSO IN CATEGORIES 16 AND 5

BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 + 2, PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME II
CAROLINA POWER + LIGHT COMPANY

400 PAGES FIGURES, TABLES, JULY 1968, DOCKET 50-324/325

VOL. II CONTAINS SECT. VII (INSTRUMENTATION AND CONTROL - INCLUDES AUTO LOAD DISPATCH FROM RALEIGH, N. C.), VIII (ELECTRICAL POWER - 4 DIESELS), IX (RAD WASTE), X (AUXILIARIES), XI (POWER CONVERSION), XII (PLANT OPERATIONS - PERSONNEL WILL BE AVAILABLE FROM ROBINSON 2), XIII (TECH. SPECS.), AND XIV (SAFETY AND ACCIDENT ANALYSIS). 40 PAGES DESCRIBE THE OFFSITE DOSE CALCULATION MODEL USED IN RADOS COMPUTER CODE, ISOTOPE FRACTIONS RELEASED FROM FUEL IN EXPERIMENTS AND IN THESE ACCIDENTS, AND PROVIDES BOTH A CONSERVATIVE BASE CASE AND A BEST ESTIMATE (MARGINS RANGE FROM FACTORS OF 8400 TO 16,700), 6 PAGES PROVIDE A SENSITIVITY ANALYSIS AND A SPECIAL COMPARISON WITH TID 14844 AND RECENT AEC-DRL SAFETY EVALUATION.

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

*DOSE + *OFF SITE + ACCIDENT MODEL + BRUNSWICK (BWR) + COMPARISON, THEORY AND EXPERIENCE + ERROR ANALYSIS + REACTOR, BWR + REPORT, PSAR + SAFETY EVALUATION + STAFFING, TRAINING, QUALIFICATION

18-27836 ALSO IN CATEGORIES 1 AND 2

DEPT. OF INTERIOR SPEAKS ON THERMAL POLLUTION

DEPT. OF INTERIOR, WASHINGTON, D. C.

6 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(34), PAGE 1-6, (AUGUST 19, 1968)

J. I. BREGMAN (DEPUTY ASST. SEC. OF INTERIOR FOR WATER POLLUTION CONTROL) IN A KEYNOTE ADDRESS AT A NATIONAL SYMPOSIUM ON THERMAL POLLUTION AT VANDERBILT U NOTED THE ELECTRIC POWER INDUSTRY IS THE PRIMARY SOURCE OF THERMAL POLLUTION. CITED 4 SOLUTIONS (INCREASED EFFICIENCY IN GENERATION AND DISSIPATION, DISPOSAL TO AIR, AND PRODUCTIVE USE) URGED USE OF WASTE HEAT PRODUCTIVELY. URGED DEPT. OF INTERIOR CERTIFICATION OF A PLANT DISPOSAL MEANS AND LIMITS.

*THERMAL POLLUTION + REGULATION, GENERAL

18-27840 ALSO IN CATEGORIES 17 AND 1

EVESR TECHNICAL SPECIFICATION - SECTION IX - G OPERATIONAL PRINCIPLES AND REQUIREMENTS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

PAGE 37 OF AMENDMENT 11 (TECHNICAL SPECIFICATION) TO THE EVESR LICENSE APPLICATION JUNE 7, 1963, DOCKET 50-183

IF IT IS DISCOVERED THAT A SYSTEM IS INOPERABLE OR DOES NOT MEET ITS SPECIFIED CONDITIONS OF OPERATION WHILE IN AN OPERATING MODE WHERE THE SYSTEM IS REQUIRED BY THESE TECHNICAL SPECIFICATIONS TO BE OPERABLE OR TO MEET PARTICULAR CONDITIONS OF OPERATION, IMMEDIATE STEPS WILL BE TAKEN TO CORRECT THE CONDITION PROMPTLY OR TO PLACE THE REACTOR IN A MODE FOR WHICH OPERABILITY OF THE PARTICULAR SYSTEM IS NOT REQUIRED. SUCH PERIODS OF OPERATION AS FALL UNDER THE REQUIREMENTS OF THIS PARAGRAPH WILL NOT BE CONSIDERED A VIOLATION OF THESE TECHNICAL SPECIFICATIONS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *TECHNICAL SPECIFICATIONS + EMERGENCY PROCEDURE + INCIDENT, EQUIPMENT + REACTOR, INTERNAL SUPERHEAT + REACTOR, POWER + REACTOR, RESEARCH + SAFETY PRINCIPLES AND PHILOSOPHY + EVESR (ISR)

18-27841 ALSO IN CATEGORIES 2 AND 1

EASTON BWR PROJECT CANCELLED DUE TO THERMAL EFFECTS CRITERIA

NIAGARA MOHAWK POWER CORPORATION

1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(33), (AUGUST 12, 1968), DOCKET 50-300, TYPE--BWR, MFG--G.E.,
AE--STONE + WEBSTER

DIFFICULTIES AND DELAYS IN SECURING REGULATORY APPROVAL FOR THE EASTON SITE HAVE LEAD TO ITS CANCELLATION. DECISIVE FACTOR WAS CONTINUOUS SITUATION WHEREBY STATE HEALTH AGENCIES COULD NOT MAKE UP THEIR MIND AS TO THERMAL EFFECTS CRITERIA. NIAGARA MOHAWK WILL PARTICIPATE IN AN OIL FIRED PLANT READY IN LATE 1971. NY STATE POWER AUTHORITY WILL ASSUME THE CONTRACT, AND BUILD THE PLANT NEXT TO THE NINE MILE POINT PLANT, WITH NIAGARA MOHAWK TO OPERATE THE PLANT BEGINNING IN 1973.

*CONSTRUCTION PERMIT PROCESS + *REGULATION, STATE + *THERMAL POLLUTION + EASTON (BWR) + REACTOR, BWR + SITING, REACTOR + STATE PROGRAM

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27845 ALSO IN CATEGORIES 17 AND 9
DRL QUESTIONS ON NINE MILE POINT CONTROL RODS
U.S. ATOMIC ENERGY COMMISSION
2 PAGES, LETTER TO M.H. PRATT FROM P.A. MORRIS, AUGUST 13, 1968, DOCKET 50-220, TYPE--BWR, MFG--G.E.,
AE--NIAGARA MOHAWK

COMPLIANCE SAYS DESIGN MODIFICATIONS HAVE BEEN MADE TO CONTROL ROD DRIVE HYDRAULIC LINE
PENETRATION IN CONTAINMENT. THIS SHOULD BE REPORTED WITH BASES AND SAFETY EVALUATION. ASKS
FOR SPECIFIC INFORMATION ON WELD REPAIR BETWEEN STUB TUBES AND ROD DRIVE HOUSINGS, (1) BASES
FOR CONTOURING SHOP WELDS, (2) FIELD WELDS DEPOSIT OF METAL ON SIDE OF TUBES, AND (3) PLANS
FOR CLEANING AND HYDROTESTING VESSEL, PLUS DETAILED RECORDS OF DYE CHECKS PRIOR TO HYDROTEST.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*CONTAINMENT PENETRATION, PIPE + *WELDING + CONTROL ROD DRIVE + INSPECTION AND COMPLIANCE +
NINE MILE POINT (BWR) + PRESSURE VESSEL + REACTOR, BWR + TEST, NONDESTRUCTIVE

18-27902 ALSO IN CATEGORIES 17 AND 1
RAMEY JT
THE PDQS OF NUCLEAR POWER PLANT LICENSING
ATOMIC ENERGY COMMISSION
37 PAGES, 14 REFERENCES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

REVIEWS HISTORY OF REGULATORY PROCESS, THEN CONCENTRATES ON (1) DEVELOPMENT OF MANAGEMENT
KNOW-HOW, BY UPGRADING UTILITY PERSONNEL AND HIRING NEW GRADUATES. (2) THE AEC LICENSING
PROCESS, TOO LITTLE PREPARATION BY UTILITIES IN A RACE TO GET THEIR PAPERWORK IN FIRST. (3)
PUBLIC UNDERSTANDING OF NUCLEAR POWER, DISQUIETING RESULTS OF A FEW UTILITIES WHO DID NOT DO
THEIR HOMEWORK WELL, SHOULD EXPECT OUTAGES DURING INITIAL OPERATION. (4) ENGINEERING
STANDARDS AND QUALITY ASSURANCE. AMONG PROBLEMS MENTIONED WERE OPTIMUM CONSTRUCTION
SCHEDULING, BACK FIT. APPENDIX A IS AEC PROGRAM FOR TRAINING UTILITY STAFF AND MANAGEMENT.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE, NEW YORK, N.Y. 10022

*CONSTRUCTION PERMIT PROCESS + *REACTOR, POWER + *STAFFING, TRAINING, QUALIFICATION + QUALITY CONTROL +
RADIATION, PUBLIC EDUCATION/ACCEPTANCE + REGULATION, AEC

18-27903 ALSO IN CATEGORY 17
RAMEY JT
APPENDIX A, AEC PROGRAM FOR TRAINING UTILITY MANAGEMENT AND STAFF
ATOMIC ENERGY COMMISSION
2 PAGES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

IN VIEW OF CONTINUING RAPID GROWTH OF NUCLEAR POWER, AND UTILITIES NOT HAVING PRIOR NUCLEAR
EXPERIENCE, AEC URGES UTILITIES DEVELOP TECHNICAL AND MANAGERIAL INHOUSE CAPABILITY.
RESPONSIBILITY RESTS WITH INDUSTRY. OPERATOR TRAINING NOT A PROBLEM, EXCEPT FOR PROPER TYPE
REACTOR TO GAIN EXPERIENCE ON. AEC ACTIONS INCLUDE (A) ESTABLISHMENT OF SUGGESTED STANDARDS
OF TECHNICAL COMPETENCE, (B) DESCRIPTION OF A NUCLEAR TRAINING AND ORIENTATION PROGRAM, (C)
STRENGTHENING FACILITIES FOR OPERATOR TRAINING, (D) REEMPHASIS OF EXISTING WORK EXPERIENCE
TRAINING PROGRAM AT AEC SITES. (E) EXPANSION OF UNIVERSITY COURSES.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE., NEW YORK, N.Y. 10022

*STAFFING, TRAINING, QUALIFICATION + ADMINISTRATIVE CONTROL + REACTOR, BWR + REACTOR, POWER +
REACTOR, PWR + SAFETY REVIEW

18-27904 ALSO IN CATEGORIES 17 AND 1
JOSLIN M
SCME OBSERVATIONS ON THE REGULATORY PROCESS
ATOMIC ENERGY COMMISSION
7 PAGES, REMARKS AT THE AIF WORKSHOP ON POWER REACTOR LICENSING, FEBRUARY 12, 1968

NEWS OF FAILURES ALERTS THE OTHER FELLOW TO PROFIT BY THE EXPERIENCE OF OTHERS. DISCUSSES
EVOLUTION OF UTILITY-REGULATORY RELATIONS. AVOID DEPENDENCE ON SUPPLIER, UTILITY IS ALONE
RESPONSIBLE TO AEC. DRESDEN 3 WAS GIVEN EXTENSIVE CORE COOLING SYSTEMS, WHICH COULD HAVE
BEEN DONE AT LOWER COST IF THOUGHT OUT IN ADVANCE. URGES UTILITIES TO EDUCATE AEC ON SPECIAL
FEATURES OF UTILITY ECONOMICS. NOTES NEED FOR UTILITIES OWN EXPERTS AND TOP MANAGEMENT
INVOLVEMENT. CONSIDERS MOST SIGNIFICANT FOR UNBIASED COOPERATION.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVE., NEW YORK, N.Y. 10022

*OPERATING EXPERIENCE SUMMARY + *REGULATION, AEC + CODES AND STANDARDS + CORE SPRAY + DRESDEN 3 (BWR) +
ECONOMICS + INFORMATION RETRIEVAL + STAFFING, TRAINING, QUALIFICATION

18-27989 ALSO IN CATEGORIES 17 AND 1

CATEGORY 18
SAFETY ANALYSIS AND DESIGN REPORTS

18-27989 *CONTINUED*
NUCLEAR TRAINING PROGRAMS
BABCOCK AND WILCOX
TRG-68-68 +. 65 PAGES, 3 FIGURES, AUGUST 1968

DESCRIBES B AND W SERVICES AND FACILITIES AT THEIR LYNCHBURG, VA., TRAINING CENTER (CLASSROOMS, PWR SIMULATORS, POOL REACTOR). PROGRAMS AVAILABLE TO ALL UTILITY PERSONNEL INCLUDE, AT MANAGEMENT (2 DAY SEMINAR) AND STAFF LEVEL (48 LECTURE HOURS), PLANT OPERATION LEVEL (5 PHASES - THEORY 3 MO., PWR OBSERVATION 3 MO., PWR TECHNOLOGY 2 MO., PWR OPERATION AT POOL REACTOR AND SIMULATOR 3 MO., AND ON JOB TRAINING AT TECHNICAL STAFF PROGRAMS (I AND C FAMILIARIZATION, BAILEY 855 COMPUTER FAMILIARIZATION, WATER AND RADIOCHEMISTRY, MAINTENANCE, SIMULATOR SIMULATES 83 FAULTS. SUGGESTED PERSONNEL QUALIFICATIONS LISTED.

AVAILABILITY - BABCOCK AND WILCOX, NUCLEAR TRAINING CENTER, P.O. BOX 1260, LYNCHBURG, VA. 24505

*STAFFING, TRAINING, QUALIFICATION + REACTOR, PWR + SIMULATION

18-27996 ALSO IN CATEGORIES 17 AND 1
SCHUMAN SD
DESCRIPTION WESTINGHOUSE REACTOR OPERATOR TRAINING PROGRAM
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
WCAP-7170 +. 45 PAGES, FEBRUARY 1968

INTENDED FOR CONTRACTED PWR STAFF TRAINING. INCLUDES SELECTION HELP (APTITUDE TEST FOR 24 PERSONNEL, ADMINISTERED 6 MONTHS BEFORE START OF TRAINING RESULTING IN SELECTION OF 6 SUPERVISORS, 6 SHIFT SUPERVISORS, AND 10 OPERATORS). PHASE I (11 WEEKS BASIC LECTURE WITH POOL REACTOR OPERATION AT WREC), PHASE II (24 WEEKS SAXTON PWR OPERATING EXPERIENCE AND LICENSE EXAM), PHASE III (6 WEEKS LECTURE SERIES AT WAPD), PHASE IV (ONE YEAR ON-SITE TRAINING FOR OPERATOR LEVEL MATERIAL). LESSON OUTLINES GIVEN FOR EACH LECTURE.

AVAILABILITY - S. D. SCHUMAN, WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER DIVISION, PENN CENTER SITE, P. O. BOX 355, PITTSBURGH, PA. 15230

*STAFFING, TRAINING, QUALIFICATION + REACTOR, POWER + REACTOR, PWR + SAXTON (PWR)

18-27997 ALSO IN CATEGORIES 1 AND 17
COMMENTS FROM BRIEFING CONFERENCE ON NUCLEAR POWER, SEPT. 3-6, 1968
YANKEE ATOMIC ELECTRIC CO.
15 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(37), PAGE 8-11 AND 19-29, (SEPTEMBER 9, 1968)

(ROGER COE) - INNUMERABLE ECONOMIC FORECASTS BUT LITTLE HINDSIGHT INFORMATION. DISCUSSED YANKEE, CONN. YANKEE, AND HUMBOLDT BAY ECONOMICS. (JAMES T. RAMEY) - NOT LIKELY TO SEPARATE REGULATORY FUNCTION FROM AEC FOR AT LEAST 5 YEARS. EVOLUTION EXPECTED. (JOHN B. ANDERSON) - DETAILED DISCUSSION OF LEGISLATIVE BILLS ON SITING, THERMAL EFFECTS, SMALL UTILITY PARTICIPATION, PRACTICAL VALUE. (H. L. PRICE) - SUGGESTED APPROVING A NUCLEAR STEAM SUPPLY SYSTEM OUTSIDE THE CONSTRUCTION PERMIT PROCESS. (P. A. MORRIS) - CONSTRUCTION PERMIT TAKE 12.4 MONTHS BECAUSE OF 12 TECHNICAL AND 4 GENERAL ITEMS NOT SPECIFICALLY TREATED IN PSAR. (R. LOWENSTEM) - LICENSING DELAYS COST APPLICANT ONE MILLION \$/MONTH. HE ADVISES APPLICANT TO PLAN ON 18 MONTHS FOR A CONSTRUCTION PERMIT, ONE YEAR FOR OPERATING LICENSE AFTER FILING FSAR (WHICH TAKES 6 MONTHS TO PREPARE).

