BIBLIOGRAPHY OF REPORTS ON RESEARCH

Sponsored by the NRC Office of Nuclear Regulatory Research

November 1975 - June 1976

J. R. Buchanan

Prepared for the
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
under Interagency Agreements ERDA
40-641-75 and 40-642-75

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55 Vol. I	Design Data and Safety Features of Commercial Nuclear Power Plants, Vol. I, Doctet No. 50-3 through 50-295, by F. A. Haddleson, Dec. 1973	\$15.00
55 Vol. II	Design Data and Safety Features of Commercial Nuclear Power Plants, Vol. II, Doctet No. 50-296 through 50-305, by F. A. Haddleson, Jan. 1972	\$15.00
55 Vol. III	Design Data and Safety Features of Commercial Nuclear Power Plants, Vol. III, Doctet No. 50-307 through 50-449, by F. A. Haddleson, Apr. 1974	\$15.00
55 Vol. IV	Design Data and Safety Features of Commercial Nuclear Power Plants, Vol. IV, Doctet No. 50-452 through 50-503, by F. A. Haddleson, June 1975	\$15.00
	See ORNL/NSIC-96 for Vol. V.	
74	Calculation of Doses Due to Accidentally Released Plutonium from an LWR, by B. R. Fish, G. V. Keilholtz, W. S. Snyder, and S. D. Swisher, Nov. 1972	\$15.00
82	Chemical and Physical Properties of Methyl Iodide and Its Occurrence Under Reactor Accident Conditions - A Summary and Annotated Bibliography, by L. F. Parsly, Dec. 1971	\$12.00
91	Safety-Related Occurrences in Nuclear Facilities as Reported in 1970, by R. L. Scott, Dec. 1971	\$10.00
93	Summary of Recent Legislative and Regulatory Activities Affecting the Environmental Quality of Nuclear Facilities, by R. W. Bryan, B. L. Nichols, and J. W. Runney, May 1972	\$10.00
96	Design Data and Safety Features of Commercial Nuclear Power Plants (Fifth Volume of ORNL/NSIC-55), by F. A. Haddleson	\$15.00
97	Indexed Bibliography of Thermal Effects Literature-2, by J. G. Morgan and C. C. Coutant, May 1972	\$10.00
100	Nuclear Power and Radiation in Perspective, Selections from Nuclear Safety, by J. R. Buchanan, Mar. 1974	\$15.00
101	Indexed Bibliography on Environmental Monitoring for Radioactivity, by B. L. Houser, May 1972	\$10.00
102	Compilation of National and International Nuclear Standards (Excluding U.S. Activities) 8th Ed., 1972, by J. P. Blakely, June 1972	\$10.00
103	Abnormal Reactor Operating Experiences, 1969-1971, by R. L. Scott and R. B. Callahan, May 1972	\$ 8.00
105	Indexed Bibliography on Nuclear Facility Siting, by H. B. Piper, June 1972	\$10.00
106	Safety-Related Occurrences in Nuclear Facilities as Reported in 1971, by R. L. Scott and R. B. Callahan, Sept. 1972	\$12.00
107	Index to Nuclear Safety, A Technical Progress Review by Chronology, Permuted Title, and Author, Vol. 1, No. 1 through Vol. 13, No. 6, May 1973	\$ 8.00
108	Personnel Involved in Development of Nuclear Standards in U.S. - 1972, J. Paul Blakely, Chairman - Status and Recommendations Committee - American Nuclear Standards Institute, May 1973	\$15.00
109	Safety-Related Occurrences in Nuclear Facilities as Reported in 1972, by R. L. Scott and R. B. Callahan, Dec. 1973	\$15.00
110	Indexed Bibliography of Thermal Effects Literature-3, by J. G. Morgan, July 1973	\$12.00

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THE NRC OFFICE OF NUCLEAR REGULATORY RESEARCH
NOVEMBER 1975-JUNE 1976**

**J. R. Buchanan
Nuclear Safety Information Center**

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FOREWORD

The Nuclear Safety Information Center (NSIC), which was established in March 1963 at Oak Ridge National Laboratory, is principally supported by the U.S. Nuclear Regulatory Commission's Office of Nuclear Regulatory Research. Support is also provided by the Division of Reactor Development and Demonstration of the U.S. Energy Research and Development Administration. NSIC is a focal point for the collection, storage, evaluation, and dissemination of safety information to aid those concerned with the analysis, design, and operation of nuclear facilities. A system of key words is used to index the information cataloged by the Center. The title, author, installation, abstract, and key words for each document reviewed are recorded at the central computing facility in Oak Ridge. The references are cataloged according to the following categories:

1. General Safety Criteria
2. Siting of Nuclear Facilities
3. Transportation and Handling of Radioactive Materials
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6. Reactor Transients, Kinetics, and Stability
7. Fission Product Release, Transport, and Removal
8. Sources of Energy Release under Accident Conditions
9. Nuclear Instrumentation, Control, and Safety Systems
10. Electrical Power Systems
11. Containment of Nuclear Facilities
12. Plant Safety Features - Reactor
13. Plant Safety Features - Nonreactor
14. Radionuclide Release and Movement in the Environment
(inactive September 1973)
15. Environmental Surveys, Monitoring, and Radiation Exposure
of Man (inactive September 1973)
16. Meteorological Considerations
17. Operational Safety and Experience
18. Safety Analysis and Design Reports

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19. Radiation Dose to Man from Radioactivity Release to the Environment (inactive September 1973)
20. Effects of Thermal Modifications on Ecological Systems (inactive September 1973)
21. Effects of Radionuclides and Ionizing Radiation on Ecological Systems (inactive September 1973)

Computer programs have been developed that enable NSIC to (1) operate a program of selective dissemination of information (SDI) to individuals according to their particular profile of interest, (2) make retrospective searches of the stored references, and (3) produce topical indexed bibliographies. In addition, the Center Staff is available for consultation, and the document literature at NSIC offices is available for examination. NSIC reports (i.e., those with the ORNL/NSIC and ORNL/NUREG/NSIC numbers) may be purchased from the National Technical Information Service (see inside front cover). All of the above services are free to NRC and ERDA personnel as well as their direct contractors. They are available to all others at a nominal cost as determined by the ERDA Cost Recovery Policy. Persons interested in any of the services offered by NSIC should address inquiries to:

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PARTS AND METHOD OF INDEXING ABSTRACTS

**BIBLIOGRAPHY OF REPORTS ON RESEARCH SPONSORED BY
THE NRC OFFICE OF NUCLEAR REGULATORY RESEARCH
NOVEMBER 1975-JUNE 1976**

J. R. Buchanan

ABSTRACT

A bibliography of 152 reports published by contractors of the NRC Office of Nuclear Regulatory Research during the period November 1975 through June 1976 is presented along with abstracts from the Nuclear Safety Information Center computer file. The bibliography has been sorted into the subject categories used by NRC to organize the research program. Within the subject categories, the reports are sorted by contractor organization and then chronologically. A brief description of the NRC research program precedes the bibliography.

INTRODUCTION

The Energy Reorganization Act of 1974 provided for an Office of Nuclear Regulatory Research within the Nuclear Regulatory Commission (NRC) to perform research, characterized as "confirmatory assessment," relating specifically to regulatory decisions for the safe and environmentally compatible operation of nuclear facilities and materials as well as their protection. In implementing these research responsibilities, NRC continued the two primary programs of reactor safety research already being carried out by the former U.S. Atomic Energy Commission - light-water reactor safety research and advanced reactor safety research - and initiated the planning and coordination needed to accomplish regulatory environmental, fuel cycle, and safeguards research programs.

The goal of the Reactor Safety Research Program is to develop an independent basis and means to reliably and credibly analyze the course of events in hypothetical nuclear reactor accidents and to estimate the consequences of such accidents. Sufficient safety data exist to permit establishment of conservative requirements and safety margins for licensing nuclear power plants. NRC reactor safety research is directed toward refining and reducing the allowable uncertainties in the data, in order

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to better define and quantify the conservative design and safety margins that must be used because of these uncertainties.

This bibliography of NRC safety research reports has been sorted into the various categories of research being performed by NRC. A brief description of these categories is given below, followed by the bibliography.

WATER REACTOR SAFETY RESEARCH

Water reactor safety research is directed toward providing a capability for independent confirmatory assessment of the safety of the current generation of nuclear plants under postulated accident conditions. The research data and analytic methods applied to the assessment of hypothetical nuclear plant accidents will result in a greater measure of confidence that the margins of safety identified in the licensing review are well defined and quantified. The program is divided into four categories: systems engineering, fuel behavior, analysis development, and metallurgy and materials.

Basic (NRC-1)

This category is included since it is used for the distribution of reports that pertain to all the water reactor safety research categories. However, no research per se is sponsored under this heading.

Systems Engineering (NRC-2)

Safety research in systems engineering is addressed primarily to the study of postulated loss-of-coolant accidents in reactors and the effectiveness of emergency core-cooling systems (ECCS). In general, such research is conducted through two types of tests: (1) separate-effects tests to obtain data on those portions of a postulated accident where transient heat transfer and fluid flow phenomena are isolated, thus reducing the number of test variables and simplifying understanding of those complex phenomena; and (2) integral systems tests to study combined phenomena representing an entire postulated accident sequence, both to assess the significance of knowledge gained from separate-effects tests and to confirm the predictive capability of computer codes.

Fuel Behavior (NRC-3)

An important goal of reactor safety research is improved understanding of the response of fuel element pellets and cladding to a postulated nuclear accident. NRC examinations in this area involve a combination of laboratory studies and in-reactor tests, which are experiments conducted in an operating nuclear reactor to observe actual fuel response. These activities, in turn, provide data for predicting fuel behavior in accident conditions through the development and verification of analytical codes.

Analysis Development (NRC-4)

Complex digital computer codes can be used to compute the time and space dependence of important factors during total or partial accident sequences and the effects that might result if a full-scale reactor accident were to occur. The credibility of using such codes in reactor safety assessment is based on the success achieved in using the codes to predict results of various reactor safety research separate-effects and integral systems experiments and on the validity of extrapolating these results to full-size, commercial systems. NRC gives code development and application high priority.

Metallurgy and Materials (NRC-5)

This area of research is aimed toward ensuring the continuing integrity of the primary-system pressure boundaries (vessels, components, and piping) in nuclear reactors. These heavy-walled vessels, components, and pipes must remain intact at all times, since failure could lead to a loss of normal primary-system water used for cooling the nuclear fuel during operation and require the injection of emergency cooling water to prevent excessive heatup of the nuclear core. The ability of the steel vessel, components, and piping to retain integrity during operating and accident conditions is governed by (1) the material properties and the response of the steel to the reactor environment and (2) the size and orientation of flaws in the vessel, components, or pipeline.

Environmental and Siting (NRC-6)

Research programs in the areas of health and environmental impact, fuel-cycle site safety, and safeguards will develop the technical information needed to ensure that measures taken for safety and for the protection of health and the environment are adequate and to make certain that unnecessary or unwarranted requirements are not imposed. The program will develop improved methods for predicting and assessing health, safety, and environmental impacts and will provide reliable and effective methods for evaluating sites for nuclear power and fuel-cycle facilities. Among other programs will be one to provide reliable and efficient monitoring methods for health and environmental protection.

ADVANCED REACTOR SAFETY RESEARCH

High-priority experimental and analytical safety research programs were initiated in 1975 on advanced reactors - liquid-metal cooled (LMFBR) and gas-cooled (GCFBR) fast breeder reactors and high-temperature gas-cooled reactors (HTGR).

Fast Reactors (NRC-7)

The program which principally covers LMFBRs gives strong consideration to the methods and data needed to assess the safety of fast reactors under a range of postulated accidents, from the anticipated loss of flow with scram to the hypothetical case of a core-disruptive accident such as might occur following a loss of flow without scram.

The radiological source used in LMFBR site assessment is based on the potential leakage of coagglomerated aerosols of sodium oxide and uranium-plutonium oxide from the containment. Consequently, there is an experimental program to verify the source and mode of transport of aerosols generated in postulated LMFBR accidents.

Gas-Cooled Reactors (NRC-8)

In the case of the HTGR, the range of accidents includes the sudden depressurization (analogous to a pipe break in a light-water reactor) of the primary system, steam ingress from leaks in the steam generator, and

combinations of these events. Because of the unique structure of HTGRs, attention is also devoted to seismic response.

Studies of fission-product chemistry and graphite oxidation in laboratory loops are under way. These studies will lead to increased accuracy in the assessment of fission-product transport in HTGRs and of safety margins associated with vital structures such as the core support posts.

ORGANIZATION OF BIBLIOGRAPHY

The bibliography which follows contains all reports published from November 1975 through June 1976 by NRC contractors that are sponsored in the programs described above. The bibliography is organized by the category regime used for NRC report distribution. If a document falls into more than one category because of its subject matter, the complete abstract is included in each applicable category. Within each subject category the reports are listed alphabetically by contractor name and then chronologically under each contractor. The bibliography is sorted into the following categories:

1. NRC-1. Water Reactor Safety Research, Basic
2. NRC-2. Water Reactor Safety Research, Systems Engineering
3. NRC-3. Water Reactor Safety Research, Fuel Behavior
4. NRC-4. Water Reactor Safety Research, Analysis Development
5. NRC-5. Water Reactor Safety Research, Metallurgy and
Materials
6. NRC-6. Water Reactor Safety Research, Environmental and
Siting
7. NRC-7. Advanced Reactor Safety Research, Fast Reactors
8. NRC-8. Advanced Reactor Safety Research. Gas-Cooled Reactors

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BIBLIOGRAPHY

**PRICES FOR DOCUMENTS ABSTRACTED
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The prices of the documents abstracted in this report depend upon the number of pages in the individual documents. The page count found in the line preceding the abstract determines the price according to the following schedule:

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151-175	7.75
176-200	8.50
201-225	8.75
226-250	9.00
251-275	10.00
276-300	10.25
301-325	10.75
326-350	11.00
351-375	11.50
376-400	11.75
401-425	12.00
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526-550	14.00
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576-600	14.75
601-up	^b

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^b Add \$2.50 for each additional 100-page increment from 601 to 1000 pages; add \$4.50 for each additional 100-page increment over 1000 pages.

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Springfield, Virginia 22161

1. NRC-1 WATER REACTOR SAFETY RESEARCH, BASIC

111993
 REACTOR OPERATING EXPERIENCES: 1972-1976
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE, NUCLEAR SAFETY INFORMATION CENTER
 UNML/NSIC-121 P. 232 PAGES, 1976, DEC. 1975

THIS NEW REPORT UPDATES THE THREE PREVIOUS EDITIONS. EACH ORIGINAL NRC REPORT WAS ISSUED BY THE COMMISSION TO KEEP ALERT THE INDUSTRY TO SPECIAL OPERATING PROBLEMS BY PRESENTING THE OPERATING EXPERIENCES OF OTHERS. THIS COMPILATION CONTAINS THE EXPERIENCES REPORTED DURING THE PERIOD. THE REPORTS WERE ARRANGED IN NUMERICAL ORDER AND CONSEQUENTLY THEY ARE IN CHRONOLOGICAL ORDER. AN INDEX HAS BEEN PREPARED USING KEYWORDS FROM THE NRC THESAUSS, IN ORDERING TERMS. IN ADDITION, A PERMUTED TITLE INDEX HAS ALSO BEEN PREPARED TO ASSIST THE READER IN LOCATING THE REPORTS OF INTEREST.

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REACTOR, OUN + FAILURE + INCIDENT COMPILATION + REACTOR, PWR + REACTOR, LWR + REVIEW + 11 PULLEIN + OPERATING EXPERIENCE + MAIN + JACOBS

112129
 RESUME OF 60
 ANNOTATED BIBLIOGRAPHY OF HYDROGEN CONSIDERATIONS IN LIGHT-WATER POWER REACTORS
 OAK RIDGE NATIONAL LABORATORY, NUCLEAR SAFETY INFORMATION CENTER, TENNESSEE
 UNML/NSIC-120 P. 355 PAGES, 3 TABS, 3 FIGS, 42 REFS, FEB. 1976

THIS REPORT IS A CRITICAL REVIEW OF THE LITERATURE NOW AVAILABLE ON HYDROGEN CONSIDERATIONS IN LIGHT-WATER POWER REACTORS AND INCLUDES A BIBLIOGRAPHY OF THAT LITERATURE. THE SUBJECT MATTER INCLUDES MECHANISMS FOR THE GENERATION OF HYDROGEN-OXYGEN MIXTURES, A DESCRIPTION OF THE FUNDAMENTAL PROPERTIES OF SUCH MIXTURES, AND THEIR SPONTANEOUS IGNITION IN BOTH STATIC AND DYNAMIC SYSTEMS. THE LIMITS FOR HYDROGEN FLAMMABILITY AND FLAME PROPAGATION ARE EXAMINED IN TERMS OF THE EFFECTS OF PRESSURE, TEMPERATURE, AND ADDITIVES; THE EMPHASIS IS ON THE EFFECTS OF STEAM AND WATER VAPOR. THE CONTAINMENT SYSTEMS FOR PRESSURIZED-WATER REACTORS AND BOILING-WATER REACTORS ARE COMPARED, AND METHODS TO CONTROL HYDROGEN AND OXYGEN UNDER THE CONDITIONS OF BOTH NORMAL OPERATION AND POSTULATED ACCIDENTS ARE REVIEWED. IT IS CONCLUDED THAT HYDROGEN CAN BE CONTROLLED SO THAT SERIOUS COMPLICATIONS FROM THE PRODUCTION OF HYDROGEN WILL NOT OCCUR.

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113008
 NUCLEAR POWER: ACCIDENT PROBABILITIES, RISK, AND BENEFITS. A BIBLIOGRAPHY
 OAK RIDGE NATIONAL LABORATORY, TENN. NUCLEAR SAFETY INFORMATION CENTER
 UNML/NSIC-123 P. 101 PAGES, FEB. 1976

THIS REPORT IS A SELECTED LISTING OF 306 DOCUMENTS PERTAINING TO NUCLEAR ACCIDENT PROBABILITY AND NUCLEAR RISK. BECAUSE OF THE ATTENTION FOCUSED ON THESE CONCEPTS BY THE RECENT (AUGUST 1976) PUBLICATION OF THE CHART OF RASH-100, "REACTOR SAFETY STUDY," IT IS INTENDED THAT THIS BIBLIOGRAPHY MAKE CONVENIENTLY AVAILABLE THE EXISTENCE OF RELEVANT LITERATURE ON THESE CONCEPTS. SUCH AN AWARENESS WILL ENHANCE AN UNDERSTANDING OF PROBABILITY AND RISK AS APPLIED TO NUCLEAR POWER PLANTS AND IS ESSENTIAL TO THEIR FURTHER DEVELOPMENT AND/OR APPLICATION. THIS BIBLIOGRAPHY INCLUDES FIRST A LISTING OF THE SELECTED DOCUMENTS WITH ABSTRACT AND KEYWORDS, FOLLOWED BY THREE INDEXES: 1) KEYWORD, 2) AUTHOR, AND 3) PERMUTED TITLE.

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 CUFFELL DR + ALLEN A
 INDEX TO NUCLEAR SAFETY: A TECHNICAL PROGRAMS REVISED BY CHRONOLOGY, PERMUTED TITLE, AND AUTHOR, VOL. 11, NO. 1 THROUGH VOL. 10, NO. 6
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE, NUCLEAR SAFETY INFORMATION CENTER
 UNML/NSIC-120 (REVISION TO UNML/NSIC-118) P. 41 PAGES, APRIL 1976

THIS INDEX TO NUCLEAR SAFETY COVERS ARTICLES IN NUCLEAR SAFETY VOL. 11, NO. 1 (JAN.-FEB. 1976) THROUGH VOL. 10, NO. 6 (NOV.-DEC. 1975). INCLUDED IN THE INDEX IS A CHRONOLOGICAL LIST OF ARTICLES (INCLUDING ABSTRACT) FOLLOWED BY BOTH A KEY INDEX AND AN AUTHOR INDEX. NUCLEAR SAFETY IS A BIMONTHLY TECHNICAL PROGRAMS REVISED BY THE NUCLEAR SAFETY INFORMATION CENTER AND COVERS ALL SAFETY ASPECTS OF NUCLEAR POWER REACTORS AND ASSOCIATED FACILITIES. THE INDEX LISTS OVER 100 TECHNICAL ARTICLES IN THE LAST SIX YEARS OF PUBLICATION.

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PROGRAM • OPERATING EXPERIENCE • NUC

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DESIGN DATA AND SAFETY FEATURES OF COMMERCIAL NUCLEAR POWER PLANTS VOL. V
OAK RIDGE NATIONAL LABORATORY, TENNESSEE. NUCLEAR SAFETY INFORMATION CENTER
ORNL/NSIC-46 • 170 PPS. FIGS. JUNE 1976 (5TH VOLUME OF ORNL/NSIC-55)

DESIGN DATA, SAFETY FEATURES, AND SITE CHARACTERISTICS ARE SUMMARIZED FOR 36 NUCLEAR POWER UNITS IN 17 POWER STATIONS IN THE UNITED STATES. SIX PAGES OF DATA ARE PRESENTED FOR EACH PLANT. CLASSIFYING OF THERMAL-HYDRAULIC AND NUCLEAR FACTORS, CONTAINMENT FEATURES, EMERGENCY-CORE-COOLING SYSTEMS, SITE FEATURES, CIRCULATING WATER SYSTEM DATA, AND MISCELLANEOUS FACTORS. AN AERIAL PERSPECTIVE IS ALSO PRESENTED FOR EACH PLANT. THIS VOLUME COVERS LIGHT WATER REACTORS (LWRs) WITH CAPACITIES 30-300 THROUGH 30-300. PWRs (LWRs) - 50-171, 50-267, 50-050/051, 50-003/004, THE ATLANTIC PLANTING STATION 50-077/078, AND THE CLINCH RIVER BREEDER 50-537.

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SITING OF NUCLEAR FACILITIES. SECTIONS FROM "NUCLEAR SAFETY"
OAK RIDGE NATIONAL LABORATORY, TENNESSEE. NUCLEAR SAFETY INFORMATION CENTER
ORNL/NSIC-110 • 207 PPS. TABS. FIGS. REFS. JULY 1976

THIS REPORT EMPHASIZES SITING POLICY AND PRACTICE FOR NUCLEAR POWER PLANTS AS DEVELOPED IN THE U.S. AND ABROAD. TWENTY-FOUR ARTICLES FROM NUCLEAR SAFETY ON THIS GENERAL TOPIC ARE REPRINTED SINCE THEY PROVIDE A VALUABLE REFERENCE SOURCE. THE APPENDICES ALSO INCLUDE REPRINTS OF SOME RELEVANT REGULATORY RULES AND ORDINANCES ON SITING. ADVANTAGES AND DISADVANTAGES OF NOVEL SITING CONCEPTS SUCH AS UNDERGROUND CONTAINMENT, OFFSHORE SITING, AND NUCLEAR ENERGY PARKS ARE ADDRESSED. OTHER TOPICS INCLUDE SITE CRITERIA, RISK CRITERIA, AND NUCLEAR SHIP CRITERIA.

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115102
SCOTT ML • GALLAGHER WD
ANALYZED BIBLIOGRAPHY OF SAFETY-RELATED OCCURRENCES IN BOILING-WATER NUCLEAR POWER PLANTS AS REPORTED IN 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE. NUCLEAR SAFETY INFORMATION CENTER
ORNL/NSIC-120 • 100 PPS. 32 REFS. JULY 1976

THIS BIBLIOGRAPHY CONTAINS 100-BURT ABSTRACTS OF REPORTS TO THE U.S. NUCLEAR BOILING-WATER REACTOR NUCLEAR POWER PLANTS IN 1975. THE REPORT INCLUDES 100 ABSTRACTS, ARRANGED ALPHABETICALLY BY REACTOR NAME AND THEN CHRONOLOGICALLY FOR EACH REACTOR THAT DESCRIBE INCIDENTS, FAILURES, AND DESIGN OR CONSTRUCTION DEFICIENCIES THAT WERE EXPERIENCED AT THE FACILITY. KEY-WORD AND SUBJECT-TITLE INDEXES ARE PROVIDED TO FACILITATE LOCATION OF THE SUBJECTS OF INTEREST. AND TABLES THAT SUMMARIZE THE INFORMATION CONTAINED IN THE BIBLIOGRAPHY ARE PROVIDED. THE INFORMATION LISTED IN THE TABLES INCLUDES INSTANT FAILURES, EQUIPMENT FAILURES, SYSTEM FAILURES, CAUSES OF FAILURES, DEFICIENCIES NOTED, AND THE TIME OF OCCURRENCE (I.E., DURING REPELING, OPERATION, TESTING, OR CONSTRUCTION). SEVEN OF THE UNIQUE EVENTS THAT OCCURRED DURING THE YEAR ARE REPRINTED IN DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA. 22101
(151100/FULL-SIZE COPY. 02-25/REF)

REACTION, BOIL • OPERATING EXPERIENCE • FAILURE • INCIDENT CORRELATION • BIBLIOGRAPHY • REACTOR, POWER • NUC

115103
SCOTT ML • GALLAGHER WD
ANALYZED BIBLIOGRAPHY OF SAFETY-RELATED OCCURRENCES IN PRESSURIZED-WATER NUCLEAR POWER PLANTS AS REPORTED IN 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE. NUCLEAR SAFETY INFORMATION CENTER
ORNL/NSIC-127 • 177 PPS. 23 REFS. JULY 1976

THIS BIBLIOGRAPHY CONTAINS 100-BURT ABSTRACTS OF REPORTS TO THE U.S. NUCLEAR REGULATORY COMMISSION CONCERNING OPERATING PLANT EVENTS THAT OCCURRED AT PRESSURIZED-WATER REACTOR NUCLEAR POWER PLANTS IN 1975. THE REPORT INCLUDES 100 ABSTRACTS, ARRANGED ALPHABETICALLY BY REACTOR NAME AND THEN CHRONOLOGICALLY FOR EACH REACTOR THAT DESCRIBE INCIDENTS, FAILURES, AND DESIGN OR CONSTRUCTION DEFICIENCIES EXPERIENCED AT THE FACILITY. KEY-WORD AND SUBJECT-TITLE INDEXES ARE PROVIDED TO FACILITATE LOCATION OF THE SUBJECTS OF INTEREST. AND TABLES SUMMARIZING THE INFORMATION CONTAINED IN THE BIBLIOGRAPHY ARE PROVIDED. THE INFORMATION LISTED IN THE TABLES INCLUDES INSTANT FAILURES, EQUIPMENT FAILURES, SYSTEM FAILURES, CAUSES OF FAILURES, DEFICIENCIES NOTED, AND THE

VISIONS - CONTINUED

TIME OF OCCURRENCE (I.E., DURING REFUELING, OPERATION, TESTING, OR CONSTRUCTION). A FEW OF THE
LARGE EVENTS THAT OCCURRED DURING THE YEAR ARE REVIEWED IN DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA. 22161
1910.75/FULL-SIZE COPY. \$2.25/HP)

OPERATION, PWR - OPERATION, EXPERIENCE - FAILURE - INCIDENT CORRELATION - BIBLIOGRAPHY - REACTOR, POWER - NUCR

2. NRC-2 WATER REACTOR SAFETY RESEARCH: SYSTEMS ENGINEERING

109540
CHAPU HS • JENSEN HF • SACRETT RE
EXPERIMENT DATA REPORT FROM SEMISCALE MOD-1 TEST S-02-6 (BLUDDOWN HEAT TRANSFER TEST)
ARMONJET NUCLEAR COMPANY, IDAHO FALLS
ANR-1236 P. 45 PMS, 5 TABS, 100 FIGS, NOV. 1975

TEST DATA ARE PRESENTED. TEST S-02-6 IS ONE OF SEVERAL SEMISCALE MOD-1 EXPERIMENTS CONDUCTED TO INVESTIGATE THE THERMAL AND HYDRAULIC PHENOMENA ACCOMPANYING A HYPOTHESIZED LOSS-OF-COOLANT ACCIDENT (LCOA) IN A WATER-COOLED NUCLEAR REACTOR SYSTEM AND TO PROVIDE DATA FOR THE ASSESSMENT OF THE LOSS-OF-FLUID (LOFT) DESIGN BASIS. THE TEST WAS CONDUCTED FROM AN INITIAL COLD LEG FLUID TEMPERATURE OF 500 F AND AN INITIAL PRESSURE OF 2,200 PSIA. A SIMULATED DOUBLE-ENDED OFFSET SHEAR COLD LEG BREAK WAS USED TO INVESTIGATE THE SYSTEM RESPONSE TO A DEPRESSURIZATION TRANSIENT WITH FULL DESIGN CORE POWER (100 MW). AN ELECTRICALLY HEATED CORE WAS USED IN THE PRESSURE VESSEL TO SIMULATE THE EFFECTS OF A NUCLEAR CORE. SYSTEM FLOW WAS SET TO ACHIEVE THE FULL DESIGN CORE TEMPERATURE DIFFERENTIAL OF 160 F. THE FLOW RESISTANCE OF THE INTACT LOOP WAS BASED ON CORE AREA SCALING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
HEAT TRANSFER • NUCRUM • TESTING • LOFT (S-N) • REACTION, LHM • BLUDDOWN • THERMAL HYDRAULIC ANALYSIS • JACOBS

109547
CHAPU HS • JENSEN HF • SACRETT RE
EXPERIMENT DATA REPORT FROM SEMISCALE MOD-1 TEST S-02-7 (BLUDDOWN HEAT TRANSFER TEST)
ARMONJET NUCLEAR COMPANY, IDAHO FALLS
ANR-1237 P. 133 PMS, 214 FIGS, NOV. 1975

RECORDED TEST DATA ARE PRESENTED FOR TEST S-02-7 OF THE SEMISCALE MOD-1 BLUDDOWN HEAT TRANSFER TEST SERIES. IT IS ONE OF SEVERAL SEMISCALE MOD-1 EXPERIMENTS CONDUCTED TO INVESTIGATE THE THERMAL AND HYDRAULIC PHENOMENA ACCOMPANYING A HYPOTHESIZED LOSS-OF-COOLANT ACCIDENT (LCOA) IN A WATER-COOLED NUCLEAR REACTOR SYSTEM AND TO PROVIDE DATA FOR THE ASSESSMENT OF THE LOSS-OF-FLUID (LOFT) DESIGN BASIS. TEST S-02-7 WAS CONDUCTED FROM AN INITIAL COLD LEG FLUID TEMPERATURE OF 500 F AND AN INITIAL PRESSURE OF 2,200 PSIA. A SIMULATED DOUBLE-ENDED OFFSET SHEAR COLD LEG BREAK WAS USED TO INVESTIGATE THE SYSTEM RESPONSE TO A DEPRESSURIZATION TRANSIENT WITH FULL DESIGN CORE POWER (100 MW). AN ELECTRICALLY HEATED CORE WAS USED IN THE PRESSURE VESSEL TO SIMULATE THE EFFECTS OF A NUCLEAR CORE WITH POWER SET TO PROVIDE A FLAT RADIAL POWER CORE PROFILE. SYSTEM FLOW WAS SET TO ACHIEVE THE FULL DESIGN CORE TEMPERATURE DIFFERENTIAL OF 160 F. THE FLOW RESISTANCE OF THE INTACT LOOP WAS BASED ON CORE AREA SCALING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
HEAT TRANSFER • NUCRUM • TESTING • LOFT (S-N) • REACTION, LHM • BLUDDOWN • THERMAL HYDRAULIC ANALYSIS • JACOBS

109553
HANSON DJ • FRENCH HS • SHUPPER CJ
AN EVALUATION OF ECC RELATED PHENOMENA DURING SEMISCALE MOD-1 ISOTHERMAL TESTS
ARMONJET NUCLEAR CO., IDAHO FALLS
ANR-1239 P. 42 PMS, 10 FIGS, 10 REFS, NOV. 1975

SELECTED EXPERIMENTAL DATA FROM TESTS PERFORMED DURING THE SEMISCALE MOD-1 ISOTHERMAL TEST SERIES ARE ANALYZED. THE ANALYSIS IS LIMITED TO DATA THAT DESCRIBE PHENOMENA RELATED TO THE INJECTION OF EMERGENCY CORE COOLANT (ECC). THE ANALYSIS IS DIRECTED AT THE ECC RELATED PHENOMENA IN THE INTACT LOOP COLD LEG, INLET ANNULUS, DOWNCOMER, AND LOWER PLenum BECAUSE, DEPENDING ON INJECTION LOCATION, SOME OR ALL OF THESE COMPONENTS WILL BE IN CONTACT WITH THE ECC AS IT FLOWS TO A POSITION WHERE COOLING OF AN ACTIVE CORE COULD RESULT. SPECIFICALLY, THE CONDENSATION PHENOMENA THAT OCCUR IN THE INTACT LOOP COLD LEG, INLET ANNULUS, AND DOWNCOMER ARE ANALYZED ALONG WITH DOWNCOMER HEAT TRANSFER AND COMPETING FLOW PHENOMENA TO DETERMINE THEIR EFFECTS ON ECC DELIVERY. FINALLY, THE EFFECTIVENESS OF INJECTING ECC AT VARIOUS LOCATIONS IN THE SEMISCALE MOD-1 SYSTEM IS EVALUATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
NUCRUM • TESTING • ANALYTICAL TECHNIQUE • OPERATIONAL • JACOBS