AEC QUESTION + CONGRESSIONAL ACTIVITY + CONSTRUCTION PERMIT PROCESS + ECONOMICS + OPERATING LICENSE PROCESS + REACTOR, POWER + REACTOR, WATER + REGULATION, AEC + REPORT, PSAR + REPORT, SAR + RESPONSE TIME

CATEGORY 19
BIBLIOGRAPHIES

19-25465
APPLEBY ER
POWER REACTOR DESIGNS. AN ANNOTATED BIBLIOGRAPHY
BATTELLE MEMORIAL INSTITUTE
BNWL-326(REV.) +. 225 PAGES, MARCH 1968

COMPILATION OF DOMESTIC AND FOREIGN POWER REACTORS. INFORMATION FOR EACH REACTOR INCLUDES NAME, OWNER, DESIGNER, TYPE, POWER, WHEN OPERATIONAL, CHARACTERISTICS OF CORE, OPERATING PARAMETERS, MATERIALS, CONTAINMENT, REMARKS, AND REFERENCES USED TO COMPILE INFORMATION. INCLUDED ARE SYSTEMS FOR NUCLEAR AUXILIARY POWER. (SOME INFORMATION OBTAINED FROM NEWS RELEASES AND TECHNICAL JOURNALS.)

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19-26702 ALSO IN CATEGORY 5
ECKERT ERG + SPARROW EM + IBELE WE + GOLDSTEIN RJ
HEAT TRANSFER BIBLIOGRAPHY
UNIVERSITY OF MINNESOTA
17 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(6), PAGES 823-839 (JUNE, 1967)

AN EXTENSIVE BIBLIOGRAPHY COVERING ALL ASPECTS OF HEAT TRANSFER DURING 1965-66. PREPARED BY THE DEPARTMENT OF MECHANICAL ENGINEERING OF THE UNIVERSITY OF MINNESOTA.

*BIBLIOGRAPHY + *HEAT TRANSFER + BOUNDARY LAYER + FLOW, TWO PHASE + FLUIDIZED BED + HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER, RADIANT + HEAT TRANSFER, TWO PHASE + HOT CHANNEL + HYDRODYNAMIC ANALYSIS + MASS TRANSFER + MEASUREMENT, GENERAL + METAL, LIQUID + THERMODYNAMICS + TRANSPORT PROPERTY + TRANSPORT THEORY

19-26704
NEEF DE
TECHNICAL PUBLICATIONS OF BATTELLE-NORTHWEST DURING 1967
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-700 +. 37 PAGES, MARCH, 1968

THIS REPORT IS ONE OF AN ANNUAL SERIES AND ANNOUNCES FORMAL RESEARCH AND DEVELOPMENT REPORTS AND TECHNICAL ARTICLES PUBLISHED DURING 1967 BY BATTELLE-NORTHWEST. THE REPORTS AND ARTICLES ARE GROUPED BY BROAD SUBJECT CATEGORIES AND ARRANGED ALPHABETICALLY BY AUTHOR WITHIN EACH CATEGORY. AUTHOR INDEX INCLUDED. NEWS RELEASES NOT INCLUDED. OTHER REPORTS IN THIS SERIES ARE BNWL-218 AND BNWL-387.

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19-27042 ALSO IN CATEGORY 1
NUCLEAR SAFETY INFORMATION
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4228 +. 58 PAGES, 5 FIGURES, 3 TABLES, 10 REFERENCES, PAGES 379-436 OF THE NSP ANNUAL PROGRESS REPORT, APRIL, 1968

PROGRESS REPORT, DEALING WITH THE FOLLOWING - NUCLEAR SAFETY INFORMATION CENTER - ORGANIZATION AND SCOPE, COMPUTERIZED OPERATIONS, MEETINGS AND CONFERENCES, STATUS OF REVIEWS AND REPORTS, SUMMARY OF INFORMATION ACTIVITIES. COMPUTER HANDLING OF REACTOR DATA - SAFETY (CHORD-S) - INITIAL DEVELOPMENT OF COMPUTERIZED INFORMATION SYSTEM, PREPARATION OF REACTOR SAFETY INFORMATION FOR COMPUTER PROCESSING, COMPUTER OUTPUT OF REACTOR SAFETY DATA TO USERS OF INFORMATION SYSTEM. NUCLEAR SAFETY (A TECHNICAL PROGRESS REVIEW) - PUBLICATION SCHEDULE, FEATURE ARTICLES. BIBLIOGRAPHY. ORGANIZATION CHART.

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19-27318 ALSO IN CATEGORY 5
LUIKOV AV
HEAT TRANSFER BIBLIOGRAPHY - RUSSIAN WORKS
HEAT AND MASS TRANSFER INSTITUTE OF THE B.S.S.R. ACADEMY OF SCIENCE, 25 PODLESNAYA, MINSK, B.S.S.R., U.S.S.R.
15 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 10(12), PAGES 1875-1889 (DECEMBER 1967)

CATEGORY 19
BIBLIOGRAPHIES

19-27318 *CONTINUED*

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*HEAT TRANSFER + *MASS TRANSFER + *THERMODYNAMICS + *TRANSPORT PROPERTY + BIBLIOGRAPHY + USSR

19-27327

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HEAT TRANSFER BIBLIOGRAPHY - JAPANESE WORKS

DEPARTMENT OF MECHANICAL ENGINEERING, KYOTO UNIVERSITY, JAPAN

2 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(6), PAGES 1069-1070 (JUNE 1968)

A BIBLIOGRAPHY OF JAPANESE HEAT AND MASS TRANSFER LITERATURE PREPARED BY THE DEPARTMENT OF
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HEAT TRANSFER, RADIANT + TRANSPORT PROPERTY

19-27456

ALSO IN CATEGORY 5

ECKERT ERG + SPARROW EM + IBELE WE + GOLDSTEIN RJ

HEAT TRANSFER BIBLIOGRAPHY

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINNESOTA

17 PAGES, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 11(5), PAGES 899-915 (MAY 1968)

AN EXTENSIVE BIBLIOGRAPHY OF HEAT AND MASS TRANSFER LITERATURE. PREPARED BY THE HEAT TRANSFER
LABORATORY OF THE UNIVERSITY OF MINNESOTA.

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HEAT TRANSFER, CONDUCTION + HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER, RADIANT + HOT CHANNEL +
MEASUREMENT, GENERAL + METAL, LIQUID + REACTOR, PEBBLE BED + THERMODYNAMICS + TRANSPORT PROPERTY +
TRANSPORT THEORY

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.

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18-27834				11-27504	17-27338	17-27504	17-27838
COMPUTER CONTROL				CONTAINMENT, PRESSURE RELIEF			
6-27039	7-27039	9-26733	9-26735	11-25954	11-25959		
9-27587				CONTAINMENT, PRESSURE SUPPRESSION			
COMPUTER PROGRAM				7-27037	11-25885	11-25959	11-27429
1-27042	5-25160	5-25884	5-25944	11-27432	18-25885	18-27429	18-27432
5-26609	5-26629	5-26630	5-27044	CONTAINMENT, PRESSURE VENTING			
5-27438	5-27491	5-27707	5-27891	5-27747			
6-25944	6-26630	6-27039	6-27616	CONTAINMENT, SHOCK GENERATION AND PROTECTION			
6-27618	6-27707	7-25944	7-27039	11-25955			
8-25160	9-26755	9-26757	9-26759	CONTAMINATION			
9-26766	9-27519	9-27594	9-27609	3-25976	13-28171	14-27075	15-26362
9-27616	15-27880	16-27880	17-25884	15-26385	15-27075	15-27444	15-27648
17-26592	17-27616	17-27618	18-25884	15-27995	17-26362	17-26385	17-26588
19-27042				17-29171			
COMPUTER PROGRAM, METEOROLOGICAL				CONTROL ROD			
14-28023	16-27291	16-28023		5-27494	9-26412	9-26474	9-25560
COMPUTER, ANALOG				9-27494	9-27500	9-27586	17-26412
6-27039	7-27039	7-27065	9-26720	17-27141	17-27338	17-27494	
9-27519				CONTROL ROD BURNUP			
COMPUTER, DIGITAL				17-26409			
9-27519	9-27587	17-27145		CONTROL ROD CALIBRATION			
CONCENTRATION, GROUND LEVEL				9-28016	9-28018		
16-25668	16-26798	16-27291		CONTROL ROD DRIVE			
CONCENTRATION, ISOPLETH				9-26470	9-26471	9-26736	9-26930
16-26799				9-27343	9-27499	9-27501	9-27845
CONCENTRATION, MAXIMUM				10-27286	17-26930	17-27286	17-27343
14-27914	15-27914	16-26799		17-27845	18-27845		
CONCRETE				CONTROL ROD INTERACTION			
11-25885	11-25955	14-26971	17-26617	9-27594	9-28016		
18-25885				CONTROL ROD PROGRAM			
CONCRETE, PRESTRESSED				6-27616	9-27586	9-27594	9-27616
11-25952	11-25953	11-25958	11-25968	17-27616			
11-27297	18-27297			CONTROL ROD SCRAM MECHANISM			
CONDENSATION				9-26471	9-26474	9-27500	
5-26700	5-27301	7-27033		CONTROL ROD WORTH			
CONGRESSIONAL ACTIVITY				6-29010	9-28016	9-28018	17-28010
1-27997	17-27997	18-27997		CONTROL SYSTEM			
CONSTRUCTION PERMIT PROCESS				9-26562	9-26720	9-26722	9-26723
1-27841	1-27902	1-27997	2-26564	9-26724	9-26725	9-26930	9-26967
2-27841	17-26564	17-27902	17-27997	9-27519	9-27586	9-27598	9-27879
18-26563	18-27479	18-27503	18-27841	9-28017	10-26967	10-27879	17-26930
18-27902	18-27997			CONTROL, GENERAL			
CONTAINMENT AIR LOCK				13-27979			
11-28034	17-28034			CONTROLLER			
CONTAINMENT CONSTRUCTION				6-27842	9-26725	9-27842	17-27842
11-25951	11-25952	11-25953	11-25968	CONVECTIVE BOILING			
11-27297	11-27448	11-27450	18-27297	5-26284	5-26285	5-26286	5-26600
CONTAINMENT DESIGN				5-26604	5-26611	5-26625	5-26635
5-27620	11-27429	11-27432	11-27448	5-26640	5-26772	5-26779	5-26924
11-27450	16-27620	18-27429	18-27431	5-27064	5-27305	5-27330	5-27437
18-27432	18-27620			5-27439	5-27440	5-27459	5-27470

5-27483	5-27546	5-27557	5-27751	DECONTAMINATION SPRAY			
5-27894	5-28538			7-27037			
COOK 1 AND 2 (PWR)				DEFORMATION			
18-27562				5-27651	8-27651		
COOLANT CHEMISTRY				DELAYED NEUTRON			
3-27041	4-27818	4-27819	4-27820	6-27628			
5-26260	6-27616	7-27818	7-27819	DEPOSITION			
7-27820	9-27616	17-27142	17-27345	4-27029	7-27029	7-27033	7-27038
17-27616				7-27066	7-27067	7-27071	12-27283
COOLANT PURIFICATION SYSTEM				14-27023	15-27880	15-28008	16-26798
1-26005	17-26005	17-27142		16-27815	16-27880		
COOLANT QUALITY				DESIGN CRITERIA			
1-25935	1-26005	5-25935	5-26260	1-27435	3-27041	5-27620	7-27093
10-27286	17-25935	17-25935	17-26005	9-26303	9-26512	9-26560	9-26729
17-26588	17-27286	18-25935		9-26730	9-26762	9-27039	10-26512
COOLING, GENERAL				11-25968	12-26303	14-27918	15-27861
5-27629	5-27886	11-25957	11-25958	15-27900	15-27918	16-27620	17-27435
17-27294				18-27620			
COOLING, SHUTDOWN				DESIGN STUDY			
5-27629				3-27877	6-26966	9-26704	9-26708
COPPER				9-26709	9-26736	9-27598	9-27879
4-27028	7-27028			9-27939	9-27941	10-27879	12-27877
CORE COMPONENTS				12-27980	13-27877	13-27878	13-27980
17-26409				15-27828	18-26966		
CORE MELTDOWN				DESTRUCTIVE WIND			
5-27886				5-27620	16-27620	18-27620	
CORE REFLOODING SYSTEM				DEUTERIUM			
2-27615	5-25907	5-27709	12-27709	14-27024	14-27078		
12-28033	17-27615	17-27709	17-28033	DIETARY HABIT			
18-25907	18-27615			15-28042			
CORE SPRAY				DIFFUSION			
1-27904	5-25903	5-25904	5-25907	2-25883	5-27308	5-27324	5-27326
12-25903	12-25904	12-25911	12-27430	7-27036	7-27038	7-27066	7-27093
17-27904	18-25903	18-25904	18-25907	7-27096	14-27024	14-27078	16-25883
18-25911	18-27430	18-27904		18-25883			
CORROSION				DIFFUSION COEFFICIENT			
3-26742	4-27821	4-27822	4-27823	5-27308	5-27315	5-27324	5-27326
5-26586	7-27092	7-27095	8-27092	DILUTION			
10-27286	11-26742	11-27297	12-27285	13-24634	14-24634	17-24634	
13-27018	15-26389	17-26389	17-26742	DIRECT ENERGY CONVERSION DEVICES			
17-26745	17-26790	17-27286	17-27617	19-25465			
18-26302	18-26586	18-27297		DISPERSION			
COUNTER				5-27436	14-27020	14-27024	14-27025
9-26705	9-27581	9-28014	14-27024	DISSOLUTION			
14-27081	15-27081	15-27861	15-27866	13-27017	13-27018	13-28028	
15-27897	15-28008			DNB			
CREEP BEHAVIOR				5-27742	5-27889		
5-27651	8-27651			DOPPLER COEFFICIENT			
CREST				6-25362	6-26746	6-27744	17-26746
2-25164	5-25160	5-25161	5-25162	18-27333			
5-25163	5-25164	5-25165	8-25160	DOPPLER EFFECT			
CRITICAL ASSEMBLY FACILITY				6-27628	6-27743		
15-27865	15-27866			DOSE			
CRITICAL MASS				5-27834	15-27866	16-27834	17-27289
6-26147				18-27103	18-27834		
CRITICALITY EXPERIMENT				DOSE CALCULATION, EXTERNAL			
6-26147	9-28018			4-27859	15-27859	15-27865	15-27880
CRITICALITY SAFETY				15-28042	16-27880		
3-27041	15-27865	19-26784		DOSE CALCULATION, INTERNAL			
CROSS SECTION				4-27466	4-27859	15-27445	15-27859
6-27705	10-27474	11-27474	17-27474	15-27865	15-27868	15-27880	15-28042
CRYOGENICS				16-27880			
17-27287				DOSE MEASUREMENT, EXTERNAL			
CSE				15-27089			
1-26558	5-25160	7-26558	7-27032	DOSE MEASUREMENT, INTERNAL			
8-25160	11-26558			14-27080	14-27874	15-27080	15-27085
CURIUM				15-27086	15-28008	16-27874	
13-28029	17-27142	17-28029		DOSIMETRY, GENERAL			
CYLINDER				9-27581	15-27085	15-27086	15-27089
5-27309				15-27443	15-27828	15-27860	15-27866
DAMAGE				15-27900	15-28008		
5-27805	11-27805	17-26409	17-27141	DOSIMETRY, THERMOLUMINESCENCE			
DAMPING				15-27076	15-27442		
9-26471	9-26474			DOWNREAY (TR)			
DATA PROCESSING				10-27286	17-26408	17-27286	
9-26712	9-26713	9-26732	9-26733	DRAGON (HTGR)			
9-26734	9-27601	14-27075	15-27075	7-27092	8-27092		
15-27897	16-26734	17-26592	18-27333	DRESDEN 2 (BWR)			
DECAY HEAT				17-27145			
3-27041	6-27039	7-27039		DRESDEN 3 (BWR)			
DECOMMISSIONING				1-27904	17-27904	18-27904	
9-28012	17-26565	17-26566	17-27844	DROPLET			
DECONTAMINATION				5-27044	5-27470		
3-26742	4-27027	4-27031	4-27818	DYSPROSIUM			
7-27031	7-27066	7-27067	7-27071	9-26412	17-26412		
7-27818	11-26742	12-27285	13-27288	EARTHQUAKE ENGINEERING			
14-03954	14-27082	15-03954	15-27082	2-27299	2-27833	12-27430	16-27833
17-25981	17-26588	17-26588	17-26742	18-27299	18-27430	18-27833	
17-27142	17-27288			EARTHQUAKE RECORDS			
DECONTAMINATION FACTOR				2-27299	18-27299		
7-27036	7-27037	15-27862		EARTHQUAKE, GENERAL			

3-27041				5-27709	6-26591	9-28012	10-27474
EASTON (BWR)				11-27428	11-27429	11-27474	12-27430
1-27841	2-26564	2-27841	17-26564	12-27709	17-26591	17-27474	17-27617
18-27841				17-27709	18-27428	18-27429	18-27430
EBOR (GCR)				18-27431			
17-26588				EXCURSION, LARGE			
EBR 1 AND 2 (RE)				5-26630	6-26630	6-27628	6-27743
17-26300	17-26301			11-25955			
ECOLOGICAL CONSIDERATION				EXPERIMENT, GENERAL			
14-27023	14-27619	15-27619	17-27619	5-27439	5-27472	5-27494	5-27719
ECONOMIC STUDY				7-27472	9-26570	9-27494	12-27283
13-28025				13-27876	13-27878	13-27978	13-27982
ECONOMICS				13-28025	13-28028	14-27025	15-27897
1-27296	1-27904	1-27997	2-27975	16-28022	17-26570	17-27494	
5-26586	9-26754	9-26967	9-27603	EXPLOSION			
9-27606	9-27879	10-26967	10-27879	5-25161	5-26630	6-26630	11-25955
11-27975	16-27292	17-27904	17-27997	13-27288	17-27288		
18-26101	18-26586	18-26623	18-27296	FABRICATION			
18-27904	18-27997			7-27284	13-27284	13-27288	17-27288
EFFLUENT				17-27617			
13-24634	14-24634	14-27914	15-27019	FAILURE, ADMINISTRATIVE CONTROL			
15-27914	16-27291	16-27292	17-24634	1-26005	9-27938	9-27939	9-27940
ELECTRIC POWER, ALTERNATE				11-26310	13-28167	15-26310	15-26312
10-27475	18-27475			15-26314	15-26321	15-26325	15-26328
ELECTRIC POWER, GENERAL				15-26330	15-26336	15-26337	15-26338
4-27128	9-26967	9-27879	10-26967	15-26353	15-26355	15-26356	15-26357
10-27578	10-27879			15-26366	15-26376	15-26378	15-26384
ELECTRIC POWER, NORMAL				15-26385	15-26387	15-26394	17-26005
9-26570	17-26570			17-26310	17-26312	17-26314	17-26321
ELECTRIC POWER, SHUTDOWN				17-26325	17-26328	17-26330	17-26336
10-25909	12-25909	18-25909		17-26337	17-26338	17-26341	17-26353
ELECTRICAL CONDUCTION				17-26355	17-26356	17-26357	17-26366
9-26512	9-26705	9-26710	9-27597	17-26376	17-26378	17-26384	17-26385
9-27614	10-26512	10-27474	10-27614	17-26387	17-26394	17-28167	
10-27988	11-27474	13-27597	17-26745	FAILURE, CLADDING			
17-27474	17-27988	18-27614		1-26005	5-25904	5-25906	6-26411
ELECTROSTATIC PRECIPITATION				12-25904	17-26005	18-25904	18-25906
7-27071				FAILURE, COMPONENT			
ELK RIVER (BWR)				9-26753	9-26755	9-26756	9-26761
1-26743	3-26742	5-27494	9-27494	9-26765	9-27597	9-27605	9-27606
11-26742	11-26743	11-28034	17-26742	9-27611	9-27613	9-27942	9-27944
17-26743	17-27494	17-28034		12-28033	13-27597	17-28033	
EMERGENCY COOLING CONSIDERATIONS				FAILURE, DESIGN ERROR			
5-25904	5-25907	12-25904	18-25904	9-26570	9-26710	9-26930	17-26570
18-25907				17-26930	17-27141	17-27294	
EMERGENCY POWER, ELECTRIC				FAILURE, EQUIPMENT			
10-25909	10-27475	12-25909	18-25909	1-27840	3-26742	5-27886	9-27344
18-27475				11-26742	12-28169	15-26332	15-26338
EMERGENCY PROCEDURE				15-26379	15-26380	15-26381	15-26382
1-27840	17-27287	17-27345	17-27840	15-26385	15-26392	17-26332	17-26338
18-27840				17-26379	17-26380	17-26381	17-26382
EMERGENCY SYSTEM				17-26385	17-26392	17-26409	17-26588
5-27886	9-27879	10-27879	15-27900	17-26617	17-26742	17-27141	17-27287
ENERGY SOURCE				17-27344	17-27347	17-27622	17-27940
5-27891	6-27628			17-27843	17-28169	18-27840	
ENGINEERED SAFETY FEATURE				FAILURE, FABRICATION ERROR			
2-27975	5-25903	11-27975	12-25903	15-26350	17-26350	17-27617	
12-27430	12-28169	17-28169	18-25903	FAILURE, FATIGUE			
18-27430				11-27040			
ENVIRONMENTAL CONDITION				FAILURE, FUEL ELEMENT			
7-27072	9-27580	9-27610	9-27942	5-25905	6-27143	12-27282	13-27282
14-27020	14-27082	14-28000	15-27082	17-26533	17-26616	17-26738	17-27143
15-27441	19-26784			17-27340	18-25905		
EQUATION OF STATE				FAILURE, FUEL ELEMENT WATERLOGGING			
6-27039	6-27743	7-27039		6-26411	6-27143	17-27143	
EQUIPMENT DESIGN				FAILURE, GENERAL			
5-26624	5-26701	5-26773	5-27057	9-27650	9-27931	17-28168	
5-27595	5-27596	5-27728	7-27449	FAILURE, INSTALLATION ERROR			
9-26512	9-26559	9-26703	9-26722	9-26710			
9-26736	9-26762	9-27583	9-27586	FAILURE, INSTRUMENT			
9-27595	9-27596	9-27598	9-28012	15-26342	17-26342	17-26569	
9-28015	10-26512	16-27292	17-27595	FAILURE, OPERATOR ERROR			
17-27596				11-26310	13-28171	15-26309	15-26310
EQUIPMENT, GENERAL				15-26311	15-26319	15-26325	15-26330
5-26624	5-26701	5-26773	5-27716	15-26333	15-26337	15-26338	15-26340
5-27728	5-27896	13-27018	13-27878	15-26342	15-26344	15-26351	15-26353
15-27828	15-27897			15-26355	15-26356	15-26357	15-26366
ERROR ANALYSIS				15-26375	15-26381	15-26382	15-26383
5-27834	9-27536	9-27938	16-26795	15-26384	15-26387	17-26309	17-26310
16-26796	16-27834	18-27834		17-26311	17-26319	17-26325	17-26330
ETR (TR)				17-26333	17-26337	17-26338	17-26340
12-27285				17-26342	17-26344	17-26351	17-26352
EURATOM				17-26355	17-26356	17-26357	17-26366
1-24694	5-26284	5-26586	5-26589	17-26375	17-26381	17-26382	17-26383
5-27437	5-27546	5-27890	6-26584	17-26384	17-26387	17-26569	17-27898
9-27586	17-26589	18-26586	18-26589	17-28171			
EUROPIUM				FAILURE, PIPE			
9-26412	17-26412			5-27982	11-26768	11-27882	16-26768
EVAPORATION				FAILURE, PRESSURE VESSEL			
5-27896	14-27023			1-26743	2-27615	3-26742	11-26571
EXAMINATION				11-26742	11-26743	11-27040	11-28034

17-26571	17-26742	17-26743	17-27615	15-26368	17-26368	17-27288	17-27474
17-28034	18-27615			18-27614			
FAILURE, SCRAM MECHANISM				FISSION GAS RELEASE			
9-26739	9-26740	9-27343	9-27344	7-27032	7-27096	7-27471	12-27282
9-27621	10-27474	11-27474	17-26569	13-27282			
17-26739	17-26740	17-27141	17-27343	FISSION PRODUCT ACTIVITY, GROSS			
17-27344	17-27474	17-27621		6-27039	7-27039		
FAILURE, SEQUENTIAL				FISSION PRODUCT RELEASE, GENERAL			
5-25905	10-27286	15-26380	17-26380	1-26413	1-26558	5-25944	5-27056
17-27286	17-27287	18-25905		5-27576	6-25944	7-25944	7-26413
FAILURE, SIMULTANEOUS				7-26558	7-27032	7-27033	7-27056
10-27286	10-27502	11-27502	13-28171	9-26716	9-26717	9-26718	11-26413
17-27286	17-28171	18-27502		11-26558	12-27282	12-27283	13-27282
FAILURE, TUBING				17-27576			
5-27882	10-27286	11-27882	17-25981	FISSION PRODUCT RETENTION			
17-27286	17-28030			1-26558	1-27827	5-25944	6-25944
FALLOUT				7-25944	7-26558	7-27033	7-27038
4-27029	7-27029	14-27293	14-27874	7-27999	8-27999	11-25959	11-26558
15-27077	15-28043	16-25668	16-26800	11-27827	17-27827		
16-27293	16-27295	16-27468	16-27835	FISSION PRODUCT TRANSPORT			
16-27874				1-26558	1-27042	3-27041	4-27029
FAST NEUTRON				5-25944	5-27056	5-27886	6-25944
17-26409				6-27039	7-25944	7-26558	7-27029
FAULT				7-27032	7-27033	7-27038	7-27039
11-27298	11-27428	18-27298	18-27428	7-27056	7-27066	11-26558	12-27283
FEDERAL RADIATION COUNCIL				19-27042			
14-27087	15-27087	15-28042		FISSION PRODUCT, AIRBORNE			
FERMI (LMFBR)				1-26558	7-26558	11-26558	
5-27595	5-27596	5-27725	9-27595	FISSION PRODUCT, IODINE			
9-27596	9-28016	17-26408	17-27595	6-25363	7-27034	7-27036	7-27066
17-27596				7-27817	7-27824	7-27825	7-27826
FFTF (TR)				14-27293	16-27293		
9-27582				FISSION PRODUCT, VOLATILE			
FILM BOILING				7-27032			
5-27053	5-27470			FISSION RECOIL			
FILM, LIQUID				7-27038			
5-27301				FLANGE			
FILTER				11-25956	11-25957	13-25956	
7-27069	7-27071	7-27284	13-27284	FLAW			
14-27075	14-27083	15-27075	15-27083	9-28067	9-28068	11-28067	11-28068
15-27900	15-28043			12-28067	12-28068		
FILTER CHARACTERISTICS				FLOW BLOCKAGE			
7-27034				1-25935	5-25903	5-25904	5-25905
FILTER EFFICIENCY				5-25935	12-25903	12-25904	17-25935
7-27034	7-27035	7-27816		17-25935	17-26408	18-25903	18-25904
FILTER INSPECTION				18-25905	18-25935		
7-27816				FLOW CORRELATION			
FILTER INSTALLATION				5-27533			
7-27069	7-27284	13-27284		FLOW DISTRIBUTION			
FILTER MAINTENANCE				5-26454	5-26455	5-26781	5-26782
7-27069				5-26922	5-27469	9-27344	14-27451
FILTER OPERATION				17-27294	17-27344		
7-27069				FLOW ORIFICE			
FILTER QUALITY ASSURANCE STATION				4-27819	4-27820	5-25905	7-27819
7-27816				7-27820	18-25905		
FILTER SAFETY EVALUATION				FLOW STABILITY			
7-27816				5-27325	5-27883	6-26584	
FILTER SPRAY				FLOW THEORY AND EXPERIMENTS			
7-27824	7-27825	7-27826		5-25905	5-26113	5-26115	5-26118
FILTER SYSTEM				5-26260	5-26454	5-26455	5-26586
7-27034	7-27035	7-27069		5-26600	5-26605	5-26607	5-26614
FILTER TEST REQUIREMENT				5-26642	5-26773	5-26923	5-26924
7-27816				5-27052	5-27054	5-27310	5-27325
FILTER THEORY, DIFFUSION				5-27453	5-27469	5-27533	5-27883
7-27070				5-27892	5-28539	6-26584	17-26300
FILTER THEORY, IMPACTION				18-25905	18-26302	18-26586	
7-27070				FLOW, ANNULAR			
FILTER THEORY, INTERCEPTION				5-26118	5-26454	5-26455	5-27884
7-27070				FLOW, AXIAL			
FILTER, ABSOLUTE				5-26187	5-27047	5-27052	5-27054
7-27816				5-27309	5-27740		
FILTER, CASCADE IMPACTOR				FLOW, CROSS			
7-27032	7-27034	7-27035	7-27065	5-26187	5-27052		
7-27068				FLOW, GENERAL			
FILTER, DAMAGED				5-26195	5-27309	5-27325	5-27329
7-28049	7-28050	13-28049	13-28050	5-27469	5-27533	5-27714	5-27890
13-28167	17-28049	17-28050	17-28167	5-27892	5-27896	7-27070	
FILTER, FIBER				FLOW, HIGH SPEED			
7-27070				5-27896			
FILTER, HIGH EFFICIENCY				FLOW, LAMINAR			
7-27816	13-28167	17-28167		5-26113	5-26118	5-26605	5-26781
FILTER, TRAP				5-26921	5-26922	5-27301	5-27308
4-27820	4-27821	7-27820		5-27313	5-27316	5-27325	5-27326
FILTRATION				5-27452	5-27453	5-27454	5-27484
1-26413	7-26413	11-26413		5-27533	5-27883		
FIN				FLOW, MIXING			
5-26701	5-26779	5-27057		5-27054			
FIRE				FLOW, NONNEWTONIAN			
3-26368	4-27029	4-27030	5-27472	5-26118	5-26478	5-27453	5-27892
7-27029	7-27030	7-27472	9-27614	FLOW, TUBE			
10-27474	10-27614	11-27474	13-27288	5-26113	5-26600	5-26607	5-26922

5-26923	5-26929	5-27045	5-27310	14-28007	14-28170	17-24634	17-27986
5-27313	5-27320	5-27329	5-27469	17-28029	17-28049	17-28050	17-28167
5-27486	5-27533	5-27716	5-27881	17-28170			
5-27883				FUEL STORAGE			
FLOW, TURBULENT				1-26005	3-27041	3-27877	5-27620
5-26113	5-26614	5-26632	5-26634	12-27877	13-27877	16-27620	17-26005
5-26636	5-26698	5-26922	5-27045	17-27843	17-28168	18-27620	
5-27046	5-27047	5-27054	5-27060	FUEL, PELLET TYPE			
5-27320	5-27469	5-27533	5-27802	6-26591	17-26591		
5-27881				GAMMA			
FLOW, TWO PHASE				6-26561	7-27817	9-26561	9-26707
5-26454	5-26455	5-26600	5-26607	9-27581	9-28014	17-26301	
5-26611	5-26638	5-26642	5-26702	GAMMA EMITTER			
5-26923	5-27052	5-27059	5-27061	9-26726	14-27024	15-27085	15-27086
5-27064	5-27310	5-27326	5-27456	15-27089	15-27442	15-27443	15-27866
5-27459	5-27469	5-27714	5-27889	15-28008			
5-27894	9-26714	11-25908	12-25908	GARIGLIANO (BWR)			
18-25908	19-26702	19-27456		5-26589	9-28013	17-26589	17-26592
FLOW, VORTEX				18-26589			
5-26642				GAS			
FLUIDIZED BED				5-26928			
5-26702	5-26774	5-27312	5-27456	GAUSSIAN PLUME FORMULA			
5-27545	5-27560	13-27982	19-26702	16-27815			
19-27456				GENERATOR, ENGINE			
FLUORIDE				5-25903	10-25909	10-27286	12-25903
13-27018	13-27878	13-27982		12-25909	17-27286	18-25903	18-25909
FLUX DISTRIBUTION				GEOLOGICAL CONSIDERATION, GENERAL			
6-25987	6-27618	9-28013	9-28018	14-27021	14-27930	14-28000	14-28007
17-25987	17-26592	17-27618		GERMANY			
FLUX, INTEGRATED				3-25976	3-25977	5-25165	5-26586
9-26706	9-26707	9-26709	9-26727	6-26584	18-26586		
9-27583	9-27584	17-27584		GLASS			
FOAM				9-27597	13-27597	14-26971	14-27074
7-27071	13-28025			GLOVE BOX			
FRACTURE TOUGHNESS				11-25956	13-25956	13-26737	13-28171
11-27040				17-26737	17-28171		
FRANCE				GODIVA (FBR)			
5-26185	5-26283	5-26586	9-26473	5-26628			
9-26474	9-26475	9-26559	9-26708	GOLD			
9-26711	9-26712	9-26713	9-26716	15-27995			
9-26719	9-26720	9-26722	9-26727	GRAPHITE			
9-26729	18-26586			6-26746	7-27038	17-26746	17-27129
FRICTION FACTOR				GROSS ALPHA			
5-27533				15-27862			
FUEL BURNUP				GROSS BETA			
5-25906	5-26590	5-27576	6-25987	15-27860			
6-26411	6-26591	6-26621	6-27618	GROSS GAMMA			
7-27096	7-27471	9-27344	10-27286	15-27860			
17-25987	17-26301	17-26590	17-26591	GROUND WATER, GENERAL			
17-26621	17-27286	17-27338	17-27344	14-27930			
17-27576	17-27618	17-27838	18-25906	GUIDE			
FUEL COEFFICIENT				1-28004	13-28004	17-28004	
6-27744				HADDAM NECK (PWR)			
FUEL CONVERSION				6-28010	17-28010		
7-27284	13-27284	13-27288	13-27979	HAFNIUM			
13-28029	17-27288	17-28029		4-27823			
FUEL ELEMENT				HALLAM (LMR)			
1-27827	4-27463	4-27822	5-25903	17-27844			
5-25906	5-25907	5-26590	5-27055	HALOGEN			
5-27651	5-27890	6-27073	6-27143	13-27288	17-27288		
6-27616	7-27096	7-27284	7-27449	HANFORD (PR)			
7-27471	8-27651	9-26740	9-27616	17-26409			
11-27827	12-25903	13-27284	13-27288	HANFORD SITE			
17-26301	17-26590	17-26740	17-27143	12-27285	13-27978		
17-27288	17-27616	17-27617	17-27827	HARWELL			
18-25903	18-25906	18-25907		12-27875	13-27875		
FUEL ELEMENT CLUSTER				HAZARDS ANALYSIS			
5-26187	5-26285	5-26481	5-26614	4-27859	5-26188	5-27647	6-27647
5-27047	5-27054	5-27714	5-27719	14-27080	15-27080	15-27859	15-27917
5-27890	7-27449			15-27977			
FUEL EXPANSION COEFFICIENT				HEALTH PHYSICS TRAINING			
6-27744				1-27856	14-27855	15-27331	15-27855
FUEL HANDLING				15-27856	15-27900	15-27976	15-27990
3-27041	3-27877	6-26621	9-26740	16-27331	17-27331	17-27855	17-27856
12-27877	13-27877	17-26301	17-26621	17-27986	17-27990	17-28001	
17-26740	17-27839			HEAT EXCHANGER			
FUEL HANDLING MACHINE				5-26624	5-26701	5-26773	5-27048
3-27424	3-27425	7-27449	9-26475	5-27057	5-27473	5-27716	5-27884
17-26738				10-27286	17-26409	17-26790	17-27286
FUEL INTEGRITY				17-27844	17-28030		
5-25906	7-27093	7-27096	18-25906	HEAT FLUX, CRITICAL			
FUEL MELTDOWN				5-25004	5-26186	5-26604	5-27061
5-26631	5-27719	5-27725	7-27033	5-27488	5-27546	5-27748	5-27884
17-26300	17-26408	17-27289		5-27889	5-27894	17-25884	18-25884
FUEL REPROCESSING				18-27488			
3-25973	6-25946	7-27284	7-28049	HEAT FLUX, DRYOUT			
7-28050	12-27875	13-24634	13-27017	5-26604	5-27061	5-27889	
13-27018	13-27284	13-27875	13-27876	HEAT GENERATION, INTERNAL			
13-27878	13-27978	13-27979	13-27982	5-26627	5-27884	5-27891	
13-28025	13-28028	13-28029	13-28049	HEAT PIPE			
13-28050	13-28167	13-28170	14-24634	5-26608	5-26776		