109556
FINGER PM
QUARTERLY TECHNICAL REPORT ON WATER REACTOR SAFETY RESEARCH SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S DIVISION OF REACTOR SAFETY RESEARCH, APRIL-JUNE, 1975
ARMONJET NUCLEAR COMPANY, IDAHO FALLS
ANR-1262 P. 226 PMS, 10 FIGS, 10 REFS, NOV. 1975

THE SEMISCALE PROGRAM CONSISTS OF A CONTINUING SERIES OF SMALL-SCALE NUCLEAR THERMAL-HYDRAULIC EXPERIMENTS HAVING AS THEIR PRIMARY PURPOSE, THE GENERATION OF EXPERIMENTAL DATA THAT CAN BE APPLIED TO THE DEVELOPMENT AND VERIFICATION OF ANALYTICAL MODELS DESCRIBING PHENOMENA IN WATER-COOLED NUCLEAR POWER PLANTS. THE LIFT PROGRAM IS A NUCLEAR TEST PROGRAM FOR PROVIDING TEST DATA TO SUPPORT ASSESSMENT AND IMPROVEMENT OF THE ANALYTICAL METHODS UTILIZED FOR PREDICTING THE BEHAVIOR OF PRESSURIZED WATER REACTORS UNDER NORMAL CONDITIONS. THE THERMAL FLUX MONITORING PROGRAM IS AN INTEGRATED EXPERIMENTAL AND ANALYTICAL PROGRAM DESIGNED TO PROVIDE INFORMATION ON THE BEHAVIOR OF REACTOR FUELS UNDER NORMAL, OFF-NORMAL, AND ACCIDENT CONDITIONS. THE REACTION

110554 OCCTINUED

BEHAVIOR PROGRAM ENCOMPASSES THE ANALYTICAL ASPECTS OF PREDICTING THE RESPONSE OF NUCLEAR POWER REACTORS UNDER NORMAL, ABNORMAL, AND ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR + REACTOR TRANSIENT + LOFT (S-M) + REACTOR, LOR + ON AND D PROGRAM + FUEL ROD + BEHAVIOR + JACOBS

109870

CRAPU NS + JENSEN HP + SACKETT RJ

EXPERIMENT DATA REPORT FOR SEMISCALE ROD-1 TEST S-02-5 (BLUDDOWN HEAT TRANSFER TEST)

RENUJET NUCLEAR COMPANY, SUANO FALLS

ANLR-1235 P. 97 PPS, 5 TABS, 152 FIGS, DEC. 1975

MEASURED TEST DATA ARE PRESENTED FOR TEST S-02-5 OF THE SEMISCALE ROD-1 BLUDDOWN HEAT TRANSFER TEST SERIES. TEST S-02-5 IS ONE OF SEVERAL SEMISCALE ROD-1 EXPERIMENTS CONDUCTED TO INVESTIGATE THE THERMAL AND HYDRAULIC PHENOMENA ACCOMPANYING A HYPOTHESIZED LOSS-OF-COOLANT ACCIDENT IN A WATER-COOLED NUCLEAR REACTOR SYSTEM AND TO PROVIDE DATA FOR THE ASSESSMENT OF THE LOSS-OF-FLUID TEST (LOFT) DESIGN BASIS. TEST S-02-5 WAS CONDUCTED FROM AN INITIAL COLD LEG FLUID TEMPERATURE OF 500 F AND AN INITIAL PRESSURE OF 2,251 PSIA. A SIMULATED DOUBLE-ENDED OFFSET SHEAR COLD LEG BREAK WAS USED TO INVESTIGATE THE SYSTEM RESPONSE TO A DEPRESSURIZATION TRANSIENT WITH FULL CORE POWER. SYSTEM FLUID WAS SET TO ACHIEVE THE FULL DESIGN CORE TEMPERATURE DIFFERENTIAL OF 60 F.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

HYDRAULIC EXPERIMENT + ACCIDENT, LOSS OF PRESSURE + REACTION, PUB + OUT OF PILE EXPERIMENT + THERMAL EXPERIMENT + LOFT (S-M) + BLUDDOWN + DATA COLLECTION

111040

CRAPU NS + JENSEN HP + SACKETT RJ

EXPERIMENT DATA REPORT FOR SEMISCALE ROD-1 TESTS S-02-9 AND S-02-9A (BLUDDOWN HEAT TRANSFER TESTS)

RENUJET NUCLEAR COMPANY, SUANO FALLS

ANLR-1236 P. 102 PPS, 5 TABS, 201 FIGS, JAN. 1976

MEASURED TEST DATA ARE PRESENTED FOR TESTS S-02-9 AND S-02-9A OF THE SEMISCALE ROD-1 BLUDDOWN HEAT TRANSFER TEST SERIES. TESTS S-02-9 AND S-02-9A WERE CONDUCTED FROM INITIAL COLD LEG FLUID TEMPERATURES OF 502 AND 500 DEG F, RESPECTIVELY, AND INITIAL PRESSURES OF 2,253 AND 2,253 PSIA, RESPECTIVELY. A SIMULATED DOUBLE-ENDED OFFSET SHEAR COLD LEG BREAK WAS USED TO INVESTIGATE THE SYSTEM RESPONSE TO A DEPRESSURIZATION TRANSIENT WITH FULL CORE POWER (1.4 MW). AN ELECTRICALLY HEATED CURE WAS USED IN THE PRESSURE VESSEL TO SIMULATE THE EFFECTS OF A NUCLEAR CORE. SYSTEM FLUID WAS SET TO ACHIEVE FULL CORE TEMPERATURE DIFFERENTIAL (60 DEG F). THE FLUID RESISTANCE OF THE INLET LOOP WAS BASED ON CURE AREA SCALING. THE PURPOSE OF THIS REPORT IS TO MAKE AVAILABLE THE UNINTERPRETED DATA FROM TESTS S-02-9 AND S-02-9A FOR FUTURE DATA ANALYSIS AND TEST RESULTS REPORTING ACTIVITIES. THE DATA, PRESENTED IN THE FORM OF GRAPHS IN ENGINEERING UNITS, HAVE BEEN ANALYZED ONLY TO THE EXTENT NECESSARY TO ASSURE THAT THEY ARE REASONABLE AND CONSISTENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

HYDRAULIC EXPERIMENT + THERMAL EXPERIMENT + LOFT (S-M) + HEAT TRANSFER EXPERIMENT + BLUDDOWN + JACOBS

112210

QUARTERLY TECHNICAL REPORT ON REACTOR REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S DIVISION OF REACTOR SAFETY RESEARCH, JULY-SEPTEMBER 1975

RENUJET NUCLEAR CO., SUANO FALLS

ANLR-1240 P. 190 PPS, 35 TABS, 111 FIGS, 20 PPS, PER. 1976

LIGHT WATER REACTOR SAFETY ACTIVITIES WERE MONITORED DURING JULY THROUGH SEPTEMBER 1975 ARE SUMMARIZED. THE ISOTHERMAL BLUDDOWN TEST SERIES OF THE SEMISCALE ROD-1 TEST PROGRAM HAS PROVIDED DATA FOR EVALUATION OF BREAK FLOW PHENOMENA AND ANALYSIS OF PIPING P-00 REGIMES AND PUMP PERFORMANCE. IN THE LOFT PROGRAM, MEASUREMENT UNCERTAINTIES WERE EVALUATED. THE THERMAL FUELS BEHAVIOR PROGRAM COMPLETED FOUR FUEL-CORE MISMATCH TESTS. IN ADDITION, FUEL RODS TO INVESTIGATE CRITICAL HEAT FLUX CHARACTERISTICS, MODEL DEVELOPMENT AND VERIFICATION EFFORTS OF THE REACTOR BEHAVIOR PROGRAM INCLUDED DEVELOPMENT OF THE SPENT CORRELATION CODE SUBROUTINES FOR THE PWR-T CODE, VERIFICATION OF REACTOR, AND RESULTS OF THE NUCLEAR REACTOR PLUTONIUM EXPERIMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

ACCIDENT ANALYSIS + COMPUTER PROGRAM + HYDRAULIC ANALYSIS + LOFT (S-M) + REACTOR, LOR + SAFETY PROGRAM + BLUDDOWN + ON AND D PROGRAM + HEAT FLUX, CRITICAL + JACOBS

112000

CRAPU NS + REYNOLDS JS

LOFT DATA ACQUISITION AND VISUAL DISPLAY SYSTEM (LOFT) PRESENTATION PROGRAM

RENUJET NUCLEAR COMPANY, SUANO FALLS

ANLR-1241-1242 P. 70 PPS, 10 FIGS, 9 PPS, MARCH 1976

THE LOFT DATA PRESENTATION PROGRAM WAS INSTALLED TO GRAPHICALLY DISPLAY BOTH LOFT DATA EXPERIMENTAL TEST DATA AND CALCULATION DATA IN THE VERSATILE PLOT/STATIC PLOTTER. IT PURPOSE WAS TO PROVIDE A QUICK FIRST LOOK AT DATA TO ASSIST IN MONITORING AND VERIFICATION

117000 CONTINUOUS VERIFICATION AND PROVIDE ALMOST INSTANTANEOUS DURING COPIES OF DATA WHICH ARE USED IN THE ANALYSIS OF THE TEST

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

COMPUTER PROGRAM + DATA PROCESSING + LUFF (S-AM) + JACK + JACOBS

115100
UNCLASSIFIED TECHNICAL REPORT ON BATHY REACTOR SAFETY PROGRAM SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S DIVISION OF REACTOR SAFETY RESEARCH, OCTOBER-DECEMBER 1975
ARGONNIE NUCLEAR COMPANY, IDAHO FALLS
ANCR-MUREG-1307 P. 147 PPS, 80 TABS, 50 FIGS, MAY 1976

THE BLOODBOM HEAT TRANSFER TEST SERIES OF THE SEMISCALE MHD-1 TEST PROGRAM WAS COMPLETED. IN THE LIFT PROGRAM, PREPARATIONS WERE MADE FOR NONNUCLEAR TESTING. THE THERMAL FUELS BEHAVIOR PROGRAM COMPLETED A PUMP-COOLING MISMATCH TEST AND AN IRRADIATION EFFECTS TEST ON PWR-TYPE FUEL RODS. MAJOR DEVELOPMENT AND VERIFICATION EFFORTS OF THE REACTOR BEHAVIOR PROGRAM INCLUDED DEVELOPING NEW ANALYSIS MODELS FOR THE RELAP-4 COMPUTER CODE, SUBROUTINES FOR THE FRAP-5 AND FRAP-7 CODES, AND NEW MODEL FOR PREDICTING REACTOR FUEL STRUCTURING AND ZIRCALOY CLADDING BEHAVIOR. AN ANALYSIS OF POST-CRIP FUEL BEHAVIOR WAS MADE USING FRAP-7.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

H AND D PROGRAM + SAFETY PROGRAM + MHD-1 + BLUFF (S-PP) + REACTOR, LWR + FUEL ROD + BEHAVIOR + BLOODBOM + HEAT TRANSFER + CORE REFLUDDING SYSTEM + COMPUTER PROGRAM + HYDRAULIC ANALYSIS + JACK

115003
SEMISCALE MHD-1 PROGRAM AND SYSTEM DESCRIPTION FOR THE REFLUDD HEAT TRANSFER TESTS (TEST SERIES 3)
ARGONNIE NUCLEAR COMPANY, IDAHO FALLS
ANCR-MUREG-1305 P. 80 PPS, 8 TABS, 23 FIGS, MAY 1976

THE SEMISCALE MHD-1 EXPERIMENTS ARE PART OF THE OVERALL PROGRAM DESIGNED TO INVESTIGATE THE RESPONSE OF A WATER-COOLED NUCLEAR REACTOR SYSTEM TO A HYPOTHEZED LOSS-OF-COOLANT ACCIDENT (LOCA). THE REFLUDD HEAT TRANSFER TEST SERIES (TEST SERIES 3) CONSISTED OF 12 TESTS. THESE TESTS WERE THE FIRST TESTS IN THE MHD-1 SYSTEM EMPLOYING REFLUDDING OF THE ELECTRICALLY HEATED CORE. THE SEMISCALE MHD-1 EXPERIMENTAL CONFIGURATION FOR THIS TEST SERIES UTILIZED HARDWARE COMPONENTS NECESSARY TO INVESTIGATE THE REFLUDD HEAT TRANSFER CHARACTERISTICS OF THE MHD-1 ROD BUNDLE. THE PURPOSE OF THIS REPORT IS TO PROVIDE A REFERENCE SOURCE OF INFORMATION FOR SUPPORT OF DATA REPORTS RELATING TO THE SPECIFIC TESTS CONDUCTED IN THE REFLUDD HEAT TRANSFER TEST SERIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

H AND D PROGRAM + SAFETY PROGRAM + HEAT TRANSFER + CORE REFLUDDING SYSTEM + SYSTEM DESCRIPTION + INSTRUMENT TESTING + ORGUEL TESTING + JACK + TEST, SYSTEM, RELIABILITY

113720
LHAPD HS + JENSEN HP + SAFETY RE
EXPERIMENT DATA REPORT FOR SEMISCALE MHD-1 TESTS S-03-1 THROUGH S-03-4 (REFLUD HEAT TRANSFER TESTS)
ARGONNIE NUCLEAR COMPANY, IDAHO FALLS
ANCR-MUREG-1306 P. 137 PPS, 235 FIGS, 1 REF, MAY 1976

RECORDED TEST DATA ARE PRESENTED FOR TESTS S-03-1, S-03-2, S-03-3, AND S-03-4 OF THE SEMISCALE MHD-1 REFLUD HEAT TRANSFER SERIES (TEST SERIES 3). THE TESTS CONDUCTED IN THIS SERIES ARE SEPARATE EFFECTS CORE REFLUD TESTS PERFORMED TO DETERMINE THE REFLUD HEAT TRANSFER CHARACTERISTICS OF THE 5.5-FOOT-LONG MHD-1 ROD BUNDLE. THE TESTS WERE CONDUCTED FROM AN INITIAL SYSTEM TEMPERATURE OF ABOUT 200 F AT A PRESSURE OF 60 PSIA. THE ELECTRICALLY HEATED CORE WAS USED IN THE PRESSURE VESSEL TO SIMULATE THE EFFECTS OF A PWR NUCLEAR CORE DURING REFLUD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

HYDRAULIC EXPERIMENT + REACTOR, PWR + THERMAL EXPERIMENT + CORE REFLUDDING SYSTEM + HEAT TRANSFER COEFFICIENT + DATA COLLECTION + JACK + HEATERS

115103
LHAPD HS + JENSEN HP + SAFETY RE
EXPERIMENT DATA REPORT FOR SEMISCALE MHD-1 TESTS S-03-A, S-03-B, S-03-C, AND S-03-D, (REFLUD HEAT TO PER TESTS)
ARGONNIE NUCLEAR COMPANY, IDAHO FALLS
ANCR-MUREG-1307 P. 140 PPS, 5 TABS, 235 FIGS, MAY 1976

THE TESTS CONDUCTED IN THIS SERIES ARE SEPARATE EFFECTS CORE REFLUD TESTS PERFORMED TO DETERMINE THE REFLUD HEAT TRANSFER CHARACTERISTICS OF THE 5.5 FOOT MHD-1 ROD BUNDLE. TESTS S-03-A THROUGH S-03-D WERE PUMP-FED REFLUD TESTS IN WHICH THE REFLUD RATE WAS HELD CONSTANT DURING EACH TEST. THE TESTS WERE CONDUCTED TO INVESTIGATE THE EFFECTS ON SYSTEM RESPONSE RESULTING FROM VARIATIONS IN OPERATING CONDITIONS OF PRESSURE, TEMPERATURE, CORE POWER, REFLUD COOLANT SUBCOOLING, AND HEAT EXCHANGER ROD THERMOCOUPLE TEMPERATURE AT REFLUD INITIATION. THE PURPOSE OF THIS REPORT IS TO MAKE AVAILABLE THE UNPUBLISHED DATA FROM TESTS S-03-A THROUGH S-03-D FOR FUTURE DATA ANALYSIS AND TEST RESULTS REPORTING ACTIVITIES.

11103 CONTINUED
 AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
 H AND D PROGRAM + SAFETY PROGRAM + HYDRAULIC EXPERIMENT + THERMAL EXPERIMENT + REACTOR, LOW + HEAT TRANSFER EXPERIMENT + DATA COLLECTION + BLOWDOWN + LWT (S-H) + CORE REFLOODING SYSTEM + NACK

114252
 LANSUM TR
 CORE THERMAL RESPONSE USING SEMISCALE ROD-1 BLOWDOWN HEAT TRANSFER TESTS
 AERJET NUCLEAR CORP., IDAHO FALLS
 ANL-NUREG-1205 +. 120 PPS, 15 TABS, 40 FIGS, 10 REFS, JUNE 1970

SELECTED EXPERIMENTAL DATA AND RESULTS CALCULATED FROM EXPERIMENTAL DATA OBTAINED FROM THE SEMISCALE ROD-1 BLOWDOWN HEAT TRANSFER TEST SERIES ARE ANALYZED. THESE TESTS WERE DESIGNED PRIMARILY TO PROVIDE INFORMATION ON THE CORE THERMAL RESPONSE TO A LOSS-OF-COOLANT ACCIDENT. THE DATA ARE ANALYZED TO DETERMINE THE EFFECT OF CORE FLOW ON THE HEAT AND THERMAL RESPONSE. THE TEST DATA AND THE CORE THERMAL RESPONSE CALCULATED WITH THE RELAP CODE ARE COMPARED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
 REACTOR, PER + BLOWDOWN + COMPUTER PROGRAM, DIGITAL + COMPARISON, THEORY AND EXPERIENCE + DNB + THERMAL EXPERIMENT + HYDRAULIC EXPERIMENT + HEAT TRANSFER, BOILING + DETTING + CORRELATION + NACK

115104
 LOZZIO JR
 THERMAL-HYDRAULIC ANALYSIS OF THE SEMISCALE ROD-1 BLOWDOWN HEAT TRANSFER TEST SERIES
 AERJET NUCLEAR CORP., IDAHO FALLS
 ANL-NUREG-1207 +. 87 PPS, 66 FIGS, 19 REFS, JUNE 1970

SELECTED EXPERIMENTAL THERMAL-HYDRAULIC DATA FROM THE RECENT SEMISCALE ROD-1 BLOWDOWN HEAT TRANSFER TEST SERIES ARE ANALYZED FROM AN EXPERIMENTAL VIEWPOINT WITH EMPHASIS ON EXPLAINING THESE PHENOMENA WHICH INFLUENCE CORE FLUID BEHAVIOR. COMPARISONS ARE MADE BETWEEN THE TRENDS MEASURED BY THE SYSTEM INSTRUMENTATION AND THE TRENDS PREDICTED BY THE RELAP COMPUTER CODE TO AID IN OBTAINING AN UNDERSTANDING OF THE INTERACTIONS BETWEEN PHENOMENA OCCURRING IN DIFFERENT PARTS OF THE SYSTEM. THE ANALYSES PRESENTED IN THIS REPORT ARE VALUABLE FOR EVALUATING THE ADEQUACY AND IMPROVING THE PREDICTIVE CAPABILITY OF ANALYTICAL MODELS DEVELOPED TO PREDICT THE SYSTEM RESPONSE OF A PRESSURIZED WATER DURING A POSTULATED LOSS-OF-COOLANT ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
 H AND D PROGRAM + SAFETY PROGRAM + COMPUTER PROGRAM + BLOWDOWN + HEAT TRANSFER + THERMAL HYDRAULIC ANALYSIS + REACTOR, LOW + THERMAL EXPERIMENT + HYDRAULIC EXPERIMENT + NACK

115105
 QUARTERLY TECHNICAL PROGRESS REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S DIVISION OF REACTOR SAFETY RESEARCH, JANUARY-MARCH 1970
 AERJET NUCLEAR CORP., IDAHO FALLS
 ANL-NUREG-1315 +. 177 PPS, 21 TABS, 131 FIGS, 60 REFS, JUNE 1970

RESULTS OF THE SEMISCALE ROD-1 BLOWDOWN HEAT TRANSFER TEST SERIES RELATING TO THOSE PHENOMENA THAT INFLUENCE CORE FLUID AND HEAT TRANSFER EFFECTS ARE ANALYZED, AND PRELIMINARY ANALYSES OF THE RECENTLY COMPLETED REFLOO HEAT TRANSFER TEST SERIES ARE SUMMARIZED FOR THE FORCED AND GRAVITY FEED REFLOO TESTS. THE FIRST NONNUCLEAR LCC IN THE LWT PROGRAM WAS SUCCESSFULLY COMPLETED AND PRELIMINARY RESULTS ARE PRESENTED. PRELIMINARY RESULTS ARE GIVEN FOR THE PER B-1 HF TEST, THE PER-2A TEST, AND THE IRRADIATION EFFECTS SCOPING TEST 2 IN THE THERMAL FLUID BEHAVIOR PROGRAM. MODEL DEVELOPMENT AND VERIFICATION EFFORTS REPORTED IN THE REACTOR BEHAVIOR PROGRAM INCLUDE CHECKOUT OF RELAP/MODS UPDATE 1, AND DEVELOPMENT OF A NEW HYDRODYNAMIC MODEL FOR TWO-PHASE SEPARATED FLOWS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
 H AND D PROGRAM + SAFETY PROGRAM + MOCKUP + REACTOR TRANSIENT + PLOTT (S-H) + REACTOR, LOW + FUEL ROD + BEHAVIOR + BLOWDOWN + HEAT TRANSFER + CORE REFLOODING SYSTEM + COMPUTER PROGRAM + HYDRAULIC ANALYSIS + NACK

115106
 LIGHT-WATER-REACTOR SAFETY RESEARCH PROGRAM: QUARTERLY PROGRESS REPORT, JULY-SEPT, 1973
 ARGONNE NATIONAL LABORATORY, ILLINOIS
 ANL-75-72 +. 105 PPS, 43 FIGS, 65 REFS, SEPT. 1975

SUMMARIZES THE ARGONNE NATIONAL LABORATORY WORK PERFORMED DURING JULY, AUGUST, AND SEPTEMBER 1975 ON WATER-REACTOR-REACTOR SAFETY HEAT-TRANSFER AND FLOW PROBLEMS. THE FOLLOWING RESEARCH AND DEVELOPMENT AREAS ARE COVERED: (1) LOSS-OF-COOLANT ACCIDENT RESEARCH; HEAT TRANSFER AND FLUID DYNAMICS; (2) TRANSIENT FUEL RESPONSE AND FISSION-PRODUCT RELEASE PROGRAM; AND (3) MECHANICAL PROPERTIES OF ZIRCALOY CONTAINING OXYGEN. ALSO INCLUDED IS AN APPENDIX ON KINETICS OF FISSION GAS AND VOLATILE FISSION-PRODUCT BEHAVIOR UNDER TRANSIENT CONDITIONS IN LOW FUEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
 FISSION PRODUCT RELEASE + HEAT TRANSFER + FUEL + REACTOR, LOW + ZIRCALOY + H AND D PROGRAM + FLOW + PROPERTY.

PAGE -8-

111003 CONTINUED
MECHANICAL & HYDRAULIC

109588

COUNCIL ON PLANTING & DENNING MS
REACTOR SAFETY PROGRAM APPLICATIONS AND COORDINATION TASK 1 - STEAM-WATER MIXING PROGRAM AND SYSTEM
HYDRODYNAMICS. QUARTERLY PROGRESS REPORT FOR JULY THROUGH SEPTEMBER 1975. TASK 55
BATTTELLE COLUMBUS LAUS., OHIO
DRI-1960 P. 25 PAGES, 4 FIGS, 3 REFS, NOV. 1975

ESTIMATES WERE MADE OF THE DEGREE OF STEAM CONDENSATION WITHIN THE 1/15-SCALE, TRANSPARENT VESSEL
MODEL DURING PENETRATION STUDIES CONDUCTED WITH AND WITHOUT COLD LEG STEAM. THE ESTIMATES
INDICATED A HIGH DEGREE OF STEAM CONDENSATION WITHIN THE MODEL. THE RELATIONSHIP BETWEEN WATER
PENETRATION TO THE LOWER PLENUM AND ANNULUS PRESSURE LOSS WAS INVESTIGATED TO ASSESS AND
QUANTIFY, TO THE EXTENT POSSIBLE, THE EFFECT OF ECC WATER IN THE ANNULUS OF THE RESISTANCE TO
REVERSE CORE STEAM FLOW OF THE FLOW SYSTEM CONSISTING OF THE LOWER PLENUM, DOWNCOMER, ANNULUS,
AND DOWN LEG. A PRELIMINARY CORRELATION FOR THE PENETRATION DATA OBTAINED WITHOUT COLD LEG
STEAM HAS BEEN OBTAINED AND COMPARED WITH THE EXPERIMENTAL DATA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

STEAM & WATER & HYDRODYNAMIC ANALYSIS & FLOW, TWO PHASE & HEAT TRANSFER ANALYSIS & R AND D PROGRAM & HEAT
TRANSFER, TWO PHASE & FLOW, MIXING & MIXING COEFFICIENT & JACOBI

109589

PLANTING & DENNING MS
TYPICAL & UNUSUAL EXPERIMENTAL STUDIES OF ECC PENETRATION IN A 1/15-SCALE TRANSPARENT VESSEL MODEL
BATTTELLE COLUMBUS LAUS., OHIO
DRI-1961 P. 70 PAGES, 42 FIGS, 5 REFS, NOV. 1975

EXPERIMENTAL STUDIES IN A 1/15-SCALE TRANSPARENT VESSEL MODEL OF A 4-LOOP PWR, OPERATED AT
APPROXIMATELY ATMOSPHERIC PRESSURE, ARE BEING CONDUCTED TO EXTEND THE UNDERSTANDING OF STEAM-
WATER INTERACTION PHENOMENA AND OF PHENOMENA ASSOCIATED WITH A LOSS-OF-COOLANT ACCIDENT. THE
WORK BEING REPORTED HAD AS ITS OBJECTIVE DEVELOPMENT OF AN UNDERSTANDING OF THE THERMODYNAMIC
AND HYDRAULIC BEHAVIOR DURING ECC INJECTION IN THE COLD LEGS, IN THE ANNULUS BETWEEN THE
PRESSURE VESSEL AND CORE BUNDLE, AND IN THE LOWER PLENUM, THAT IS BOTH QUALITATIVE AND
QUANTITATIVE. EXPERIMENTAL STUDIES OF ECC PENETRATION INTO THE LOWER PLENUM AS A FUNCTION OF
ECC FLOW RATE, REVERSE CORE STEAM FLOW RATE, AND WATER SURROUNDING WERE CARRIED OUT FIRST WITH
WARM WATER INJECTED INTO THE COLD LEGS AND THEN WITH BOTH STEAM AND WATER INJECTED INTO THE COLD
LEGS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR & FLOW, TWO PHASE & R AND D PROGRAM & HEAT TRANSFER, TWO PHASE & PERFORMANCE & EMERGENCY COOLING
CONSIDERATIONS & THERMAL HYDRAULIC ANALYSIS & JACOBI

109715

COUNCIL ON PLANTING & DENNING MS
REACTOR SAFETY PROGRAM APPLICATIONS AND COORDINATION TASK 1 - STEAM-WATER MIXING PROGRAM AND SYSTEM
HYDRODYNAMICS
BATTTELLE COLUMBUS LAUS., OHIO
DRI-1962-1965 P. 19 PAGES, 3 TABS, 4 FIGS, 4 REFS, MARCH 1976

THIS PROGRESS REPORT (OCTOBER-DECEMBER 1975) INCLUDES DETAILS ON THE FOLLOWING: PRELIMINARY
STUDIES WERE CARRIED OUT IN THE TRANSPARENT VESSEL MODEL TO INVESTIGATE THE EFFECT OF HYDRAULIC
COMMUNICATION BETWEEN THE INTACT COLD LEG AND CORE STEAM SUPPLIES ON ECC PENETRATION. A LIMITED
COMPARISON OF THESE DATA WITH DATA OBTAINED PREVIOUSLY WITH FIRED COLD LEG STEAM INDICATED THAT
THE PENETRATION BEHAVIOR IS ESSENTIALLY THE SAME. EXAMINATION OF THE DATA ON THE STEAM FLOW
SPLIT BETWEEN THE INTACT COLD LEGS AND CORE INDICATED THAT THE INJECTED ECC WATER DID NOT
INCREASE THE RESISTANCE TO COLD LEG STEAM FLOW. PENETRATION OF THE 1/15-SCALE, STEEL VESSEL
MODEL FOR USE IN CONDUCTING STUDIES AT PRESSURES UP TO ABOUT 60 PSIG AND SHUTDOWN OF THE STEEL
VESSEL SYSTEM WERE COMPLETED LATE IN THE QUARTER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

HYDRAULIC EXPERIMENT & REACTOR SAFETY RESEARCH & STEAM & WATER & MODEL TESTING & FLOW, MIXING & HYDRAULIC

109812

RESEARCH &
EVALUATION OF PRESSURE DROP ACROSS AREA CHANGES DURING SHUTDOWN
U.S. NUCLEAR REGULATORY COMMISSION & UNIV. OF CINCINNATI, OH
NUREG-75065 & LUD-7507-19 P. 20 PAGES, 7 FIGS, 2 REFS, JUNE 10, 1975

A SERIES OF SHUTDOWN EXPERIMENTS ARE TO BE CONDUCTED, WITH RFPON 113 AS THE TEST FLUID, IN A WELL
INSTRUMENTED APPARATUS. PRELIMINARY SHUTDOWN RUNS HAVE BEEN MADE USING A SLIGHTLY MODIFIED
VERSION OF THE APPARATUS USED FOR PREVIOUS OSCILLATORY FLOW STUDIES. THESE RUNS INDICATED THE
FURTHER SYSTEM MODIFICATIONS REQUIRED IN ORDER TO OBTAIN SATISFACTORY PERFORMANCE. STEADY STATE
STUDIES OF THE PRESSURE DROP ACROSS AREA CHANGES ARE BEING CONDUCTED TO PROVIDE A
FIRM DATA BASE FOR THE TRANSIENT TESTS. THE TESTS HAVE SHOWN THAT THE PRESSURE DROP BEHAVIOR OF

113012 CONTINUOUS
RESTRICTIONS DEPEND ON THE LENGTH OF THE RESTRICTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE - U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MECHANICAL EXPERIMENT - MEASUREMENT - FLUID FLOW - PRESSURE DROP - BLOWDOWN - ORIFICE

113028
DESMAN, J.
EVALUATION OF PRESSURE DROP ACROSS AREA CHANGES DURING BLOWDOWN. QUARTERLY PROGRESS REPORT JUNE 30, 1975-
SEPTEMBER 30, 1975
UNIVERSITY OF CINCINNATI, OHIO
NMEC-0007-2 P. 12 PDS. 1 TAB. 4 FIGS. APRIL 1976

TRANSIENT PRESSURE DROPS ACROSS AREA CHANGES ARE TO BE DETERMINED IN A SERIES OF BLOWDOWN EXPERIMENTS. THESE TESTS ARE TO BE CONDUCTED WITH FREON 113 AS THE TEST FLUID, IN A WELL INSTRUMENTED APPARATUS. ALL NECESSARY INSTRUMENTATION AND READOUT HAVE NOT YET BEEN RECEIVED. ONLY PRELIMINARY BLOWDOWN RUNS WERE THEREFORE POSSIBLE. THE PRELIMINARY RUNS INDICATED THE REVISIONS TO THE APPARATUS TO BE GENERALLY SATISFACTORY. THE APPARATUS IS NOW BEING REVISED TO REMEDY HANDWARE FAILURES AND TO ADD SOME ADDITIONAL INSTRUMENTATION. THE VOID SENSORS TO BE USED IN THE FINAL SYSTEM HAVE BEEN BUILT AND THE STEADY STATE APPARATUS FOR THEIR CALIBRATION IS NEARLY COMPLETE. WORK IS PROCEEDING IN THE COMPUTATIONAL PROCEDURES NEEDED FOR DATA ANALYSIS. A FINITE DIFFERENCE PROCEDURE HAS BEEN DEVELOPED AND THE COMPUTER PROGRAM LARGELY COMPLETED. A PARALLEL EFFORT, USING THE METHOD OF CHARACTERISTICS, SHOWS REAL CHARACTERISTICS FOR THE CONDITIONS EXAMINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE - U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LOW - BLOWDOWN - PRESSURE DROP - MEASUREMENT - INSTRUMENT, PRESSURE - R AND D PROGRAM - COMPUTER PROGRAM - FLUID - JACOBS