HEAT TRANSFER				5-26922	5-27045	5-27048	5-27049
4-27579	5-25163	5-25165	5-25944	5-27055	5-27057	5-27060	5-27309
5-26113	5-26114	5-26116	5-26118	5-27312	5-27313	5-27315	5-27317
5-26186	5-26187	5-26188	5-26189	5-27320	5-27327	5-27329	5-27437
5-26260	5-26478	5-26481	5-26606	5-27452	5-27453	5-27483	5-27484
5-26608	5-26624	5-26627	5-26632	5-27486	5-27547	5-27560	5-27742
5-26633	5-26634	5-26636	5-26637	5-27748	5-27802	5-27881	5-27888
5-26640	5-26641	5-26698	5-26700	8-27998	19-27327		
5-26701	5-26702	5-26772	5-26774	HEAT TRANSFER, GAS			
5-26775	5-26776	5-26778	5-26921	5-26189	5-26606	5-27481	5-27482
5-26922	5-26924	5-26926	5-26927	5-27484			
5-26928	5-27045	5-27046	5-27048	HEAT TRANSFER, NATURAL CONVECTION			
5-27049	5-27053	5-27057	5-27060	5-26284	5-26478	5-26606	5-26625
5-27061	5-27301	5-27302	5-27305	5-26698	5-26701	5-26702	5-26781
5-27312	5-27313	5-27315	5-27316	5-27316	5-27453	5-27454	5-27456
5-27318	5-27320	5-27321	5-27327	5-27483	5-27742	5-27748	5-27895
5-27329	5-27330	5-27453	5-27454	19-26702	19-27456		
5-27455	5-27456	5-27457	5-27458	HEAT TRANSFER, RADIANT			
5-27470	5-27473	5-27480	5-27481	5-26606	5-26702	5-26927	5-26928
5-27482	5-27483	5-27484	5-27485	5-27306	5-27327	5-27454	5-27455
5-27486	5-27491	5-27545	5-27546	5-27456	5-27480	5-27482	5-27547
5-27547	5-27560	5-27576	5-27716	19-26702	19-27327	19-27456	
5-27740	5-27741	5-27802	5-27803	HEAT TRANSFER, SUPERCRITICAL			
5-27887	5-27888	5-27890	5-27892	5-27322	5-27330	5-28538	
5-27894	5-27895	5-28538	6-25944	HEAT TRANSFER, TWO PHASE			
6-26411	6-27579	7-25944	9-27579	5-26606	5-26702	5-27052	5-27059
17-27294	17-27576	19-26702	19-27318	5-27061	5-27064	5-27305	5-27312
19-27327	19-27456			19-26702			
HEAT TRANSFER ANALYSIS				HEAVY WATER			
5-26114	5-26116	5-26118	5-26186	6-26721	9-26721	17-27141	
5-26187	5-26188	5-26189	5-26481	HEIGHT OF RISE			
5-26589	5-26608	5-26609	5-26611	16-27291			
5-26627	5-26637	5-26640	5-26698	HELIUM			
5-26700	5-26775	5-26776	5-26780	5-27802	7-27096		
5-26781	5-26782	5-26922	5-26927	HFBR (RR)			
5-26928	5-26929	5-27044	5-27045	6-26721	9-26721	17-26409	
5-27046	5-27048	5-27049	5-27064	HFIR (FTR)			
5-27302	5-27309	5-27313	5-27316	6-26561	9-26437	9-26561	17-27142
5-27320	5-27321	5-27452	5-27453	17-27854			
5-27454	5-27455	5-27457	5-27458	HIGH TEMPERATURE			
5-27470	5-27480	5-27482	5-27491	3-27041	4-27822	4-27823	5-25907
5-27560	5-27647	5-27740	5-27741	5-26116	5-26633	7-27093	7-27095
5-27803	5-27887	5-27889	5-27890	9-26705	9-26968	9-27580	17-26616
5-27892	6-27647	17-26589	18-26589	17-27294	18-25907		
HEAT TRANSFER AUGMENTATION				HOT CELL			
5-26586	18-26586			6-26591	6-26591	12-27980	12-27981
HEAT TRANSFER COEFFICIENT				13-27979	13-27980	13-27981	14-27918
5-26774	5-26778	5-27060	5-27312	15-27918	17-26591	17-26591	
5-27436	5-27545	5-27802	12-25911	HOT CHANNEL			
18-25911				5-26481	5-26605	5-26632	5-26635
HEAT TRANSFER CORRELATION				5-26640	5-26702	5-27052	5-27452
5-26114	5-26186	5-26478	5-26606	5-27456	5-27557	5-27714	5-27740
5-26772	5-26773	5-26922	5-26926	5-27741	5-27890	19-26702	19-27456
5-26929	5-27045	5-27059	5-27061	HOT CHANNEL ANALYSIS			
5-27312	5-27319	5-27454	5-27481	5-27452			
5-27545	5-27546	5-27802	5-27895	HUMBOLT BAY (BWR)			
HEAT TRANSFER EXPERIMENT				17-27434	17-27478		
5-26478	5-26481	5-26506	5-26606	HUMIDITY			
5-26608	5-26634	5-26699	5-26700	7-27034			
5-26775	5-26779	5-27045	5-27053	HYDRAULIC EFFECT			
5-27055	5-27060	5-27305	5-27306	9-26474			
5-27314	5-27319	5-27322	5-27330	HYDRIDE			
5-27459	5-27470	5-27473	5-27481	5-25906	17-26409	18-25906	
5-27483	5-27484	5-27485	5-27486	HYDRODYNAMIC ANALYSIS			
5-27545	5-27560	5-27726	5-27742	5-26285	5-26605	5-26609	5-26702
5-27748	5-27802	5-27881	5-27894	5-26924	5-27557	5-27714	19-26702
5-28538	18-26586			HYDROGEN			
HEAT TRANSFER, BOILING				5-27883	7-27037	7-27095	7-27096
5-25884	5-26284	5-26284	5-26285	17-27287			
5-26286	5-26600	5-26604	5-26606	HYDROLOGICAL CONSIDERATION, GENERAL			
5-26625	5-26640	5-26779	5-26780	14-27020	14-27021	14-27024	14-27078
5-26924	5-26926	5-27053	5-27059	14-27930	14-28000	14-28007	
5-27064	5-27322	5-27330	5-27437	ICRP			
5-27438	5-27439	5-27440	5-27459	13-27018	15-28042		
5-27470	5-27483	5-27485	5-27557	IDAHO FALLS			
5-28538	8-27998	17-25884	18-25884	12-27285			
HEAT TRANSFER, CONDENSATION				IGNITION			
5-26606	5-26700	5-26929	5-27044	5-27472	7-27035	7-27472	
5-27314	5-27315	5-27319	12-27430	IGNITION TEMPERATURE			
18-27430				5-27472	7-27472		
HEAT TRANSFER, CONDUCTION				IMPACT PROPERTY			
5-26116	5-26118	5-26606	5-26702	1-26558	3-27427	5-27494	7-26558
5-26775	5-26776	5-26778	5-26927	9-27494	11-26558	17-27494	
5-27321	5-27327	5-27456	5-27457	IMPACT SHOCK			
5-27740	5-27803	19-26702	19-27327	3-27427			
19-27456				IN CORE MEASUREMENT			
HEAT TRANSFER, CONVECTION				9-26473	9-26706	9-28013	18-27333
5-26113	5-26116	5-26118	5-26186	IN PILE EXPERIMENT			
5-26187	5-26189	5-26284	5-26286	1-26558	5-26283	5-26631	5-27805
5-26604	5-26606	5-26632	5-26637	7-26558	7-27032	7-27035	7-27038
5-26701	5-26774	5-26782	5-26921	11-26558	11-27805	17-27129	

IN PILE LOOP				9-26968	9-27588	9-27589	9-27590
5-26283	5-26631	5-27055		9-28018	9-28041	12-28033	15-26311
INCIDENT, EQUIPMENT				15-26315	15-26316	17-26311	17-26315
1-27840	6-27842	7-28049	7-28050	17-26316	17-26341	17-28033	
9-26570	9-27842	13-28049	13-28050	INSTRUMENTATION, ABNORMAL INDICATION			
15-26307	15-26359	15-26373	15-26379	6-27616	6-27842	9-26710	9-26968
17-26307	17-26359	17-26373	17-26379	9-27344	9-27589	9-27590	9-27616
17-26570	17-27840	17-27842	17-28049	9-27842	17-27344	17-27347	17-27616
17-28050	18-27840			17-27842			
INCIDENT, GENERAL				INSTRUMENTATION, AIR SAMPLING			
1-25935	5-25935	17-25935	17-25935	7-27068	16-25668	16-27835	
18-25935				INSTRUMENTATION, AMPLIFIER			
INCIDENT, HUMAN ERROR				9-26724			
15-26306	15-26309	15-26326	15-26329	INSTRUMENTATION, COINCIDENT			
15-26330	15-26332	15-26344	15-26351	9-26437	9-28014		
15-26352	15-26364	15-26365	15-26371	INSTRUMENTATION, COMPONENT			
15-26372	15-26374	15-26380	15-26381	9-25699	9-26512	9-26705	9-26706
15-26382	15-26383	15-26386	15-26388	9-26708	9-26716	9-26718	9-26723
15-26389	15-26391	15-26392	17-26306	9-26726	9-26728	9-26730	9-26732
17-26309	17-26326	17-26329	17-26330	9-26736	9-26765	9-27580	9-27591
17-26332	17-26344	17-26351	17-26352	9-27592	9-27605	9-27613	9-27650
17-26364	17-26365	17-26371	17-26372	9-27934	9-27936	9-27942	9-27944
17-26374	17-26380	17-26381	17-26382	9-28014	9-28041	10-26512	
17-26383	17-26386	17-26388	17-26389	INSTRUMENTATION, CONTROL			
17-26391	17-26392			4-27579	6-27579	9-26708	9-26709
INCIDENT, NONREACTOR				9-26723	9-26725	9-26726	9-26733
3-26368	15-26305	15-26306	15-26307	9-26967	9-27500	9-27579	9-27586
15-26308	15-26309	15-26319	15-26320	9-27587	9-28017	10-26967	
15-26326	15-26329	15-26330	15-26332	INSTRUMENTATION, COOLANT QUALITY			
15-26333	15-26340	15-26351	15-26352	5-27885	9-27885		
15-26362	15-26364	15-26365	15-26368	INSTRUMENTATION, DETECTION FAILED FUEL ELEMENT			
15-26370	15-26371	15-26372	15-26374	9-26472	9-26715	9-26716	9-26717
15-26377	15-26379	15-26380	15-26381	9-26718			
15-26382	15-26383	15-26386	15-26388	INSTRUMENTATION, FLOW			
15-26389	15-26390	15-26391	15-26392	9-26714	12-28033	17-28033	
17-26305	17-26306	17-26307	17-26308	INSTRUMENTATION, FUEL SCANNING			
17-26309	17-26319	17-26320	17-26326	17-26301			
17-26329	17-26330	17-26332	17-26333	INSTRUMENTATION, GENERAL			
17-26339	17-26340	17-26351	17-26352	1-27042	5-27885	9-26473	9-26967
17-26362	17-26364	17-26365	17-26368	9-27885	9-27941	9-27943	10-26967
17-26370	17-26371	17-26372	17-26374	19-26784	19-27042		
17-26377	17-26379	17-26380	17-26381	INSTRUMENTATION, IN CURE			
17-26382	17-26383	17-26386	17-26388	5-27595	5-27596	9-26473	9-26705
17-26389	17-26390	17-26391	17-26392	9-26706	9-27582	9-27583	9-27584
INCIDENT, RECOVERY FROM				9-27595	9-27596	9-28013	9-28015
15-25982	15-26330	15-26359	15-26365	17-27347	17-27584	17-27595	17-27596
15-26370	15-26373	15-26377	17-25982	17-27838			
17-26330	17-26359	17-26365	17-26370	INSTRUMENTATION, INDICATOR			
17-26373	17-26377	17-26588		9-26967	10-26967		
INCIDENT, SL 1				INSTRUMENTATION, LIQUID LEVEL DETECTION			
15-25982	17-25982			17-27347			
INCINERATION				INSTRUMENTATION, LOGARITHMIC			
14-27914	15-27914			9-28041			
INDEPENDENCE				INSTRUMENTATION, METEOROLOGICAL			
10-27474	11-27474	17-27474		9-26734	16-26734		
INDIA				INSTRUMENTATION, NUCLEAR			
9-26707	9-26709	9-26717		6-26561	9-26559	9-26561	9-26703
INDIAN POINT 1 (PWR)				9-26704	9-26705	9-26706	9-26708
17-26794				9-26709	9-26710	9-26712	9-26713
INDIUM				9-26719	9-26723	9-26724	9-27581
9-26412	17-26412			9-27583	9-27584	9-27592	9-28013
INDUSTRIAL SAFETY				9-28014	17-27584		
13-27288	17-27287	17-27288		INSTRUMENTATION, PERIOD			
INFORMATION RETRIEVAL				9-26559	9-26711	9-26712	9-26719
1-26413	1-27904	7-26413	9-27943	INSTRUMENTATION, POSITION			
11-26413	17-27904	18-27904		9-27591	9-27593		
INGESTION				INSTRUMENTATION, POWER RANGE			
15-27441	15-27868	15-27880	16-27880	6-27842	9-26741	9-27588	9-27842
INHALATION				17-26741	17-26745	17-27842	
13-28171	14-27080	15-27080	15-27880	INSTRUMENTATION, PRESSURE			
15-27976	15-27977	16-27880	17-28171	5-25161	9-27580	9-27585	17-27585
INSPECTION AND COMPLIANCE				INSTRUMENTATION, PROCESS			
7-28050	9-26741	9-27845	9-27940	9-27587			
9-28012	11-26310	13-28050	13-28167	INSTRUMENTATION, PROTECTIVE			
15-26310	15-26312	15-26314	15-26315	9-26437	9-26967	10-26967	
15-26316	15-26317	15-26318	15-26321	INSTRUMENTATION, PULSE			
15-26325	15-26328	15-26333	15-26336	9-28014			
15-26337	15-26338	15-26342	15-26353	INSTRUMENTATION, RADIATION MONITORING			
15-26355	15-26356	15-26366	15-26376	9-26705	9-26707	9-28015	14-27075
15-26384	15-26387	17-26310	17-26312	15-26315	15-26316	15-26317	15-26318
17-26314	17-26315	17-26316	17-26317	15-26342	15-27075	15-27076	15-27442
17-26310	17-26321	17-26325	17-26328	15-27443	15-27861	15-27900	15-27976
17-26333	17-26336	17-26337	17-26338	15-28008	17-26301	17-26315	17-26316
17-26341	17-26342	17-26353	17-26355	17-26317	17-26318	17-26342	
17-26356	17-26366	17-26376	17-26384	INSTRUMENTATION, RECORDER			
17-26387	17-26741	17-26745	17-27845	9-26713			
17-27898	17-28050	17-28167		INSTRUMENTATION, RELAY			
INSTABILITY				9-26570	17-26570		
5-27557	9-26710	9-27589	9-27599	INSTRUMENTATION, STARTUP			
9-27879	10-27879			9-26720	9-26735		
INSTRUMENTATION CALIBRATION				INSTRUMENTATION, SURVEILLANCE			