113077
DESMAN, J.
EVALUATION OF PRESSURE DROP ACROSS AREA CHANGES DURING BLOWDOWN. QUARTERLY PROGRESS REPORT OCT. 1, 1975-DEC.
31, 1975
UNIVERSITY OF CINCINNATI, OHIO
NMEC-0007-1 P. 8 PDS. 2 FIGS. 4 REF. APRIL 1976

TRANSIENT PRESSURE DROPS ACROSS AREA CHANGES ARE TO BE DETERMINED IN A SERIES OF BLOWDOWN EXPERIMENTS. THESE TESTS ARE TO BE CONDUCTED WITH FREON 113 AS THE TEST FLUID, IN A WELL INSTRUMENTED APPARATUS. ALL NECESSARY INSTRUMENTATION AND READOUT HAVE NOT YET BEEN RECEIVED. ONLY PRELIMINARY BLOWDOWN RUNS WERE THEREFORE POSSIBLE. THE PRELIMINARY RUNS INDICATED THE REVISIONS TO THE APPARATUS TO BE GENERALLY SATISFACTORY. THE APPARATUS IS NOW BEING REVISED TO REMEDY HANDWARE FAILURES AND TO ADD SOME ADDITIONAL INSTRUMENTATION. THE VOID SENSORS TO BE USED IN THE FINAL SYSTEM HAVE BEEN BUILT AND THE STEADY STATE APPARATUS FOR THEIR CALIBRATION IS NEARLY COMPLETE. WORK IS PROCEEDING IN THE COMPUTATIONAL PROCEDURES NEEDED FOR DATA ANALYSIS. A FINITE DIFFERENCE PROCEDURE HAS BEEN DEVELOPED AND THE COMPUTER PROGRAM LARGELY COMPLETED. A PARALLEL EFFORT, USING THE METHOD OF CHARACTERISTICS, SHOWS REAL CHARACTERISTICS FOR THE CONDITIONS EXAMINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE - U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM - RELATION, LOW - PRESSURE DROP - EXPERIMENT - BLOWDOWN - R AND D PROGRAM - INSTRUMENT, PRESSURE - FLUID - JACOBS

113056
BLICK, J. A. & CHURLEY, L. J. & LACY, W.
ONE- AND TWO-SCALE CYLINDRICAL ELEVATED PRESSURE FACILITY DESCRIPTION. QUARTERLY PROGRESS REPORT OCT. 1, 1975-
DEC. 31, 1975
CHLAME, INC., HANOVER, N.H.
CHLAME-TH-229 P. 22 PDS. 7 TABS. 4 FIGS. 7 REF. APRIL 1976

A 17.5-SCALE, CYLINDRICAL, ELEVATED PRESSURE, PAR-MODEL TEST VESSEL AND ASSOCIATED INSTRUMENTATION IS DESCRIBED. THIS FACILITY HAS BEEN CONSTRUCTED TO PROVIDE A FLEXIBLE TEST BED FOR STUDYING THE TIMING AND RATE OF FILLING OF THE MODEL LIQUID PLENUM UNDER BOTH STEADY STATE AND DYNAMIC-LOADING TRANSIENT CONDITIONS. THE PRINCIPAL MEASUREMENTS, THE LIQUID PLENUM WATER LEVEL AS A FUNCTION OF TIME, IS MADE WITH MULTIPLE (20 AND 70) CONDUCTIVITY PROBES. THE DATA OBTAINED IN THIS FACILITY ARE BEING USED TO SUPPORT THE DEVELOPMENT OF A PREDICTIVE, FIRST-ESTIMATE MODEL FOR PLENUM FILLING BEHAVIOR, AND FOR ASSISTING IN THE DESIGN OF LARGE-SCALE PLENUM FILLING EXPERIMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE - U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, HIGH - INSTRUMENT, LIQUID LEVEL - PRESSURE, INTERNAL - EXPERIMENT - MODEL TESTING - R AND D PROGRAM - FILL - FLUID - CORE MELTING - JACOBS

113079
BLICK, J. A. & NOTHE, M. & FANNING, W.
ANALYSIS OF LCC DELIVERY

PAGE -10

115070 BLUNTIN:JO
CREARE INC., MANUVER, N.H.
CREARE-TN-231 P. 05 PPS, 57 FIGS, 16 PPS, APRIL 1976

AN ANALYTICAL MODEL FOR CALCULATING THE TIME-DEPENDENT RATE OF DELIVERY OF ECC WATER TO THE LOWER PLENUM IS DEVELOPED AND COMPARED WITH DATA OBTAINED FROM A 1/15-SCALE EXPERIMENTAL APPARATUS SIMULATING THE COLD LEGS, DOWNCOMER, AND LOWER PLENUM REGIONS OF A PWR. THE ANALYTICAL MODEL CORRECTLY PREDICTS THE EFFECTS OF VARIOUS GEOMETRIC, HYDRAULIC, AND THERMAL PARAMETERS ON THE TIMING AND RATE OF DELIVERY OF WATER TO THE LOWER PLENUM IN THE 1/15-SCALE TESTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTION, PWR + ANALYTICAL MODEL + COMPARISONS, THEORY AND EXPERIENCE + NUC

115272
BLUER JA + CRUMLEY CJ
PRELIMINARY ECC DELIVERY DATA AT 1/15-SCALE. QUARTERLY PROGRESS REPORT JANUARY 1, 1976-MARCH 31, 1976
CREARE INC., MANUVER, NEW HAMPSHIRE
CREARE-TN-235 P. 36 PPS, 23 FIGS, 12 PPS, MAY 1976

PRELIMINARY TEST RESULTS IN A 1/15-SCALE, CYLINDRICAL, ELEVATED PRESSURE, PWR-MODEL TEST VESSEL ARE DESCRIBED. THESE TESTS FORM PART OF A PROGRAM TO DEVELOP AN ANALYTICAL AND EMPIRICAL MODEL FOR PLENUM FILLING. DURING THE QUARTER, COUNTERCURRENT FLOW, LOWER PLENUM VOIDING, AND SUPERHEATED-WALL-NUCLEATION-COUNTERCURRENT-FLOW TESTS WERE CONDUCTED. SAMPLE DATA COMPARED TRENDS WITH PAST DATA IN A DIFFERENT QUARTER ARE PRESENTED. GOOD AGREEMENT IS DEMONSTRATED. SPECIAL INTEREST ITEMS OF PRESSURE WIRE MEASUREMENTS, OSCILLATORY WATER DELIVERY, STEAM AND WATER INJECTION SEQUENCING AND ELEVATED PRESSURE CONTROL ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

R AND O PROGRAM + SAFETY PROGRAM + REACTION, PWR + INSTRUMENT, LIQUID LEVEL + DEPENDENT + PRESSURE, INTERNAL + MODEL TESTING + FILL + CORE REPLEADING + NUC

115056
BLUER JA + CRUMLEY CJ + STANT WD
CREARE 1/15-SCALE CYLINDRICAL ELEVATED PRESSURE FACILITY DESCRIPTION QUARTERLY PROGRESS REPORT OCT. 1, 1975-DEC. 31, 1975
CREARE INC., MANUVER, N.H.
CREARE-TN-229 P. 27 PPS, 7 TABS, 9 FIGS, 7 PPS, FEB. 1976

A 1/15-SCALE, CYLINDRICAL, ELEVATED PRESSURE, PWR-MODEL TEST VESSEL AND ASSOCIATED INSTRUMENTATION IS DESCRIBED. THIS FACILITY HAS BEEN CONSTRUCTED TO PROVIDE A FLEXIBLE TEST BED FOR STUDYING THE TIMING AND RATE OF FILLING OF THE MODEL LOWER PLENUM UNDER BOTH STEADY STATE AND LOCA-SIMULATING TRANSIENT CONDITIONS. THE PRINCIPAL MEASUREMENT, THE LOWER PLENUM WATER LEVEL AS A FUNCTION OF TIME, IS MADE WITH MULTIPoint (24 AND 72) CONDUCTIVITY PROBES. THE DATA OBTAINED IN THIS FACILITY ARE BEING USED TO SUPPORT THE DEVELOPMENT OF A PREDICTIVE, "BEST-ESTIMATE" MODEL FOR PLENUM FILLING BEHAVIOR, AND FOR ASSISTING IN THE DESIGN OF LARGE-SCALE PLENUM FILLING EXPERIMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTION, PWR + INSTRUMENT, LIQUID LEVEL + PRESSURE, INTERNAL + EXPERIMENT + MODEL TESTING + R AND O PROGRAM + FILL + NUC + CORE REPLEADING + JACOBS

115070
BLUER JA + RUTHE WM + FANNING WD
ANALYSIS OF ECC DELIVERY
CREARE INC., MANUVER, N.H.
CREARE-TN-231 P. 05 PPS, 57 FIGS, 16 PPS, APRIL 1976

AN ANALYTICAL MODEL FOR CALCULATING THE TIME-DEPENDENT RATE OF DELIVERY OF ECC WATER TO THE LOWER PLENUM IS DEVELOPED AND COMPARED WITH DATA OBTAINED FROM A 1/15-SCALE EXPERIMENTAL APPARATUS SIMULATING THE COLD LEGS, DOWNCOMER, AND LOWER PLENUM REGIONS OF A PWR. THE ANALYTICAL MODEL CORRECTLY PREDICTS THE EFFECTS OF VARIOUS GEOMETRIC, HYDRAULIC, AND THERMAL PARAMETERS ON THE TIMING AND RATE OF DELIVERY OF WATER TO THE LOWER PLENUM IN THE 1/15-SCALE TESTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTION, PWR + ANALYTICAL MODEL + COMPARISONS, THEORY AND EXPERIENCE + NUC

115272
BLUER JA + CRUMLEY CJ
PRELIMINARY ECC DELIVERY DATA AT 1/15-SCALE. QUARTERLY PROGRESS REPORT JANUARY 1, 1976-MARCH 31, 1976
CREARE INC., MANUVER, NEW HAMPSHIRE
CREARE-TN-235 P. 36 PPS, 23 FIGS, 12 PPS, MAY 1976

PRELIMINARY TEST RESULTS IN A 1/15-SCALE, CYLINDRICAL, ELEVATED PRESSURE, PWR-MODEL TEST VESSEL ARE DESCRIBED. THESE TESTS FORM PART OF A PROGRAM TO DEVELOP AN ANALYTICAL AND EMPIRICAL MODEL FOR PLENUM FILLING. DURING THE QUARTER, COUNTERCURRENT FLOW, LOWER PLENUM VOIDING, AND SUPER-

115272 CONTINUED

HEATED-WALL-WITH-COUNTERCURRENT-FLUX TESTS WERE CONDUCTED. SAMPLE DATA COMPARING TRENDS WITH PAST DATA IN A DIFFERENT GEOMETRY ARE PRESENTED. GOOD AGREEMENT IS DEMONSTRATED. SPECIAL INTEREST ITEMS OF PRESSURE DROP MEASUREMENTS, OSCILLATORY WATER DELIVERY, STEAM AND WATER INJECTION SEQUENCING AND ELEVATED PRESSURE CONTROL ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

H AND O PROGRAM • SAFETY PROGRAM • REACTOR, BOR • INSTRUMENT, LIQUID LEVEL • EXPERIMENT • PRESSURE, INTERNAL • MODEL TESTING • FILL • SCRAM INFLODDING • WICK

115449

BOR BLUDDOWN HEAT TRANSFER FOURTH QUARTLY PROGRESS REPORT, OCTOBER 1-DECEMBER 31, 1975
GENERAL ELECTRIC CO., SAN JOSE, CALIF.
GEAP-13317-14 • 115 PPS, FIGS JAN. 1976

BONT TESTING WAS COMPLETED DURING THE QUARTER AND THE LAST OF THE BONT TEST DATA IS REPORTED HEREIN. THE MID-PRESSURE START AND W/ASE FLUX JET PUMP PERFORMANCE TESTS ARE DISCUSSED. CONCLUSIONS FROM THE FOLLOWING INDEPENDENT PARAMETER EFFECTS STUDIES ARE PRESENTED: BYPASS FLOW AREA, DRIVE PUMP CAPABILITY, ALTERNATE LOW-P-PLENUM GEOMETRY, LOW-P PLENUM SUBCOOLING, AND STEAM LINE DRUMS. THE BLUDDOWN/ECC PROGRAM CONTROL WAS FULLY EXECUTED IN DECEMBER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 N STREET, WASHINGTON, D. C. 20545 (100 CENTS/PAGE -- MINIMUM CHARGE \$2.00)

BLUDDOWN • REACTOR, BOR • HEAT TRANSFER EXPERIMENT • GENERAL ELECTRIC • HEAT TRANSFER ANALYSIS • WICK

115133

JOZZI 64 • BUZZY RJ • DUNNETTE 60
BLUDDOWN HEAT TRANSFER PHENOMENA IN THE SCALE BOR TEST SYSTEM
GENERAL ELECTRIC CO., SAN JOSE, CALIF.
GEAP-21120 • 25 PPS, 24 FIGS, 12 REFS, JAN. 1976

EXPERIMENTAL RESULTS FROM THE JUILING BATH REACTOR (BOR) BLUDDOWN HEAT TRANSFER PROGRAM (BONT), OBTAINED IN THE BOR SCALE-TEST APPARATUS, ARE USED TO PROVIDE A BASIS FOR EVALUATING BONT PHENOMENA. BOR LOSS-OF-COOLANT ACCIDENT (LCCA) ANALYSIS USING THE CURRENT BOR LCCA EVALUATION METHOD, WHEN APPLIED TO THE TEST APPARATUS, SHOWS A SUBSTANTIAL MARGIN IN THE PREDICTION OF PEAK CLADDING TEMPERATURE. OBSERVED THERMAL-HYDRAULIC AND HEAT TRANSFER PHENOMENA ARE EVALUATED AND COMPARED WITH THE CURRENT METHOD. SPECIFIC PHENOMENOLOGICALLY BASED MODEL REFINEMENTS ARE RECOMMENDED FOR BREAK FLOW, VOID DISTRIBUTION, AND HEAT TRANSFER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

HEAT TRANSFER, BULLING • REACTOR, BOR • HEAT TRANSFER EXPERIMENT • BLUDDOWN • WICK • THERMAL HYDRAULIC ANALYSIS • MATTERS

115448

DOUGHERTY JP • BUZZY RJ
BOR AND FUEL ROD SIMULATION USING ELECTRICAL HEATING
GENERAL ELECTRIC CO., SAN JOSE, CALIF.
GEAP-21207 • 40 PPS, FIGS, MARCH 1976

ELECTRICAL HEATING ROD SIMULATION OF JUILING BATH (BOR) TRANSIENT FUEL ROD THERMAL BEHAVIOR INCLUDING A HYPOTHETICAL LOSS-OF-COOLANT (LOCA) IS TREATED IN THIS REPORT. THIS COMPLETE SIMULATION FROM BREAK INITIATION THROUGH THE ACTIVATION OF EMERGENCY CORE COOLING SYSTEMS (ECCS) AND CORE MELT/DROPPING IS ACHIEVED BY PROGRAMMING POWER TO ELECTRICALLY HEATED RODS WHICH HAVE THE SAME PHYSICAL DIMENSIONS AS THE NUCLEAR FUEL RODS. POWER INPUT TO ACHIEVE THIS SIMULATION IS DERIVED FROM DIRECT (SURFACE HEATED) AND INDIRECT (INTERNALLY HEATED) RODS, AND APPLICABILITY OF THE RESULTS FOR BLUDDOWN HEAT TRANSFER TESTING IS DISCUSSED. THE RESULTS OF THIS ANALYSIS WILL BE INCORPORATED INTO THE BLUDDOWN/EMERGENCY CORE COOLING (BOR/ECC) TEST PROGRAM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 N STREET, WASHINGTON, D. C. 20545 (100 CENTS/PAGE -- MINIMUM CHARGE \$2.00)

H AND O PROGRAM • SAFETY PROGRAM • EPPH • REACTOR, BOR • SIMULATION • ELECTRIC POWER • MATTERS • FUEL ROD • BLUDDOWN • HEAT TRANSFER • WICK

110280

LATHROP RD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT (OCTOBER 1-DECEMBER 31, 1975)
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAMP-MURK-6233 • 93 PPS, 23 TABS, 41 FIGS, 124 REFS, MARCH 1976

ON DECEMBER 1, 1975, THE LOS ALAMOS SCIENTIFIC LABORATORY FORMED A DIVISION TO SERVE AS A FOCUS FOR RESEARCH IN NUCLEAR SAFEGUARDS, REACTOR SAFETY AND TECHNOLOGY. THIS PROGRAM INCLUDES NTR, LTR, AND LAMP SAFETY RESEARCH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

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114200 01 JUN 68

ANALYTICAL CHEMISTRY • PHYSICAL CHEMISTRY • POLYMER SCIENCE • ANALYTICAL TOOLS • SPECTROSCOPY • REACTION
MECHANISMS • MATERIALS SCIENCE • CHEMICAL ENGINEERING • CHEMICAL PHYSICS • CHEMICAL THERMODYNAMICS • CHEMICAL KINETICS

113011

[illegible]

AN INFLUENCE OF WEATHER. WINDSPEED, DAILY DATA AND WEATHER HAVE BEEN INCLUDED IN THE PRESENT ANALYSIS. RELEASE CLOUD COVER AND THE CLOUD HAVE ALSO BEEN RELEASE. ANALYSES OF THESE WEATHER-SENSITIVE ELEMENTS FOR THREE TEMPERATURE WAVES. FOR THE ANALYSIS OF WEATHER DATA, THE DATA FOR LOW WEATHER WEATHERMAN, AN IMPROVED WEATHER HAS BEEN USED. IN THE CLOUD ONE-DEGREE TEMPERATURES TO INCLUDE ALSO CLOUDS AND TO AVOID CONSIDERATION. IN CLOUD DATA, WEATHERMAN, OTHER CLOUDS ON WEATHER, THE WEATHER VERSION OF THE SEVEN CLOUDS. SIMILARLY, THE MULTIPLE OF WEATHERMAN CLOUD-SENSITIVE ELEMENTS OF WEATHERMAN IN A WEATHER REPORT AND TESTS AND CLOUDS TO BE MORE ACCURATE AND EFFICIENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, ILL. 62161

1. AAA D INFORMATION = DATA IN COLLECTION OF THE FBI. IF A DESIGN PRODUCT OR CASE = COMPLETED PRODUCT = ANALYTICAL
 ANAL. = ANALYSIS = ANALYSIS = ANALYSIS. THE INFORMATION IS THE INFORMATION AND THE INFORMATION IS THE INFORMATION AND THE INFORMATION IS THE INFORMATION

1375000

[illegible]

The proposed Model has been adapted at the F. J. C. rate mass flow rate and other quantities at each phase plane in a pipe over the pipe in stepwise relationship between the phases. The calculations made is based on assumptions concerning the characteristics of a turbine inlet and a drag disk. In order to estimate the mass flow rate and the pressure drop, the ratio of the mass flow rate to the mass flow rate of the gas is used to calculate the mass flow rate and the mass flow rate.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

ADMINISTRATIVE WORK - FILING, MAIL HANDLING & OTHERS; TRANSPORTATION & TRAVEL - BUS; MEALS & LODGING - TRANSPORTATION & TRAVEL

12591

TOWNSHIP OF PLEASANT HILL
 MANIFESTATION OF THE POWER OF THE TOWNSHIP OF PLEASANT HILL
 THE TOWNSHIP OF PLEASANT HILL, IOWA
 THE TOWNSHIP OF PLEASANT HILL, IOWA
 THE TOWNSHIP OF PLEASANT HILL, IOWA

THIS REPORT DOCUMENTED PROGRESS MADE IN THE FOLLOWING AREAS: (1) TWO-PHASE FLOW INSTRUMENTATION STUDIES; (2) FLOW-CONDUCTION TEST FACILITY OPERATIONS; (3) PARAMETER MEASURING AND ANALYSIS; (4) THERMAL-CONDUCTION TEST FACILITY OPERATIONS; (5) HEAT EXCHANGER AND DEVELOPMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, ILL. 62710

THEIRAS, EXPERTISES & PLANS, TWO PHASES OF REAF TRAINING, FROM EXPERIMENTAL TO REAL TRAINING, COUNCILING & ACQUISITION OF
INTERNAL PSYCHICALLY ADAPTATION & ABILITIES

113123

PER AG
 4) THE OTHER 1475 HOURS OF WORKING TIME FOR THE PERIOD OF JULY 14 TO JULY 24 OF 2000 ARE RECORDED AT THE OFFICE OF THE
 LABORATORY
 FOR THE REASONABLE LABORATORY. THE OTHER
 1475-1475 OF 2000 OF 2000 OF 2000

[illegible]

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, 525 NORTH DOWNSWORTH RD., SPRINGFIELD, ILLINOIS 62761

[illegible]

109300

FIG 66

MONTH 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/76-15 23 PPS. MARCH 1976

THIS MONTHLY REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ONSITE PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LEAK RELEASE FROM LWR FUEL, RADIATION BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, FUEL ELEMENT HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, WREN SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • TEST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, WREN • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • RD AND D PROGRAM • SAFETY PROGRAM • NJCK

112520

FIGURE 06 • PERIODIC OR
QUARTERLY PROGRESS REPORT ON BLOWDOWN HEAT TRANSFER PROGRAM FOR OCTOBER-DECEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TN-2900 70 PPS. TABS, FIGS, REFS. MARCH 1976

THE PROGRESS IN THE FUEL BLOWDOWN HEAT TRANSFER PROGRAM IN THE THFF AT ORNL IS REVIEWED. THE 40- AND BUNDLE 1 WAS INSTALLED IN PREPARATION FOR POWERED-ROD BLOWDOWN. ISOTHERMAL TESTS WERE RUN AND INSTRUMENTATION CHECKED. SINGLE HEATERS TAKEN FROM THE PRODUCTION LOT OF BUNDLE 1 HEATERS WERE SUBJECTED TO TWO BLOWDOWNS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, SAFETY RESEARCH • REACTOR, FWR • HEAT TRANSFER EXPERIMENT • BLOWDOWN • NJCK

110023

FIG 66

MONTH 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/76-21 25 PPS. MAY 1976

THIS MONTHLY REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ONSITE PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LEAK RELEASE FROM LWR FUEL, RADIATION BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, FUEL ELEMENT HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, WREN SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • TEST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, WREN • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • RD AND D PROGRAM • SAFETY PROGRAM • NJCK

110309

FIGURE 06 • HELIX RE • BLOWDOWN HE
QUARTERLY PROGRESS REPORT ON BLOWDOWN HEAT TRANSFER PROGRAM FOR JANUARY-MARCH 1976
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/76-16 70 PPS. TABS, FIGS. JULY 1976

TWO-PHASE FLOW TESTS HAVE NOT SHOWN THAT WHEN THE TURBINE METER IS UPSTREAM OF THE DRAG DISK, FLOW MEASUREMENT ACCURACY INCREASES SIGNIFICANTLY WHEN A FLOW DISPENSER IS LOCATED IMMEDIATELY DOWNSTREAM OF THE TURBINE METER. A SECOND HEATER TAKEN FROM THE PRODUCTION LOT FOR THFF BUNDLE 1 IS NOW BEING TESTED IN THE PLFW. RELAP4 CODE AND ITS ASSOCIATED SUPPORT PACKAGES IS NOW OPERATIONAL ON THE ORNL COMPUTERS. EMPHASIS IS BEING PLACED ON IMPROVING THE THFF MODEL BY INCORPORATING MEASURED VALUES OF LOOP VOLUMES, PUMP CONSUMED DEVIATION, AND BUNDLE PRESSURE DROP INTO THE MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

RD AND D PROGRAM • SAFETY PROGRAM • REACTOR, LWR • THERMAL EXPERIMENT • FLOW, TWO PHASE • HEAT TRANSFER EXPERIMENT • HEAT TRANSFER, CONVECTION • COMPUTER PROGRAM • BLOWDOWN • THERMAL HYDRAULIC ANALYSIS • NJCK

110300

FIG 66

115300 CONTINUED
JUNE 1970 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT ORNL RIDGE NATIONAL LABORATORY
ORNL/RNRC/TH-34 P. 25 PPS. JULY 1970

THIS PROCESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT DATA AND LOCA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPHASE BUBBLE TESTS, NUCLEAR SAFETY INFORMATION JA CENTER, FUEL ELEMENTS HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING CORROSION STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, NRC SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

REACTION, LWR • NEST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS DATA • GROSS LOSS • FAILURE, FUEL ELEMENT • NUC • OXIDATION • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTION, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTION, NRC • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • ON AND D PROGRAM • SAFETY PROGRAM • NUC

115301
JULY 66
JUNE 1970 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT ORNL RIDGE NATIONAL LABORATORY
ORNL/RNRC/TH-40 P. 27 PPS. JULY 1970

THIS PROCESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT DATA AND LOCA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPHASE BUBBLE TESTS, NUCLEAR SAFETY INFORMATION JA CENTER, FUEL ELEMENTS HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING CORROSION STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, NRC SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

REACTION, LWR • NEST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS DATA • GROSS LOSS • FAILURE, FUEL ELEMENT • NUC • OXIDATION • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTION, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTION, NRC • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • ON AND D PROGRAM • SAFETY PROGRAM • NUC

100300
RUSAL ER • MCWILLIEN LE • MCQUIRE HP • KARPINEVICH MC
FLECHT LOW FLOODING RATE COSINE TEST SERIES DATA REPORT
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA
WCAP-8051 P. APPROX. 600 PPS. FIGS. 10PS. DEC. 1975

THESE TESTS WERE PERFORMED TO SUPPLEMENT PARAMETRIC EFFECTS STUDIED IN THE ORIGINAL FLECHT PROGRAM, PROVIDE DATA FOR REFLOW MODEL DEVELOPMENT, REPEAT ORIGINAL FLECHT TESTS WITH NEW INSTRUMENTATION AND DATA PROCESSING TECHNIQUES, AND TO PROVIDE DATA TO ESTABLISH TEST REPEATABILITY. THESE TESTS EXAMINED THE EFFECTS OF LOW INITIAL CLAD TEMPERATURE, VARIABLE STOPPED AND CONTINUOUSLY VARIABLE FLOODING RATES, FLOODING HEAT RELEASE, RUN PEAK POWER, CONSTANT LOW FLOODING RATES, COOLANT SURGEING, HOT AND COLD CHANNEL ENTRAINMENT, AND SINGLE STAGED AND GENERATED POWER. DATA OBTAINED IN SIXTY FOUR RUNS WHICH MET THE TEST SPECIFICATIONS ARE REPORTED.

AVAILABILITY - NRC PUBLIC DOCUMENT NUMBER, 1717 M STREET, WASHINGTON, D. C. 20545 100 CENTS/PAGE -- MINIMUM (MAYBE \$2.00)

REACTION, FWR • TESTING • LOW REFLOWING SYSTEM • EMERGENCY COOLING CONSIDERATIONS

3. NRC-3 WATER REACTOR SAFETY RESEARCH, FUEL BEHAVIOR

100004
TANLEY P.
INTERIM TECHNICAL REPORT ON WATER REACTOR SAFETY PROGRAM SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S
DIVISION OF REACTOR SAFETY RESEARCH, APRIL-JUNE 1975
GENERAL ELECTRIC COMPANY, BROAD FALLS
NRC-1202 P. 220 PPS, 1000, FIGS, REFS. NOV. 1975

THE DEMOSCALE PROGRAM CONSISTS OF A CONTINUING SERIES OF SMALL-SCALE NONNUCLEAR THERMAL-HYDRAULIC EXPERIMENTS HAVING AS THEIR PRIMARY PURPOSES THE GENERATION OF EXPERIMENTAL DATA THAT CAN BE APPLIED TO THE DEVELOPMENT AND VERIFICATION OF ANALYTICAL MODELS DESCRIBING PHENOMENA IN WATER-COOLED NUCLEAR POWER PLANTS. THE LOFT PROGRAM IS A NUCLEAR TEST PROGRAM FOR PROVIDING TEST DATA TO SUPPORT ASSESSMENT AND IMPROVEMENT OF THE ANALYTICAL METHODS UTILIZED FOR PREDICTING THE BEHAVIOR OF PRESSURIZED WATER REACTORS UNDER LOCA CONDITIONS. THE THERMAL FUEL BEHAVIOR PROGRAM IS AN INTEGRATED EXPERIMENTAL AND ANALYTICAL PROGRAM DESIGNED TO PROVIDE INFORMATION ON THE BEHAVIOR OF REACTOR FUELS UNDER NORMAL, OFF-NORMAL, AND ACCIDENT CONDITIONS. THE REACTOR BEHAVIOR PROGRAM ENCOMPASSES THE ANALYTICAL ASPECTS OF PREDICTING THE RESPONSE OF NUCLEAR POWER REACTORS UNDER NORMAL, ABNORMAL, AND ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
REACTOR, TRANSMUT, LOFT (S-RR) + REACTOR, LUR + ON AND D PROGRAM + FUEL ROD + BEHAVIOR + JACOBS

100770
LAATS ET + MACDONALD PL + QUAPP WJ
USNRC - ORNL MAHLEN PROJECT FUEL BEHAVIOR TEST PROGRAM - EXPERIMENT DATA REPORT FOR TEST ASSEMBLIES IFA-220
AND IFA-230
GENERAL ELECTRIC COMPANY, BROAD FALLS
NRC-1270 P. 235 PPS, 20 TABS, 100 FIGS, DEC. 1975

PRESENTS THE EXPERIMENTAL DATA WHICH WERE OBTAINED FROM THE IFA-220 AND IFA-230 TEST ASSEMBLIES DURING OPERATION IN THE MAHLEN BOILING WATER REACTOR. INCLUDED ARE CLADDING FLUORINATION, FUEL CENTERLINE TEMPERATURE, INTERNAL GAS PRESSURE, AND POWER HISTORY DATA. A DESCRIPTION OF THESE WIRE OXIDE FUEL TEST ASSEMBLIES AND THEIR INSTRUMENTATION IS PRESENTED IN THE EARLY CHAPTERS OF THE TEST. TEST PIN FABRICATION HISTORY, INSTRUMENT CALIBRATION DATA, ASSEMBLY POWER CALIBRATION METHODS, AND THE NEUTRON DETECTOR DATA REDUCTION TECHNIQUE ARE INCLUDED AS APPENDICES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
REACTOR, BWR + CLADDING + FUEL BURNUP + TESTING + CENTERLINE TEMPERATURE + REACTOR, LUR + PRESSURE, INTERNAL + ON AND D PROGRAM + FUEL ROD + GAS + BEHAVIOR

112005
MILLER WJ
EFFECTS OF BURNUP ON FUEL FAILURE
GENERAL ELECTRIC COMPANY, BROAD FALLS
NRC-1200 P. 30 PPS 2 TABS, 25 FIGS, 20 REFS, JAN. 1976

THIS REPORT PRESENTS RESULTS FROM PRELIMINARY TESTS DESIGNED TO INVESTIGATE THE BEHAVIOR OF PREIRRADIATED FUEL RODS UNDER REACTIVITY INITIATED ACCIDENT (RIA) CONDITIONS. THE TESTS WERE CONDUCTED IN 1970 AS PART OF THE SPENT/CAPABLE DRIVER CORE (SCDC) PROGRAM. THE REPORT WAS INTENDED TO BE PUBLISHED IN A SERIES OF GENERAL ELECTRIC COMPANY TECHNICAL REPORTS (GTR-175); HOWEVER, THE SCDC PROGRAM WAS TERMINATED BEFORE THE REPORT COULD BE RELEASED. IN SEPTEMBER 1975, THE NUCLEAR REGULATORY COMMISSION CONCLUDED THAT THE DATA CONTAINED IN THE REPORT COULD BE A VALUABLE REFERENCE IN PLANNING FUTURE WATER REACTOR SAFETY PROGRAM TESTS AND REQUESTED ITS RELEASE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
FUEL BURNUP + FAILURE, FUEL ELEMENT + REACTOR TRANSIENT + URANIUM OXIDE + REACTOR, LUR + SPENT, ALL (S-RR) + NUCLE

112075
FRANCIS WC + QUAPP WJ + MARTIN BR + GIBSON GJ
NONDESTRUCTIVE EXAMINATION OF IRRADIATED FUEL RODS BY PULSED EDDY CURRENT TECHNIQUES
GENERAL ELECTRIC COMPANY, BROAD FALLS
NRC-1202 P. 40 PPS, 30 FIGS, 9 REFS, FEB. 1976

A NUMBER OF FUEL RODS AND UNFUELED ZIRCALOY CLADDING TUBES WHICH HAD BEEN IRRADIATED HAVE UNDERGONE EXTENSIVE NONDESTRUCTIVE AND COMPARATIVE DESTRUCTIVE EXAMINATIONS. THIS REPORT DISCUSSES THE PULSED EDDY CURRENT (PEC) NONDESTRUCTIVE EXAMINATIONS ON THE FUEL RODS AND TUBES AND THE METALGRAPHY RESULTS ON TWO FUEL RODS AND ONE IRRADIATED ZIRCALOY TUBE. THE PEC EQUIPMENT PERFORMED SATISFACTORILY THE FUNCTIONS OF DIAMETER, PROFILE, AND WALL THICKNESS MEASUREMENTS AND OD AND ID SURFACE DEFECT DETECTION. THE DESTRUCTIVE EXAMINATION PROVIDED REASONABLY GOOD CONFIRMATION OF "DEFECTS" DETECTED IN THE NONDESTRUCTIVE EXAMINATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101
SANTON (PWR) + IRRADIATION TESTING + TEST, NONDESTRUCTIVE + ZIRCALOY + FUEL ROD + COMPARISON + METALLURGY + JACOBS

115100
 QUARTERLY TECHNICAL REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S
 DIVISION OF REACTOR SAFETY RESEARCH, JULY-SEPTEMBER 1975
 AEROMET NUCLEAR COMPANY, IDAHO FALLS
 AEROMET-1200-75 106 PPS, 35 TABS, 111 FIGS, 26 REFS, FEB. 1976

SHORT-SCALE REACTOR SAFETY ACTIVITIES (PREFACE) DURING JULY THROUGH SEPTEMBER 1975 ARE SUMMARIZED.
 THE SHORT-SCALE REACTOR TEST SERIES OF THE SHORT-SCALE REACTOR TEST PROGRAM HAS PROVIDED DATA FOR
 EVALUATION OF CORE FLOW PROBLEMS AND ANALYSIS OF POSTULATED MODELS AND PUMP PERFORMANCE. IN
 THE LOFT PROGRAM, REACTOR BEHAVIOR UNDERSTANDING IS EVALUATED. THE THERMAL FUEL BEHAVIOR PROGRAM
 COMPLETES THE PUMP-CLADDING-HEAT EXCHANGE TEST. IN PUMP-TYPE FUEL BEHAVIOR TO INVESTIGATE CRITICAL HEAT
 PLUS UNPREDICTABLES. MODEL DEVELOPMENT AND VERIFICATION EFFORTS OF THE REACTOR BEHAVIOR PROGRAM
 INCLUDE DEVELOPMENT OF THE SPREAD COMPUTER CODE, SUBROUTINES FOR THE PUMP-TYPE FUEL BEHAVIOR
 OF REACTOR, AND RESULTS OF THE SHORT-SCALE REACTOR TEST PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

ACCIDENT ANALYSIS - COMPUTER PROGRAM - HYDRAULIC ANALYSIS - LOFT (S-RR) - REACTOR, LVR - SAFETY PROGRAM -
 BLOWDOWN - A AND D PROGRAM - HEAT FLUX, CRITICAL - JACK

115102
 RESEARCH ON
 TEMPERATURE MEASUREMENT IN ZIRCALOY-CLAD FUEL PINS DURING HIGH TEMPERATURE EXPOSURES
 AEROMET NUCLEAR COMPANY, IDAHO FALLS
 AEROMET-1303-75 75 PPS, 23 FIGS, 10 REFS, APRIL 1976

THE DEVELOPMENT OF A SHEATHED THERMOCOUPLE ATTACHMENT TO ZIRCALOY-CLAD FUEL RODS AND
 FOR USE DURING HIGH TEMPERATURE (2,000 DEG F) EXPOSURES UNDER LOSS-OF-COOLANT ACCIDENT
 CONDITIONS IS DESCRIBED. DEVELOPMENT, FABRICATION, AND TESTING OF THE THERMOCOUPLES TO FUEL RODS
 IS DISCUSSED. THE THERMOCOUPLES AND ATTACHMENT WELDS HAVE BEEN TESTED FOR RESISTANCE TO
 CORROSION AND RADIATION AND HAVE BEEN SUBJECTED TO FAST THERMAL CYCLE, RISE, HE, AND
 BLOWDOWN ACCIDENT TESTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

A AND D PROGRAM - SAFETY PROGRAM - ZIRCALOY - CLADDING - HIGH TEMPERATURE - MEASUREMENT, TEMPERATURE -
 THERMOCOUPLE - LASER - WELDING - JACK

115100
 QUARTERLY TECHNICAL REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S
 DIVISION OF REACTOR SAFETY RESEARCH, OCTOBER-DECEMBER 1975
 AEROMET NUCLEAR COMPANY, IDAHO FALLS
 AEROMET-1301-75 107 PPS, 36 TABS, 50 REFS, MAY 1976

THE SHORT-SCALE HEAT TRANSFER TEST SERIES OF THE SHORT-SCALE REACTOR TEST PROGRAM WAS COMPLETED. IN THE
 LOFT PROGRAM, PREPARATIONS WERE MADE FOR NONNUCLEAR TESTING. THE THERMAL FUEL BEHAVIOR PROGRAM
 COMPLETED A PUMP-COOLING MISMATCH TEST AND AN IRRADIATION EFFECTS TEST ON PUMP-TYPE FUEL RODS.
 MODEL DEVELOPMENT AND VERIFICATION EFFORTS OF THE REACTOR BEHAVIOR PROGRAM INCLUDED DEVELOPING
 NEW ANALYSIS MODELS FOR THE REACTOR COMPUTER CODE, SUBROUTINES FOR THE PUMP-TYPE FUEL BEHAVIOR
 AND A MODEL FOR PREDICTING REACTOR FUEL BEHAVIOR AND ZIRCALOY CLADDING BEHAVIOR. AN
 ANALYSIS OF POST-LOFT FUEL BEHAVIOR WAS MADE USING PUMP-T.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

A AND D PROGRAM - SAFETY PROGRAM - REACTOR - LOFT (S-RR) - REACTOR, LVR - FUEL ROD - BEHAVIOR - BLOWDOWN -
 HEAT TRANSFER - CORE REFLUDDING SYSTEM - COMPUTER PROGRAM - HYDRAULIC ANALYSIS - JACK

115105
 QUARTERLY TECHNICAL PROGRESS REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY
 COMMISSION'S DIVISION OF REACTOR SAFETY RESEARCH, JANUARY-MARCH 1976
 AEROMET NUCLEAR COMPANY, IDAHO FALLS
 AEROMET-1315-75 177 PPS, 23 TABS, 133 FIGS, 40 REFS, JUNE 1976

RESULTS OF THE SHORT-SCALE REACTOR HEAT TRANSFER TEST SERIES RELATING TO THOSE PHENOMENA THAT
 INFLUENCE CORE FLOW AND HEAT TRANSFER EFFECTS ARE ANALYZED, AND PRELIMINARY ANALYSIS OF THE
 RECENTLY COMPLETED REFLUDD HEAT TRANSFER TEST SERIES ARE SUMMARIZED FOR THE FORCED AND GRAVITY
 FEED REFLUDD TESTS. THE FIRST NONNUCLEAR LOFT IN THE LOFT PROGRAM WAS SUCCESSFULLY COMPLETED AND
 PRELIMINARY RESULTS ARE PRESENTED. PRELIMINARY RESULTS ARE GIVEN FOR THE PUMP-TYPE FUEL BEHAVIOR
 PUMP-TYPE FUEL BEHAVIOR AND THE IRRADIATION EFFECTS SCOPING TEST 2 IN THE THERMAL FUEL BEHAVIOR PROGRAM.
 MODEL DEVELOPMENT AND VERIFICATION EFFORTS REPORTED IN THE REACTOR BEHAVIOR PROGRAM INCLUDE
 CHECKOUT OF REACTOR/RODS UPDATE 1, AND DEVELOPMENT OF A NEW HYDRODYNAMIC MODEL FOR TWO-PHASE
 SEPARATED FLOWS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

A AND D PROGRAM - SAFETY PROGRAM - REACTOR - REACTOR TRANSIENT - LOFT (S-RR) - REACTOR, LVR - FUEL ROD -
 BEHAVIOR - BLOWDOWN - HEAT TRANSFER - CORE REFLUDDING SYSTEM - COMPUTER PROGRAM - HYDRAULIC ANALYSIS - JACK

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

112045
 COVER AS - LOUVE LA - PLEININ JA
 EVALUATION STUDIES AND QUALITY OF IMMEDIATE BIOLOGY JOINTLY PROCEEDS HELD FOR ACTION THROUGH
 RECORDS, 1,75
 METALLIC COMPOUND LATE. ONE
 ONE-ONE-2 P. 30 PPS. 6 TABS. 7 PICS. DEC. 1975

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

015873
MAKER AS - LOUVE LN - PERRIN JS
EVALUATING STRENGTH AND DUCTILITY OF IMMEDIATELY ZINC JR. TANK OF. QUALITATIVE PROCESS REPORT JACQUES TROUEN
MAY 1970
GUTHRIE COLUMBUS LABS., OHIO
ORG-MAKING-1000 P. 62 PPS. 5 TABS. 10 FIGS. NOV 1970

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

110000
 GLENN J. + DAVITT P. BEARING RS
 PASSION PROTECT TRANSPORT ANALYSIS Page 2 - 0 MAY 17 1976
 BAYVILLE COLUMBUS LANT., OHIO
 001-0000-1910 v. 0 001. 3 001. JUNE 1976

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22104

FISHION PRODUCT TRANSPORT, COMPUTER PROGRAM, TRANSPORTATION AND MODELING, SHIPPING CONTAINER, SYSTEMS ANALYSIS, REACTION, PWR, ADSORPTION, CHEMICAL REACTION, NUCR, ANALYTICAL MODEL, THE SMALL HYDRAULIC ANALYSIS

100000

DETER C2 + MARK C1 + LAMINAR CO
 VARIOUS WIRE FUEL CAPSULE-THERMAL-2: A COMPUTER PROGRAM FOR CALCULATING THE THERMAL BEHAVIOR OF AN OXIDE FUEL ROD
 BATTILLE PACIFIC NORTHWEST LABS., RICHMOND, WASH.
 ORNL-1007 P. 105 PPS, 2 FIGS, 15 REFS, NOV. 1975

THE MECHANISMS WHEN EL MODEL CHANGES IN THE FUEL-TO-CLADDING GAP INCLUDE DIFFERENTIAL THERMAL EXPANSION OF FUEL AND CLADDING, ELASTIC AND CREEP DEFORMATION OF THE CLADDING, FUEL EXPANSION CAUSED BY CRYSTAL-TO-AMORPH FUEL SWELLING AND CRACKING AS WELL AS LATE-IN-LIFE SWELLING INDUCED BY THE BUILD UP OF FISSION PRODUCTS, AND FUEL CONTRACTION CAUSED BY DENSIFICATION. IN ADDITION TO THE GAP CHANGES, THE CODE SIMULATES THE EFFECTS OF A VARIETY OF FUEL GAS COMPOSITIONS AND CHANGES IN THE GAS COMPOSITION (AND THUS GAP CONDUCTANCE) CAUSED BY THE RELEASE OF FISSION GAS AND RELATIVE IMPERMEABILITY. THE REACTION OF FUEL TO CLADDING IMPURITIES WITH THE CLAD IS ALSO TAKEN INTO ACCOUNT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

COMPUTER PROGRAM + CLADDING + FISSION GAS RELEASE + OXIDE + THERMAL ANALYSIS + THERMAL MECHANICAL EFFECT + INFORMATION + CREEP + HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ROD + MIXED OXIDE

100726

DETER C2 + MARK C1 + LAMINAR CO
 CAPSULE-THERMAL-2: A COMPUTER PROGRAM FOR CALCULATING THE THERMAL BEHAVIOR OF AN OXIDE FUEL ROD
 BATTILLE PACIFIC NORTHWEST LABS., RICHMOND, WASHINGTON
 ORNL-1000 P. 170 PPS, 50 FIGS, 00 REFS, NOV. 1975

IN THIS REVISED VERSION OF CAPSULE-THERMAL-2 CLOSE DETAIL IS GIVEN TO THE CALCULATION OF THE FUEL-CLADDING THERMAL GAP CONDUCTANCE. THE MAJOR REVISIONS INCLUDE AN ADDED STEADY-STATE POWER HISTORY CAPABILITY, IMPROVED FISSION GAS GENERATION MODEL, FUEL RELOCATION AND DENSIFICATION MODELS, IMPROVED GAP CONDUCTANCE, AND FISSION GAS RELEASE MODELS PLUS THE ADDED ABILITY TO ACCOUNT FOR VOLATILE IMPURITIES, MIXED PL-2FS, MIXED OXIDE FUEL AND MIXED UO₂. THE GAS RELEASE AND RELOCATION MODELS PROVIDE AS A USER OPTION EITHER BEST ESTIMATE OR CONSERVATIVE PREDICTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

COMPUTER PROGRAM + FISSION GAS RELEASE + MIXED FUEL + HEAT TRANSFER, CONDUCTION + HEAT CONDUCTANCE, FUEL TO CLAD + FUEL DENSIFICATION + MIXED OXIDE

112327

VARNEY C2 + MARK C1
 ON EVALUATION OF THE DISCREPANCIES BETWEEN THE PREDICTED AND THE EXPERIMENTAL EFFECTS OF XENON AND KRYPTON IN NUCLEAR FUEL RODS
 BATTILLE PACIFIC NORTHWEST LABS., RICHMOND, WASH.
 ORNL-1055 P. 20 PPS, 5 FIGS, 20 REFS, 25 REFS, NOV. 1975

ALTHOUGH THE CODE ACCURATELY MODELED GAP CONDUCTANCE WHEN HELIUM WAS THE FILL GAS, IT PREDICTED GAP CONDUCTANCES BELOW THOSE DETERMINED EXPERIMENTALLY IF ARGON-XENON MIXTURES WERE THE FILL GAS. THE EFFECT OF SWELLING GAS ON THE GAP CONDUCTANCE WAS FOUND TO BE SIGNIFICANT. THE TEMPERATURE JUMP DISTANCES FOR VARIOUS FILL GASES WERE EXAMINED AND A NEW VALUE SUGGESTED FOR XENON. THE USE OF THE NEW VALUE RESULTS IN A DRAMATIC INCREASE IN GAP CONDUCTANCE WHEN THE GAP SIZE IS SMALL. THE CASE OF A FUEL PELLET NON-CENTRICALLY POSITIONED IN THE CLADDING WAS ALSO CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

COMPUTER PROGRAM + ARGON + COMPARISON, THEORY AND EXPERIENCE + XENON + FUEL PELLET TYPE + HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ROD

112303

VARNEY C2 + MARK C1
 FISSION PRODUCT DECAY HEAT STUDIES AS OF DECEMBER 15, 1975
 LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
 LA-0209-SR P. 10 PPS, 5 FIGS, 30 REFS, JAN. 1976

THIS REPORT DESCRIBES THE STATUS OF THE LOS ALAMOS FISSION PRODUCT DECAY HEAT STUDIES PROGRAM AS OF DECEMBER 15, 1975. THE PURPOSE OF THIS PROJECT IS TO STUDY FISSION PRODUCT DECAY HEATING RATES, WITH EMPHASIS ON SHORT DECAY TIMES. ISOTHERMAL CALORIMETRY IS USED TO PERFORM BENCHMARK EXPERIMENTS FOR "AT TIMES" BETWEEN 20 SECONDS AND 2000 SECONDS WITH AN ABSOLUTE ACCURACY OF BETTER THAN 5%. E. TREATMENTS ARE BEING DONE WITH U235 (TSA 1) AND WILL BE DONE EVENTUALLY WITH PU239 (TSA 2). THERMAL NEUTRON SPECTRA ARE USED FOR THE IRRADIATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

DECAY HEAT + ENERGY SOURCE + PLUTONIUM + URANIUM + THERMAL EXPERIMENT + DATA LITTER + SPECTROMETRY, GAMMA + GAMMA SPECTRUM + ENERGY SPECTRUM + WAX

110200

117200 CONTINUED

LATHROP RD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT OCTOBER 1-DECEMBER 30, 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAPD-MUREG-0233 +. 53 PPS, 23 TABS, 41 FIGS, 100 REFS, MARCH 1976

ON DECEMBER 1, 1975, THE LOS ALAMOS SCIENTIFIC LABORATORY FORMED A DIVISION TO SERVE AS A FOCUS FOR RESEARCH IN NUCLEAR SAFEGUARDS, REACTOR SAFETY AND TECHNOLOGY. THIS PROGRAM INCLUDES HIGH-TEMP, AND HIGH-TEMP SAFETY RESEARCH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + FISSION PRODUCT RELEASE + COOLANT CHEMISTRY + ANALYTICAL MODEL + SEISMIC DESIGN + REACTOR, LETHAL + REACTOR, HIGH + REACTOR, LOW + REACTOR, PWR + HELIUM + SAFEGUARDS, NUCLEAR MATERIAL + NUCLEAR

117001

LATHROP RD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT, JANUARY 1-MARCH 31, 1976
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAPD-MUREG-0317 +. 65 PPS, 10 TABS, 31 FIGS, 71 REFS, MAY 1976

IN HIGH SAFETY RESEARCH, IMPROVED BASIC DATA AND METHODS HAVE BEEN INCLUDED IN THE FISSION PRODUCT RELEASE CODE, LATHROP, AND THE CODE WAS USED TO CALCULATE RELEASES OF THREE REPRESENTATIVE ISOTOPES FOR THREE TEMPERATURE REGIONS. FOR THERMAL-HYDRAULIC ANALYSIS OF TWO-PHASE FLOW IN HIGH SAFETY RESEARCH, AN IMPROVED METHOD HAS BEEN DEVELOPED TO COMPILE ONE-DIMENSIONAL MESHES TO INCLUDE FLOW LOSSES DUE TO AREA CHANGES. IN HIGH SAFETY RESEARCH, WORK CONTINUED ON TESTING THE RELEASE VERSION OF THE SIMMER CODE, SIMMER-1. THE MULTI-ISOTOPE QUANTITATIVE CROSS-SECTION TREATMENT DESCRIBED IN A PREVIOUS REPORT WAS TESTED AND FOUND TO BE BOTH ACCURATE AND EFFICIENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + REACTOR, HIGH + FISSION PRODUCT RELEASE + COMPUTER PROGRAM + ANALYTICAL MODEL + IODINE + KRYPTON + REACTOR, LOW + THERMAL HYDRAULIC ANALYSIS + BLOWDOWN + CONTAINMENT ANALYSIS + REACTOR, LETHAL + ACCIDENT, CORE DISRUPTIVE + NUCLEAR

109030

HALANG 5
SIBIRAN 1 - A COMPUTER CODE FOR THE SIMULTANEOUS CALCULATION OF OXYGEN DISTRIBUTIONS AND TEMPERATURE PROFILES IN ZIRCALOY DURING EXPOSURE TO HIGH-TEMPERATURE BOILING ENVIRONMENTS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5003 +. 105 PPS, 9 FIGS, NOV. 1975

THE CODE SOLVES THE TRANSPORT EQUATIONS FOR BOTH HEAT AND MASS FLOW FOR THE ONE-DIMENSIONAL, MULTIPHASE, MOVING-BOUNDARY, TRANSIENT-TEMPERATURE TRANSPORT PROBLEM IN A FINITE-GEOMETRY SYSTEM DEFINED BY CYLINDRICAL COORDINATES. THE CODE UTILIZES AN IDEAL DIFFUSION MODEL WHICH REQUIRES UNIFORM LAYER GROWTH OF ALL PHASES AND ASSUMES THE EXISTENCE OF THERMODYNAMIC EQUILIBRIUM AT ALL INTERFACES AT ALL TIMES. ONLY MINOR CHANGES ARE NECESSARY TO MAKE IT GENERALLY APPLICABLE TO OTHER MATERIALS THAN ZIRCALOY AND A NUMBER OF OXIDATION, DIFFUSION AND HEAT-TRANSFER PROBLEMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + DIFFUSION + HEAT TRANSFER + OXIDATION + OXYGEN + ZIRCALOY + CONCENTRATION + DISTRIBUTION + TEMPERATURE

107039

HALANG 5
SIMULATION OF NUCLEAR FUEL RODS BY USING PROCESS COMPUTER-CONTROLLED PWR FOR INDIRECT ELECTRICALLY HEATED RODS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TN-4712 +. 63 PPS, 31 FIGS, NOV. 1975

RESULTS SHOW THAT WITHOUT COMPUTER CONTROL OF HEAT AND POWER, ONLY THE PART OF A BLOWDOWN UP TO THE TIME WHEN THE HEAT TRANSFER MODE CHANGES FROM NUCLEATE BOILING TO TRANSITION OR FILM BOILING CAN BE SIMULATED WELL AND THEN ONLY FOR SHORT TIMES. WITH COMPUTER CONTROL, THE SURFACE CAN BE MADE NEARLY IDENTICAL TO THAT OF A REACTOR FUEL ROD WITH THE SAME COOLING CONDITIONS DURING MOST OF THE LOCA. A SMALL PROCESS CONTROL COMPUTER CAN BE USED TO ACHIEVE CLOSE SIMULATION OF A NUCLEAR FUEL ROD WITH AN INDIRECT ELECTRICALLY HEATED ROD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + HEAT TRANSFER + BLOWDOWN + SIMULATION + COMPUTER CONTROL + FUEL ROD + JACKET

100011

HALANUSKAS AP + USORINE AP + LORENZ RA
QUARTERLY PROGRESS REPORT ON FISSION PRODUCT RELEASE FROM LWR FUEL FOR PERIOD JULY-SEPTEMBER '75
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TN-5143 +. 17 PPS, 6 FIGS, 5 REFS, NOV. 1975

METHYL IODIDE WAS FOUND TO DECOMPOSE IN AN OXIDE STREAM--20% ARGON ATMOSPHERE AT THE RATE OF 0.06 PER

100011 CONTINUED

SECOND AT 500 C. THE SAME AS THAT REPORTED IN THE LITERATURE FOR DECOMPOSITION IN DRY ATMOSPHERES. THE RATE OF DECOMPOSITION INCREASED WITH TEMPERATURE. WHEN CESIUM OXIDE WAS EXPOSED TO THE STEAM-ARGON ATMOSPHERE AT TEMPERATURES OF 700 C AND HIGHER, A VAPOR FORM (PROBABLY CESIUM HYDROXIDE) REACTED WITH THE QUARTZ FURNACE LINER. AT TEMPERATURE BELOW 700 C, LESS THAN 1% OF THE RADIOACTIVELY TRACED CESIUM WAS TRANSPORTED OUT OF THE FURNACE TUBE; AT 950 C, HOWEVER, MORE THAN HALF OF THE CESIUM WAS CARRIED INTO THE COLLECTION SYSTEM. PRELIMINARY OBSERVATIONS FROM A SIMILAR EXPERIMENT WITH LSI REVEALED COMPLETE VAPORIZATION (OR REACTION) AT 700 C WITH SIGNIFICANT CHEMICAL CHANGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, OXID. + CESIUM + FISSION PRODUCT RELEASE + REACTION, PHOT. + STEAM + ARGON + ORGANIC IODIDE + TEMPERATURE
LOADING + THERMAL PROPERTY + IODIDE + JACOBS

100044

MASON DC
CREEPOW AND COLLAPSE OF ZIRCALOY FUEL CLADDING
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TR-5144 + 15 PPS, 6 FIGS, NOV. 1975

THE PURPOSE OF THIS STUDY IS TO DETERMINE THE DEFORMATION BEHAVIOR OF ZIRCALOY FUEL CLADDING UNDER NORMAL AND NEAR-NORMAL REACTOR OPERATING CONDITIONS. IN PARTICULAR, IT IS NECESSARY TO DETERMINE DEFORMATION RATES FOR CLADDING CREEPOW ONTO FUEL PELLETS AND INTO PELLET-TO-PELLET GAPS. COLLAPSE INTO SUCH GAPS IS EXPECTED TO OCCUR IN TWO STAGES. THE FIRST STAGE INVOLVE: A SLOW CREEP COLLAPSE INTO THE GAP TO A POINT WHERE A CONDITION OF ELASTIC INSTABILITY IS REACHED. AT THIS POINT THE CLADDING IS EXPECTED TO COLLAPSE SUDDENLY INTO THE GAP (2ND STAGE). EFFORTS THIS PAST QUARTER HAVE CONTINUED ON THREE PHASES OF THE PROGRAM: (1) EQUIPMENT DEVELOPMENT, (2) TUBING CHARACTERIZATION, AND (3) COLLAPSE TESTING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

CLADDING + DEFORMATION + ZIRCALOY + CREEP + TUBING + JACOBS

100102

DILBERTS JR + LOVE TA + EMERY JR
FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE QUARTERLY PROGRESS REPORT FOR JULY-SEPTEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TR-5150 + 37 PPS, 27 FIGS, 4 REFS, NOV. 1975

PRELIMINARY DATA FOR GAMMA-RAY ENERGY RELEASE FROM FISSION PRODUCT DECAY FOLLOWING THERMAL-NEUTRON FISSION OF U235 HAS BEEN OBTAINED AND REDUCED FOR COOLING TIMES BETWEEN 3 AND 10,000 SEC. THE DATA WERE OBTAINED AS PULSE-HEIGHT SPECTRA FOR PHOTON ENERGIES BETWEEN 0.05 AND 0.8 MEV USING A NaI SPECTROMETER AND WERE UNFOLED TO GIVE PHOTON-ENERGY SPECTRA OF MODERATE RESOLUTION. THESE DATA ARE PRESENTED IN GRAPHICAL FORM FOR 27 COMBINATIONS OF IRRADIATION, COOLING, AND COUNTING TIMES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

DECAY HEAT + FISSION PRODUCT RELEASE + GAMMA EMISSION + REACTOR PHYSICS + EMISSION + ENERGY SPECTRUM + JACOBS

100745

CATHEART JV
QUARTERLY PROGRESS REPORT ON THE ZIRCONIUM METAL-WATER OXIDATION KINETICS PROGRAM SPONSORED BY THE NRC
DIVISION OF REACTOR SAFETY RESEARCH FOR JULY-SEPTEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TR-5100 + 31 PPS, 9 FIGS, 13 REFS, DEC. 1975

ADDITIONAL DIFFUSIVITY DATA FOR OXYGEN IN BETA-ZIRCALOY-4 WERE OBTAINED. SIMILAR MEASUREMENTS AT 1000, 1200, AND 1400 C (1832, 2100, AND 2552 F) IN BETA-ZIRCONIUM AND BETA-ZIRCALOY-2 AGREED WELL WITH PREVIOUSLY OBTAINED DATA FOR DIFFUSION IN ZIRCALOY-4. PUBLISHED OXIDATION RATE AND DIFFUSIVITY DATA WERE ANALYZED STATISTICALLY, AND, WHERE APPROPRIATE, THE RESULTS WERE COMPARED WITH DATA FROM OUR OWN WORK. IMPROVEMENTS IN OUR REACTION RATE APPARATUS ARE DESCRIBED ALONG WITH NEW EXPERIMENTAL RESULTS BEARING ON THE PROBLEM OF SPECIMEN SELF-HEATING DURING OXIDATION. THE PREVIOUSLY REPORTED LINE OF PONES IN HIGH-TEMPERATURE OXIDE SCALES ON ZIRCALOY WAS SHOWN TO BE POLYMERIC ARTIFACT; THE 'PONES' ARE ACTUALLY METAL PARTICLES THAT ARE RICH IN Fe. A REPORT DESCRIBING OUR COMPUTER CODE, SIMTRAN-1, IS IN PRESS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

CHEMICAL REACTION + COMPUTER PROGRAM + METAL WATER REACTION + OXIDATION + STEAM + ZIRCONIUM + ZIRCALOY +
THERMAL TRANSIENT JACOBS

100908

CHAPMAN AM
MULTI-ROD MURPHY TEST PROGRAM QUARTERLY PROGRESS REPORT FOR JULY-SEPTEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TR-5150 + 39 PPS, 7 FIGS, 4 REFS, DEC. 1975

FABRICATION DIFFICULTIES CONTINUE TO OBLAY DELIVERY OF ACCEPTABLE HEATERS AND THERMOCOUPLES.

109498 *CONTINUED*

THESE DELAYS REFLECT DIRECTLY ON OUR PROJECTED TEST SCHEDULES. DURING THIS REPORT PERIOD, ORNL HEATER EXPERTS VISITED THE HEATER MANUFACTURERS TO AID IN FABRICATION PROBLEMS. AS A RESULT, 17 HEATERS WERE RECEIVED FROM HAMA AND NINE FROM SENCOR. ALL THE HAMA HEATERS AND SEVEN OF THE NINE SENCOR HEATERS WERE FOUND UNACCEPTABLE. EFFORTS ARE BEING MADE TO IMPROVE UNIFORMITY OF HEATERS BY THE CURRENT FABRICATION TECHNIQUES AND BY INTRODUCING NEW CONCEPTS OF MANUFACTURING. MECHANICAL AND ELECTRICAL DESIGN OF THE MULTIROD TEST FACILITY IS COMPLETE. FABRICATION AND CONSTRUCTION ACTIVITIES WERE INITIATED AND SHOULD BE COMPLETED LATE NEXT QUARTER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OF: CATHARTION • TESTING • SIMULATION • FUEL ROD • THERMOCOUPLE • JACOBS • HEATERS

115355

FEE 66

NOVEMBER 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TN-5217 • 27 PPS, DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, MTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR • PWR • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE • FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • HEATLON, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, MTGR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND O PROGRAM • SAFETY PROGRAM • NJCK

115356

FEE 66

DECEMBER 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TN-5263 • 25 PPS, DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, MTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR • PWR • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE • FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, MTGR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND O PROGRAM • SAFETY PROGRAM • NJCK

112127

CATHART JV • KECLOY DL • PABEL RE

ZIRCONIUM METAL-WATER OXIDATION KINETICS - I. THERMOMETRY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-5102 • 70 PPS, 5 TABS, 7 FIGS, FEB. 1976

THIS REPORT DESCRIBES THE THERMOMETRY TECHNIQUES USED IN THE ZIRCONIUM METAL-WATER OXIDATION KINETICS PROGRAM. TEMPERATURE MEASUREMENTS IN THE RANGE 900 TO 1500 C (1652-2732 F) ARE MADE IN THREE EXPERIMENTAL SYSTEMS: TWO OXIDATION APPARATUSES AND THE ANNEALING FURNACE USED IN A COROLLARY STUDY OF THE DIFFUSION OF OXYGEN IN BETA-ZIRCALOY. CAREFULLY CALIBRATED PT VS PT-10% RH THERMOCOUPLES ARE EMPLOYED IN ALL THREE APPARATUSES, WHILE A PT-6% RH VS PT-30% RH THERMOCOUPLE AND AN OPTICAL PYROMETER ARE USED IN ADDITION IN THE ANNEALING FURNACE. FEATURES OF THE EXPERIMENTAL SYSTEMS PERTAINING TO THERMOCOUPLE INSTALLATION, TEMPERATURE CONTROL, EMP MEASUREMENTS, ETC. ARE DESCRIBED, AND POTENTIAL TEMPERATURE-MEASUREMENT ERROR SOURCES ARE DISCUSSED IN DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL WATER REACTION • OXIDATION • ZIRCONIUM • MEASUREMENT, TEMPERATURE • HIGH TEMPERATURE • CHEMICAL KINETICS • RHODIUM • THERMAL PROPERTY • ZIRCALOY • PLATINUM • THERMOCOUPLE

112341

DECHENS JK • LOVE TA • MCCONNELL JW

FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE QUARTERLY PROGRESS REPORT FOR OCTOBER-DECEMBER 1975

112301 (CONTINUED)
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 OURL/TR-5272 +. 17 PPS, 6 FIGS, 8 REFS, FEB. 1976

PRELIMINARY EXPERIMENTAL INFORMATION FOR BETA-RAY ENERGY RELEASE FROM FISSION PRODUCT DECAY FOLLOWING THERMAL-NEUTRON FISSION OF U235 HAS BEEN OBTAINED FOR PULSE-HEIGHT SPECTRA FOR BETA ENERGIES BETWEEN 0.75 AND 0 MEV USING A TWO-CRYSTAL SCINTILLATION SPECTROMETER, AND WERE UNFOLDED TO GIVE BETA-RAY ENERGY SPECTRA OF MODERATE RESOLUTION. PREVIOUSLY REPORTED PRELIMINARY GAMMA-RAY SPECTRA CALCULATED USING SPECTRAL INFORMATION IN THE ENDF/B-IV DATA FILE FOR 180 FISSION PRODUCTS. SEVERAL COMPARISONS ARE PRESENTED FOR $t_1 = 100$ SECS. AS EXPECTED THE COMPARISON IS NOT VERY GOOD FOR SHORT COOLING TIMES, BUT IS ENCOURAGING FOR T(COOL) OF ABOUT 2000 SECS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + SPECTROMETRY, BETA + SPECTROMETRY, GAMMA + ENERGY SPECTRUM + MEASUREMENT + BETA EMITTER + URANIUM + GAMMA EMITTER + ENERGY SOURCE + NJCK

2040
 HOBSON DG
 QUARTERLY PROGRESS REPORT OF THE CREEDOWN AND COLLAPSE OF ZIRCALOY FUEL CLADDING PROGRAM SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR OCTOBER-DECEMBER 1975
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 OURL/TR-5279 +. 11 PPS, 1 TAB, 3 FIGS, FEB. 1976