5-27595	9-27595	9-28067	9-28068	17-27838	17-28168		
11-28067	11-28068	12-28067	12-28068	MAINTENANCE, REMOTE			
17-27595				5-27595	5-27596	9-27595	9-27596
INSTRUMENTATION, SWITCH				17-27130	17-27595	17-27596	
9-26930	17-26930			MANGANESE			
INSTRUMENTATION, TEMPERATURE				13-27017			
5-25907	9-26968	9-27344	9-27582	MASS TRANSFER			
9-27585	9-27589	9-27590	17-27344	5-26702	5-27047	5-27308	5-27314
17-27585	18-25907			5-27315	5-27318	5-27324	5-27326
INSTRUMENTATION, TESTING				5-27327	5-27329	5-27456	5-27481
9-26437	9-26710			5-27896	7-27036	19-26702	19-27318
INTEGRITY				19-27327	19-27456		
6-27143	9-26710	9-28067	9-28068	MATERIAL			
11-28067	11-28068	12-28067	12-28068	5-26624	5-27494	5-27805	9-26412
14-28007	17-27143			9-27494	11-27040	11-27805	17-26412
IODINE				17-27494			
7-27034	7-27036	7-27037	7-27066	MATHEMATICAL STUDY			
7-27067	7-27071	7-27817	7-27824	5-26600	5-26628	5-26698	5-26780
7-27825	13-27017	15-27019	15-27868	5-26923	5-26926	5-26927	5-27044
ION EXCHANGE				5-27046	5-27310	5-27436	5-27452
13-28029	14-26971	14-27025	14-27078	5-27457	5-27480	5-27803	5-27888
14-27081	14-27082	14-27930	15-27081	MATHEMATICAL TREATMENT			
15-27082	15-27290	15-27862	15-27867	5-26629	5-26630	5-26778	5-26781
17-27142	17-28029			5-26782	5-26921	5-26922	5-26928
IRON				5-26929	5-27048	5-27049	5-27054
4-27822	7-27095	12-27875	13-27875	5-27064	5-27309	5-27317	5-27324
IRRADIATION FACILITY				5-27454	5-27480	5-27547	5-27741
6-26966	12-27980	12-27981	13-26737	5-27803	5-27888	6-26411	6-26630
13-27980	13-27981	17-26737	18-26966	9-25699	9-26139	9-26476	9-26562
IRRADIATION TESTING				9-26725	9-26752	9-26753	9-26755
5-25906	5-26590	5-27805	7-27038	9-26757	9-27536	9-27600	9-27604
7-27093	9-27589	9-27590	9-27597	15-27086	15-27445	17-26408	
9-27598	10-27286	11-27040	11-27805	MAXIMUM PERMISSIBLE BODY BURDEN			
13-27597	15-27443	17-26590	17-26592	15-27900			
17-27129	17-27286	18-25906		MAXIMUM PERMISSIBLE CONCENTRATION (MPC)			
ISOTOPIIC GENERATOR				13-24634	14-24634	14-26618	14-27914
5-26627				15-27077	15-27914	17-24634	17-26618
ITALY				MAXIMUM PERMISSIBLE DOSE (MPD)			
3-25973	9-28013			3-25976	14-26970	15-26644	15-27900
JAPAN				17-26644			
5-26609	9-27499	9-27500	9-27501	MEASUREMENT, GENERAL			
9-28018	11-27448	16-27292		5-26702	5-27456	6-27744	9-26727
K THEORY				15-27442	15-28043	19-26702	19-27456
16-27815				MEASUREMENT, REACTIVITY			
KIWI TNT (S-RR)				6-25363	6-26147	6-26746	9-28012
5-26630	6-26630			17-26746			
KRYPTON				MEASUREMENT, TEMPERATURE			
7-27071	7-27096	12-27282	13-27282	4-27579	6-27579	9-26968	9-27579
14-28005				MERCURY			
LACROSSE (BWR)				4-27031	7-27031	13-27017	
9-27621	11-27504	11-28011	17-27346	MESOSPHERE			
17-27347	17-27504	17-27621	17-27622	16-27468			
17-28011	17-28030			METAL			
LAKE				5-27805	9-28067	9-28068	11-27805
2-25883	16-25883	18-25883		11-28067	11-28068	12-28067	12-28068
LANTHANUM				13-27018	13-27288	17-27288	
9-26412	14-27914	15-27914	17-26412	METAL WATER REACTION			
17-27142				5-27651	8-27651		
LASL				METAL, ALKALI			
5-26608	15-27865			4-27818	4-27819	4-27820	4-27821
LAW				4-27823	5-27737	5-27751	7-27818
3-25977				7-27819	7-27820	7-27999	8-27999
LEAD				METAL, LIQUID			
6-27842	9-27842	15-27995	17-27842	4-27027	4-27028	4-27029	4-27030
LEAK				4-27031	4-27043	4-27818	4-27819
5-27709	11-25908	12-25908	12-27709	4-27020	4-27821	4-27822	4-27823
15-27444	17-26408	17-27345	17-27709	5-26286	5-26606	5-26611	5-26632
17-27843	17-28168	18-25908		5-26633	5-26635	5-26702	5-26780
LEAK RATE				5-27043	5-27302	5-27319	5-27439
1-26743	10-27286	11-26743	17-26743	5-27456	5-27473	5-27486	5-27740
17-27286	17-27338			7-27028	7-27029	7-27030	7-27031
LIQUID				7-27818	7-27819	7-27820	19-26702
5-26774	5-26921	5-27302	9-27586	19-27456			
LITHIUM				METAL, REFRACTORY			
4-27821	5-26611			4-27822	4-27823		
LOFT (S-RR)				METEOROLOGICAL SUPPORT			
1-26558	5-25160	5-27728	7-26558	4-27859	14-28023	15-27331	15-27859
7-27032	8-25160	11-26558		16-27331	16-27815	16-28023	17-27331
LUBRICATION				METEOROLOGY			
17-26588	17-27141			1-27042	9-26734	15-27331	16-25978
MAIN COOLING SYSTEM				16-26734	16-27331	16-27815	17-27331
3-26742	11-26742	17-26408	17-26588	19-27042			
17-26742	17-27142	17-27345	17-27622	MICROMETEOROLOGY			
17-27844				16-26795	16-26796	16-26797	
MAINE YANKEE (PWR)				MILLSTONE POINT (BWR)			
10-27475	18-27342	18-27475		11-27298	18-25342	18-27298	
MAINTENANCE AND REPAIR				MISSILE GENERATION AND PROTECTION			
5-27595	5-27596	6-26621	9-27595	5-27620	11-27429	16-27620	18-27429
9-27596	9-27600	9-27936	9-27941	18-27620			
12-27980	13-27980	17-25981	17-26409	MIST			
17-26621	17-27130	17-27595	17-27596	7-27037			

MIXING DEPTH					NS SAVANNAH (PWR)				
16-25978					17-27345	17-27839			
MODEL TESTING					NSIC				
14-27020	14-27451				1-26413	1-27042	7-26413	11-26413	
MODIFICATION, SYSTEM OR EQUIPMENT					19-27042				
5-27709	6-26591	6-27143		9-26570	NSPP				
9-26930	11-25885	12-27709		17-26409	7-27032	7-27033	7-27037	7-27824	
17-26569	17-26570	17-26591		17-26790	NUCLEAR DETONATION				
17-26930	17-27141	17-27143		17-27294	14-27293	14-27874	15-27441	15-27911	
17-27709	18-25885				15-28043	16-27293	16-27295	16-27874	
MOLTEN FUEL					NUCLEAR EXPLOSION DEBRIS				
6-27039	7-27039				4-27462	4-27463	4-27466	15-27077	
MOLYBDENUM					NUCLEAR ROCKET				
4-27822					4-27461	4-27463	4-27464	4-27466	
MONITOR, RADIATION, AIR					4-27579	6-27579	9-27579	9-27580	
15-27917					14-28023	16-28023	17-26300		
MONITOR, RADIATION, AREA					NUCLEATE BOILING				
15-26318	17-26318				4-27043	5-26185	5-26287	5-26779	
MONITOR, RADIATION, BACKGROUND					5-26924	5-26925	5-27043	5-27059	
15-27019					5-27305	5-27459	5-27751	5-27894	
MONITOR, RADIATION, ENVIRONMENTAL					NUMERICAL METHOD				
14-27083	14-27087	15-27019		15-27076	5-27455	5-27547			
15-27083	15-27087	15-27089		15-27290	OBSTRUCTION				
15-27911	15-28042				9-26740	10-27286	17-26740	17-27286	
MONITOR, RADIATION, GAS					17-27338				
12-27282	13-27282	15-27648			OCEAN AND SEA				
MONITOR, RADIATION, GENERAL					3-25976	5-26627	14-27874	15-26306	
14-27918	15-27917	15-27918			15-26346	15-27897	16-27874	17-26306	
MONITOR, RADIATION, PERSONNEL					17-26346				
15-26311	15-26336	15-26342		15-27089	OECD				
15-27860	15-27861	15-27917		17-26311	5-27576	17-27576			
17-26336	17-26342				OFF GAS				
MONITORING PROGRAM, ENVIRONMENTAL					7-28050	13-28050	13-28167	17-28050	
7-27072	14-27874	16-25668		16-27835	17-28167				
16-27874					OFF SITE				
MONITORING SYSTEM, RADIATION					5-27834	16-27834	17-27289	18-27103	
15-27977					18-27834				
MONTE CARLO					ON SITE WORK				
5-27455	9-26761	9-26766		9-27601	2-25803	16-25883	19-25883		
MSRE (RE)					OPERATING EXPERIENCE				
6-27039	7-27039	17-27130			3-25973	4-27031	7-27031	7-27096	
NAK					9-26412	9-26437	9-26512	9-26559	
4-27031	4-27821	5-26634		5-27486	9-26719	9-26726	9-26727	9-26729	
7-27031	17-27129				9-27343	9-27584	9-27585	9-28013	
NBS					9-28015	10-26512	10-27578	11-27297	
9-27343	17-27343				11-27299	13-27017	13-27018	17-25981	
NEPTUNIUM					17-26408	17-26409	17-26412	17-26738	
13-28029	14-27081	15-27081		17-28029	17-26790	17-27343	17-27584	17-27585	
NERVA PROGRAM					18-27297	18-27298			
4-27462	4-27467	4-27579		6-27579	OPERATING EXPERIENCE SUMMARY				
6-28002	9-27579	9-27580		17-28002	1-27435	1-27904	5-25906	5-26590	
NEUTRON					10-27286	10-27474	11-27474	17-26590	
6-26561	9-26561	9-26705		9-26706	17-27286	17-27435	17-27474	17-27904	
9-26707	9-26708	9-26709		9-26727	17-27984	17-27994	18-25906	18-27904	
9-26741	9-27592	14-27024		15-27089	OPERATING LICENSE PROCESS				
15-27861	15-27865	15-28008		17-26741	1-27997	17-26615	17-26794	17-27340	
NEUTRON INTERACTION					17-27346	17-27434	17-27839	17-27846	
6-25987	17-25987				17-27997	18-27997			
NEVADA TEST SITE					OPERATION				
14-28023	16-28023				14-27918	15-27918	17-27145		
NFS					OPERATOR ACTION				
7-28049	7-28050	13-24634		13-28049	6-27842	9-27842	17-27842		
13-28050	13-28167	13-28170		14-24634	ORE CONVERSION				
14-28170	17-24634	17-28049		17-28050	7-27284	13-27284			
17-28167	17-28170				ORGANIC IODIDE				
NINE MILE POINT (BWR)					7-27034	7-27036	7-27037	7-27067	
9-27614	9-27845	10-27614		11-27428	7-27071	7-27817	7-27826		
11-27429	11-27432	12-27430		17-27845	ORNL				
18-27428	18-27429	18-27430		18-27431	5-27060	5-27716	5-27748	6-26561	
18-27432	18-27614	18-27845			9-26437	9-26561			
NIOBIUM					ORR (RR)				
4-27821	4-27823				5-27055	7-27032	17-26409		
NITROGEN					OSCILLATION				
4-27821	5-26699				5-27557				
NOBLE GAS					OSCILLATOR, REACTIVITY				
7-27035	7-27096				18-27333				
NOISE					OUT OF PILE LOOPS AND EXPERIMENTS				
5-27885	9-27885	17-26369			1-26558	4-27031	5-26185	5-26283	
NOISE ANALYSIS					5-26285	5-26586	5-26780	7-26558	
5-27885	6-26561	9-26561		9-27885	7-27031	7-27032	7-27034	7-27035	
17-27347					7-27824	11-26558	18-26586		
NOISE CROSS CORRELATION					OXIDATION				
6-26561	9-26561				5-27651	7-27038	7-27092	7-27817	
NOZZLE					8-27092	8-27651			
1-26558	7-26558	7-27824		11-25951	OXIDE				
11-26558	11-27040	11-27428		12-27430	4-27029	4-27030	4-27031	4-27819	
18-27428	18-27430				4-27820	7-27029	7-27030	7-27031	
NPD 2 (BWR)					7-27471	7-27819	7-27820		
10-27578					OXYGEN				
NRTS					5-27056	7-27056	14-27078		
1-26515	17-26515	18-26515			OYSTER CREEK 1 (BWR)				