THE STUDY IS CONCERNED WITH DEFORMATION BEHAVIOR OF CLADDING UNDER NORMAL AND NEAR-NORMAL OPERATING CONDITIONS. EFFORTS THIS PAST QUARTER HAVE CONTINUED ON TWO PHASES: (1) COLLAPSE TESTING AND (2) DEVELOPMENT AND FABRICATION OF DEFORMATION-MONITORING EQUIPMENT. SUFFICIENT COLLAPSE TESTING HAS BEEN DONE TO BEGIN THE ANALYSIS OF THE TEST DATA. IT IS APPARENT THAT ALL THREE OF THE INDEPENDENT VARIABLES USED IN THIS STUDY (PELLET-TO-PELLET GAP, PELLET-TO-CLADDING GAP, AND TEMPERATURE) PLAY MAJOR ROLES IN THE COLLAPSE PHENOMENON. THE INSTRUMENTATION FOR DEFORMATION MONITORING HAS BEEN DEVELOPED AND PROVISION HAS BEEN MADE FOR AUTOMATIC CONTROL OF THE DATA LOGGING SYSTEM AND FOR PROTECTION OF THE MONITORING COILS FROM DAMAGE CAUSED BY COLLAPSE OF THE SPECIMEN TUBE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + CLADDING + ZIRCALOY + CREEP + R AND D PROGRAM + FUEL ROD + NJCK

115357
 FEE GG
 JANUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 OURL/TR-5290 +. 25 PPS, FEB. 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING OURL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, NRC SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NSIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, NRC + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + R AND D PROGRAM + NJCK + SAFETY PROGRAM

115358
 FEE GG
 FEBRUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 OURL/NURLG/TR-1 +. 25 PPS, FEB. 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING OURL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, NRC SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NSIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, NRC + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + R AND D PROGRAM + SAFETY PROGRAM + NJCK

115399

PER JC

MARCH 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NRRL/TR-15 v. 23 PPS, MARCH 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 6 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BUNST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PUR DOWNDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + NSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NSIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTION, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + LR AND D PROGRAM + SAFETY PROGRAM + PULS

112268

CATHART JV

QUARTERLY PROGRESS REPORT ON THE ZIRCONIUM METAL-WATER OXIDATION KINETICS PROGRAM, OCTOBER - DECEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TM-3268 v. 30 PPS, 2 TABS, 17 FIGS, 8 REFS, MARCH 1976

THE EXPERIMENTAL PHASE OF THE STUDY OF THE DIFFUSIVITY OF OXYGEN IN BETA ZIRCALOY BETWEEN 900 AND 1500 DEG C IS ESSENTIALLY COMPLETE. NO DIFFERENCES BETWEEN CHEMICAL AND TRACE DIFFUSIVITIES WERE OBSERVED. THE FORTY SPECIMENS REQUIRED TO DEFINE ISOTHERMAL OXIDATION RATE CURVES AT 900, 1000, 1100, AND 1300 DEG C HAVE BEEN OXIDIZED IN THE MINIZON APPARATUS AND ARE UNDERGOING METALLOGRAPHIC EXAMINATION. OXIDATION RATE DATA OBTAINED AT 900 AND 1000 DEG C IN THE MAXIZON APPARATUS ARE PRESENTED, AND THE PROCEDURES FOLLOWED IN EVALUATING AND CORRELATING SUCH DATA ARE DESCRIBED IN DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + DIFFUSION + METAL WATER REACTION + OXIDATION + OXYGEN + STEAM + ZIRCONIUM + REACTOR, LWR + ZIRCALOY + THERMOCOUPLE + THERMAL TRANSIENT + NJCK

112342

DISCRETS JK + LWR TA + MCCONNELL JV

PRELIMINARY FISSION PRODUCT ENERGY RELEASE MEASUREMENTS FOR THERMAL NEUTRON FISSION OF U235
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TM-3273 v. 37 PPS, 15 FIGS, 32 REFS, MARCH 1976

AN EXPERIMENTAL SYSTEM TO MEASURE TIME-DEPENDENT SPECTRA OF BETA AND GAMMA RAYS FROM FISSION-PRODUCT PRODUCTION BY THERMAL NEUTRON FISSION OF U235 IS DESCRIBED, AND FOR EACH COMPONENT (BETA AND GAMMA) THE SYSTEM HAS BEEN TESTED WITH A PILOT DATA-ACCUMULATION RUN. DATA REDUCTION TECHNIQUES ARE DESCRIBED AND TEST RESULTS GIVEN. GAMMA-RAY SPECTRA ARE COMPARED WITH CALCULATIONS USING ENDF/B-IV DATA FILES. BOTH BETA- AND GAMMA-RAY SPECTRA WERE INTEGRATED TO GIVE TOTAL YIELDS AND TOTAL ENERGY-RELEASE RESULTS FOR TIMES AFTER FISSION BETWEEN 3 AND 10000 SEC. THESE PRELIMINARY INTEGRAL DATA ARE COMPARED WITH PREVIOUS MEASUREMENTS AND WITH INTEGRAL CALCULATIONS USING ENDF/B-IV DATA FILES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + ENERGY SOURCE + MEASUREMENT + URANIUM + BETA EMITTER + FREQUENCY SPECTRA + SPECTROMETRY, GAMMA + GAMMA EMITTER + ENERGY SPECTRUM + NJCK

113391

LORENZ BA + COLLINS JL + HANMING SR

QUARTERLY PROGRESS REPORT ON FISSION PRODUCT RELEASE FROM LWR FUEL FOR THE PERIOD OCTOBER-DECEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TM-3290 v. 37 PPS, 5 TABS, 16 FIGS, 11 REFS, MARCH 1976

THE SERIES OF CONTROL TESTS HAS BEEN COMPLETED. THESE TESTS WERE CONDUCTED TO EVALUATE THE SUSTAINABILITY OF THE APPARATUS DESIGN, TO TEST THE VARIOUS FISSION PRODUCT CHARACTERIZATION DEVICES AND METHODS, AND TO ESTABLISH THE BEHAVIOR OF KNOWN CHEMICAL SPECIES WHICH ARE EXPECTED TO BE ENCOUNTERED IN THE LATER PHASES OF THE PROGRAM. THOSE TESTS WHICH UTILIZED EITHER CS1 OR CS20 WERE FOUND TO YIELD DEPOSITS OF HYDRATED CSOH IN THE MOIST ENVIRONMENT. ALTHOUGH PROBLEMS HAD BEEN ENCOUNTERED IN ATTEMPTS TO CALIBRATE A KNOWN CELL-MASS SPECTROMETER APPARATUS FOR USE IN LIMITED STUDIES OF CS VAPOR PRESSURE OVER UO2, THESE DIFFICULTIES APPEAR TO HAVE BEEN RESOLVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FISSION PRODUCT RELEASE + FUEL BURNUP + TELLURIUM + ACCIDENT, TRANSPORTATION + TRANSPORTATION AND HANDLING + REACTOR, LWR + SIMULATION + IODIDE + NJCK + FUEL CYCLE + JACOBS

113731
CHAPMAN RW
MULTIPL BURST TEST PROGRAM QUARTERLY PROGRESS REPORT FOR OCTOBER-DECEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TM-10 P. 50 PPS, 8 TABS, 20 FIGS, MAY 1976

IN REGARD TO TESTS OF DEFORMATION BEHAVIOR OF UNIRRADIATED ZIRCALOY CLADDING UNDER LOCA CONDITIONS, THE PROGRESS MADE DURING THIS REPORTING PERIOD IS DISCUSSED. THE PRELIMINARY RESULTS OF SINGLE-WALL TESTS AS WELL AS TEST FACILITY NEEDS AND PROCEDURES ARE OUTLINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161
TEST, DESTRUCTIVE + DEFORMATION + FAILURE, CLADDING + ZIRCALOY + WICK + HEATERS

114000
CATHART JV
QUARTERLY PROGRESS REPORT ON THE ZIRCONIUM METAL-WATER OXIDATION KINETICS PROGRAM SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR JANUARY-MARCH 1976
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TM-17 P. 25 PPS, 7 TABS, 7 FIGS, 11 REFS, MAY 1976

THE CORRELATION OF THE DATA FOR THE DIFFUSION OF OXYGEN IN BETA-ZIRCALOY-4 BETWEEN 950 AND 1500 DEG C (1732-2732 DEG F) HAS COMPLETED. BETWEEN 1000 AND 1500 DEG C (1832-2732 DEG F) THE DIFFUSION COEFFICIENT IS GIVEN BY $D = 0.0240 \text{ (cm}^2\text{)} \exp(-20190/RT)$ CM SQUARED/SEC WITH UNCERTAINTIES OF APPROX. ± 0.1 , ± 0.1 , AND ± 0.1 AT 1000, 1250, AND 1500 DEG C (1832, 2282, AND 2732 DEG F) RESPECTIVELY. AN ERROR ANALYSIS OF THE DIFFUSION TECHNIQUES USED WAS ALSO MADE. THE EXPERIMENTAL PHASE OF THE ISOTHERMAL OXIDATION MEASUREMENTS WAS COMPLETED, AND THE SPECIMENS ARE CURRENTLY UNDERGOING METALLOGRAPHIC EXAMINATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161
METAL WATER REACTION + OXIDATION + HIGH TEMPERATURE + REACTOR, SAFETY RESEARCH + WICK + ZIRCONIUM + DIFFUSION COEFFICIENT + CHEMICAL KINETICS

114923
FEE GC
APRIL 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TM-21 P. 25 PPS, MAY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPHASE BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLUO DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161
REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + MSIC + BLUO DOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTOR, LWR BN + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + OR AND D PROGRAM + SAFETY PROGRAM + WICK

114039
DICRENS JR + LOVE TA + MCCONNELL JR
FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE QUARTERLY PROGRESS REPORT FOR JANUARY-MARCH 1976
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TM-23 P. 10 PPS, 2 TABS, 7 REFS, MAY 1976

SEVERAL IMPORTANT ASPECTS OF THE OVERALL PROGRAM TO DETERMINE FISSION-PRODUCT ENERGY RELEASE RATES USING SPECTROSCOPIC METHODS ARE PRESENTED. THESE ASPECTS INCLUDE: (A) FABRICATION OF A SAMPLE HOLDER FOR THE BETA-RAY MEASUREMENTS HAVING AN ABSORBING LAYER BETWEEN SAMPLE AND DETECTOR OF APPROX. 5 MG/SQ CM; (B) A MEASUREMENT OF THE MAXIMUM PROBABLE LOSS OF THE FISSION-GAS PRODUCT ^{131}I ; AND (C) A NEW DETERMINATION OF THE ABSOLUTE INTENSITIES OF THE PRINCIPAL X AND GAMMA RAYS IN THE DECAY OF ^{90}mY IN EQUILIBRIUM WITH ^{90}Zr .

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161
ANALYTICAL TECHNIQUE + ENERGY SPECTRUM + BETA EMITTER + GAMMA EMITTER + WICK + IODINE + MOLYBDENUM

114957
MOBSON OD
THE EFFECT OF THERMAL TRANSIENTS ON THE HARDNESS OF ZIRCALOY FUEL CLADDING
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TM-26 P. 13 PPS, 4 FIGS, JUNE 1976

110957 *CONTINUED*

THIS STUDY IS DIRECTED TOWARD THE DETERMINATION OF THE EFFECTS OF ANNEALING CYCLES WITH RAPID HEATING RATES, SHORT HOLD TIMES AT SPECIFIC TEMPERATURES, AND RAPID COOL-DOWN RATES ON THE HARDNESS OF ZIRCALOY FUEL CLADDING. THESE RAPID ANNEALING CYCLES ARE DESIGNED TO PROVIDE PRELIMINARY ANNEALING BEHAVIOR DATA ON LOSS-OF-FLUID-TEST REACTOR CLADDING SAMPLES. IT WAS FOUND THAT THERE WAS LITTLE DIFFERENCE IN THE HARDNESS RESPONSE BETWEEN SINGLE- AND TRIPLE-CYCLE TRANSIENTS FOR A GIVEN TOTAL HOLD TIME AT A PARTICULAR TEMPERATURE. TEMPERATURES EQUAL TO OR GREATER THAN 1300 F (700 C) RESULTED IN FULLY ANNEALED MATERIAL FOR ALL HOLD TIMES. THE 1000 F (530 C) TESTS PRODUCED NO MEASURABLE SOFTENING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PROPERTY, PHYSICAL * HARDENING * CYCLING * THERMAL TRANSIENT * LOFT (S-BR) * ZIRCALOY * PROPERTY, MECHANICAL * CLADDING * THERMAL EXPERIMENT * NUCC

115300

PERKINS WA

ZIRCONIUM METAL-WATER OXIDATION KINETICS II. OXYGEN-18 DIFFUSION IN BETA-ZIRCALOY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/TM-19 * 81 PPS, TABS. FIGS. JULY 1976

AT THE END OF A HYPOTHETICAL LOSS-OF-COOLANT ACCIDENT IN A LIGHT WATER REACTOR THE MECHANICAL PROPERTIES OF THE "PRISON" BETA REGION OF THE ZIRCALOY FUEL CLAD WILL BE DETERMINED TO A LARGE EXTENT BY ITS OXYGEN CONTENT. FOR THIS REASON THE DIFFUSION OF OXYGEN-18 IN BETA-ZIRCALOY-4 HAS BEEN MEASURED FROM 900 TO 1500 DEG C (1652-2732 DEG F), AND SURVEY MEASUREMENTS HAVE BEEN MADE FOR BETA-ZIRCONIUM AND BETA-ZIRCALOY-2. THE TRACER DIFFUSIVITY WAS MEASURED OVER THE ENTIRE TEMPERATURE RANGE AND THE CHEMICAL DIFFUSIVITY FROM 1100 TO 1500 DEG C (2012-2732 DEG F). THE EXPERIMENTS WERE PERFORMED BY USING OXYGEN-18 AS THE TRACER AND ACTIVATING IT BY PROTON DOPANTMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM * SAFETY PROGRAM * REACTOR, LWR * METAL WATER REACTION * OXIDATION * ZIRCONIUM * MEASUREMENT * TEMPERATURE * HIGH TEMPERATURE * CHEMICAL KINETICS * THERMAL PROPERTY * ZIRCALOY * POLYMER * DIFFUSION * NUCC

115088

CHAPMAN AN

CHARACTERIZATION OF ZIRCALOY-4 TUBING PROCURED FOR FUEL CLADDING RESEARCH PROGRAMS

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/TM-29 * 131 PPS, TABS, FIGS. REFS. JULY 1976

A QUANTITY OF ZIRCALOY-4 TUBING (10.92 MM (0.430 IN.) OUTSIDE DIAMETER BY 0.635 MM (0.025 IN.) WALL THICKNESSES) WAS PURCHASED SPECIFICALLY FOR USE IN A NUMBER OF RELATED FUEL CLADDING RESEARCH PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION. THE TUBING IS REPRESENTATIVE OF CURRENT REACTOR TECHNOLOGY. THIS REPORT DOCUMENTS THE PROCUREMENT ACTIVITIES, PROVIDES A CONVENIENT REFERENCE SOURCE OF MANUFACTURER'S DATA AND TUBING DISTRIBUTION TO THE VARIOUS USERS, AND PRESENTS SOME PRELIMINARY CHARACTERIZATION DATA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM * SAFETY PROGRAM * REACTOR, PWR * ZIRCALOY * CLADDING * COMPONENT DESCRIPTION * FABRICATION * MATERIAL * NUCC

115300

PER 66

MAY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/TM-34 * 25 PPS, JULY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR SHUTDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR * HYST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE, FUEL ELEMENT * NSIC * SHUTDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE, CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR, LWR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR, HYDR * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * R AND D PROGRAM * SAFETY PROGRAM * NUCC

115301

PER 66

JUNE 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL

LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

100720
SPINRAD 01
ANNUAL REPORT EVALUATION OF FISSION PRODUCT AFTER-HEAT
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON. ONE QUARTER 1975
ORNL-75/649 P. 110 PPS. 9 TABS. 10 FIGS. NOV. 1975

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

113425
SPINRAD R1
EVALUATION OF FISSION PRODUCT AFTER-HEAT: QUARTERLY REPORT JULY - SEPTEMBER, 1975
U.S. NUCLEAR REGULATORY COMMISSION, OREGON STATE UNIV.
NUREG-0018-1 P. 32 PPS. 6 TABS. 3 FIGS. JAN. 1976

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

113423
SPINRAD 21
EVALUATION OF FISSION PRODUCT AFTER-HEAT. QUARTERLY REPORT OCTOBER 1, 1975 - DECEMBER 31, 1975
U.S. NUCLEAR REGULATORY COMMISSION, OREGON STATE UNIV., CORVALLIS
NUREG-0010-2 P. 51 PPS. 9 TABS. 6 FIGS. MARCH 1976

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

013021
LIGHT WATER REACTION SAFETY RESEARCH PROGRAM QUARTERLY REPORT, JULY-SEPTEMBER 1975

115021 CONTINUED
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-75-0032 +. 72 PPS, 9 TABS, 20 FIGS, 0 REFS, DEC. 1975

REPORTS PROGRESS FOR THE PERIOD COVERING: MELTEN CORE-CONCRETE INTERACTION; KINETICS AND
STOICHIOMETRY OF THE THERMAL DECOMPOSITION OF CONCRETE; RESPONSE OF CONCRETE TO HIGH HEAT PULSES;
THERMAL-HYDRAULIC PHENOMENA AT THE MELT-CONCRETE INTERFACE; AND STEAM EXPLOSION PHENOMENA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

CONCRETE + EXPLOSION + FUEL MELTDOWN + STEAM + THERMAL MECHANICAL EFFECT + MELTEN FUEL + REACTION, LWR + SAFETY
PROGRAM + A AND D PROGRAM + EFFECT + DECOMPOSITION + NJOX

115321
DANLACHEN CA
LIGHT WATER REACTOR SAFETY RESEARCH PROGRAM QUARTERLY REPORT, OCTOBER-DECEMBER 1975
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-0103 +. 71 PPS, 27 FIGS, 2 REFS, APRIL 1976

THE MELTEN CORE - CONCRETE INTERACTIONS STUDY WAS INITIATED ON JULY 15, 1975 TO PROVIDE A
QUALITATIVE, SCOPING EXPLANATION OF THE PHENOMENA ASSOCIATED WITH CONTACT BETWEEN MELTEN CORE
MATERIALS AND CONCRETE. NO MAJOR TESTS WERE POSSIBLE DURING THIS QUARTER BECAUSE THE 90 DAY
CURING PERIOD FOR THE CONCRETE CONTINUED THROUGH DECEMBER. INSTEAD, ADDITIONAL SMALL SCALE
TESTING, ANALYSIS, AND OTHER EXPLORATORY PROJECTS WERE PURSUED AND PREPARATIONS FOR THE MAJOR
TESTS WERE COMPLETED. THE STEAM EXPLOSION PROJECT IS A LABORATORY-SCALE STUDY ADDRESSING THE
REQUIREMENTS FOR TRIGGERING A STEAM EXPLOSION UNDER TYPICAL REACTOR CORE MELTDOWN CONDITIONS. IN
THIS QUARTER, THE EXPERIMENTAL DESIGNS FOR THE STEAM EXPLOSION TRIGGERING APPARATUS WERE
COMPLETED AND SUBMITTED TO THE SHOP.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

A AND D PROGRAM + SAFETY PROGRAM + CONCRETE + EXPLOSION + FUEL MELTDOWN + STEAM + THERMAL MECHANICAL EFFECT
+ REACTION, LWR + MELTEN FUEL + CORE MELTDOWN + EFFECT + DECOMPOSITION + NJOX

4. NRC-WATER REACTOR SAFETY RESEARCH, ANALYSIS DEVELOPMENT

104733
 OWEN, D.J. + RAYMOND, J.D. + TRAPP, J.A.
 TRANSIENT THREE-DIMENSIONAL THERMAL-HYDRAULIC ANALYSIS OF NUCLEAR REACTOR FUEL ROD ARRAYS - GENERAL EQUATIONS
 AND NUMERICAL SCHEME
 ARGUMENT NUCLEAR COMPANY, IDAHO FALLS
 ANLN-1267 P. 47 PPS, 0 TABS, 00 REFS, NOV. 1975

A MATHEMATICAL MODEL AND A NUMERICAL SOLUTION SCHEME FOR THERMAL-HYDRAULIC ANALYSIS OF FUEL ROD
 ARRAYS ARE GIVEN. THE MODEL ALLEVIATES THE TWO MAJOR DEFICIENCIES ASSOCIATED WITH EXISTING ROD
 ARRAY ANALYSIS MODELS, THAT OF A CORRECT TRANSVERSE MOMENTUM EQUATION AND THE CAPABILITY OF
 HANDLING MIXED- AND CIRCULATORY FLOWS. POSSIBLE APPLICATIONS OF THE MODEL INCLUDE STEADY
 STATE AND TRANSIENT SUBCHANNEL CALCULATIONS AS WELL AS ANALYSIS OF FLOWS IN HEAT EXCHANGERS,
 OTHER ENGINEERING EQUIPMENT, AND POROUS MEDIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + EQUATION + ANALYTICAL MODEL + FLOW, TWO PHASE + THEORETICAL INVESTIGATION + FUEL ROD +
 THERMAL HYDRAULIC ANALYSIS + JACOBS + FUEL ELEMENTS

104554
 TENGLEY, P.P.
 QUARTERLY TECHNICAL REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S
 DIVISION OF REACTOR SAFETY RESEARCH, APRIL-JUNE 1975
 ARGUMENT NUCLEAR COMPANY, IDAHO FALLS
 ANLN-1267 P. 278 PPS, 1 TABS, 1 FIGS, 00 REFS, NOV. 1975

THE NUCLEAR PROGRAM CONSISTS OF A CONTINUING SERIES OF SMALL-SCALE NUCLEAR THERMAL-HYDRAULIC
 EXPERIMENTS HAVING AS THEIR PRIMARY PURPOSES THE GENERATION OF EXPERIMENTAL DATA THAT CAN BE
 APPLIED TO THE DEVELOPMENT AND VERIFICATION OF ANALYTICAL MODELS DESCRIBING PHENOMENA IN WATER-
 COOLED NUCLEAR POWER PLANTS. THE LOFT PROGRAM IS A NUCLEAR TEST PROGRAM FOR PROVIDING TEST DATA
 TO SUPPORT ASSESSMENT AND IMPROVEMENT OF THE ANALYTICAL METHODS UTILIZED FOR PREDICTING THE
 BEHAVIOR OF PRESSURIZED WATER REACTORS UNDER LOCA CONDITIONS. THE THERMAL FUELS BEHAVIOR PROGRAM
 IS AN INTEGRATED EXPERIMENTAL AND ANALYTICAL PROGRAM DESIGNED TO PROVIDE INFORMATION ON THE
 BEHAVIOR OF REACTOR FUELS UNDER NORMAL, OFF-NORMAL, AND ACCIDENT CONDITIONS. THE REACTOR
 BEHAVIOR PROGRAM ENCOMPASSES THE ANALYTICAL ASPECTS OF PREDICTING THE RESPONSE OF NUCLEAR POWER
 REACTORS UNDER NORMAL, ABNORMAL, AND ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ROCKUP + REACTOR TRANSIENT + LOFT (S-RR) + REACTOR, LOW + ON AND D PROGRAM + FUEL ROD + BEHAVIOR + JACOBS

112214
 QUARTERLY TECHNICAL REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S
 DIVISION OF REACTOR SAFETY RESEARCH, JULY-SEPTEMBER 1975
 ARGUMENT NUCLEAR CO., IDAHO FALLS
 ANLN-1266 P. 179 PPS, 75 TABS, 181 FIGS, 26 REFS, FEB. 1976

LIGHT WATER REACTOR SAFETY ACTIVITIES PERFORMED DURING JULY THROUGH SEPTEMBER 1975 ARE SUMMARIZED.
 THE ISO-THERMAL BLOWDOWN TEST SERIES OF THE SENSIBLE ROD-1 TEST PROGRAM HAS PROVIDED DATA FOR
 EVALUATION OF BREAK FLOW PHENOMENA AND ANALYSIS OF PIPING FLOW REGIMES AND PUMP PERFORMANCE. IN
 THE LOFT PROGRAM, MEASUREMENT UNCERTAINTIES WERE EVALUATED. THE THERMAL FUELS BEHAVIOR PROGRAM
 COMPLETED TWO POWER-COOLING-MISMATCH TESTS ON PWR-TYPE FUEL RODS TO INVESTIGATE CRITICAL HEAT
 FLUX CHARACTERISTICS. MODEL DEVELOPMENT AND VERIFICATION EFFORTS OF THE REACTOR BEHAVIOR PROGRAM
 INCLUDED DEVELOPMENT OF THE SPLEN COMPUTER CODE, SUBROUTINES FOR THE FRAP-T CODE, VERIFICATION
 OF RELAP, AND RESULTS OF THE WARDEN RECYCLE PLUTONIUM EXPERIMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + COMPUTER PROGRAM + HYDRAULIC ANALYSIS + LOFT (S-RR) + REACTOR, LOW + SAFETY PROGRAM +
 BLOWDOWN + N AND D PROGRAM + HEAT FLUX, CRITICAL + NJCR

115108
 QUARTERLY TECHNICAL REPORT ON WATER REACTOR SAFETY PROGRAMS SPONSORED BY THE NUCLEAR REGULATORY COMMISSION'S
 DIVISION OF REACTOR SAFETY RESEARCH, OCTOBER-DECEMBER 1975
 ARGUMENT NUCLEAR COMPANY, IDAHO FALLS
 ANLN-NUREC-1301 P. 147 PPS, 00 TABS, 50 REFS, MAY 1976

THE BLOWDOWN HEAT TRANSFER TEST SERIES OF THE SENSIBLE ROD-1 TEST PROGRAM HAS COMPLETED. IN THE
 LOFT PROGRAM, COMPARISONS WERE MADE FOR NONNUCLEAR TESTING. THE THERMAL FUELS BEHAVIOR PROGRAM
 COMPLETED A POWER-COOLING MISMATCH TEST AND AN IRRADIATION EFFECTS TEST ON PWR-TYPE FUEL RODS.
 MODEL DEVELOPMENT AND VERIFICATION EFFORTS OF THE REACTOR BEHAVIOR PROGRAM INCLUDED DEVELOPING
 NEW ANALYSIS MODELS FOR THE RELAP COMPUTER CODE, SUBROUTINES FOR THE FRAP-S AND FRAP-T CODES,
 AND NEW MODELS FOR PREDICTING REACTOR FUEL RESTRUCTURING AND ZIRCALOY CLADDING BEHAVIOR. AN
 ANALYSIS OF POST-LOCA FUEL BEHAVIOR WAS MADE USING FRAP-T.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

N AND D PROGRAM + SAFETY PROGRAM + ROCKUP + C-RT (S-RR) + REACTOR, LOW + FUEL ROD + BEHAVIOR + BLOWDOWN +
 HEAT TRANSFER + CORE FLOODING SYSTEM + COMPUTER PROGRAM + HYDRAULIC ANALYSIS + NJCR

RESULTS OF THE SMALLSCALE MOD-1 BLOWDOWN HEAT TRANSFER TEST SERIES RELATING TO THOSE PHENOMENA THAT INFLUENCE CLOVE FLUID AND HEAT TRANSFER EFFECTS ARE ANALYZED, AND PRELIMINARY ANALYSIS OF THE RECENTLY COMPLETED REFUEL HEAT TRANSFER TEST SERIES ARE SUMMARIZED FOR THE FORCED AND GRAVITY FLOW REFUELING TESTS. THE FIRST MINICORE LORE IN THE LUST PROGRAM WAS SUCCESSFULLY COMPLETED AND PRELIMINARY RESULTS ARE PRESENTED. PRELIMINARY RESULTS ARE GIVEN FOR THE PCN A-1 NO TEST, THE PCN-2A TEST, AND THE IRRADIATION EFFECTS SCOPING TEST 2 IN THE THERMAL FLUX BEHAVIOR PROGRAM. MODEL DEVELOPMENT AND VERIFICATION EFFORT, REPORTED IN THE REACTOR BEHAVIOR PROGRAM INCLUDE CHECKOUT OF RELAP/MODS UPDATE 1, AND DEVELOPMENT OF A NEW HYDRODYNAMIC MODEL FOR TWO-PHASE SEPARATED FLOWS.

2. AND D PROGRAM • SAFETY PROGRAM • NOXAP • REACTOR TRANSIENT • PLOTT (S-RRI • REACTOR, LUN • FUEL ROD • BEHAVIOR • GLUONON • HEAT TRANSFER • CORE REFLOODING SYSTEM • COMPUTER PROGRAM • HYDRAULIC ANALYSIS • NOXAP

LAUREN JH + BATES JH
EFFECTS OF SHELVE PACKAGES ON AIR VELOCITY DISTRIBUTIONS IN AN UNHEATED 7 X 7 FOOT SQUARE
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
MAY-1973 +. 98 PGS. 10 FIGS. 12 REFS. JAN. 1976

HYDRAULIC EXPERIMENTS • REACTION, PHEN • ANALYTICAL MODEL • AIR • FLOW STABILITY • FLOW BLOCKAGE • FLOW, RECIRCULATION • COMPUTER PROGRAM, DIGITAL • FUEL ELEMENTS

DEVELOPMENT OF A COMPUTER CODE FOR THERMAL HYDRAULICS OF REACTORS (THIRD) THIRD QUARTERLY PROGRESS REPORT APRIL-JUNE, 1975
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY
BNL-30438 P. 63 PPS. FIGS. REFS. JAN. 1976

COMPUTED PROGRAM • REACTOR, LOW • THERMAL HYDRAULIC ANALYSIS • THERMAL TRANSIENT • TRANSIENT • FLOW, TWO
PHASE • TRANSPORT PROPERTY • WATER VAPOR • NICK

DEVELOPMENT OF A COMPUTER CODE FOR THERMAL HYDRAULICS OF REACTORS (THOR), FOURTH QUARTERLY PROGRESS REPORT,
JULY-SEPTEMBER 1975
ORNL-CONF-75-500, UNIV. OF CALIF., RPT. NO. 75-1
ORNL-CONF-75-500, 31 PAGES, 10 FIGS., 1 REF., APRIL 1976

N AND O PROGRAM + SAFETY PROGRAM + REACTOR, LOW + COMPUTER PROGRAM + THERMAL HYDRAULIC ANALYSIS + THERMAL TRANSIENT + ANALYTICAL MODEL + FLOW, TWO PHASE + HEAT TRANSFER, NATURAL CONVECTION + MCR + TRANSPORT PROPERTY + WATER VAPOR

114206
LATHROP AC
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT OCTOBER 1-DECEMBER 31, 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LANS-MUREG-6211 P. 43 PPS, 23 TABS, 41 FIGS, 104 REFS, MARCH 1976

ON DECEMBER 1, 1975, THE LOS ALAMOS SCIENTIFIC LABORATORY FORMED A DIVISION TO SERVE AS A FOCUS FOR RESEARCH IN NUCLEAR SAFEGUARDS, REACTOR SAFETY AND TECHNOLOGY. THIS PROGRAM INCLUDES REGR, LWR, AND LWRM SAFETY RESEARCH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS • FISSION PRODUCT RELEASE • COOLANT CHEMISTRY • ANALYTICAL MODEL • SEISMIC DESIGN • REACTOR, LWRM • REACTOR, HTGR • REACTOR, BBN • REACTOR, PHN • HELIUM • SAFEGUARDS, NUCLEAR MATERIAL • MCK

115011
LATHROP AC
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT, JANUARY 1-MARCH 31, 1976
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LANS-MUREG-6317 P. 45 PPS, 10 TABS, 37 FIGS, 71 REFS, MAY 1976

IN LWR SAFETY RESEARCH, IMPROVED BASIC DATA AND METHODS HAVE BEEN INCLUDED IN THE FISSION PRODUCT RELEASE CODE, LARC, AND THE CODE WAS USED TO CALCULATE RELEASES OF THREE REPRESENTATIVE ISOTOPES FOR THREE TYPICAL MODELS. FOR THERMAL-HYDRAULIC ANALYSIS OF TWO-PHASE FLOW IN LWR SAFETY RESEARCH, AN IMPROVED METHOD HAS BEEN DEVELOPED TO COUPLE ONE-DIMENSIONAL MESHES TO INCLUDE FLOW LOSSES DUE TO AREA CHANGES. IN LWRM SAFETY RESEARCH, WORK CONTINUED ON TESTING THE RELEASE VERSION OF THE SIMMER CODE, SIMMER-1. THE MULTI-ISOTOPE BONDARENKO CROSS-SECTION TREATMENT DESCRIBED IN A PREVIOUS REPORT WAS TESTED AND FOUND TO BE BOTH ACCURATE AND EFFICIENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM • SAFETY PROGRAM • REACTOR, HTGR • FISSION PRODUCT RELEASE • COMPUTER PROGRAM • ANALYTICAL MODEL • LOOING • RAYTRON • ORATION, LWR • THERMAL-HYDRAULIC ANALYSIS • BLOWDOWN • CONTAINMENT ANALYSIS • ORATION, LWRM • ACCIDENT, LINE DISRUPTIVE • MCK

115100
TUBNEY MD • RIVARO MC
NUMERICAL CALCULATING OF FLASHING FROM LONG PIPES USING A TWO-FIELD MODEL
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LANS-MUREG-6330 P. 13 PPS, 3 TABS, 10 FIGS, 7 REFS, MAY 1976

A TWO-FIELD MODEL FOR TWO-PHASE FLOWS, IN WHICH THE VAPOR AND LIQUID PHASES HAVE DIFFERENT DENSITIES, VELOCITIES, AND TEMPERATURES, HAS BEEN USED TO CALCULATE THE FLASHING OF WATER FROM LONG PIPES. THE TECHNIQUE IS USED TO NUMERICALLY SOLVE THE TRANSIENT EQUATIONS THAT GOVERN THE DYNAMICS OF EACH PHASE. THE FLOW PHYSICS IS DESCRIBED WITH FINITE RATE PHASE TRANSITIONS, INTERFACIAL FRICTION, HEAT TRANSFER, PIPE WALL FRICTION, AND APPROPRIATE STATE EQUATIONS. THE RESULTS OF THE CALCULATIONS ARE COMPARED WITH MEASURED HISTORIES OF PRESSURE, TEMPERATURE, AND VOID FRACTION. A PARAMETER STUDY INDICATES THE RELATIVE SENSITIVITY OF THE RESULTS TO THE VARIOUS PHYSICAL MODELS USED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MCK • FLOW, TWO PHASE • PIPES AND PIPE FITTINGS • TRANSIENT • EQUATION OF STATE • PHASE CHANGE

115354
HINT CU • ROBERT MC
APPLICATION OF A DRIFT-FLUX MODEL TO FLASHING IN STRAIGHT PIPES
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO • U.S. NUCLEAR REGULATORY COMMISSION
NM-LRM-881 P. 14-0005-05 P. 16 PPS, 20 FIGS, ISSUED JULY 1975, REISSUED JULY 1976

A NEW COMPUTER PROGRAM, SOLA-DF, HAS BEEN WRITTEN TO SOLVE THE UNSTEADY, TWO-DIMENSIONAL EQUATIONS OF MOTION FOR A TWO-PHASE MIXTURE. THE EQUATIONS SOLVED ARE BASED ON THE DRIFT-FLUX APPROXIMATION AND INCLUDE A PHASE TRANSITION MODEL AND A GENERAL DRIFT VELOCITY CALCULATION. IN THIS REPORT THE SOLA-DF CODE IS USED FOR A STUDY OF THE BLOWDOWN OF STRAIGHT PIPES INITIALLY FILLED WITH WATER AT HIGH TEMPERATURE AND PRESSURE. COMPUTED RESULTS ARE PRESENTED THAT SHOW THE RELATIVE IMPORTANCE OF PHASE TRANSITION RATES, PIPE FRICTION, DRIFT VELOCITY MAGNITUDE, AND OTHER MODEL VARIATIONS. THE COMPUTED RESULTS ARE ALSO COMPARED WITH EXPERIMENTAL DATA. (ALSO SEE NSIC ACCESSION NO. 100100.)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM • SAFETY PROGRAM • COMPUTER PROGRAM • EQUATION • FLOW, TWO PHASE • DRIFT • BLOWDOWN • PHASE CHANGE • COMPARISON, THEORY AND EXPERIENCE • REACTOR, PHN • MCK

3. NRC'S WATER REACTOR SAFETY RESEARCH, METALLURGY AND MATERIALS

109587

MAHO GT • WELLEN PL • MORGAN RD
CRITICAL EXPERIMENTS, MEASUREMENTS AND ANALYSES TO ESTABLISH A CRACK ARREST METHODOLOGY FOR NUCLEAR PRESSURE VESSEL STEELS. FOURTH QUARTERLY PROGRESS REPORT. TASK 02
BATTELLE COLUMBUS LABS., OHIO
DNL-1036 • 40 PPS., 4 TABS., 21 FIGS., 0 REFS. NOV. 1975

A TWO-DIMENSIONAL, FINITE-DIFFERENCE, DYNAMIC ANALYSIS OF CRACK PROPAGATION AND ARREST IS DEVELOPED. TWO "CRITICAL" TESTS OF THE DYNAMIC/ENERGY CONSERVATION ANALYSIS OF CRACK ARREST HAVE BEEN PERFORMED. MEASUREMENTS OF CRACK PROPAGATION AND ARREST IN NORMAL STE-100 PERFORMED AT THE UNIVERSITY OF WASHINGTON HAS BEEN COMPARED WITH ONE-DIMENSIONAL CALCULATIONS EMPLOYING THE K_{IC} VELOCITY DEPENDENCE OF THIS MATERIAL MEASURED INDEPENDENTLY AT THE UNIVERSITY OF MARYLAND. THE CALCULATIONS ARE IN SURPRISINGLY GOOD ACCORD WITH THE MEASUREMENTS OF CRACK SPEED, ARREST LENGTH AND THE LOCAL STRESS INTENSITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

STEEL • TESTING • STRESS ANALYSIS • ANALYTICAL TECHNIQUE • R AND D PROGRAM • METALLURGY • CRACK • PRESSURE VESSELS • JACOBS

113992

MAHO GT • WELLEN PL • MORGAN RD • KARNERUP W • JOPELON C • ROSENFIELD AR
CRITICAL EXPERIMENTS, MEASUREMENTS AND ANALYSES TO ESTABLISH CRACK ARREST METHODOLOGY FOR NUCLEAR PRESSURE VESSEL STEELS
BATTELLE COLUMBUS LABS., OHIO
DNL-1036-1976 • 55 PPS., 21 FIGS. MARCH 1976

A SERIES OF CALCULATIONS ARE REPORTED WHICH EXPLORE THE SIGNIFICANCE OF A K_{IC} THAT DECREASES WITH INCREASING CRACK VELOCITY. THE EFFECT OF K_{IC} ON THE CRACK PROPAGATION BEHAVIOR, AND THE MODE I INSTABILITIES WHICH DEVELOP ARE DESCRIBED IN DETAIL. A SERIES OF EXPERIMENTS ON CONTAINED SPECIMENS ARE DESCRIBED AND COMPARED WITH K_{IC} DATA. SEVERAL DIFFICULTIES WERE ENCOUNTERED IN THESE TESTS, AMONG THEM BEING RELATIVELY SHORT CRACK EXTENSIONS TO THE FIRST HALF-CYCLE WITH DIFFICULTIES IN MAKING ACCURATE CRACK VELOCITY MEASUREMENTS NEAR THE ONSET OF PROPAGATION. ADDITIONAL K_{IC} DATA FOR A533B HAVE BEEN COLLECTED AND THE COMPLETE SET OF DATA AVAILABLE TO DATE IS REPORTED. AT LOW TEMPERATURE (NOT +30C) K_{IC} IS RELATIVELY INDEPENDENT OF CRACK VELOCITY WITH A POSSIBLE INCREASE STARTING AT ABOUT 9000 KSI (1-1). AT HIGHER K_{IC} DECREASES MODESTLY WITH INCREASING CRACK VELOCITY. AT A SLIGHTLY HIGHER TEMPERATURE (NOT +30C) K_{IC} AGAIN APPEARS TO DECREASE WITH VELOCITY. THE RELEVANCE OF K_{IC} TO K_{IC}, THE DYNAMICALLY-LOADED, CRACK-INITIATION TOUGHNESS, IS DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

STEEL • TESTING • ANALYTICAL MODEL • STRESS ANALYSIS • MATHEMATICAL TREATMENT • COMPARISON • GROWTH/DEVELOPMENT • NUCR • CRACK • PRESSURE VESSELS • JACOBS

115077

INTERGRANULAR STRESS CORROSION CRACKING OF SENSITIZED STAINLESS STEEL QUARTERLY PROGRESS REPORT, OCTOBER 1-DECEMBER 31, 1975
BROOKHAVEN NATIONAL LAB., UPTON, N.Y.
DNL-50497 • 20 PPS., 12 FIGS., 15 REFS. JAN. 1976

THIS IS A NEW PROGRAM JUST GETTING STARTED. EQUIPMENT HAS BEEN PURCHASED AND SET UP. THE KEY APPARATUS (THE SCANNING ELECTROCHEMICAL PROBE) WAS ALREADY AVAILABLE. PROCUREMENT AND HEAT TREATMENT OF SSI SPECIMENS WAS STARTED. AT THE SAME TIME, WORK WAS STARTED ON COMPUTER CALCULATIONS OF THE POTENTIAL DISTRIBUTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

R AND D PROGRAM • STRESS CORROSION • CRACK • STEEL, STAINLESS • COMPUTER PROGRAM • NUCR

113010

PRIME DV • CLARK AN
INSPECTION OF NUCLEAR REACTOR WELDING BY ACOUSTIC EMISSION
U.S. NUCLEAR REGULATORY COMMISSION • GENERAL AMERICAN RESEARCH DIV., INC., NILES, ILL.
NUREG-0035-1 • 05 PPS., 3 TABS., 05 FIGS. FEB. 1976

THE GOAL OF THIS PHASE THE FIRST YEAR OF A THREE YEAR RESEARCH PROGRAM IS TO SHOW FEASIBILITY AND DEVELOP EQUIPMENT DESIGN PARAMETERS FOR REAL TIME, IN PROCESS, MON OF NUCLEAR POWER PIPING WELDS BY MEANS OF ACOUSTIC EMISSION. INCLUDED IN THIS REPORT IS SOME INTRODUCTORY MATERIAL THAT WAS PREVIOUSLY PUBLISHED IN THE FIRST INTERIM REPORT, MAY 1975. IN ADDITION, EXTENSIVE DOCUMENTATION OF ONE CALIBRATION AND TWO PRODUCTION TESTS IS INCLUDED. THE TEST RESULTS DEFINITELY SHOW THAT IN-PROCESS MON OF NUCLEAR POWER PIPING WELDS BY MEANS OF ACOUSTIC EMISSION IS FEASIBLE AND PRACTICAL. RESULTS SHOW THAT ACOUSTIC EMISSION IS VERY EFFECTIVE AT DETECTING CRACKING TYPE FLAWS DURING THE WELDING PROCESS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

FAILURE, PIPE • WELDING • TEST, NONDESTRUCTIVE • EXAMINATION • ACOUSTICS • NUCR • CRACK • JACOBS

113415

PAINTER, J. A. • SATTEL, J. A. • PATRICK, H. L.
IMPROVED ULTRASONIC NONDESTRUCTIVE TESTING OF PRESSURE VESSELS
JACOBI NUCLEAR REGULATORY COMMISSION • JACOBI, W. WICHIGAN, AND ANDERSON
NUREG-0087-1 • 46 PAGES, 16 FIGS. JAN. 1976

A NEW APPROACH TO ULTRASONIC IMAGING FOR IMPROVED NONDESTRUCTIVE TESTING IS DESCRIBED. DIGITAL SIGNAL PROCESSING IS EMPLOYED TO REALIZE LATERAL RESOLUTION ON THE ORDER OF ONE WAVELENGTH. HIGH-RESOLUTION B-SCAN PRESENTATIONS OF ARTIFICIAL DISCONTINUITIES IN ALUMINUM AND STEEL MATERIALS ARE DISPLAYED IN SEVERAL FORMATS. COMPONENT SPECIFICATIONS OF THE REAL TIME DATA ACQUISITION SYSTEM ARE INCLUDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

TEST, NONDESTRUCTIVE • ULTRASONICS • EQUIPMENT DEVELOPMENT • NUCLEAR PRESSURE VESSELS • JACOBI

110320

RENNAL, J. C. • WITMAN, G. D. • BRYAN, R. M.
AN EVALUATION OF THE MOST PROGRAM INTERMEDIATE PRESSURE VESSEL TESTS IN TERMS OF LIGHT-WATER-REACTOR PRESSURE VESSEL SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TR-5096 • 50 PAGES, 4 TABS, 21 FIGS. 11 REFS. NOV. 1975

TESTING OF INTERMEDIATE PRESSURE VESSELS IS A MAJOR ACTIVITY OF THE PROGRAM. A PRIMARY OBJECTIVE OF THESE TESTS IS TO DEVELOP ON VERIFY METHODS OF FRACTURE PREDICTION BY TESTING SELECTED STRUCTURES AND MATERIALS SO THAT A VALID BASIS CAN BE ESTABLISHED FOR EVALUATING SERVICEABILITY AND SAFETY OF LIGHT-WATER REACTOR (LWR) PRESSURE VESSELS. THIS IS A PRELIMINARY REPORT OF THE RESULTS OF TESTS ALREADY CONDUCTED AND IMPLICATIONS OF THE RESULTS WITH RESPECT TO THE SAFETY AGAINST FRACTURE OF REACTOR PRESSURE VESSELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

NUST • PRESSURE VESSELS • TESTING • R AND D PROGRAM • REACTOR, LWR • FRACTURE TOUGHNESS • STRESS ANALYSIS • NUCLEAR

100900

WATSON, J. D. • SWINSON, G.
STRESS ANALYSIS OF PLATE PLATES WITH ATTACHED NOZZLES. VOL. 3 - EXPERIMENTAL STRESS ANALYSIS OF A PLATE PLATE WITH FOUR CLOSELY SPACED NOZZLES OF EQUAL DIAMETER ATTACHED
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5000 • 103 PAGES, 051 TABS, 277 FIGS. 6 REFS. DEC. 1975

CONTAINS COMPLETE TEST RESULTS FOR A PLATE PLATE WITH FOUR CLOSELY SPACED NOZZLES ATTACHED. TEST RESULTS WERE FOR: 1) AND 2) ISOTROPIC PLATE TENSION LOADINGS ON THE PLATE, AXIAL TENSILE LOADINGS APPLIED SEPARATELY TO NOZZLES, AND BENDING MOMENT LOADINGS APPLIED TO NOZZLES BOTH WITHIN AND OUTSIDE OF THE PLANE OF SYMMETRY CONTAINING THE NOZZLE AXIS. TEST PLATE WAS 36 IN. BY 36 IN. AND ATTACHED NOZZLES HAD OUTER DIAMETERS OF 2.625 IN. AND WALL THICKNESSES OF 0.250 IN. NOZZLES WERE LOCATED IN THE CENTER OF THE PLATE WITH THEIR CENTERS 3.0 IN. APART.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

CODES AND STANDARDS • TESTING • STRESS ANALYSIS • NOZZLE • PLATE • LABORATORY EXPERIMENT • PRESSURE VESSELS

115355

FEB 76
JANUARY 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TR-5217 • 27 PAGES, DEC. 1975

THIS MONTHLY REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING ONSITE PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MAINTAINED BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, FUEL OIL ON OIL HEAT TRANSFER, SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER CORROSION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • NUST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NUCLEAR CORROSION • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, LWR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPING AND PIPE FITTINGS • R AND D PROGRAM • SAFETY PROGRAM • NUCLEAR

115356

FEB 76
JANUARY 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

215358 UNTERNEHMT
JAN RUDGE NATIONAL LABORATORY, TENNESSEE
JANUARY-SEPTEMBER 1975, 25 PAGES, DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING LINE PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT DATA AND GAMMA RAY RELEASE, LOCAL RELEASE FROM LOW FUEL, MATERIALS TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BULK OXIDE HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LOW FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LOW FUEL, ENERGY LEVEL, FISSION PRODUCT RELEASE, GROSS BETA, GROSS GAMMA, FAILURE, FUEL ELEMENT, FUEL, OXIDATION, HEAT TRANSFER, ZIRCALOY, FAILURE, CLADDING, METAL WATER REACTION, ZIRCONIUM, OXIDATION, REACTION, LOW FUEL, AEROSOL, FISSION PRODUCT TRANSPORT, REACTOR, HIGH, ACCIDENT ANALYSIS, DESIGN CRITERIA, PIPES AND PIPE FITTINGS, OR AND O PROGRAM, SAFETY PROGRAM, PWR

110074
QUANITATIVE, EL, GYMANA PH, JR., MOORE SE
PLANNED: A COMPUTER PROGRAM FOR THE ANALYSIS OF FLANGE JOINTS WITH RING-TYPE GASKETS
JAN RUDGE NATIONAL LAB., JAN RUDGE, TN
JANUARY-SEPTEMBER 1975, 13 PAGES, TABS, FIGS, JAN. 1976

PLANGE CALCULATES THE STRESSES DUE TO BOLT LOADS ON THE FLANGE RING. THE STRESSES DUE TO INTERNAL PRESSURE, STRESSES DUE TO A TEMPERATURE DIFFERENCE BETWEEN THE HUB AND RING AND STRESS DUE TO THE VARIATIONS IN BOLT LOAD THAT RESULT FROM PRESSURE, HUB-RING DIFFERENCE. THE ANALYSIS METHOD IS BASED ON THE DIFFERENTIAL EQUATIONS FOR THIN PLATES AND SHELLS RATHER THAN ON THE STRAIN-RATE METHOD USED BY BARTON ET AL (TRANS. ASME 80, 101-09 (1977)).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

COMPUTER PROGRAM, STRESS ANALYSIS, STRESS, PLANGE, PLATE, SHELL, PRESSURE, INTERNAL, THERMAL MECHANICAL EFFECT, PIPES AND PIPE FITTINGS, JACOBS, HUB

110075
CHILDRESS, EL
FABRICATION AND MECHANICAL TEST DATA FOR THE FOUR 6-INCH-THICK INTERMEDIATE TEST VESSELS MADE FROM STEEL PLATE FOR THE HEAVY SECTION STEEL TECHNOLOGY PROGRAM
JAN RUDGE NATIONAL LAB., JAN RUDGE, TN
JANUARY-SEPTEMBER 1975, 21 PAGES, 3 TABS, 12 FIGS, JAN. 1976

REPORT COVERS FABRICATION DETAILS OF FOUR ADDITIONAL 6-INCH-THICK INTERMEDIATE TEST VESSELS HAVING SMALL CHANGES FABRICATED FROM ASTM A-515 IN A CL 1 PLATE. THE REMAINING COMPONENTS WERE MADE FROM PUMPHOUSE. THIS REPORT IS A CONTINUATION OF CHILDRESS ET AL (1975) IT DESCRIBES THE MANUFACTURING DETAIL OF THE INDIVIDUAL PARTS AND THEIR ULTIMATE ASSEMBLY INTO FINISHED VESSELS. DETAILS CONCERNING CHEMICAL COMPOSITION AND MECHANICAL AND NONDESTRUCTIVE TEST DATA ARE PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

FABRICATION, DETAILS, TEST, NONDESTRUCTIVE, MECHANICAL, CHEMICAL, PLATE, PROPERTY, MECHANICAL, PHYSIC, NONDESTRUCTIVE TESTS, JACOBS

110076
CHILDRESS, EL
QUANTITATIVE PROGRESS REPORT IN THE HEAVY SECTION STEEL TECHNOLOGY PROGRAM FOR JULY-SEPTEMBER 1975
JAN RUDGE NATIONAL LAB., JAN RUDGE, TN
JANUARY-SEPTEMBER 1975, 25 PAGES, TABS, FIGS, JAN. 1976

CURRENT WORK CONCERNS THE FOLLOWING TASKS: FRACTURE MECHANICS ANALYSES AND INVESTIGATIONS, EFFECT OF HIGH-TEMPERATURE PRIMARY REACTOR WATER ON CRACK GROWTH OF REACTOR VESSEL STEEL, INVESTIGATIONS OF IRRADIATED MATERIALS, PRESSURE VESSEL INVESTIGATIONS, THERMAL SHOCK INVESTIGATIONS, AND OLD HEAT-AFFECTED-ZONE CRACKING. CALCULATIONS WERE PERFORMED TO EVALUATE SAFETY OF A HYPOTHETICAL PWR VESSEL AGAINST FAILURE USING METHODS USED TO ANALYZE INTERMEDIATE TEST VESSEL FAILURE ANALYSIS. THESE ANALYTICAL PROCEDURES INDICATE THAT A SIMILAR MARGIN OF SAFETY IS IMPLICATED IN FULL-SCALE VESSELS. CRACK GROWTH TESTS IS CONTINUING ON TWO SPECIMENS IN A PWR ENVIRONMENT AT 150 DEG F.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, CRACK, FRACTURE, IRRADIATION TESTING, FRACTURE TOUGHNESS, PHYSIC, PRESSURE VESSELS, JACOBS

110077
P25
JANUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT JAN RUDGE NATIONAL LABORATORY
JAN RUDGE NATIONAL LABORATORY, TENNESSEE
JANUARY-SEPTEMBER 1976, 10 PAGES, FEB. 1976

115357 PLUMFORD 30

THIS PROGRAM IS REPORT CONTAINS SHORT 11 TO 6 PAGE SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING MAIN PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPLE BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, FOR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NOIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTION, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, HIGH • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND D PROGRAM • MSST • SAFETY PROGRAM

115358

PER 66

FEBRUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG-710-1 P. 25 PPS., FEB. 1976

THIS PROGRAMS REPORT CONTAINS SHORT 11 TO 6 PAGE SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING MAIN PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPLE BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, FOR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NOIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTION, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, HIGH • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND D PROGRAM • SAFETY PROGRAM • MSST

115359

PER 66

MARCH 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG-710-15 P. 21 PPS., MARCH 1976

THIS PROGRAMS REPORT CONTAINS SHORT 11 TO 6 PAGE SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING MAIN PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPLE BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, FOR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NOIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTION, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, HIGH • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND D PROGRAM • SAFETY PROGRAM • MSST

115360

WHITMAN 66

QUARTERLY PROGRAMS REPORT IN THE HEAVY-SECTION STEEL TECHNOLOGY PROGRAM FOR OCTOBER-DECEMBER 1975

OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG-710-3 P. 130 PPS., TABS. 1-165, 166PS., APRIL 1976

MSST IS AN ENGINEERING RESEARCH ACTIVITY DEVOTED TO EXTENDING AND DEVELOPING THE TECHNOLOGY FOR ASSURING THE MARGIN OF SAFETY AGAINST FRACTURE IN THE THICK-WALLED STEEL PRESSURE VESSELS USED IN LWR'S. THE PRINCIPAL AREA OF RESEARCH IS THE BEHAVIOR AND STRUCTURAL INTEGRITY OF VESSELS CONTAINING CORROSION FLAWS. CURRENT WORK CUMULATES FRACTURE MECHANICS ANALYSES, EFFECT OF HIGH-TEMPERATURE PRESSURE RESIDUAL WATER ON CRACK GROWTH, INVESTIGATIONS OF IRRADIATED MATERIALS, PRESSURE VESSEL INVESTIGATIONS, THERMAL SHOCK STUDIES, AND WELD HEAT-AFFECTED-ZONE CRACKING. PROGRAMS IN MATHEMATICAL CALCULATIONS, SPECIMEN PREPARATION, AND TESTING IS DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

STEEL • REACTOR COMPONENT • WELDING • HIGH TEMPERATURE • IRRADIATION TESTING • STRUCTURAL INTEGRITY • OR AND D PROGRAM • FRACTURE TOUGHNESS • GROWTH/DEVELOPMENT • CRACK • MSST • PRESSURE VESSELS • JACOBS

115361

PER 66

APRIL 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL

114923 *CONTINUED*
 LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/NUREG/TN-21 *. 25 PPS, MAY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR * MSST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE, FUEL ELEMENT * NSIC * BLOWDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE, CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR, LWR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR, HTGR * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * OR AND D PROGRAM * SAFETY PROGRAM * NJCK

114947
 MOORE SE * BRYSON JB
 PROGRESS REPORT FOR THE DESIGN CRITERIA FOR PIPING AND NOZZLES PROGRAM FOR THE TWO QUARTERLY PERIODS JULY 1 TO SEPT. 30 AND OCT. 1 TO DEC. 31, 1975
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/NUREG/TN-18 *. 43 PPS, 12 TABS, 11 FIGS, 33 REFS, JUNE 1976

PRECIS ARE GIVEN OF THE REPORTS PUBLISHED BY PROGRAM PERSONNEL ABOUT STRESSES AT NOZZLES IN SPHERICAL SHELLS, ABOUT STRESSES AT OPENINGS IN CYLINDRICAL PRESSURE VESSELS, ABOUT STRESSES AT AND STRESS INDICES FOR NOZZLE ATTACHMENTS, RECOMMENDING STRESS INDICES FOR SOCKET-WELDING FITTINGS, MEASURING AND ANALYZING STRESSES IN CYLINDER-TO-CYLINDER JUNCTIONS, ABOUT STRESSES IN PLAT PLATES WITH ATTACHED NOZZLES, AND ABOUT STRESSES IN AND FATIGUE FAILURE OF FORGED TEES. SUMMARIES ARE ALSO PRESENTED OF WORK IN PROGRESS DEALING WITH THE DEVELOPMENT OF STRESS INDICES AND FLEXIBILITY FACTORS FOR ELBOGS, AND THE DEVELOPMENT OF CODE RULES REGARDING ISOLATED AND CLOSELY SPACED NOZZLES IN CYLINDRICAL PRESSURE VESSELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

R AND D PROGRAM * STRESS ANALYSIS * PLATE * NOZZLE * PIPES AND PIPE FITTINGS * DESIGN CRITERIA * FAILURE, FATIGUE * CODES AND STANDARDS * NJCK

115360
 FEE GG
 MAY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/NUREG/TN-34 *. 25 PPS, JULY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR * MSST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE, FUEL ELEMENT * NSIC * BLOWDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE, CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR, LWR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR, HTGR * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * OR AND D PROGRAM * SAFETY PROGRAM * NJCK

115361
 FEE GG
 JUNE 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/NUREG/TN-40 *. 27 PPS, JULY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR * MSST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE, FUEL ELEMENT * NSIC * BLOWDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE, CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR, LWR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR, HTGR * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * OR AND D PROGRAM * SAFETY PROGRAM * NJCK

6. NRC-6 WATER REACTOR SAFETY RESEARCH, ENVIRONMENTAL AND SITING

115181
BULMANAN JR
SITING OF NUCLEAR FACILITIES. SECTIONS FROM "NUCLEAR SAFETY"
OAK RIDGE NATIONAL LABORATORY, TENNESSEE. NUCLEAR SAFETY INFORMATION CENTER
ORNL/NUREG/NSIC-110 P. 247 PPS, TABS, FIGS, REFS. JULY 1976

THIS REPORT EXPLORES SITING POLICY AND PRACTICE FOR NUCLEAR POWER PLANTS AS DEVELOPED IN THE U.S. AND ABROAD. TWENTY-TWO ARTICLES FROM NUCLEAR SAFETY ON THIS GENERAL TOPIC ARE REPRINTED SINCE THEY PROVIDE A VALUABLE REFERENCE SOURCE. THE APPENDICES ALSO INCLUDE REPRINTS OF SOME RELEVANT REGULATORY RULES AND GUIDES ON SITING. ADVANTAGES AND DISADVANTAGES OF NOVEL SITING CONCEPTS SUCH AS UNDERGROUND CONTAINMENT, OFFSHORE SITING, AND NUCLEAR ENERGY PARKS ARE ADDRESSED. OTHER TOPICS INCLUDE SITE CRITERIA, RISK CRITERIA, AND NUCLEAR SHIP CRITERIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA. 22101
(89-75/FULL-SIZE COPY, \$2.25/NF)

REACTOR, POWER + SITING, SITING, MULTIPLE + SITING, OFF SHORE + SITING, REACTOR + SITING, URBAN + SITE
CRITERIA + POPULATION DISTRIBUTION + CONTAINMENT, UNDERGROUND + JACK

7. NRC-7 ADVANCED REACTOR SAFETY RESEARCH: FAST REACTORS

112052
PHYSICS OF REACTOR SAFETY: QUARTERLY REPORT, JULY - SEPTEMBER 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-76-6 +. 25 PPS, 4 FIGS, 4 TABS, SEPT. 1975

THIS QUARTERLY PROGRESS REPORT SUMMARIZES WORK DONE IN ARGONNE NATIONAL LABORATORY'S APPLIED PHYSICS DIVISION FOR THE DIVISION OF REACTOR SAFETY RESEARCH OF THE U.S. NUCLEAR REGULATORY COMMISSION DURING THE MONTHS OF JULY-SEPTEMBER 1975. IT INCLUDES REPORTS ON REACTOR SAFETY RESEARCH AND TECHNICAL COORDINATION OF THE RSH SAFETY ANALYSIS PROGRAM BY MEMBERS OF THE REACTOR SAFETY APPRAISALS GROUP, MONTE CARLO ANALYSIS OF SAFETY-RELATED CRITICAL ASSEMBLY EXPERIMENTS BY MEMBERS OF THE THEORETICAL FAST REACTOR PHYSICS GROUP, AND PLANNING OF DEMO SAFETY-RELATED CRITICAL EXPERIMENTS BY MEMBERS OF THE ZERO POWER REACTOR (ZPR) PLANNING AND EXPERIMENTS GROUP.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + REACTOR, FAST + CORE COMPONENTS + REACTOR PHYSICS + SAFETY ANALYSIS + ZPR 3 (CAF) + WJCK + PUMPS

113394
PHYSICS OF REACTOR SAFETY: QUARTERLY REPORT OCT.-DEC. 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-76-13 +. 21 PPS, 4 TABS, 10 FIGS, DEC. 1975

THIS QUARTERLY PROGRESS REPORT SUMMARIZES WORK DONE IN ARGONNE NATIONAL LABORATORY'S APPLIED PHYSICS DIVISION FOR THE DIVISION OF REACTOR SAFETY RESEARCH OF THE U.S. NRC. IT INCLUDES REPORTS ON REACTOR SAFETY RESEARCH AND TECHNICAL COORDINATION OF THE RSH SAFETY ANALYSIS PROGRAM BY MEMBERS OF THE REACTOR SAFETY APPRAISALS GROUP, MONTE CARLO ANALYSIS OF SAFETY-RELATED CRITICAL ASSEMBLY EXPERIMENTS BY MEMBERS OF THE THEORETICAL FAST REACTOR PHYSICS GROUP, AND PLANNING OF DEMO SAFETY-RELATED CRITICAL EXPERIMENTS BY MEMBERS OF THE ZERO POWER REACTOR PLANNING AND EXPERIMENTS GROUP.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CRITICAL ASSEMBLY + REACTOR, FAST + REACTOR CONTROL + ZPR 9 (CAF) + ZPR 6 (CAF) + CRITICALITY EXPERIMENT + MONTE CARLO + SAFETY EVALUATION + REACTOR PHYSICS + H AND D PROGRAM + ZPR 3 (CAF) + JACOBS

112994
PIZZICA PA + BENELEY DA
SYMBURN-A FAST-REACTOR FUEL-CYCLE PROGRAM
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-76-14 +. 66 PPS, 9 TABS, 4 FIGS, 6 REFS, JAN. 1976

THE SYMBURN COMPUTER PROGRAM FOR FAST REACTORS WILL CALCULATE ALL THE NEUTRONICS NECESSARY TO COMPLETELY CHARACTERIZE THE EQUILIBRIUM CYCLE AS WELL AS THE STARTUP TO EQUILIBRIUM CYCLES. THE PROGRAM'S RUN TIME IS VERY SHORT AND THIS MAKES THE PROGRAM PARTICULARLY SUITABLE FOR SURVEY OF PARAMETRIC STUDIES. IT CAN SEARCH ON THE CYCLE TIME FOR A SPECIFIED BURNUP, FOR THE SHUT CONTROL NECESSARY FOR CRITICALITY AS WELL AS FUEL ENRICHMENTS AND THE ENRICHMENT RATIO AMONG CORE ZONES. SYMBURN SYNTHESIZES IN A VERY SIMPLE FASHION THE ONE-DIMENSIONAL FLUXES IN RADIAL AND AXIAL GEOMETRY TO ACHIEVE AN APPROXIMATE TWO-DIMENSIONAL SOLUTION WHICH AGREES VERY WELL WITH THE EXACT TWO-DIMENSIONAL SOLUTION WHEN MEASURING REGIONAL INTEGRATED QUANTITIES.