11-26571	11-26768	17-26571	17-27341	3-27426	5-27472	6-25363	6-25946
17-27433	18-26768			6-26147	6-26591	6-26966	7-27472
OZONE				13-28029	14-27081	15-27081	15-27862
16-26800				17-26591	17-28029	18-26966	
PACKED BED				PLUTONIUM DIOXIDE			
5-27545	5-27547			5-26590	17-26590		
PARTICLE SIZE				PNEUMATIC SYSTEM			
7-27032	7-27068	7-27072	15-28043	9-27614	10-27614	18-27614	
PARTICLE SIZE DISTRIBUTION				POINT BEACH 1 AND 2 (PWR)			
4-27463	7-27034	7-27035	7-27065	17-27984	18-26101		
7-27068	15-28043			POISON, BURNABLE			
PARTICLE, RADIOACTIVE				9-26476			
4-27464	7-27072			POISON, FIXED			
PARTICULATE				9-26476			
4-27464	12-27282	13-27282	15-27019	POISON, SOLUBLE			
16-26798	16-27291	16-27468		4-27467			
PARTITION COEFFICIENT				PONTRYAGINS PRINCIPLE			
1-27827	11-27827	17-27827		9-26562	9-27599		
PATENT				POOL BOILING			
3-25974	3-25975	3-27424	3-27425	5-26284	5-26625	5-26925	5-26926
7-27069	7-27449	9-26470	9-26471	5-27322	5-27485		
9-26472	9-26473	9-26474	9-26475	POPULATION EXPOSURE			
9-27499	9-27500	9-27501	9-28012	14-26971	14-27087	15-27087	15-27868
11-27448	11-27450	14-27075	15-27075	POTASSIUM			
PBF (S-RR)				4-27043	4-27821	5-26284	5-26608
6-27143	17-27143			5-26611	5-27043	5-27319	5-27439
PEACH BOTTOM 1 (HTGR)				5-27737			
10-27474	11-27474	17-26533	17-26616	POWER COEFFICIENT			
17-27294	17-27474			6-27842	9-27344	9-27842	10-27286
PEACH BOTTOM 2 AND 3 (BWR)				17-27286	17-27344	17-27842	
12-25911	18-25911			POWER DISTRIBUTION			
PERFORMANCE LIMIT				6-27616	6-27618	9-27616	17-27616
5-25903	5-25904	5-25906	5-26589	17-27618			
6-27616	9-27606	9-27616	12-25903	POWER UPGRATING			
12-25904	17-26589	17-26592	17-27616	5-26589	9-26741	10-27474	11-27474
18-25903	18-25904	18-25906	18-26589	14-26618	17-26589	17-26592	17-26618
PERIOD METER				17-26741	17-26744	17-27289	17-27474
9-26711				18-26589			
PERSONNEL EXPOSURE, RADIATION				PRAIRIE ISLAND 1 AND 2 (PWR)			
3-26368	6-26621	13-28171	15-26305	18-26563			
15-26307	15-26308	15-26309	15-26311	PRECIPITATION			
15-26319	15-26320	15-26326	15-26329	12-27875	13-27875	13-28025	14-27082
15-26330	15-26332	15-26333	15-26337	15-27082	16-27295		
15-26340	15-26350	15-26351	15-26352	PRESSURE DROP			
15-26353	15-26357	15-26359	15-26364	5-26605	5-26921	5-26923	5-27310
15-26368	15-26371	15-26372	15-26374	5-27437	5-27747	5-27883	7-28049
15-26375	15-26377	15-26378	15-26379	13-28049	13-28167	17-28049	17-28167
15-26380	15-26381	15-26382	15-26383	PRESSURE PULSE			
15-26386	15-26388	15-26389	15-26390	8-27998			
15-26391	15-26392	15-26393	15-27995	PRESSURE RELIEF			
17-26305	17-26307	17-26308	17-26309	3-26742	5-27709	11-26742	12-27709
17-26311	17-26319	17-26320	17-26326	17-26742	17-27709		
17-26329	17-26330	17-26332	17-26333	PRESSURE TRANSIENT			
17-26337	17-26340	17-26350	17-26351	5-27620	5-27747	16-27620	18-27620
17-26352	17-26353	17-26357	17-26359	PRESSURE VESSEL			
17-26364	17-26368	17-26371	17-26372	1-26413	1-26558	3-26742	5-27709
17-26374	17-26375	17-26377	17-26378	7-26413	7-26558	9-27845	9-28068
17-26379	17-26380	17-26381	17-26382	10-27502	11-25951	11-25952	11-25953
17-26383	17-26386	17-26388	17-26389	11-25955	11-25957	11-25958	11-25968
17-26390	17-26391	17-26392	17-26393	11-26413	11-26558	11-26571	11-26742
17-26621	17-28171			11-27040	11-27429	11-27448	11-27502
PERSONNEL PROTECTIVE DEVICE				11-28034	11-28068	12-27709	12-28068
13-28171	15-26315	15-26316	15-26317	17-26571	17-26742	17-27709	17-27845
15-26318	15-26342	17-26315	17-26316	17-28034	18-26302	18-27428	18-27502
17-26317	17-26318	17-26342	17-28171	18-27845			
PH REACTIVITY EFFECT				PRESSURE, INTERNAL			
6-26621	9-27344	17-26621	17-27344	3-26742	6-26411	11-26742	17-26617
PHANTOM, HUMAN BODY				17-26742			
15-27866				PRESSURE, SUBATMOSPHERIC			
PHOSPHATE				5-27620	16-27620	18-27620	
14-27074				PROBABILITY			
PHOSPHORUS				1-27827	9-26758	9-27601	9-27602
14-26970	15-27445			9-27605	9-27931	9-27932	11-27827
PIPING				17-27827			
1-26413	4-27031	5-27709	5-27882	PROCEDURES AND MANUALS			
7-26413	7-27031	9-28067	9-28068	3-26742	6-25987	9-28017	11-26742
11-26413	11-26571	11-26768	11-27040	17-25987	17-26742	17-27130	
11-27882	11-28011	11-28067	11-28068	PROPERTY, PHYSICAL			
12-27709	12-28067	12-28068	17-26571	4-27028	7-27028	11-27040	
17-27142	17-27709	17-28011	18-26768	PROTACTINIUM			
PLANT PROTECTIVE SYSTEM				14-27080	15-27080		
5-27709	5-27882	9-27614	10-27502	PRTR (TR)			
10-27614	11-27502	11-27882	12-27709	5-26590	12-27285	17-26590	
17-27709	18-27502	18-27614		PULSTAR (RR)			
PLASMA				6-26746	17-26746		
5-27317				PUMP			
PLOWSHARE PROGRAM				11-27040	12-28033	17-26409	17-27141
15-27868				17-27622	17-28033		
PLUME BEHAVIOR, GENERAL				PYROLYTIC			
16-26799	16-27815			7-27093			
PLUTONIUM				QUAD CITIES 1 AND 2 (BWR)			

18-27479				1-28003	1-28004	7-27284	9-27597
QUALITY CONTROL				13-26737	13-27284	13-27597	13-27876
1-27902	9-26710	9-27934	9-27938	13-27979	13-28003	13-28004	13-28025
9-27939	9-27940	9-27942	17-27902	13-28029	13-28171	14-28048	15-27911
18-27902				15-28043	17-26737	17-28003	17-28004
R AND D PROGRAM				17-28029	17-28171		
4-27128	5-25903	5-25905	5-26586	RADIOLOGICAL ASSISTANCE			
6-26584	6-27143	12-25903	15-27900	1-27856	14-27855	15-27855	15-27856
17-26300	17-26592	17-27143	18-25903	15-27911	17-27855	17-27856	
18-25905	18-26302	18-26586	18-27333	RADIOLOGY			
RADIATION DAMAGE				15-26365	15-26375	15-26378	15-26379
7-27037	7-27817	15-27900		15-26393	15-27900	15-27995	17-26365
RADIATION EFFECT				17-26375	17-26378	17-26379	17-26393
1-24694	7-27037	7-27817	9-27589	RADIOLYTIC GAS			
9-27590	9-27597	13-27597		17-26565			
RADIATION IN PERSPECTIVE				RADIUM			
1-24694				14-27855	15-27444	15-27855	17-27855
RADIATION INJURY, TREATMENT OF				RADON			
1-27856	14-27855	15-27855	15-27856	15-27444			
17-27855	17-27856			RAINOUT			
RADIATION MODEL				16-27295	16-27815		
15-27868				RANCHO SECO (PWR)			
RADIATION SAFETY AND CONTROL				10-27502	11-27502	18-27502	
1-27435	1-27856	4-27859	9-26741	RATE			
14-26970	14-27080	14-27082	14-27087	14-27451			
14-27918	14-27930	15-26312	15-26328	REACTIVITY COEFFICIENT			
15-26351	15-26356	15-26365	15-26377	6-26783	6-27705	6-27744	
15-26378	15-26380	15-26385	15-26387	REACTIVITY EFFECT			
15-26394	15-26644	15-27019	15-27076	5-26638	5-26639	6-25362	6-25987
15-27080	15-27082	15-27085	15-27086	6-26783	6-27039	6-27842	7-27039
15-27087	15-27856	15-27859	15-27860	9-26559	9-26719	9-27842	9-28018
15-27861	15-27897	15-27900	15-27911	17-25987	17-27842		
15-27917	15-27918	15-27976	15-27977	REACTIVITY EFFECT, ANOMALOUS			
15-28008	15-28042	15-28043	17-26312	6-26591	6-27143	6-27842	9-27842
17-26328	17-26351	17-26356	17-26365	10-27474	11-27474	17-26591	17-27143
17-26377	17-26378	17-26380	17-26385	17-27474	17-27842		
17-26387	17-26394	17-26644	17-26741	REACTIVITY EFFECT, EXPANSION			
17-27435	17-27856			6-26783			
RADIATION, PUBLIC EDUCATION/ACCEPTANCE				REACTIVITY EFFECT, VOID			
1-24694	1-27902	2-27299	13-24634	5-26639	5-26639	6-26584	
14-24634	17-24634	17-27902	18-27299	REACTIVITY, EXCESS			
18-27902				6-28010	17-28010		
RADIOACTIVITY RELEASE				REACTOR CONTROL			
12-27283	14-27087	14-28023	15-27087	5-27047	6-26721	9-26303	9-26412
16-28023				9-26562	9-26720	9-26721	9-26722
RADIOBIOLOGY				9-26724	9-26725	9-26726	9-26733
1-24694	4-27859	15-27859		9-26735	9-27519	9-27587	9-28017
RADIOCHEMICAL ANALYSIS				12-26303	17-26300	17-26412	
14-27083	14-27874	15-27083	16-27874	REACTOR COOLANT			
RADIOCHEMICAL PLANT SAFETY				5-26260	7-27999	8-27999	
14-27918	15-27918			REACTOR DESCRIPTION			
RADIOCHEMICAL PROCESSING				5-26609	5-27728	5-27742	6-25987
14-27918	15-27918			9-28018	17-25987	17-27289	17-27854
RADIOGRAPHY				18-26302	18-27103	19-25465	
3-26368	9-26741	11-26310	15-26305	REACTOR DYNAMICS			
15-26306	15-26307	15-26308	15-26309	5-26287	5-26629	5-26630	5-27047
15-26310	15-26311	15-26312	15-26314	5-27707	6-26561	6-26630	6-26721
15-26315	15-26316	15-26317	15-26318	6-27707	9-26561	9-26721	
15-26319	15-26320	15-26321	15-26325	REACTOR KINETICS			
15-26326	15-26328	15-26329	15-26330	5-25944	5-27647	5-27707	6-25944
15-26332	15-26333	15-26336	15-26337	6-26966	6-27073	6-27143	6-27647
15-26338	15-26340	15-26342	15-26344	6-27707	7-25944	17-27143	18-26966
15-26345	15-26346	15-26347	15-26351	REACTOR PHYSICS			
15-26352	15-26353	15-26355	15-26356	6-25987	6-26591	6-28002	17-25987
15-26357	15-26359	15-26362	15-26364	17-26591	17-28002		
15-26365	15-26366	15-26368	15-26370	REACTOR POWER			
15-26371	15-26372	15-26373	15-26374	5-26589	5-27887	6-27842	9-26726
15-26375	15-26376	15-26377	15-26378	9-27842	9-28018	10-27578	14-27082
15-26379	15-26380	15-26381	15-26382	14-27918	14-28005	15-27082	15-27911
15-26383	15-26384	15-26385	15-26386	15-27918	17-26589	17-27842	18-26589
15-26387	15-26388	15-26389	15-26390	REACTOR SAFETY SYSTEM			
15-26391	15-26392	15-26394	17-26305	5-26437	9-26570	9-26709	9-26724
17-26306	17-26307	17-26308	17-26309	9-26727	9-26728	9-26729	9-26730
17-26310	17-26311	17-26312	17-26314	9-26732	9-28017	17-26570	
17-26315	17-26316	17-26317	17-26318	REACTOR STABILITY			
17-26319	17-26320	17-26321	17-26325	6-26584	6-27039	6-27143	7-27030
17-26326	17-26328	17-26329	17-26330	17-26300	17-27143		
17-26332	17-26333	17-26336	17-26337	REACTOR STARTUP EXPERIENCE			
17-26338	17-26339	17-26340	17-26341	17-26408	17-27347		
17-26342	17-26344	17-26345	17-26346	REACTOR STARTUP TESTING			
17-26347	17-26351	17-26352	17-26353	6-28010	17-28010	18-25342	
17-26355	17-26356	17-26357	17-26359	REACTOR TEST FACILITY			
17-26362	17-26364	17-26365	17-26366	5-27576	17-27576		
17-26368	17-26370	17-26371	17-26372	REACTOR TRANSIENT			
17-26373	17-26374	17-26375	17-26376	1-27042	5-26285	5-26287	6-26411
17-26377	17-26378	17-26379	17-26380	6-27143	17-27143	18-26302	19-27042
17-26381	17-26382	17-26383	17-26384	REACTOR, DEC OWNED			
17-26385	17-26386	17-26387	17-26388	1-26005	1-26743	3-26742	5-26628
17-26389	17-26390	17-26391	17-26392	5-27894	6-26561	6-26721	9-26437
17-26394	17-26741	17-27334	17-27898	9-26561	9-26721	9-27588	9-27593
RADIOISOTOPE				11-26742	11-26743	17-26005	17-26301

17-26742	17-26743	17-27142	17-27986	6-27073	7-27028	7-27029	7-27030
REACTOR, AIRCRAFT				7-27031	7-27818	7-27819	7-27820
4-27462	4-27467			9-27519	9-27582	9-27595	9-27596
REACTOR, BREEDER				9-28016	12-27283	17-25935	17-25935
1-26413	3-27877	5-27595	5-27596	17-26300	17-26301	17-26408	17-27595
6-25946	6-27073	7-26413	9-26560	17-27596	17-27844	18-25935	18-26082
9-26967	9-27595	9-27596	9-28016	REACTOR, LMFBR			
10-26967	11-26413	12-27877	13-27877	1-27827	4-27818	4-27819	4-27820
17-26300	17-26301	17-27595	17-27596	4-27822	4-27823	5-26635	5-27438
REACTOR, BWR				5-27440	5-27725	5-27751	7-27818
1-26515	1-26743	1-27841	2-25883	7-27819	7-27820	11-27827	17-27827
2-26564	2-27299	2-27833	2-27841	REACTOR, MARITIME			
2-27975	3-26742	5-25884	5-25904	17-27839			
5-25905	5-25906	5-25907	5-25910	REACTOR, MILITARY			
5-26481	5-26586	5-26589	5-26609	17-27984			
5-26772	5-27488	5-27494	5-27647	REACTOR, MOLTEN SALT			
5-27707	5-27714	5-27834	5-27884	1-26413	6-26783	6-27039	7-26413
6-26584	6-27647	6-27707	9-26412	7-27039	11-26413	17-27130	
9-26714	9-26735	9-27494	9-27614	REACTOR, ORGANIC COOLED			
9-27621	9-27845	9-28013	10-25909	5-25161	5-27437		
10-27614	11-25885	11-25908	11-25910	REACTOR, PERBLE BED			
11-26571	11-26742	11-26743	11-26768	5-26114	5-26115	5-26189	5-27436
11-27298	11-27428	11-27429	11-27432	5-27456	5-28539	19-27456	
11-27504	11-27975	11-28011	11-28034	REACTOR, POOL TYPE			
12-25904	12-25908	12-25909	12-25911	12-28169	17-26622	17-27843	17-28168
12-27430	15-26644	16-25883	16-27833	17-28169			
16-27834	17-25884	17-26412	17-26515	REACTOR, POWER			
17-26564	17-26571	17-26589	17-26592	1-27840	1-27902	1-27992	1-27996
17-26644	17-26742	17-26743	17-27145	1-27997	2-27975	5-27491	5-27629
17-27340	17-27341	17-27346	17-27347	6-25946	6-28002	10-27988	11-27975
17-27433	17-27434	17-27478	17-27494	14-27855	15-25982	15-26644	15-27290
17-27504	17-27621	17-27622	17-27845	15-27331	15-27855	16-27331	17-25982
17-27903	17-28009	17-28011	17-28030	17-26644	17-27331	17-27840	17-27855
17-28034	18-25342	18-25882	18-25883	17-27902	17-27903	17-27984	17-27988
18-25884	18-25885	18-25904	18-25905	17-27992	17-27996	17-27997	17-28002
18-25906	18-25907	18-25908	18-25909	17-28009	18-27840	18-27902	18-27903
18-25910	18-25911	18-26515	18-26586	18-27996	18-27997	19-25465	
18-26589	18-26623	18-26768	18-27298	REACTOR, PRESSURE TUBE			
18-27299	18-27428	18-27429	18-27430	5-25161	5-26481	9-26303	10-27578
18-27431	18-27432	18-27479	18-27488	12-26303			
18-27503	18-27614	18-27745	18-27832	REACTOR, PRESSURE TUBE, BOILING			
18-27833	18-27834	18-27841	18-27845	5-25161			
18-27903				REACTOR, PRODUCTION			
REACTOR, CIRCULATING FUEL				17-26409			
5-26115	5-28539			REACTOR, PULSED			
REACTOR, DESALINATION				5-26631	5-27719	5-27742	6-26746
1-27296	18-27296			6-26966	9-26713	9-26740	9-28015
REACTOR, FAST				17-26740	17-26744	17-26746	18-26966
1-25935	3-27425	3-27877	5-25935	REACTOR, PWR			
5-26283	5-26284	5-26285	5-26286	1-26515	1-27989	1-27996	2-27615
5-26287	5-27438	5-27440	5-27595	2-27975	5-26614	5-26641	5-26772
5-27596	5-27725	6-25362	6-25946	5-27620	5-27647	5-27707	5-27709
6-26783	6-27073	6-27743	9-26560	5-27728	6-26591	6-26621	6-27616
9-26967	9-27519	9-27582	9-27595	6-27618	6-27647	6-27707	6-28010
9-27596	9-28016	10-26967	12-27283	7-27096	9-26412	9-27344	9-27616
12-27877	12-27980	12-27981	13-27877	10-27475	10-27502	11-27297	11-27502
13-27980	13-27981	17-25935	17-25935	11-27975	12-27709	12-28033	15-26644
17-26300	17-27595	17-27596	18-25935	16-27620	17-25981	17-26412	17-26515
18-27333				17-26591	17-26619	17-26620	17-26621
REACTOR, FAST BURST				17-26644	17-26794	17-27338	17-27344
5-26628				17-27345	17-27615	17-27616	17-27617
REACTOR, FLUX TRAP				17-27618	17-27709	17-27838	17-27839
6-26561	9-26437	9-26561	17-27142	17-27903	17-27984	17-27989	17-27996
17-27854	18-27103	18-27104		17-28009	17-28010	17-28033	18-26515
REACTOR, GCR				18-26563	18-26972	18-27297	18-27475
1-27827	2-25164	5-25164	5-26114	18-27502	18-27562	18-27615	18-27620
5-26187	5-26605	5-27747	7-27092	18-27903	18-27989	18-27996	
7-27093	8-27092	9-26472	9-26560	REACTOR, RESEARCH			
11-27827	17-26588	17-27827		1-26005	1-27840	5-27629	5-25987
REACTOR, GENERAL				6-26561	6-26721	6-26721	6-26746
3-27877	5-27887	7-27284	12-27282	6-27842	9-26437	9-26561	9-26570
12-27285	12-27875	12-27877	12-27980	9-26709	9-26721	9-26721	9-26723
12-27981	13-27282	13-27284	13-27875	9-26726	9-26739	9-26740	9-26741
13-27877	13-27980	13-27981	13-28025	9-26930	9-27343	9-27587	9-27590
REACTOR, HTGR				9-27842	9-28015	9-28018	13-26737
1-26413	1-26558	1-27827	5-26114	14-26618	14-27855	15-27331	15-27855
5-26115	5-28539	7-26413	7-26558	16-27331	17-25987	17-26005	17-26300
7-27092	8-27092	10-27474	11-26413	17-26409	17-26565	17-26569	17-26570
11-26558	11-27474	11-27827	17-26533	17-26617	17-26618	17-26622	17-26737
17-26616	17-27294	17-27474	17-27827	17-26738	17-26739	17-26740	17-26741
REACTOR, HWR				17-26744	17-26746	17-26790	17-26930
9-26303	9-26715	10-27578	12-26303	17-27129	17-27142	17-27289	17-27331
15-27976	15-27977	17-27141	17-27289	17-27343	17-27840	17-27842	17-27843
REACTOR, INTERNAL SUPERHEAT				17-27846	17-27854	17-27855	17-28168
1-27840	17-26566	17-27840	18-27840	18-27840			
REACTOR, LMCR				REACTOR, SAFETY RESEARCH			
1-25935	4-27027	4-27028	4-27029	5-25160	5-26629	5-26630	5-26631
4-27030	4-27031	4-27043	4-27818	5-27719	5-27728	6-26630	6-27143
4-27819	4-27820	4-27822	4-27823	8-25160	17-27143		
5-25935	5-26286	5-26634	5-27043	REACTOR, SPACE			
5-27595	5-27596	6-25946	6-26783	4-27031	4-27128	4-27821	5-26636