COMPUTER PROGRAM + REACTOR, FAST + FUEL BURNUP + FUEL CYCLE

113403
ARMSTRONG DR + GOLDFUSS GT + GEBNER RH
EXPLOSIVE INTERACTION OF MOLTEN UO₂ AND LIQUID SODIUM
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-76-24 +. 15 PPS, 3 TABS, 2 FIGS, 5 REFS, MARCH 1976

DESCRIBES A CONTINUATION OF THE WORK REPORTED IN ANL-7890. INTERACTION OF SODIUM WITH MOLTEN UO₂ AND STAINLESS STEEL USING A DROPPING MODE OF CONTACT. IN THE CURRENT STUDY, SODIUM WAS INJECTED INTO A POOL OF MOLTEN UO₂. THE EXPERIMENT CONSISTENTLY PRODUCED VAPOR EXPLOSIONS, BOTH WITH THE INJECTION NOZZLE ABOVE AND BENEATH THE SURFACE OF THE UO₂. ALTHOUGH THE EFFICIENCY OF THE CONVERSION OF THERMAL TO MECHANICAL ENERGY WAS SMALL (DUE IN PART TO VERY CONSERVATIVE DATA ANALYSIS AND AN INEFFICIENT GEOMETRY), THE RESULTS DID DEMONSTRATE THAT THERE IS NO INTRINSIC REASON WHY REACTOR MATERIALS CANNOT PRODUCE A VAPOR EXPLOSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + FUEL MELTDOWN + SODIUM + MOLTEN FUEL + HIGH TEMPERATURE + VAPOR PRESSURE + URANIUM DIOXIDE + FUEL COOLANT INTERACTION + JACOBS

112253
MUMFEL NH + PIZZICA PA + KAMRULLAH
STUDIES OF UNPROTECTED LOSS-OF-FLOW ACCIDENTS FOR THE CLINCH RIVER BREEDER REACTOR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-76-51 +. 34 PPS, 9 TABS, 10 FIGS, 21 REFS, APRIL 1976

114253 *CONTINUE*

THE STUDIES OF CRACK LMF ACCIDENTS WITH SAS 3A CODE INDICATED THAT THESE ACCIDENTS DO NOT LEAD TO CONDITIONS FOR VIOLENT DISASSEMBLY. STUDY OF SEVERE PIPE RUPTURE ACCIDENTS WITH SCRAM INDICATED THAT PIN POWER DENSITY AND FUEL-CLAD CONDUCTANCE WERE IMPORTANT PARAMETERS IN DETERMINING WHAT COOLANT FLOW RATE WAS NEEDED TO PREVENT BOILING AFTER THE RUPTURE. IT APPEARS THAT FOR THE CRACK WHEN ENGINEERING NOT CHANNEL FACTORS ARE CONSIDERED, THIS FRACTION WOULD HAVE TO EXCEED 25%.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLINCH RIVER (LMFR) * ACCIDENT, LOSS OF FLOW * REACTOR, LMFR * COMPUTER PROGRAM, DIGITAL * ANALYTICAL MODEL * FAILURE, PIPE * MODEL, PHYSICAL * SODIUM * FUEL MELTDOWN * BOILING

115352

PHYSICS OF REACTOR SAFETY, QUARTERLY REPORT, JANUARY-MARCH 1976
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-76-72 *, 43 PPS, 13 TABS, 9 FIGS, 23 REFS, 1976

STUDIES OF DOUBLE-ENDED PIPE RUPTURE ACCIDENTS WITH SCRAM HAVE BEEN MADE FOR THE CRBR USING THE KERN CODE. IT WAS FOUND THAT COOLANT BOILING WILL OCCUR IN THE DENDRO MODEL "HOT" CHANNEL, WHICH INCLUDES ENGINEERING NOT-CHANNEL FACTORS, ABOUT 1.8 SECONDS AFTER A DOUBLE-ENDED RUPTURE OF THE INLET NOZZLE. THE EPIC FUEL-COOLANT INTERACTION CODE IS OPERATIONAL AND YIELDS STABLE RESULTS FOR AN UNVOIDED CHANNEL AND A CLAD RIP ONLY ONE NODE LONG. A MEETING WAS HELD AT ARGONNE ON APRIL 5TH AND 6TH TO ATTEMPT TO ACHIEVE A CONSENSUS THAT RECRITICALITY IS NO LONGER A LIVE ISSUE FOR LMFR'S, BUT THIS GOAL WAS NOT ATTAINED. A KEY UNCERTAINTY IS WHETHER OR NOT A STABLE CRUST OF FROZEN FUEL WILL FORM AT THE BOTTOM AND SIDES OF A BOILING FUEL/STEEL POOL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM * SAFETY PROGRAM * REACTOR, LMFR * CLINCH RIVER (LMFR) * REACTOR PHYSICS * COMPUTER PROGRAM * ZPR 9 (CAP) * CRITICALITY EXPERIMENT * FUEL COOLANT INTERACTION * MCK * ACCIDENT ANALYSIS

112347

REED LD * GIESKE JA * JORDAN M
EFFECTS OF RADIATION ON AEROSOL BEHAVIOR
BATTELLE COLUMBUS LABS., OHIO
BRL-MURR-1943 *, 20 PPS, 4 TABS, 14 REFS, DEC. 10, 1975

EACH OF THE PHYSICAL SCHEMES PRESENTED IN THIS REPORT AS EXERTING POSSIBLE INFLUENCES ON THE BEHAVIOR OF AEROSOL PARTICLES IN POSTULATED ACCIDENT SITUATIONS HAVE BEEN FOUND TO BE NEGLIGIBLE. IT IS FELT THAT LOCALIZED "HOT SPOTS" WITHIN NONCONDUCTIVE DUST LAYERS OR AGGLOMERATES MAY, IN FACT, LEAD TO PARTICLE EJECTIONS. THE SCHEME REQUIRES VERIFICATION THAT, INDEED, LOCALIZED "HOT SPOTS" DO EXIST IN THE DUST LAYER AND THAT THE PARTICLES IN THE "HOT SPOTS" RETAIN THEIR CHARGE FOR A SUFFICIENT LENGTH OF TIME FOR THE COULOMBIC FORCES TO OVERCOME THE LONDON-VAN DER WAALS ADHESION FORCES. IN SHORT, THERE MUST BE A FEW HIGHLY ACTIVE PARTICLES SURROUNDED BY LESS ACTIVE ONES AND THE LAYER MUST BE ELECTRICALLY NONCONDUCTIVE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT * AEROSOL * AIRBORNE RELEASE * CONTAINMENT * DEPOSITION * PARTICLE * FISSION PRODUCT TRANSPORT * AEROSOL PROPERTIES * AEROSOL, RADIOACTIVE * RESUSPENSION * THEORETICAL INVESTIGATION * REACTOR, LMFR * CONCENTRATION * RADIATION EFFECT * MCK

113443

REED LD * JORDAN M * GIESKE JA
AEROSOL BEHAVIOR MODELING FOR FAST REACTOR SAFETY
BATTELLE COLUMBUS LABS., OHIO
BRL-R-668 *, 16 PPS, 2 FIGS, 9 REFS, DEC. 1975

PROGRESS DURING THE PREVIOUS QUARTER AT BATTELLE HAS BEEN MADE IN SEVERAL GENERAL AREAS. A DETAILED COMPARISON OF THE THEORETICAL APPROACHES OF THE MAHR-2 AND PARISEN-III CODES WAS REPORTED AND CONSIDERABLE EFFORT WAS EXPENDED TO COMPLETE THE ANALYTICAL STUDY OF THE EFFECTS OF RADIOACTIVITY ON THE GENERAL BEHAVIOR OF AEROSOL PARTICLES. FURTHER PROGRESS WAS ALSO MADE ON THE PREPARATION OF THE SODIUM OXIDE AEROSOL GENERATOR TO BE USED WITH THE MILLIKAN CELL APPARATUS. EACH OF THESE TOPICS ARE DISCUSSED IN SOMEWHAT MORE DETAIL IN LATER SECTIONS OF THIS REPORT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL * COMPUTER PROGRAM * OXIDE * PLUTONIUM * SODIUM * PLUTONIUM DIOXIDE * SIMULATION * THERMOPHORESIS * REACTOR, LMFR * BEHAVIOR * MCK * JACOBS

11403P

REED LD * GIESKE JA * JORDAN M
AEROSOL BEHAVIOR MODELING FOR FAST REACTOR SAFETY, TASK 56, QUARTERLY PROGRESS REPORT JANUARY THROUGH MARCH 1976
BATTELLE COLUMBUS LABS., OHIO
BRL-MURR-1946 *, 14 PPS, 2 TABS, 1 FIG, 9 REFS, APRIL 20, 1976

DURING THE PREVIOUS THREE MONTH PERIOD RESEARCH EFFORTS AT BATTELLE HAVE BEEN FOCUSED PRIMARILY ON

114738 *CONTINUED*

THE EXPERIMENTAL DETERMINATION OF THE AERODYNAMIC PROPERTIES OF SODIUM OXIDE AGGLOMERATES. SEVERAL MINOR MODIFICATIONS WERE REQUIRED ON THE MILLIKAN CELL APPARATUS TO PERMIT MOBILITY MEASUREMENTS TO BE PERFORMED ON INDIVIDUAL PARTICLES AT VARIOUS PRESSURE LEVELS. IN ORDER TO DEMONSTRATE THE ACCURACY OF THE RESULTS AND TO TEST THE EXPERIMENTAL AND DATA REDUCTION PROCEDURES, SEVERAL MILLIKAN CELL TESTS WERE PERFORMED WITH UNIFORM POLYSTYRENE LATEX SPHERES OF STATED SIZE. FOLLOWING THESE CALIBRATION EXPERIMENTS, STUDIES OF AGGLOMERATES OF SODIUM OXIDE PARTICLES WERE BEGUN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL * ANALYTICAL MODEL * BEHAVIOR * R AND D PROGRAM * NJCH * REACTOR, LMFBR * SODIUM * OXIDE

111928

AGRAWAL AK * RAISE G * MAROWITZ M

SSC: AN ADVANCED THERMODYNAMIC TRANSIENT CODE FOR LMFBRs QUARTERLY PROGRESS REPORT JULY 1 - SEPTEMBER 30, 1975

BROOKHAVEN NATIONAL LAB., UPTON, N.Y.

BNL-50467 * 100 PPS, 12 FIGS, 39 REFS, OCT. 1975

THIS IS THE FIRST OF A SERIES OF QUARTERLY PROGRESS REPORTS FOR THE CODE DEVELOPMENT FOR FAST REACTOR SAFETY EVALUATION PROGRAM. THE CODE IS BEING DEVELOPED TO ANALYZE: (1) THE CONSEQUENCES OF A MASSIVE PIPE RUPTURE IN THE PRIMARY HEAT TRANSPORT SYSTEM, AND (2) THE LONG-TERM AFTER-HEAT REMOVAL CAPABILITY FROM THE LOOP TYPE LIQUID METAL COOLED FAST BREEDER. CORE DISRUPTIVE ACCIDENTS ARE NOT CONSIDERED AT THE PRESENT TIME. A VERSION OF THE CODE FOR THE "POT" OR "POOL" TYPE PLANT WILL BE DEVELOPED LATER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM * DECAY HEAT * FAILURE * PIPE * REACTOR, LMFBR * TRANSIENT * NJCH * THERMAL HYDRAULIC ANALYSIS

111521

KAZIMI RS * CHEN JC * GUSTAVSON BR

THERMODYNAMIC LMFBR SAFETY EXPERIMENTS QUARTERLY REPORT JULY-SEPTEMBER 1975

BROOKHAVEN NATIONAL LAB., UPTON, N.Y.

BNL-50477 * 21 PPS, 7 FIGS, 18 REFS, NOV. 1975

INITIAL PHASE OF LMFBR THERMODYNAMIC EXPERIMENTAL AND ANALYTICAL EFFORTS IN THE AREAS OF POST-ACCIDENT HEAT REMOVAL (PAHR) AND TRANSITION PHASE (TP) OF A HYPOTHETICAL CORE DISRUPTIVE ACCIDENT IS DISCUSSED. THREE AREAS ARE BEING INVESTIGATED: (1) HEAT-GENERATING BOILING POOL PHENOMENA, (2) FLOWING FLUID STREAMING/FREEZING PHENOMENA, AND (3) TEMPERATURE-DEPENDENCE OF ELECTRIC RESISTIVITY IN SALT SOLUTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEAT TRANSFER, BOILING * HYDRAULIC EXPERIMENT * ACCIDENT, LOSS OF FLOW * ANALYTICAL MODEL * THERMAL EXPERIMENT * ACCIDENT, HYPOTHETICAL * ACCIDENT MODEL * CORE MELTDOWN * REACTOR, LMFBR * THERMAL HYDRAULIC ANALYSIS * JACOBS

111829

KAZIMI RS * CHEN JC * GUSTAVSON BR

THERMODYNAMIC LMFBR SAFETY EXPERIMENTS, QUARTERLY REPORT, OCTOBER-DECEMBER 1975

BROOKHAVEN NATIONAL LAB., UPTON, N.Y.

BNL-50495 * 20 PPS, 1 TAB, 8 FIGS, 4 REFS, FEB. 1976

PROGRESS IS REPORTED ON EXPERIMENTS AND MODELING OF LMFBR POST-ACCIDENT HEAT REMOVAL AND THE TRANSITION PHASE OF A HYPOTHETICAL CORE DISRUPTIVE ACCIDENT CONDUCTED AT BROOKHAVEN NATIONAL LABS. THE BOILING POOL EXPERIMENT WITH VERTICAL TEST PLATE HAS BEEN ASSEMBLED AND PRELIMINARY RUNS UNDERTAKEN. A SEMI-EMPIRICAL MODEL HAS BEEN DEVELOPED TO CORRELATE PHYSICAL PARAMETERS AFFECTING HORIZONTAL HEAT TRANSFER FROM THE BOILING POOL TO THE WALL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEAT TRANSFER, BOILING * ANALYTICAL MODEL * ACCIDENT, HYPOTHETICAL * HEAT TRANSFER EXPERIMENT * REACTOR, LMFBR * THERMAL HYDRAULIC ANALYSIS * ACCIDENT, CORE DISRUPTIVE

110803

AGRAWAL AK * GUPPY JR * NADEI IR

SSC - AN ADVANCED THERMODYNAMIC TRANSIENT CODE FOR LMFBRs - QUARTERLY PROGRESS REPORT, OCTOBER 1-DECEMBER 31, 1975

BROOKHAVEN NATIONAL LAB., UPTON, N.Y.

BNL-NUREG-50502 * 50 PPS, 10 FIGS, 16 REFS, APRIL 1976

THIS IS THE SECOND QUARTERLY PROGRESS REPORT DESCRIBING THE ACCOMPLISHMENTS OF THE SSC RESEARCH PROGRAM. THE SSC CODE IS BEING DEVELOPED TO ANALYZE THE RESPONSE OF AN LMFBR SYSTEM (1) DUE TO A PASSIVE PIPE RUPTURE IN THE PRIMARY HEAT TRANSPORT SYSTEM, AND (2) THE LONG-TERM SHUTDOWN HEAT REMOVAL CAPABILITY IN THE ABSENCE OF ANY FORCED PUMPING POWER. THE PROGRESS MADE DURING THIS QUARTER IS REPORTED UNDER THE FOLLOWING FIVE CATEGORIES: (1) IN-VESSEL MODELING, (2) PRIMARY LOOP MODELING, (3) INTERMEDIATE LOOP MODELING, (4) TERTIARY LOOP MODELING, AND (5) CODE

114003 PLUTINUMED
DEVELOPMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

COMPUTER PROGRAM • REACTOR, LWR • THERMAL HYDRAULIC ANALYSIS • TRANSIENT • FLOW, TWO PHASE • ACCIDENT, LOSS OF FLUX • DELAY HEAT • MUCK

109474
CATTON I
POST-ACCIDENT HEAT REMOVAL FOR LWR'S
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7543 • 50 PPS, 4 FIGS, 29 REFS, NOV. 1975

PREDICTIONS OF DRYOUT CONDITIONS FOR FF ARE MADE AND FOUND TO DIFFER FROM THOSE PREVIOUSLY REPORTED. AN APPROXIMATE CRITERION FOR JUNE DISPLACEMENT IS PRESENTED WHICH INDICATES THAT MUCH HIGHER DELAY HEAT LEVELS MAY BE REQUIRED FOR CORE DISPERAL THAN PREDICTED. APPLICATION OF RECENT WORK ON PREDICTION OF HEAT TRANSFER FROM DOWNWARD FACING SURFACES INDICATES THAT NON-UNIFORM HEAT FLUX HAS A SIGNIFICANT EFFECT ON THE FFV LOWER DOME THICKNESS.

AVAILABILITY - UNIVERSITY OF CALIFORNIA, SCHOOL OF ENGINEERING & APPLIED SCIENCE, ENERGY AND KINETICS DEPARTMENT, LOS ANGELES, CALIFORNIA

DELAY HEAT • PWR, (TR) • CORE MELTDOWN • HEAT TRANSFER ANALYSIS • HEAT FLUX, DRYOUT • REACTOR, LWR • JACOBS • ACCIDENT, CORE DISRUPTIVE

111530
ANAKENT VM • CATTON I • KASTENBERG DE • PLESNET MS
AN EXPERIMENTAL STUDY OF THE THERMAL INTERACTION FOR MOLTEN TIN DROPPED INTO WATER
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7502 • 75 PPS, 23 FIGS, 32 REFS, DEC. 1975

MULTIFISH PHOTOGRAPHY WITH EXTREMELY SHORT DURATION EXPOSURE TIMES PER FLASH HAVE BEEN USED TO OBSERVE THE INTERACTION OF MOLTEN TIN DROPPED INTO A WATER BATH. DETAILED PHOTOGRAPHIC EVIDENCE IS PRESENTED WHICH DEMONSTRATES THAT TRANSITION, OR NUCLEATE BOILING, IS A POSSIBLE TRIGGERING MECHANISM FOR VAPOR EXPLOSIONS AND FRAGMENTATION. IT WAS ALSO FOUND THAT THE THERMAL CONSTRAINTS REQUIRED TO PRODUCE VAPOR EXPLOSIONS COULD BE RELAXED BY INTRODUCING A STABLE THERMAL STRATIFICATION WITHIN THE COOLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

EXPLOSION • METAL WATER REACTION • STEAM • HIGH TEMPERATURE • NUCLEATE BOILING • WATER VAPOR • TIN • BOILING • JACOBS

113404
UNO R • MORILL AJ • TETELMAN AS
HEALTHY STEELS STUDIES PROGRESS REPORT FOR THE PERIOD OF JULY 1974-JANUARY 1976
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-JAP177-23 • 12 PPS, 1 TAB, 4 FIGS, MARCH 1976

TENSILE SPECIMENS OF TYPE 304 STAINLESS STEEL WERE PRESTRAINED BY VARIOUS AMOUNTS RANGING FROM 0 TO 10% AT ROOM TEMPERATURE. THESE WERE LATER CREEP-TESTED UNDER CONDITIONS OF CONSTANT STRESS AT TEMPERATURES FROM 1200 TO 1400 DEG F AND STRESS LEVELS OF 15,000-37,500 PSI. ESSENTIALLY NO TRANSIENT CREEP WAS OBSERVED IN SPECIMENS PRESTRAINED MORE THAN 8%. ENHANCEMENT OF CREEP STRENGTH OCCURES APPRECIABLE ONLY AT THE LOWEST CREEP RATES WHEN RECOVERY IS SLOW.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

TENSILE PROPERTY • STEEL, STAINLESS • DEFORMATION • HIGH TEMPERATURE • MATERIAL • CREEP • REACTOR, LWR • HARDENING • JACOBS

114280
LATHROP RD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT OCTOBER 1-DECEMBER 31, 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAPR-MNLG-6233 • 93 PPS, 23 TABS, 41 FIGS, 104 REFS, MARCH 1976

ON DECEMBER 1, 1975, THE LOS ALAMOS SCIENTIFIC LABORATORY FORMED A DIVISION TO SERVE AS A FOCUS FOR RESEARCH IN NUCLEAR SAFEGUARDS, REACTOR SAFETY AND TECHNOLOGY. THIS PROGRAM INCLUDES HTGR, LWR, AND LWR SAFETY RESEARCH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

ACCIDENT ANALYSIS • FISSION PRODUCT RELEASE • COOLANT CHEMISTRY • ANALYTICAL MODEL • SEISMIC DESIGN • REACTOR, LWR • REACTOR, HTGR • REACTOR, BWR • REACTOR, PWR • HELIUM • SAFEGUARDS, NUCLEAR MATERIAL • MUCK

114305

114305 CONTINUED

SCOTT JM
POWER DISTRIBUTION REQUIREMENT FOR TRANSIENT POWER TESTING IN 37-PIN BUNDLES
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-NUREG-6286 P. 20 PPS, 43 FIGS, 10 REFS, MARCH 1976

THE EFFECT OF POWER GRADIENTS IN THE TRANSIENT THERMAL RESPONSE OF 37 FUEL PIN TEST BUNDLES HAS BEEN INVESTIGATED. IT IS CONCLUDED THAT IN ORDER TO ACHIEVE ADEQUATE THERMAL SIMULATION IN A TRANSIENT POWER TEST, A RADIAL POWER DISTRIBUTION HAVING AN INTRABUNDLE MAXIMUM-TO-MINIMUM OF 1.15 IS REQUIRED. FURTHER, AN INTRAPIN POWER DEPRESSION OF 1.6 TO 1 SURFACE-TO-CENTERLINE IS ACCEPTABLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

THERMAL TRANSIENT * ACCIDENT MODEL * FUEL ELEMENT CLUSTER * THERMAL HYDRAULIC ANALYSIS * POWER DISTRIBUTION * FTR (FR) * NJCK

114306

SAPIR J * UNNOFF J
USE OF ROVER-LIKE SYSTEMS AS DRIVERS FOR LMFBR FUEL PIN TESTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-NUREG-6286 P. 9 PPS, 3 TABS, 10 FIGS, APRIL 1976

CALCULATIONS AND EXPERIMENTS HAVE BEEN PERFORMED TO INVESTIGATE THE USE OF ROVER-TYPE REACTORS AS DRIVER CORES FOR TRANSIENT TESTING OF LMFBR FUEL PINS. A PARRA ASSEMBLY CAN DEPOSIT SIGNIFICANT ENERGIES IN TEST ARRAYS CONTAINING UP TO 37 PINS, WHILE A PROBUS 2-TYPE REACTOR CAN BE USED AS A DRIVER CORE FOR FULL SUBASSEMBLY TESTS (217 PINS). A PROPOSED TEST FACILITY USING THE INTER (ULTRA HIGH TEMPERATURE REACTOR EXPERIMENT) SHIELDED FACILITY IS DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LMFBR * FUEL ROD * REACTOR TRANSIENT * THERMAL TRANSIENT * THERMAL EXPERIMENT * CRITICAL ASSEMBLY * NJCK

115011

LATHROP RC
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT, JANUARY 1-MARCH 31, 1976
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-NUREG-6317 P. 65 PPS, 10 TABS, 37 FIGS, 71 REFS, MAY 1976

IN PWR SAFETY RESEARCH, IMPROVED BASIC DATA AND METHODS HAVE BEEN INCLUDED IN THE FISSION PRODUCT RELEASE CODE, LARC, AND THE CODE WAS USED TO CALCULATE RELEASES OF THREE REPRESENTATIVE ISOTOPES FOR THREE TEMPERATURE MODELS. FOR THERMAL-HYDRAULIC ANALYSIS OF TWO-PHASE FLOW IN LWR SAFETY RESEARCH, AN IMPROVED METHOD HAS BEEN DEVELOPED TO COUPLE ONE-DIMENSIONAL MESHES TO INCLUDE FLOW LOSSES DUE TO AREA CHANGES. IN LMFBR SAFETY RESEARCH, WORK CONTINUED ON TESTING THE RELEASE VERSION OF THE SINER CODE, SINER-1. THE MULTI-ISOTOPE BONDARENKO CROSS-SECTION TREATMENT DESCRIBED IN A PREVIOUS REPORT WAS TESTED AND FOUND TO BE BOTH ACCURATE AND EFFICIENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND O PROGRAM * SAFETY PROGRAM * REACTOR, PWR * FISSION PRODUCT RELEASE * COMPUTER PROGRAM * ANALYTICAL MODEL * IODINE * KRYPTON * REACTOR, LWR * THERMAL-HYDRAULIC ANALYSIS * BLOWDOWN * CONTAINMENT ANALYSIS * REACTOR, LMFBR * ACCIDENT, CORP DISRUPTIVE * NJCK

115448

BLEWETT PJ * DEVAULT GP
DEVELOPMENT OF THIN SHELL EQUATIONS FOR REACTOR SUBASSEMBLY DYNAMICS
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
LA-NUREG-6320-MS P. 11 PPS, 4 FIGS, 4 REFS, MAY 1976

BY MEANS OF HAMILTON'S PRINCIPLE THE ELASTIC EQUATIONS OF MOTION FOR THIN CYLINDRICAL SHELLS ARE DEVELOPED. EXPLICITLY INCLUDED IN THESE EQUATIONS ARE THE POSSIBILITIES OF LOADING DUE TO INTERNAL PRESSURE PULSES AND TO THERMAL STRESSES. A TEST PROBLEM IS CONSIDERED FOR THE CASE OF A UNIFORM PRESSURE PULSE TRAVELING ALONG THE AXIS; AN EXACT ANALYTIC SOLUTION IS COMPARED WITH THE RESULTS FOUND BY A FINITE-DIFFERENCE METHOD. THE TWO SOLUTIONS AGREE WITHIN 1% WHICH AGREEMENT IS SATISFACTORY FOR PRESENT PURPOSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND O PROGRAM * SAFETY PROGRAM * SHELL * ELASTICITY * RADIATION * STRESS * PRESSURE, INTERNAL * TEMPERATURE * PRESSURE PULSE * CYCLING * REACTOR, LMFBR * NJCK

115353

SORAN PO
NEUTRONIC REBALANCE ALGORITHMS FOR SINER
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-NUREG-6320-MS P. 21 PPS, 5 FIGS, 6 REFS, MAY 1976

FROM ALGORITHMS TO SOLVE THE TWO-DIMENSIONAL NEUTRONIC REBALANCE EQUATIONS IN SINER AND

115351 CONTINUED

INVESTIGATION. RESULTS OF THE STUDY ARE PRESENTED AND INDICATE THAT A MATRIX DECOMPOSITION TECHNIQUE WITH A VARIABLE CONVERGENCY CRITERION IS THE BEST SOLUTION ALGORITHM IN TERMS OF ACCURACY AND CALCULATIONAL SPEED. RESONANCE NUMERICAL STABILITY PROBLEMS ARE EXAMINED. THE RESULTS OF THIS STUDY CAN BE APPLIED TO OTHER NEUTRON TRANSPORT CODES WHICH USE DISCRETE ORDINATES TECHNIQUES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OR AND J PROGRAM • REACTOR PHYSICS • COMPUTER PROGRAM • EQUATION • TRANSPORT PROPERTY • NEUTRON • NUCL

115355

FEE 66

NOVEMBER 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TM-5217 • 27 PPS. DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT DATA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, MTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR • LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE • FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE • CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR • LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR • MTGR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND J PROGRAM • SAFETY PROGRAM • NUCL

115356

FEE 66

DECEMBER 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TM-5263 • 25 PPS. DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH IN THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT DATA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, MTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR • LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE • FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE • CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR • LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR • MTGR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND J PROGRAM • SAFETY PROGRAM • NUCL

109979

PARTIAL LQ

WORK PLAN: TRANSIENT RELEASE FROM LWR FUEL. ADDENDUM 1: INVESTIGATION OF LWR AEROSOL BEHAVIOR IN THE AEROSOL TEST FACILITY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TM-4075 • 17 PPS, 3 FIGS, 32 REFS. JAN. 1976

THE OBJECTIVES OF THIS TASK ARE TO CHARACTERIZE THE PROPERTIES AND TRANSIENT BEHAVIOR OF MIXED-OXIDE (SODIUM AND URANIUM) AEROSOLS IN A RELATIVELY LARGE CONTAINMENT VESSEL AND TO CORRELATE THEIR BEHAVIOR WITH ANALYTICAL MODELS. EXPERIMENTS ARE TO BE CONDUCTED UNDER CONDITIONS THAT CAN BE RELATED TO RELEASE INTO AN LWR CONTAINMENT BUILDING AS A RESULT OF A COA. THE CONDITIONS WILL COVER THOSE RESULTING FROM A RANGE OF ACCIDENT SEVERITY UP TO AND INCLUDING LOSS OF FLOW AND UNEXPECTED TRANSIENT OVERPOWER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL • CONTAINMENT • FUEL MELTDOWN • ACCIDENT, LOSS OF FLOW • SODIUM • ANALYTICAL MODEL • AEROSOL PROPERTIES • SAMPLING • REACTOR, LWR • BEHAVIOR • TRANSIENT • MIXED OXIDE • JACOBS

109981

REAFEL BJ • SANITARY OR

EVALUATION OF THE STRUCTURAL INTEGRITY OF LWR EQUIPMENT CELL LINERS - RESULTS OF PRELIMINARY INVESTIGATIONS

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TM-5104 • 200 PPS, FIGS, REFS. JAN. 1976

BEHAVIOR OF A PLAIN WALL SEGMENT OF A PROTOTYPE LWR CELL UNDER CONDITIONS OF A MASSIVE SODIUM

809843 PCONTINUED

SPILL WAS STUDIED. SODIUM-CONCRETE REACTION CALCULATIONS WERE PERFORMED ASSUMING AN INITIAL FLAW EXISTED IN THE LINER SUCH THAT HIGH-TEMPERATURE SODIUM COULD PENETRATE TO THE CONCRETE UNDERNEATH. BASED ON EXISTING SODIUM-CONCRETE REACTION RATE DATA, BOUNDING VALUES WERE ESTABLISHED FOR THE MAXIMUM ENERGY RELEASE PER UNIT VOLUME OF CONCRETE. THE POTENTIAL EFFECT OF THIS ENERGY RELEASE ON THE DEFORMATION OF THE LINER MATERIAL WAS DETERMINED. TEMPERATURE BUILDUP IN THE LINER AND PRESSURE DIFFERENTIAL ACROSS THE FLAW IN THE LINER WERE ALSO STUDIED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONCRETE + PYROPHORIC REACTION + SODIUM + DEFORMATION + FLAW + HIGH TEMPERATURE + STEEL LINER + MATHEMATICAL TREATMENT

115357

FEE 66

JANUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TN-5290 +. 25 PPS, FEB. 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NSIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + RP AND D PROGRAM + HJCK + SAFETY PROGRAM

115358

FEE 66

FEBRUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TN-1 +. 25 PPS, FEB. 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NSIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + RP AND D PROGRAM + SAFETY PROGRAM + HJCK

115359

FEE 66

MARCH 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TN-15 +. 23 PPS, MARCH 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NSIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + RP AND D PROGRAM + SAFETY PROGRAM + HJCK

115370

PONTANA RM + KRESS TS + ADAMS ME

LWR AEROSOL RELEASE AND TRANSPORT PROGRAM - QUARTERLY PROGRESS REPORT FOR JULY-SEPTEMBER 1975

113070 CONTINUED
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/MURG/TR-6 40 51 PPS, 10 FIGS, 21 REFS, APRIL 1976

A CAPACITOR DISCHARGE VAPORIZATION TECHNIQUE IS BEING DEVELOPED FOR GENERATING ELECTRICAL ENERGY DIRECTLY IN THE LIQUID FUEL SO THAT MOXA-LIKE FUEL DISASSEMBLIES CAN BE PRODUCED. THE US90 AEROSOL EXPERIMENTS (COLD PROOF TESTS), WHICH ARE BEING CONDUCTED IN THE 5-M CU VESSEL (CRI-110), WERE CONTINUED. CONCEPTUAL DESIGN FOR THE MODIFICATIONS TO THE NUCLEAR SAFETY PILOT PLANT HAS BEEN COMPLETED. CONCEPTUAL DESIGN OF THE FACILITY FOR CONDUCTING THE MOXA, UNDER-SODIUM, FUEL-BUNDLE SIMULATION TASK, DESIGNATED THE FUEL-AEROSOL SIMULANT TEST (FAST), IS ABOUT 70% COMPLETE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL * ACCIDENT * BUBBLE * FUEL MELTDOWN * TESTING * FISSION PRODUCT TRANSPORT * REACTOR, LMFBR * SODIUM * URANIUM DIOXIDE * MIX * R AND D PROGRAM * SIMULATION

114256
 FONTANA HW * ADAMS HE * KRESS TS * PARSLEY LF * PARKER GW
 LMFBR AEROSOL RELEASE AND TRANSPORT PROGRAM QUARTERLY PROGRESS REPORT FOR OCTOBER-NOVEMBER 1975
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/MURG/TR-9 40 51 PPS, 25 FIGS, 4 REFS, MAY 1976

THE LMFBR AEROSOL RELEASE AND TRANSPORT (ART) PROGRAM AT ORNL, ONE OF THE NUCLEAR REGULATORY COMMISSION'S LEAD PROGRAMS FOR LMFBR SAFETY, IS DESIGNED TO INVESTIGATE RADIONUCLIDE RELEASE AND TRANSPORT FROM LMFBRs AS A RESULT OF REACTOR EVENTS OF VARYING SEVERITY UP TO AND INCLUDING A HYPOTHETICAL CORE-DISRUPTIVE ACCIDENT (HCDA).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL * FISSION PRODUCT RELEASE * FISSION PRODUCT TRANSPORT * ACCIDENT, HYPOTHETICAL * RADIONUCLIDE TRANSFER * BUBBLE * ANALYTICAL MODEL * REACTOR, LMFBR * PLUTONIUM * SODIUM * MIX

114922
 FEE 66
 APRIL 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/MURG/TR-21 40 25 PPS, MAY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LMFBR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LMFBR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LMFBR * MSST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE, FUEL ELEMENT * NSIC * BLOWDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE, CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR, LMFBR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR, HTGR * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * R AND D PROGRAM * SAFETY PROGRAM * MIX

115340
 FEE 66
 MAY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/MURG/TR-10 40 25 PPS, JULY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LMFBR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LMFBR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LMFBR * MSST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE, FUEL ELEMENT * NSIC * BLOWDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE, CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR, LMFBR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR, HTGR * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * R AND D PROGRAM * SAFETY PROGRAM * MIX

115361
 FEE 66
 JUNE 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
 OAK RIDGE NATIONAL LABORATORY, TENNESSEE
 ORNL/MURG/TR-10 40 27 PPS, JULY 1976

11336: CONTINUED

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 6 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT DATA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIPHASE BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, NRC SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTION, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE, FUEL ELEMENT + NOIC + BLOWDOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM + OXIDATION + REACTION, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTION, HTGR + ACCIDENT ANALYSIS + DESIGN CRITERIA + PIPES AND PIPE FITTINGS + OR AND D PROGRAM + SAFETY PROGRAM + NJCK

112335

EXPERIMENTAL FAST REACTOR SAFETY RESEARCH PROGRAM QUARTERLY REPORT, JULY - SEPTEMBER 1975

SANDIA LABS., ALBUQUERQUE, N.M.