5-26637	6-25362	6-27705	6-28002	18-27832	18-27833	18-27834	18-27997
7-27031	17-28002			REPORT, SAR			
REACTOR, TEST				1-27997	11-27428	11-27429	11-27432
5-26590	5-27055	9-27588	9-27593	12-27430	14-26618	17-26618	17-27289
9-27598	10-27286	12-27285	12-28169	17-27997	18-25342	18-26082	18-27103
17-26408	17-26590	17-27286	17-28169	18-27104	18-27428	18-27429	18-27430
REACTOR, TRAINING				18-27431	18-27432	18-27997	
17-26745				RESIN			
REACTOR, WATER				13-28029	15-27290	17-28029	17-28168
1-26515	1-27827	1-27997	2-27975	RESPONSE TIME			
3-27041	5-26639	5-26772	5-27647	1-27997	5-25910	9-27343	11-25908
5-27887	5-27891	6-26721	6-27647	11-25910	12-25908	17-26794	17-27343
9-26721	11-25959	11-27827	11-27975	17-27997	18-25908	18-25910	18-27997
17-26515	17-27827	17-27997	18-26515	REVIEW			
18-27997				1-25935	1-27042	2-27615	5-25935
REDUNDANCE				5-26188	5-26606	10-27475	10-27502
9-26139	9-26732	9-26751	9-26761	11-27432	11-27502	17-25935	17-25935
9-26766	9-27603	9-27937		17-26300	17-27615	18-25935	18-27432
REENTRY, ATMOSPHERIC				18-27475	18-27502	18-27615	19-27042
4-27461				RIVER, CLINCH			
REFLECTOR				15-28042			
6-26746	6-27842	9-27842	17-26746	RIVER, GENERAL			
17-27842				15-26370	17-26370		
REFUELING				ROBINSON 2 (PWR)			
3-27424	6-26621	17-26301	17-26621	11-27297	18-27297		
REGULATION, AEC				ROCK MECHANICS			
1-27902	1-27904	1-27997	1-28003	14-28007			
1-28004	2-27975	11-27975	13-28003	ROVER PROGRAM			
13-28004	17-27902	17-27904	17-27997	4-27461	4-27463	5-26636	5-26637
17-28003	17-28004	18-27902	18-27904	RUBIDIUM			
18-27997				3-26742	5-27737	11-26742	12-27282
REGULATION, GENERAL				13-27282	17-26742		
1-27836	2-27836	18-27836		SAFETY ANALYSIS			
REGULATION, IAEA				1-27827	5-26285	6-27073	11-27827
3-25976	3-25977			17-27827			
REGULATION, STATE				SAFETY EVALUATION			
1-27841	2-27841	18-27841		2-25164	5-25164	5-27834	9-26764
RELEASE RATE				10-27474	11-27474	16-27834	17-26565
7-27096				17-26566	17-26744	17-27340	17-27346
RELIABILITY ANALYSIS				17-27474	18-27934		
5-25162	9-26139	9-26747	9-26748	SAFETY MARGIN			
9-26749	9-26750	9-26752	9-26753	2-27615	5-25884	17-25884	17-27615
9-26754	9-26755	9-26756	9-26757	18-25884	18-27615		
9-26758	9-26759	9-26760	9-26761	SAFETY PRINCIPLES AND PHILOSOPHY			
9-26763	9-27536	9-27600	9-27601	1-25935	1-27042	1-27435	1-27827
9-27602	9-27607	9-27609	9-27610	1-27840	2-27975	3-27041	5-25935
9-27611	9-27612	9-27650	9-27931	11-27827	11-27975	13-27288	17-25935
9-27933	9-27935	9-27937	9-27938	17-25935	17-27287	17-27288	17-27435
9-27939	9-27943			17-27827	17-27840	18-25935	18-27940
RELIABILITY, COMPONENT				19-27042			
5-25162	9-25699	9-26753	9-26760	SAFETY PROGRAM			
9-26762	9-26765	9-27601	9-27605	1-26413	1-26515	7-26413	11-26413
9-27607	9-27611	9-27613	9-27932	17-26515	18-26515		
9-27934	9-27935	9-27936	9-27942	SAFETY REVIEW			
9-27944	10-25909	12-25909	18-25909	1-26743	1-27042	1-27435	1-27827
RELIABILITY, SYSTEM				3-27041	4-27030	5-27629	7-27030
5-25162	9-26751	9-26752	9-26757	9-26729	9-26740	9-26741	9-26764
9-26758	9-26761	9-26764	9-26766	10-27286	11-26743	11-27827	17-26617
9-27601	9-27602	9-27603	9-27604	17-26740	17-26741	17-26743	17-26745
9-27606	9-27607	9-27879	9-27932	17-27286	17-27435	17-27827	17-27903
9-27933	9-27936	9-27937	9-27940	18-27333	18-27903	19-27042	
9-27941	10-27578	10-27879		SALEM 1 AND 2 (PWR)			
REMOTE MANIPULATING AND VIEWING				18-26972			
5-27595	5-27596	9-27595	9-27596	SAMARIUM			
9-27598	9-27599	15-25982	15-26332	6-25987	17-25987		
15-26365	17-25982	17-26332	17-26365	SAMPLING			
17-27130	17-27595	17-27596		1-26743	7-27032	7-27034	7-27095
REPORT, OPERATIONS				7-27065	7-27068	7-27072	11-26743
1-26743	3-26742	6-26591	6-26621	14-27020	14-27075	14-27083	15-27075
9-27621	11-26742	11-26743	11-27504	15-27083	17-26743		
11-28011	11-28034	17-26300	17-26533	SAMPLING, HIGH ALTITUDE			
17-26591	17-26621	17-26742	17-26743	14-27874	16-25668	16-26800	16-27874
17-27294	17-27338	17-27347	17-27504	SAN ONOFRE (PWR)			
17-27621	17-27622	17-27838	17-27844	9-27344	12-28033	17-27344	17-28033
17-28011	17-28034			SAVANNAH RIVER PLANT			
REPORT, OPERATIONS ANALYSIS				13-27017	14-27025	14-27087	15-27087
6-27616	9-27616	17-26592	17-27616	15-27976			
17-27617	17-28030			SAXTON (PWR)			
REPORT, OPERATIONS SUMMARY				1-27996	5-27709	6-26591	12-27709
9-26570	9-26741	9-27344	17-26569	17-26591	17-27709	17-27996	18-27996
17-26570	17-26617	17-26741	17-26745	SCRAM, REAL			
17-27344				10-27286	17-26569	17-27286	
REPORT, PSAR				SCRAM, SPURIOUS			
1-27997	2-25883	2-27615	2-27833	9-26570	17-26570		
5-25884	5-27620	5-27834	10-27475	SEAL			
10-27502	11-25885	11-27502	16-25883	9-26512	10-26512	11-25956	11-25957
16-27620	16-27833	16-27834	17-25884	13-25956	17-26409	17-26588	17-27141
17-27615	17-27997	18-25882	18-25883	17-27287			
18-25884	18-25885	18-26101	18-26623	SEDIMENT			
18-26972	18-27342	18-27475	18-27502	14-27020	14-28000	15-27019	
18-27562	18-27615	18-27620	18-27745	SEFOR (RE)			

18-26082	18-27333			14-26618	15-27880	16-26798	16-26799
SENN				16-27880	17-26618		
17-26592				SOURCE, ELEVATED			
SEPARATOR				16-26798	16-26799		
15-28043				SOURCE, INSTANTANEOUS			
SERVOMECHANISM				15-27880	16-27880		
9-26473	9-26724	9-27599		SOURCE, POINT			
SET POINT				15-27445	16-26799		
12-28033	17-28033			SOURCE, RADIATION			
SHIELDING				3-26368	9-26741	15-26305	15-26312
3-27041	9-26741	9-27597	13-27597	15-26314	15-26319	15-26321	15-26326
15-27866	15-27900	17-26617	17-26741	15-26329	15-26332	15-26333	15-26336
17-27347				15-26338	15-26350	15-26352	15-26353
SHIPPING ANALYSIS				15-26359	15-26362	15-26364	15-26365
1-27042	3-27041	15-27911	19-27042	15-26368	15-26371	15-26372	15-26373
SHIPPING CONTAINER				15-26374	15-26377	15-26378	15-26379
3-25973	3-25974	3-25975	3-26742	15-26385	15-26386	15-26388	15-26389
3-27041	3-27427	11-26742	17-26742	15-26391	15-26392	15-27444	17-26305
SHIPPINGPORT (PWR)				17-26312	17-26314	17-26319	17-26321
6-27616	6-27618	9-27616	17-27616	17-26326	17-26329	17-26332	17-26333
17-27617	17-27618			17-26336	17-26338	17-26350	17-26352
SHOCK WAVE				17-26353	17-26359	17-26362	17-26364
5-26640				17-26365	17-26368	17-26371	17-26372
SHUTDOWN COOLING SYSTEM				17-26373	17-26374	17-26377	17-26378
17-27347	17-28030			17-26379	17-26385	17-26386	17-26388
SHUTDOWN MARGIN				17-26389	17-26391	17-26392	17-26741
10-27474	11-27474	17-27474		SOURCE, RADIATION, LOST			
SHUTDOWN SYSTEM, SECONDARY				5-26627	15-26306	15-26344	15-26345
4-27467	9-26303	12-26303	12-28033	15-26346	15-26347	15-26370	15-26394
17-28033				17-26306	17-26339	17-26344	17-26345
SILVER				17-26346	17-26347	17-26370	17-26394
9-26412	17-26412			SPACE DEPENDENT DYNAMICS			
SIMULATION				5-25944	6-25944	7-25944	
1-27989	7-27032	7-27034	7-27035	SPACECRAFT			
9-26720	9-26725	9-26967	9-27601	4-27859	15-27859		
10-26967	16-28022	17-27145	17-27989	SPECTROMETRY, GAMMA			
18-27989				9-26715	9-26717	9-27581	15-27290
SINGLE FAILURE CRITERION				15-28043			
10-27502	11-27502	18-27502		SPECTROMETRY, NEUTRON			
SINTERING				9-27592			
14-28005				SPERT 3 (S-RR)			
SITE CLIMATOLOGY				6-27143	17-27143		
16-27815				SPERT 4 (S-RR)			
SITING, GENERAL				6-27143	17-27143		
1-27042	14-28007	19-27042		SPHERE			
SITING, REACTOR				5-26189	5-26633	5-26927	5-27302
1-27841	2-25164	2-26564	2-27841	5-27308	5-27324	5-27545	
2-27975	5-25164	11-27975	15-27900	SPRAY, GENERAL			
17-26564	18-27832	18-27841		1-26413	7-26413	7-27036	7-27037
SITING, URBAN				7-27071	7-27824	7-27825	7-27826
2-25164	5-25164			11-26413			
SNAP 50 (SR)				STACK			
4-27821				7-28049	7-28050	13-28049	13-28050
SNAP 8 (SR)				14-26618	15-27019	15-27900	16-26795
4-27031	7-27031			16-26796	16-27291	17-26618	17-28049
SNAPTRAN (S-RR)				17-28050			
5-26629				STAFFING, TRAINING, QUALIFICATION			
SNOW				1-26515	1-27856	1-27902	1-27904
14-03954	15-03954	16-27295		1-27987	1-27989	1-27991	1-27992
SODIUM				1-27996	5-27834	6-25987	6-28002
3-27425	4-27027	4-27028	4-27029	10-27988	14-27619	14-27855	15-26312
4-27030	4-27031	4-27043	4-27818	15-26325	15-26356	15-26376	15-27331
4-27819	4-27820	4-27822	4-27823	15-27619	15-27855	15-27856	16-27331
5-25163	5-26283	5-26284	5-26285	16-27815	16-27834	17-25987	17-26312
5-26287	5-26608	5-26625	5-26633	17-26325	17-26356	17-26376	17-26515
5-26635	5-26780	5-27043	5-27438	17-26619	17-26620	17-26622	17-27145
5-27440	5-27473	5-27737	5-27751	17-27331	17-27334	17-27340	17-27346
7-27028	7-27029	7-27030	7-27031	17-27619	17-27855	17-27856	17-27902
7-27071	7-27818	7-27819	7-27820	17-27903	17-27904	17-27984	17-27985
7-27999	8-27999	9-27519	12-27283	17-27986	17-27987	17-27988	17-27989
17-25935	17-26301	17-26408	17-27844	17-27991	17-27992	17-27993	17-27994
18-25935				17-27996	17-28001	17-28002	17-28009
SOIL				18-26515	18-27834	18-27902	18-27903
14-26971	14-27020	14-27023	14-27451	18-27904	18-27989	18-27996	
14-27930	14-28007	14-28048		STATE PROGRAM			
SOIL, RADIONUCLIDE MOVEMENT THROUGH				1-27841	2-27841	18-27841	
14-27021	14-27024	14-27025	14-27078	STATISTICAL ANALYSIS			
14-27451	14-27930			9-26755	9-26756	9-26757	9-26758
SOLID				9-26761	9-27604	9-27605	9-27607
5-26921				14-28048	15-27089		
SOLID STATE DEVICE				STATISTICAL CORRELATION			
9-26559	9-26711	9-26728	9-26730	9-26750	9-27943	10-27578	
9-26765	9-28014	9-28041		STEAM			
SOLVENT EXTRACTION PROCESS				4-27818	5-26454	5-26455	5-26607
13-27017	13-27978			5-26699	5-27301	5-27314	5-27482
SORPTION				5-27651	7-27034	7-27038	7-27095
14-26971	14-27020	14-28048	15-27976	7-27818	8-27651	9-26560	
15-27977				STEAM GENERATOR			
SOURCE MATERIAL				11-28011	17-25981	17-26616	17-27294
5-26188				17-27345	17-28011		
SOURCE, CONTINUOUS				STEEL			

1-26558	5-27545	7-26558	7-27092	17-28167	17-28169	18-27104	18-27840
8-27092	11-25951	11-25957	11-26558	TELLURIUM			
11-27040	11-27297	17-27129	18-27297	7-27067			
STEEL LINER				TEMPERATURE COEFFICIENT			
11-25885	11-25952	11-25958	17-27843	5-26629	6-25362	6-27073	6-27744
17-28168	18-25885			TEMPERATURE GRADIENT			
STEEL, STAINLESS				5-26189	5-26774	5-26781	5-26782
4-27821	4-27822	5-25907	5-26925	5-26928	5-27048	5-27049	5-27458
5-27651	7-27092	8-27092	8-27651	5-27895	17-27294		
11-26571	17-26571	17-26790	18-25907	TEMPERATURE REACTIVITY EFFECT			
STORAGE CONTAINER				6-25987	17-25987		
15-26336	15-26338	15-26353	17-26336	TEMPERATURE TRANSIENT			
17-26338	17-26353			5-26634	5-26635	5-27719	5-27726
STRATOSPHERE				5-27895	9-27613		
14-27083	15-27083	16-25668	16-26800	TENSILE PROPERTY			
16-27468				5-27494	9-27494	17-27494	
STRESS				TEST, BENCH			
5-26628	17-26408			8-27998	13-27288	17-27288	
STRESS ANALYSIS				TEST, COMPONENT			
5-26189	5-26628	5-26778	9-27931	9-27597	9-27613	12-27430	13-27597
11-27428	11-27429	11-27432	11-28011	18-27430			
12-27430	17-28011	18-26302	18-27428	TEST, DESTRUCTIVE			
18-27429	18-27430	18-27431	18-27432	4-27462	4-27464	9-27944	
STRESS CORROSION				TEST, DROP			
17-27345				3-27427			
STRESS RUPTURE				TEST, FILTER			
6-26411				7-27071			
STRONTIUM				TEST, INSTRUMENT RESPONSE			
3-26742	5-27056	7-27056	11-26742	9-26715	9-26717	9-26727	9-26728
13-27978	13-28171	14-27020	14-27083	9-27580	9-27583	9-27585	9-27590
14-28048	15-27083	15-27445	15-27867	9-27591	9-28015	9-28041	17-27585
15-27897	16-25668	16-27835	17-26742	TEST, LEAK RATE			
17-28171				9-26512	10-26512	11-27504	11-28011
STRUCTURAL ANALYSIS, DYNAMIC				11-28034	17-26569	17-27504	17-27838
5-26628	5-27651	8-27651		17-28011	17-28030	17-28034	
STRUCTURAL INTEGRITY				TEST, NONDESTRUCTIVE			
3-27427				5-27709	9-27845	9-28067	9-28068
SUBCOOLING				11-28067	11-28068	12-27709	12-28067
5-25884	5-27485	5-27885	9-27885	12-28068	17-27709	17-27845	18-27431
17-25884	18-25884			18-27845			
SULFUR DIOXIDE				TEST, ON LINE			
16-27292				9-26437	9-26732	9-26968	
SURFACE CONTAMINATION				TEST, PLANT RESPONSE			
13-27979	14-03954	15-03954		9-28018	17-27347	18-25342	
SURFACE FILM DEPOSIT				TEST, PREOPERATIONAL			
17-27340	17-27617			2-27615	9-27606	9-27934	17-27615
SURFACE WATER, GENERAL				18-25342	18-27615		
14-28000				TEST, PROOF			
SURFACE WATER, TRACER				2-27615	3-26742	5-25904	5-25907
14-27021	14-27024	14-27025		11-25908	11-26742	12-25904	12-25908
SURFACE, GENERAL				12-25911	17-26742	17-27615	18-25904
5-26925	5-26926			18-25907	18-25908	18-25911	18-27615
SURFACE, PAINTED				TEST, SYSTEM OPERABILITY			
7-27066	7-27067			9-26437	9-26740	9-26741	9-26751
SURVEILLANCE PROGRAM				9-27933	10-25909	12-25909	17-26533
5-27494	5-27709	9-27494	9-28012	17-26740	17-26741	18-25909	
10-27502	11-26571	11-26768	11-27428	TESTING			
11-27502	12-27709	14-27087	15-27087	4-27464	6-26584	6-27143	7-27071
15-27911	15-27917	15-28042	17-26571	7-27284	9-26762	9-27933	9-28016
17-27494	17-27709	18-26768	18-27428	11-27040	12-27875	12-27981	13-27018
18-27502				13-27284	13-27875	13-27878	13-27978
SURVEY, GENERAL				13-27981	13-27982	13-28028	17-27143
9-26708	9-26716	9-26747	16-25978	THEORETICAL INVESTIGATION			
16-26797				5-26589	5-27306	5-27313	5-27316
SURVEY, RADIATION, EMERGENCY				5-27322	5-27457	5-27458	5-27547
1-27856	15-27856	17-27856		6-26591	6-27628	6-27705	6-27743
SURVEY, RADIATION, ENVIRONMENTAL				7-27065	7-27066	7-27070	7-27999
14-27855	15-27855	17-27855		8-27999	9-26476	9-26562	9-26725
SURVEY, RADIATION, GENERAL				9-26752	9-26754	9-26755	9-27519
15-26355	15-26364	17-26355	17-26364	13-27979	16-28022	17-26589	17-26591
SWEDEN				18-26589			
9-26735				THERMAL ANALYSIS			
SYSTEM CAPABILITY				5-26114	5-27321		
5-25904	10-25909	11-25908	12-25904	THERMAL CONSIDERATION			
12-25908	12-25909	12-25911	18-25904	15-27076			
18-25908	18-25909	18-25911		THERMAL EXPERIMENT			
SYSTEM DESCRIPTION				4-27822	4-27823	5-27651	8-27651
9-26303	9-27586	12-26303	17-26301	THERMAL MECHANICAL EFFECT			
SYSTEM OPERABILITY IN ACCIDENT				2-27615	5-26628	9-27613	11-28011
5-25903	5-25904	5-25907	10-25909	17-26408	17-27615	17-27838	17-28011
11-25908	12-25903	12-25904	12-25908	18-27615			
12-25909	12-25911	18-25903	18-25904	THERMAL NEUTRON			
18-25907	18-25908	18-25909	18-25911	9-26707	15-27866		
TANTALUM				THERMAL POLLUTION			
4-27823				1-27836	1-27841	2-25883	2-27836
TECHNICAL SPECIFICATIONS				2-27841	14-27619	15-27619	16-25883
1-26743	1-27840	11-26743	12-28169	17-27619	18-25883	18-27836	18-27841
13-28167	14-26618	17-26565	17-26566	THERMAL PROPERTY			
17-26618	17-26743	17-26744	17-27294	3-27041	4-27043	5-26699	5-27043
17-27340	17-27341	17-27345	17-27346	5-27436	5-27651	7-27033	7-27038
17-27433	17-27434	17-27478	17-27840	8-27651			

<p>THERMODYNAMICS</p> <p>5-26640 5-26702 5-27318 5-27456</p> <p>5-27888 7-27033 7-27038 7-27066</p> <p>7-27999 8-27999 19-26702 19-27318</p> <p>19-27456</p> <p>THORIUM</p> <p>10-27474 11-27474 13-28028 13-28029</p> <p>17-27474 17-28029</p> <p>TIN</p> <p>7-27095</p> <p>TITANIUM</p> <p>5-27306</p> <p>TOPOGRAPHY</p> <p>2-25883 16-25883 18-25883</p> <p>TRACER, FLUORESCENT</p> <p>3-27426 14-27451</p> <p>TRACER, GENERAL</p> <p>14-28000</p> <p>TRACER, RADIOACTIVE</p> <p>3-26742 11-26742 11-28034 14-27024</p> <p>14-27078 14-28000 15-27019 15-27077</p> <p>17-26742 17-28034</p> <p>TRANSFER FUNCTION</p> <p>6-26584 9-26726 9-27519 9-27593</p> <p>9-27600</p> <p>TRANSPORT PROPERTY</p> <p>5-26702 5-27318 5-27325 5-27327</p> <p>5-27456 5-27737 5-27881 14-27020</p> <p>19-26702 19-27318 19-27327 19-27456</p> <p>TRANSPORT THEORY</p> <p>5-26702 5-27456 19-26702 19-27456</p> <p>TRANSPORTATION AND HANDLING</p> <p>3-25973 3-25977 3-26368 15-26368</p> <p>15-27911 17-26368</p> <p>TRANSURANIUM ELEMENT</p> <p>15-27917</p> <p>TRANSURANIUM PROGRAM</p> <p>17-27854</p> <p>TREAT (PRR)</p> <p>5-26631 5-27719 7-27032</p> <p>TRIGA (RR)</p> <p>6-27842 9-26726 9-26740 9-26741</p> <p>9-27590 9-27842 9-28015 14-26618</p> <p>17-26618 17-26740 17-26741 17-26744</p> <p>17-27842 17-27846</p> <p>TRITIUM</p> <p>14-27021 14-27023 14-27025 14-27078</p> <p>14-28005 15-27648 15-27860 15-27868</p> <p>15-27976 15-27977 17-27838</p> <p>TROPOSPHERE</p> <p>16-26800 16-27295 16-27468</p> <p>TUBING</p> <p>11-28011 17-26409 17-27141 17-28011</p> <p>TUNGSTEN</p> <p>5-27545</p> <p>TURBINE</p> <p>17-27345</p> <p>TURBULENCE, CONVECTIVE</p> <p>5-26636</p> <p>TURBULENCE, STATISTICS</p> <p>16-26797 16-27815</p> <p>UNITED KINGDOM</p> <p>1-27827 2-25164 3-25974 3-25975</p> <p>3-27424 3-27425 5-25164 7-27449</p> <p>9-26303 9-26470 9-26471 9-26472</p> <p>9-26705 9-26736 11-27450 11-27827</p> <p>12-26303 14-27080 15-27077 15-27080</p> <p>15-27445 15-27861 15-27862 17-27827</p> <p>URANIUM</p> <p>13-28029 14-26970 14-27081 15-27081</p> <p>17-28029</p> <p>URANIUM CARBIDE</p> <p>6-27073</p> <p>URANIUM DIOXIDE</p> <p>5-26590 5-27056 5-27651 5-27719</p> <p>6-27743 7-27033 7-27056 7-27999</p> <p>8-27651 8-27998 8-27999 13-27878</p> <p>13-27982 17-26590 17-27129</p> <p>URANIUM OXIDE</p> <p>5-27742</p> <p>URANIUM-233</p> <p>6-25363</p> <p>URANIUM-235</p> <p>6-26147</p> <p>URANIUM, NATURAL</p> <p>5-27056 7-27056</p> <p>USAEC</p> <p>1-27987 1-27991 15-27990 17-27986</p> <p>17-27987 17-27990 17-27991</p> <p>USSR</p> <p>5-26625 5-27318 9-25699 9-26139</p>	<p>9-26476 15-26644 17-26644 19-27318</p> <p>VALVE</p> <p>9-26303 9-27344 11-25908 12-25908</p> <p>12-26303 17-27344 17-27347 17-27622</p> <p>18-25908</p> <p>VAPOR, VAPOR PRESSURE</p> <p>7-27033 15-27976</p> <p>VENTILATION SYSTEM</p> <p>7-28049 7-28050 13-26737 13-28049</p> <p>13-28050 14-27918 15-27917 15-27918</p> <p>17-26737 17-27141 17-28049 17-28050</p> <p>VERMONT YANKEE (BWR)</p> <p>2-27299 18-27299</p> <p>VESR (ISR)</p> <p>1-27840 17-26566 17-27840 18-27840</p> <p>VIBRATION</p> <p>5-26641 9-27591 9-27593 17-26409</p> <p>VIBRATION ANALYSIS</p> <p>5-26641</p> <p>VOID COEFFICIENT</p> <p>6-26783</p> <p>VOID FRACTION</p> <p>5-26454 5-26455 5-26607 5-26638</p> <p>5-26639 5-27052 5-27751</p> <p>VOLATILITY PROCESS</p> <p>13-27878</p> <p>WASHOUT</p> <p>16-27295</p> <p>WASTE DISPOSAL, ECONOMICS</p> <p>14-27074</p> <p>WASTE DISPOSAL, GENERAL</p> <p>14-26971 15-27900</p> <p>WASTE DISPOSAL, HYDRAULIC FRACTURING</p> <p>13-28170 14-26971 14-27918 14-28170</p> <p>15-27918 17-28170</p> <p>WASTE DISPOSAL, LIQUID</p> <p>9-27344 13-24634 13-28170 14-24634</p> <p>14-26971 14-27021 14-27619 14-28007</p> <p>14-28170 15-27619 17-24634 17-27344</p> <p>17-27619 17-28170</p> <p>WASTE DISPOSAL, OCEAN</p> <p>15-27077</p> <p>WASTE DISPOSAL, SALT</p> <p>14-26971 14-27074</p> <p>WASTE DISPOSAL, SOLID</p> <p>14-26971 14-27074 14-27451</p> <p>WASTE MANAGEMENT</p> <p>14-27021 14-27930 15-27911</p> <p>WASTE STORAGE</p> <p>14-27021 14-27074 14-27451 14-27918</p> <p>14-28005 14-28007 15-27918</p> <p>WASTE TREATMENT, ECONOMICS</p> <p>14-27074 14-27930</p> <p>WASTE TREATMENT, FIXATION</p> <p>14-27074 14-28005</p> <p>WASTE TREATMENT, GAS</p> <p>14-27074</p> <p>WASTE TREATMENT, GENERAL</p> <p>12-27875 13-27875 14-26971 15-27019</p> <p>WASTE TREATMENT, LIQUID</p> <p>13-27876 13-27978 13-28025 14-27074</p> <p>14-27082 15-27082</p> <p>WASTE TREATMENT, SOLID</p> <p>14-27914 15-27914</p> <p>WATER POLLUTION</p> <p>14-27930</p> <p>WATER VAPOR</p> <p>7-27036 7-27038 7-27999 8-27999</p> <p>14-27024</p> <p>WATER, GENERAL</p> <p>5-25163 5-26607 5-26614 5-26641</p> <p>5-26642 5-26780 5-27314 5-27726</p> <p>5-27881 7-27095 7-27999 8-27998</p> <p>8-27999 14-27020</p> <p>WAVE, STRESS</p> <p>5-25161</p> <p>WELDING</p> <p>9-27845 11-26571 11-27040 17-25981</p> <p>17-26571 17-27845 18-27431 18-27845</p> <p>WELDS</p> <p>11-27298 11-27428 18-27298 18-27428</p> <p>WIND PROFILE</p> <p>16-26795 16-26796 16-26797</p> <p>WIND STATISTICS</p> <p>16-26795 16-26796 16-26797 16-27815</p> <p>X-RAY</p> <p>3-27426 14-27855 15-26378 15-27085</p> <p>15-27442 15-27855 15-27900 17-26378</p> <p>17-27855</p> <p>XENON</p> <p>6-25987 6-27618 7-27096 12-27282</p>
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XENON OSCILLATION			ZION 1 AND 2 (PWR)				
6-27616	9-27616	17-27616	2-27615	17-27615	18-26623	18-27615	
YANKEE (PWR)			ZIRCALLOY				
6-26621	7-27096	17-25981	4-27821	5-25906	5-25907	5-27651	
17-26620	17-26621	17-27338	8-27651	17-26409	17-27617	18-25906	
YTTRIUM			18-25907				
15-27445			ZIRCONIUM				
ZINC			7-27032	7-27095	13-27018		

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

AARESTAD NO			15-27444		
15-27085			BEASLEY EG		
ACKLEY RD			5-27747		
7-27034			BECKMAN WA		
ADAMS RE			5-27547		
7-27034			BEDENIG D		
ADAMS RW			5-26115	5-28539	
7-27035			BENZEL M		
ADDISON RA			7-27069		
7-27284	13-27284		BERENSON PJ		
ADELMAN M			5-26929		
5-26478			BERGER MJ		
AGAZZI A			4-27466		
9-27586			BERGER S		
AILOR RH			12-27283		
9-27932			BERGLES AE		
AKIMOTO S			5-27894		
9-27501			BERRY DA		
ALLEMAND R			7-27067		
9-26704			BERRY RE		
AMAMIYA S			4-27462		
9-27500			BERRY WE		
AMES LL			7-27067		
14-28048			BERSSFNBRUGGE MW		
AMSTADTER RB			9-26759		
9-26758			BERTOLETTI S		
ANDEEN GB			5-27546		
5-26923			BERTRAND J		
ANDREWS DG			9-26722		
9-27581			BEZELLA WA		
ANSLEY WG			7-27096		
9-27611			BIASI L		
APELBLAT A			5-26186		
5-27326			BIERY JC		
APPLEBY ER			4-27819	7-27819	
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AREHART TA			4-27859	15-27859	
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ARMSTRONG DB			4-27461		
9-27933			BILLURIS G		
ARNESON SO			18-27333		
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ASHENDUKE G			5-27888		
9-26749			BIRSS IR		
ATTIX FH			5-27805	11-27805	
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BABBE EL			14-28005		
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BACKS H			5-26283		
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5-27486			BLUMBERG R		
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7-27038			BLUTREICH JN		
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5-26640			BOURNE JG		
BATES AEG			5-27894		
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BATES EF			16-27295		
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BAYLISS RJ			14-03954	14-27914	15-03954 15-27914

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BRADY JM				5-27310			
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BRAIN TJS				4-27462			
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7-27035				HARRISON D	
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GLOYNA EF				5-27325	
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3-27424				HAVERFIELD AJ	
GOEDDEL WV				15-28008	
7-27093				HAWKINS RH	
GOLDBERG P				14-27024	
5-27894				HAWORTH DR	
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9-26763				HENCH JE	
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9-26716				HENRY M	
GRAHAM WW				9-26711	
17-27289				HENZEL N	
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GRASS G				5-26772	
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GROSE VL				17-27130	
9-26747				HITCHCOCK JE	
GUALTIERI G				5-27484	
3-25973				HUCHREITER LE	
GUNTER AY				5-26634	
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9-26968				HOLZWORTH GC	
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APPENDIX

REFERENCE SOURCES

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