SAND-75-0567 P. 75 PPS, 2 TABS, 21 FIGS, 38 REFS, DEC. 1, 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING: PROMPT BURST EXCURSION EXPERIMENT, DEBRIS BED STUDIES, MATERIAL MOTION DETECTION, MULTIPLE FUEL POOL STUDIES, AND EQUATION OF STATE STUDIES OF REACTOR FUELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + FUEL MELTDOWN + ACCIDENT, REACTIVITY + OR AND D PROGRAM + REACTOR, LWR + EMERGENCY COOLING CONSIDERATIONS

113396

ANNUAL CORE PULSE REACTOR UPGRADE QUARTERLY REPORT: JULY-SEPT. 1975

SANDIA LABS., ALBUQUERQUE, N.M.

SAND-75-0670 P. 67 PPS, 7 TABS, 10 FIGS, 5 REFS, JAN. 1976

THE OBJECT OF THE ACRP UPGRADE IS TO ARRIVE AT A REACTOR MODIFICATION WHICH WILL PROVIDE AN INCREASED PULSED NEUTRON FLUENCE IN THE IRRADIATION CAVITY WITHOUT AN INCREASED DEGRADATION OF THE PULSE DURATION. THE APPROACH TO THE UPGRADE MODIFICATION INVOLVES A TWO-REGION CORE CONCEPT. THE INNER REGION, SURROUNDING THE IRRADIATION CAVITY, CONSISTS OF A HIGH-HEAT CAPACITY FUEL WHICH WILL SUSTAIN A LARGE FISSION ENERGY DEPOSITION. THE OUTER REGION CONSISTS OF A URANIUM-ZIRCONIUM HYDRIDE FUEL SIMILAR TO THE PRESENT ACRP FUEL. THIS REACTOR MODIFICATION WILL MAKE USE OF THE MAJORITY OF THE EXISTING REACTOR STRUCTURE AND CAN BE ACCOMPLISHED IN A RELATIVELY SHORT TIME. THE ACRP UPGRADE PROJECT IS DIVIDED INTO NINE TASKS TO IMPROVE MANAGEMENT OF THE OVERALL PROJECT AND TO MAINTAIN CLOSE CONTROL OF THE PROJECT BUDGET. THIS REPORT DISCUSSES THE PROGRESS ON EACH TASK IN A SEPARATE CHAPTER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, FAST + COUPLED CORES + DESIGN STUDY + MODIFICATION + REACTOR, PULSED + PERFORMANCE + JACOBS

114953

FAST BREEDER SAFETY RESEARCH PROGRAM - QUARTERLY REPORT OCT.-DEC. 1975

SANDIA LABS., ALBUQUERQUE, N.M.

SAND-76-0157 P. 70 PPS, 20 FIGS, 20 REFS, APRIL 1976

THE EARLY THRUST OF THIS PROGRAM IS TO DEVELOP A BETTER UNDERSTANDING OF TWO AREAS OF MAJOR INTEREST TO LWR SAFETY. THESE ARE FUEL RESPONSE IN THE POSTULATED PROMPT BURST REGIME AND POST ACCIDENT PHENOMENA. STUDIES REPORTED ARE FOR THE FOLLOWING PROGRAM TASKS: PROMPT BURST EXCURSION, POST-ACCIDENT HEAT REMOVAL OPTIONS, FUEL MOTION DETECTION, PAWR MELTEN POOL, EQUATION-OF-STATE, AND DEVELOPMENT OF FUEL MOTION DETECTION EQUIPMENT FOR THE UPGRADED ACRP.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PULSED + PURDUS MEDIA + A-RAY + EQUATION OF STATE + REACTOR, LWR + REACTOR, FAST + EXPLOSION + SAFETY ANALYSIS + NJCK + FLOW STABILITY

114952

ANNUAL CORE PULSE REACTOR UPGRADE QUARTERLY REPORT OCT.-DEC. 1975

SANDIA LABS., ALBUQUERQUE, N.M.

SAND-76-0165 P. 65 PPS, 16 FIGS, 6 REFS, APRIL 1976

THE OBJECT OF THE ACRP UPGRADE IS TO ARRIVE AT A REACTOR MODIFICATION WHICH WILL PROVIDE AN INCREASED PULSED NEUTRON FLUENCE IN THE IRRADIATION CAVITY WITHOUT INCREASING THE PULSE DURATION. THE UPGRADED REACTOR WILL ALSO HAVE AN INCREASED STEADY-STATE NEUTRON FLUX. THE APPROACH TO THE UPGRADE MODIFICATION INVOLVES A TWO-REGION CORE CONCEPT. THE INNER REGION, SURROUNDING THE IRRADIATION CAVITY, CONSISTS OF A HIGH-HEAT CAPACITY FUEL WHICH WILL SUSTAIN A LARGE FISSION ENERGY DEPOSITION. THE OUTER REGION CONSISTS OF A URANIUM-ZIRCONIUM HYDRIDE FUEL SIMILAR TO THE PRESENT ACRP FUEL. THIS REACTOR MODIFICATION WILL MAKE USE OF THE MAJORITY OF THE EXISTING REACTOR STRUCTURE AND CAN BE ACCOMPLISHED IN A RELATIVELY SHORT TIME.

114952 UNCONTINUED
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161
SAFETY ANALYSIS • CORE COMPONENTS • DESIGN STUDY • FUEL ELEMENTS • DESIGN CRITERIA • REACTOR, LMFBR • REACTOR,
FAST • PROMISE • CARBIDE • MACH • CONTROL ROD DRIVES

8. NRC-B ADVANCED REACTOR SAFETY RESEARCH, GAS COOLED REACTORS

113448
SCHNEITZER DG
HTGR SAFETY EVALUATION DIVISION QUARTERLY REPORT JULY 1-SEPTEMBER 30, 1975
BROOKHAVEN NATIONAL LAB., UPTON, N.Y.
BNL-50079 P. 135 PPS, TABS, FIGS, REFS, JAN. 1976

CONSTRUCTION OF THE APPARATUS FOR MEASURING METAL FISSION PRODUCT ADSORPTION ISOTHERMS ON MOIST GRAPHITE HAS BEEN COMPLETED. PRELIMINARY EXPERIMENTS MEASURING THE VAPOR PRESSURE OF ELEMENTAL CESIUM BY THE KNUDSEN EFFUSION TECHNIQUE HAVE BEEN STARTED. A REVIEW OF AVAILABLE VAPOR PRESSURE DATA FOR CESIUM HAS BEEN COMPLETED. THE REQUIREMENTS OF AN IN-PILE LOOP EXPERIMENT TO ESTIMATE MAXIMUM HYPOTHETICAL FISSION PRODUCT RELEASE HAVE BEEN EVALUATED. A PRE-IRRADIATED HTGR FUEL ELEMENT FULLY IRRADIATED AND STEPWISE HEATED IN THE REGION 1400 C TO 2100 C IS REQUIRED FOR AN EXPERIMENT TO UNDERSTAND THE INFLUENCE OF FUEL PARTICLE COATING FAILURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM • FISSION PRODUCT RELEASE • GRAPHITE • OXIDATION • OUT OF PILE EXPERIMENT • COOLANT CHEMISTRY • MELTUP • IN PILE EXPERIMENT • SAFETY ANALYSIS • REACTOR, HTGR • SEISMIC DESIGN • CRACK • PRESSURE VESSELS • JACOBS

111514
STARATELAKOS NG
CROSS SECTION SPACE SHIELDING IN DOUBLY HETEROGENEOUS HTGR SYSTEMS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6157-MS P. 12 PPS, 35 REFS, NOV. 1975

COLLISION PROBABILITY METHODS USING RATIONAL APPROXIMATIONS FOR SPACE SHIELDING OF CROSS SECTIONS IN NUCLEAR REACTOR CODES ALLOWING FOR ONE LEVEL OF HETEROGENEITY ARE FIRST REVIEWED. A GAMMA FACTOR FOR A CYLINDRICAL HTGR FUEL PIN WITH GRAIN STRUCTURE IS THEN DERIVED. A NEW SIMPLE METHOD FOR CROSS SECTION SPACE SHIELDING IN A DOUBLY HETEROGENEOUS HTGR SYSTEM USING COLLISION PROBABILITIES AND RATIONAL APPROXIMATIONS IS SUBSEQUENTLY PRESENTED AND CALCULATIONS BASED ON IT ARE COMPARED WITH CALCULATIONS BASED ON MORE ELABORATE METHODS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM • SHIELDING • THEORETICAL INVESTIGATION • CROSS SECTION • REACTOR, HTGR • FUEL ROD • JACOBS

110001
MIRK WL
HTGR SAFETY RESEARCH PROGRAM QUARTERLY PROGRESS REPORT FOR JULY - SEPTEMBER 1975
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-6101-PH P. 40 PPS, 7 TABS, 40 FIGS, DEC. 1975

THE PRESENT LAST PROGRAM INCLUDES THE FOLLOWING TASK AREAS: FISSION PRODUCT TECHNOLOGY; PRIMARY COOLANT IMPURITIES; STRUCTURAL EVALUATION; SAFETY INSTRUMENTATION AND CONTROL SYSTEMS; ACCIDENT DELINEATION; PHENOMENA MODELING AND SYSTEMS ANALYSIS. THIS PROGRAM WAS STARTED IN MARCH 1974 AND IS A CONTINUING EFFORT. THE PRESENT REPORT IS THE FOURTH IN A SERIES OF FORMAL QUARTERLY PROGRESS REPORTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS • IODINE • ANALYTICAL MODEL • FISSION PRODUCT RETENTION • REACTOR, HTGR • COOLANT QUALITY • IMPURITY • SEISMIC DESIGN • JACOBS

111515
VEGIL JC
BEGINNING-OF-LIFE NEUTRONIC ANALYSIS OF A 3000-MW(T) HTGR
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6174-MS P. 38 PPS, 40 TABS, 36 FIGS, 25 REFS, JAN. 1976

DESCRIBES THE RESULTS OF AN INDEPENDENT STUDY OF SAFETY-RELATED NEUTRONIC CHARACTERISTICS FOR THE BEGINNING-OF-LIFE CORE OF A 3000-MW(T) HIGH-TEMPERATURE GAS-COOLED REACTOR. EMPHASIS WAS PLACED ON THE TEMPERATURE-DEPENDENT REACTIVITY EFFECTS OF FUEL, MODERATOR, CONTROL POISONS, AND FISSION PRODUCTS. OTHER NEUTRONIC CHARACTERISTICS STUDIED WERE GROSS AND LOCAL POWER DISTRIBUTIONS, NEUTRON KINETICS PARAMETERS, CONTROL ROD AND OTHER MATERIAL WORTHS AND WORTH DISTRIBUTIONS, AND THE REACTIVITY WORTH OF A SELECTED HYPOTHETICAL PERTURBATION IN THE CORE CONFIGURATION. THE STUDY WAS PERFORMED FOR THE MOST PART USING DISCRETE-ORDINATES TRANSPORT THEORY CODES AND NEUTRON CROSS SECTIONS THAT WERE INTERPOLATED FROM A FOUR-PARAMETER NINE-GROUP LIBRARY SUPPLIED BY THE HTGR VENDOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

POISON, BURNABLE • CONTROL SYSTEM • CROSS SECTION • REACTOR PHYSICS • REACTOR, HTGR • CONTROL RODS • JACOBS

112324
SECKER PA • GILBERT JS
STATUS OF CHAP: COMPOSITE HTGR ANALYSIS PROGRAM
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

112324 CONTINUED
LA-8180-SR +. 51 PPS, 11 TABS, 35 FIGS, 26 REFS, JAN. 1976

DEVELOPMENT OF AN HTGR ACCIDENT SIMULATION PROGRAM IS IN PROGRESS FOR THE PREDICTION OF THE OVERALL HTGR PLANT TRANSIENT RESPONSE TO VARIOUS INITIATING EVENTS. THE STATUS OF THE DIGITAL COMPUTER PROGRAM NAMED CHAP (COMPOSITE HTGR ANALYSIS PROGRAM) AS OF JUNE 30, 1975, IS GIVEN. THE PHILOSOPHY, STRUCTURE, AND CAPABILITIES OF THE CHAP CODE ARE DISCUSSED. MATHEMATICAL DESCRIPTIONS ARE GIVEN FOR THOSE HTGR COMPONENTS THAT HAVE BEEN MODELED. COMPONENT MODEL VALIDATION AND EVALUATION USING AUXILIARY ANALYSIS CODES ARE ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF POWER + ACCIDENT, LOSS OF PRESSURE + REACTOR, HTGR + TRANSIENT + NUCR + THERMAL HYDRAULIC ANALYSIS

113080
JULY 76
CONSEQUENCE ANALYSIS OF DEPRESSURIZATION ACCIDENTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-8224-MS +. 17 PPS, 0 TABS, 10 FIGS, 0 REFS, FEB. 1976

THE CONSEQUENCES OF THE DEPRESSURIZATION ACCIDENTS FOR THE HIGH-TEMPERATURE GAS-COOLED REACTOR ARE INVESTIGATED. A CONSEQUENCE MODEL IS DEVELOPED THAT IS USED TO DELINEATE THE PARAMETERS THAT ARE IMPORTANT TO THE CONSEQUENCE CALCULATIONS. A NUMERICAL EXAMPLE OF THE CALCULATIONAL TECHNIQUE IS GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

ACCIDENT ANALYSIS + ACCIDENT, CONSEQUENCES + DOSE + IOWINE + ACCIDENT, LOSS OF PRESSURE + ACCIDENT MODEL + DOSE CALCULATION, INTERNAL + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + REACTOR, HTGR + THYROID + WHOLE BODY + NUCR + JACOBS

114280
LATHROP RD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT OCTOBER 1-DECEMBER 31, 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAPM-NUREG-6233 +. 93 PPS, 23 TABS, 41 FIGS, 124 REFS, MARCH 1976

ON DECEMBER 1, 1975, THE LOS ALAMOS SCIENTIFIC LABORATORY FORMED A DIVISION TO SERVE AS A FOCUS FOR RESEARCH IN NUCLEAR SAFEGUARDS, REACTOR SAFETY AND TECHNOLOGY. THIS PROGRAM INCLUDES HTGR, LWR, AND LMFBR SAFETY RESEARCH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

ACCIDENT ANALYSIS + FISSION PRODUCT RELEASE + COOLANT CHEMISTRY + ANALYTICAL MODEL + SEISMIC DESIGN + REACTOR, LMFBR + REACTOR, HTGR + REACTOR, BWR + REACTOR, PWR + HELIUM + SAFEGUARDS, NUCLEAR MATERIAL + NUCR

115011
LATHROP RD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT, JANUARY 1-MARCH 31, 1976
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAPM-NUREG-6317 +. 65 PPS, 10 TABS, 37 FIGS, 71 REFS, MAY 1976

IN HTGR SAFETY RESEARCH, IMPROVED BASIC DATA AND METHODS HAVE BEEN INCLUDED IN THE FISSION PRODUCT RELEASE CODE, LARC, AND THE CODE WAS USED TO CALCULATE RELEASES OF THREE REPRESENTATIVE ISOTOPES FOR THREE TEMPERATURE MODELS. FOR THERMAL-HYDRAULIC ANALYSIS OF TWO-PHASE FLOW IN LWR SAFETY RESEARCH, AN IMPROVED METHOD HAS BEEN DEVELOPED TO COUPLE ONE-DIMENSIONAL MESHES TO INCLUDE FLOW LOSSES DUE TO AREA CHANGES. IN LMFBR SAFETY RESEARCH, WORK CONTINUED ON TESTING THE RELEASE VERSION OF THE SIMMER CODE, SIMMER-1. THE MULTI-ISOTOPE BONDARENKO CROSS-SECTION TREATMENT DESCRIBED IN A PREVIOUS REPORT WAS TESTED AND FOUND TO BE BOTH ACCURATE AND EFFICIENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

R AND D PROGRAM + SAFETY PROGRAM + REACTOR, HTGR + FISSION PRODUCT RELEASE + COMPUTER PROGRAM + ANALYTICAL MODEL + IODINE + KRYPTON + REACTOR, LWR + THERMAL HYDRAULIC ANALYSIS + BLOWDOWN + CONTAINMENT ANALYSIS + REACTOR, LMFBR + ACCIDENT, CORE DISRUPTIVE + NUCR

117106
EUGEN OT
MODELLING OF CLADDING AND FUEL MOTION IN A LOSS OF -LUB SITUATION FOR GCFR SAFETY ANALYSIS
NORTHWESTERN UNIVERSITY, EVANSTON, ILLINOIS
CUU-2471-S +. 14 PPS, 12 FIGS, NOV. 9, 1975

PROGRESS IS REPORTED ON CONSTRUCTION OF A CLOSED LOOP AND OF CLADDED HEATING ELEMENTS IN ORDER TO CONDUCT CLADDING MELTDOWN EXPERIMENTS IN AN ARGON ATMOSPHERE. ELECTRICAL WIRING NEEDS TO BE COMPLETED BEFORE TESTING BEGINS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 M STREET, WASHINGTON, D. C. 20545 (100 CENTS/PAGE -- MINIMUM CHARGE \$2.00)

111100 CONTINUED

FUEL MELTDOWN • OUT OF PILE EXPERIMENT • ACCIDENT MODEL • FAILURE, CLADDING • STRUCTURAL INTEGRITY • SAFETY ANALYSIS • STRUCTURAL ANALYSIS, DYNAMIC • HEATERS

110369

EGGEN DT

MODELING OF CLADDING AND FUEL MOTION IN A LOSS OF FLOW SITUATION FOR GCFR SAFETY ANALYSIS. PROGRESS REPORT 6. OCT. 15, 1975-JAN. 15, 1976

THE FIRST EXPERIMENTS HAVE BEEN RUN USING ELECTRICALLY HEATED 'FUEL ELEMENTS' IN AN INERT GAS (ARGON) LOOP. THE FUEL ELEMENTS HAVE A CHOPPED COSINE POWER INPUT AND HAVE A Pb/Sn ALLOY CLADDING. SINGLE ELEMENTS WERE USED IN THE FIRST TWO EXPERIMENTS WITH A STEP POWER PULSE OF ABOUT 1 MW/FT WHICH WAS SUFFICIENT TO MELT THE CENTER OF THE CLAD WITHIN 0 TO 10 SEC. AS THE MOLten CLADDING ENTERED THE 'BLANKET' (UNHEATED) REGION, IT FROZE WITHIN ABOUT 1 INCH. THE APPARATUS FOR THE STAINLESS STEEL POURING EXPERIMENT IS PROGRESSING. ADDITIONAL MODELS FOR FREEZING OF MOLten 'CLADDING' IN COLDER REGIONS ARE BEING ANALYZED AND TESTED AGAINST THE SINGLE TUBE POURING TESTS PREVIOUSLY REPORTED. ANALYTICAL ROUTINES ARE UNDER DEVELOPMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, GCFR • GAS • ARGON • HEATERS • FAILURE, CLADDING • HYDRAULIC EXPERIMENT • ACCIDENT, LOSS OF FLOW • MODEL TESTING • NACA

115355

FEE GG

NOVEMBER 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TN-5217 • 27 PPS, DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PUR BLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, HTGR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND D PROGRAM • PSAFETY PROGRAM • NACA

115356

FEE GG

DECEMBER 1975 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TN-5203 • 25 PPS, DEC. 1975

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PUR BLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HIGH SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

REACTOR, LWR • MSST • ENERGY LEVEL • FISSION PRODUCT RELEASE • GROSS BETA • GROSS GAMMA • FAILURE, FUEL ELEMENT • NSIC • BLOWDOWN • HEAT TRANSFER • ZIRCALOY • FAILURE, CLADDING • METAL WATER REACTION • ZIRCONIUM • OXIDATION • REACTOR, LWR • AEROSOL • FISSION PRODUCT TRANSPORT • REACTOR, HTGR • ACCIDENT ANALYSIS • DESIGN CRITERIA • PIPES AND PIPE FITTINGS • OR AND D PROGRAM • PSAFETY PROGRAM • NACA

112097

SANDERS JP

QUARTERLY PROGRESS REPORT ON HIGH-TEMPERATURE GAS-COOLED REACTOR SAFETY STUDIES SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR OCTOBER-DECEMBER 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TN-5255 • 14 PPS, 7 FIGS, 9 REFS, FEB. 1976

FURTHER DEVELOPMENT WORK WAS DONE ON THE COMPONENT MODELS AND CODES USED IN THE OVERALL NSS PLANT SIMULATION (ORTAP) AND ON THE CODE USED TO SIMULATE EMERGENCY-COOLING SHUTDOWN ACCIDENTS (ORECA). SIGNIFICANT PROGRESS WAS ALSO MADE IN INVESTIGATIONS OF ONCE-THROUGH STEAM GENERATOR MODELS AND IN PREPARATIONS FOR THE DYNAMIC TESTS PLANNED FOR THE FORT ST. VRAIN (FSV) REACTOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22101

112047 PCONTINUED
COMPUTER PROGRAM + TESTING + ANALYTICAL MODEL + SAFETY ANALYSIS + R AND D PROGRAM + STEAM GENERATOR + REACTOR.
HTGR + NJCK

112357
FEE 66
JANUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL
LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TR-5290 + 25 PPS, FEB. 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE
MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT
BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY
INFORMATION CENTER, PWR BLU DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE
STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL,
HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE + FUEL
ELEMENT + NSIC + BLU DOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM +
OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN
CRITERIA + PIPES AND PIPE FITTINGS + R AND D PROGRAM + NJCK + SAFETY PROGRAM

115352
FEE 66
FEBRUARY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL
LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TR-1 + 25 PPS, FEB. 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE
MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT
BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY
INFORMATION CENTER, PWR BLU DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE
STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL,
HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE + FUEL
ELEMENT + NSIC + BLU DOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM +
OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN
CRITERIA + PIPES AND PIPE FITTINGS + R AND D PROGRAM + SAFETY PROGRAM + NJCK

115359
FEE 66
MARCH 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL
LABORATORY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/NUREG/TR-15 + 23 PPS, MARCH 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE
MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT
BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY
INFORMATION CENTER, PWR BLU DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE
STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL,
HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR + MSST + ENERGY LEVEL + FISSION PRODUCT RELEASE + GROSS BETA + GROSS GAMMA + FAILURE + FUEL
ELEMENT + NSIC + BLU DOWN + HEAT TRANSFER + ZIRCALOY + FAILURE, CLADDING + METAL WATER REACTION + ZIRCONIUM +
OXIDATION + REACTOR, LWR + AEROSOL + FISSION PRODUCT TRANSPORT + REACTOR, HTGR + ACCIDENT ANALYSIS + DESIGN
CRITERIA + PIPES AND PIPE FITTINGS + R AND D PROGRAM + SAFETY PROGRAM + NJCK

180325
DALL 5J
URECA-1: A DIGITAL COMPUTER CODE FOR SIMULATING THE DYNAMICS OF HTGR CORES FOR EMERGENCY COOLING ANALYSES
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL/TR-5159 + 57 PPS, 7 FIGS, 8 REFS, APRIL 1976

URECA-1 PREDICTS THE THREE-DIMENSIONAL TRANSIENT THERMAL-HYDRAULIC BEHAVIOR OF THE CORE OF A HIGH-
TEMPERATURE GAS-COOLED REACTOR (HTGR) FOR SPECIFIED EMERGENCY SHUTDOWN CONDITIONS. IT WAS
MODELED AFTER THE RECA CODE (REACTOR EMERGENCY COOLING ANALYSIS) BY THE GENERAL ATOMIC COMPANY TO
PROVIDE A BETTER UNDERSTANDING OF THE RELATIVE IMPORTANCE OF MECHANISMS FOR AFTERHEAT REMOVAL AND
ENABLE INDEPENDENT EVALUATION OF THE GENERAL ATOMIC COMPANY ANALYSES. DESCRIPTIONS ARE GIVEN OF
THE MODELING AND SOLUTION TECHNIQUES, AND EXAMPLES OF TRANSIENT CALCULATIONS ARE PRESENTED.

114325 (CONTINUED)

PREDICTIONS OF SEVERAL TYPES OF ACCIDENT TRANSIENTS WERE IN GOOD AGREEMENT WITH THE RESULTS OF RECA CALCULATIONS. THE RELATIVELY SMALL COMPUTATION TIMES REQUIRED FOR ORCA ALSO MAKE IT CONVENIENT TO USE FOR MODEL AND PARAMETER SENSITIVITY STUDIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM - REACTOR, HTGR - FT. ST. VRAIN (HTGR) - REACTOR DYNAMICS - THERMAL HYDRAULIC ANALYSIS - NJCK

115351

SANDERS, JP

HIGH-TEMPERATURE GAS-COOLED REACTOR SAFETY STUDIES FOR THE DIVISION OF REACTOR SAFETY RESEARCH
OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/NUREG/TR-13 - 15 PPS, 2 FIGS, 9 REFS, MAY 1976

WORK CONTINUED ON DEVELOPING CODES FOR OVERALL NSS PLANT SIMULATION (ORTAP) AND EMERGENCY-COOLING SHUTDOWN SIMULATION (ORECA). PREPARATIONS WERE MADE FOR RUNNING AND ANALYZING DYNAMICS TESTS ON THE FORT ST. VRAIN (FSV) REACTOR. WORK HAS CONTINUED ON THE IMPLEMENTATION OF BOTH THE ORCA-3 COMPUTER CODE AND THE SYSTEM OF PROGRAMS RELATED TO THE RECA CODE. PARTS OF THE RECA COMPUTATIONAL METHOD HAVE BEEN EVALUATED; HOWEVER, COMPLETE FACILITY IN USING THE PROGRAM HAS NOT BEEN DEVELOPED. AN INFORMATION MEETING ON HTGR SAFETY STUDIES WAS HELD AT ORNL ON MARCH 11 AS PART OF THE TOTAL GAS-COOLED REACTOR PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM - SAFETY PROGRAM - COMPUTER PROGRAM - REACTOR, HTGR - TESTING - ANALYTICAL MODEL - STEAM GENERATOR - NJCK

114923

FEE GG

APRIL 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/NUREG/TR-21 - 25 PPS, MAY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR FLOW DOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR - NSS - ENERGY LEVEL - FISSION PRODUCT RELEASE - GROSS BETA - GROSS GAMMA - FAILURE, FUEL ELEMENT - NSIC - BLOWDOWN - HEAT TRANSFER - ZIRCALOY - FAILURE, CLADDING - METAL WATER REACTION - ZIRCONIUM - OXIDATION - REACTOR, LWR - AEROSOL - FISSION PRODUCT TRANSPORT - REACTOR, HTGR - ACCIDENT ANALYSIS - DESIGN CRITERIA - PIPES AND PIPE FITTINGS - R AND D PROGRAM - SAFETY PROGRAM - NJCK

115360

FEE GG

MAY 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/NUREG/TR-24 - 25 PPS, JULY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT BETA AND GAMMA ENERGY RELEASE, LOCA RELEASE FROM LWR FUEL, MULTIROD BURST TESTS, NUCLEAR SAFETY INFORMATION CENTER, PWR BLOWDOWN HEAT TRANSFER-SEPARATE EFFECTS, ZIRCALOY FUEL CLADDING COLLAPSE STUDIES, ZIRCONIUM METAL-WATER OXIDATION KINETICS, AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL, HTGR SAFETY ANALYSIS AND RESEARCH, AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, LWR - NSS - ENERGY LEVEL - FISSION PRODUCT RELEASE - GROSS BETA - GROSS GAMMA - FAILURE, FUEL ELEMENT - NSIC - BLOWDOWN - HEAT TRANSFER - ZIRCALOY - FAILURE, CLADDING - METAL WATER REACTION - ZIRCONIUM - OXIDATION - REACTOR, LWR - AEROSOL - FISSION PRODUCT TRANSPORT - REACTOR, HTGR - ACCIDENT ANALYSIS - DESIGN CRITERIA - PIPES AND PIPE FITTINGS - R AND D PROGRAM - SAFETY PROGRAM - NJCK

115361

FEE GG

JUNE 1976 MONTHLY HIGHLIGHTS FOR OFFICE OF NUCLEAR REGULATORY RESEARCH PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL/NUREG/TR-40 - 27 PPS, JULY 1976

THIS PROGRESS REPORT CONTAINS SHORT (1 TO 4 PAGE) SUMMARIES OF THE ACCOMPLISHMENTS DURING THE MONTH ON THE FOLLOWING ORNL PROJECTS: HEAVY SECTION STEEL TECHNOLOGY PROGRAM, FISSION PRODUCT

115361 CONTINUED

DATA AND GAMMA ENERGY RELEASE. LOCA RELEASE FROM LWR FUEL. MULTIROD BURST TESTS. NUCLEAR SAFETY INFORMATION CENTER. POW BLUDDOWN HEAT TRANSFER-SEPARATE EFFECTS. ZIRCALOY FUEL CLADDING COLLAPSE STUDIES. ZIRCONIUM METAL-WATER OXIDATION KINETICS. AEROSOL RELEASE AND TRANSPORT FROM LWR FUEL. NRGH SAFETY ANALYSIS AND RESEARCH. AND DESIGN CRITERIA FOR PIPING AND NOZZLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD, VA. 22161

REACTION. LWR * MSST * ENERGY LEVEL * FISSION PRODUCT RELEASE * GROSS BETA * GROSS GAMMA * FAILURE. FUEL ELEMENT * NSIC * BLUDDOWN * HEAT TRANSFER * ZIRCALOY * FAILURE. CLADDING * METAL WATER REACTION * ZIRCONIUM * OXIDATION * REACTOR. LWR * AEROSOL * FISSION PRODUCT TRANSPORT * REACTOR. NRGH * ACCIDENT ANALYSIS * DESIGN CRITERIA * PIPES AND PIPE FITTINGS * OR AND D PROGRAM * SAFETY PROGRAM * NJCH

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A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS REVED TO IT.

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1. The purpose of this document is to provide a comprehensive overview of the current state of the project and to outline the key objectives and milestones for the upcoming phase.

2. The project is currently in the planning stage, and the following objectives have been identified:

- 2.1. Conduct a thorough analysis of the existing data and resources.
- 2.2. Develop a detailed project plan, including a timeline and budget.
- 2.3. Establish a clear communication channel between all stakeholders.
- 2.4. Identify potential risks and develop mitigation strategies.

3. The key milestones for the upcoming phase are as follows:

- 3.1. Completion of the initial data analysis by the end of the month.
- 3.2. Finalization of the project plan and budget by the end of the quarter.
- 3.3. Implementation of the project plan, starting in the first half of the next year.
- 3.4. Regular reporting and communication throughout the project duration.

4. It is important to note that the project is subject to change, and the timeline and budget may be adjusted as more information becomes available.

5. The project team is committed to ensuring the successful completion of the project and to providing regular updates to all stakeholders.

6. The next steps are to conduct a meeting with all stakeholders to discuss the project plan and to begin the implementation phase.

7. The project team is looking forward to the challenges ahead and to the opportunity to make a significant contribution to the organization.

8. The project is currently on track, and the team is confident that the objectives will be achieved.

9. The project is a high priority for the organization, and the team is dedicated to its success.

10. The project is a complex task, but the team is well-equipped to handle it.

11. The project is a significant challenge, but the team is up to the task.

12. The project is a major undertaking, but the team is determined to see it through.

13. The project is a critical component of the organization's strategy, and the team is committed to its success.

14. The project is a key element of the organization's future, and the team is dedicated to its success.

15. The project is a vital part of the organization's mission, and the team is committed to its success.

16. The project is a central part of the organization's vision, and the team is dedicated to its success.

17. The project is a core part of the organization's identity, and the team is committed to its success.

18. The project is a fundamental part of the organization's culture, and the team is dedicated to its success.

19. The project is a defining part of the organization's character, and the team is committed to its success.

20. The project is a lasting part of the organization's legacy, and the team is dedicated to its success.

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