NUREG-0304 Vol. 22, No. 2

Regulatory and Technical Reports (Abstract Index Journal)

.

Compilation for Second Quarter 1997 April - June

U.S. Nuclear Regulatory Commission

Office of Information Resources Management



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Documents available from the National Technical Information Service include NUREG-series reports and technical reports prepared by other Federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, and transactions. *Federal Register* notices, Federal and State legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC confarence proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free, to the extent of supply, upon written request to the Office of Administration, Distribution and Mail Services Section, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

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A year's subscription of this report consists of four quarterly issues.

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L. L. Stevenson, Project Manager

Publications Branch Office of Information and Resources Management U.S. Nuclear Regulatory Commission Washington, DC 20555-0001



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PREFACE

This compilation consists of bibliographic data and abstracts for the formal regulatory and technical reports issued by the U.S. Nuclear Regulatory Commission (NRC) Staff and its contractors. It is NRC's intention to publish this compilation quarterly and to cumulate it annually. Your comments will be appreciated. Please send them to:

Publications Branch Office of Information Resources Management T-6 E7 U.S. Nuclear Regulatory Commission Washington, D.C. 20555-0001

The main citations and abstracts in this compilation are listed in NUREG number order: NUREG-XXXX, NU-REG/CP-XXXX, NUREG/CR-XXXX, and NUREG/IA-XXXX. These precede the following indexes:

Secondary Report Number Index Personal Author Index Subject Index NRC Originating Organization Index (Staff Reports) NRC Originating Organization Index (International Agreements) NRC Contract Sponsor Index (Contractor Reports) Contractor Index International Organization Index Licensed Facility Index

A detailed explanation of the entries precedes each index.

The bibliographic elements of the main citations are the following:

Staff Report

NUREG-0808: MARK II CONTAINMENT PROGRAM EVALUATION AND ACCEPTANCE CRITERIA. ANDER-SON, C. J. Division of Safety Technology. August 1981. 90 pp. 8109140048. 09570:200.

Where the entries are (1) report number, (2) report title, (3) report author, (4) organizational unit of author, (5) date report was published, (6) number of pages in the report, (7) the NRC Document Control System accession number, (8) the microfiche address (for internal NRC use).

Conference Report

NUREG/CP-0017: EXECUTIVE SEMINAR ON THE FUTURE ROLE OF RISK ASSESSMENT AND RELIABIL-ITY ENGINEERING IN NUCLEAR REGULATION. JANERP, J.S. Argonne National Laboratory. May 1981. 141 pp. 8105280299. ANL-81-3. 08632:070.

Where the entries are (1) report number, (2) report title, (3) report author, (4) organization that compiled the proceedings, (5) date report was published, (6) number of pages in the report, (7) the NRC Document Control System accession number, (8) the report number of the originating organization, (9) the microfiche address (for NRC internal use).

Contractor Report

NUREG/CR-1556: STUDY OF ALTERNATE DECAY HEAT REMOVAL CONCEPTS FOR LIGHT WATER REACTORS-CURRENT SYSTEMS AND PROPOSED OPTIONS. BERRY, D.L.; BENNETT, P.R. Sandia Laboratories. May 1981. 100 pp. 8107010449. SAND80-0929. 08912:242.

Where the entries are (1) report number, (2) report title, (3) report authors, (4) organizational unit of authors or publisher, (5) date report was published, (6) number of pages in the report, (7) the NRC Document Control System accession number, (8) the report number of the originating organization (if given), (9) the micro-fiche address (for NRC internal use).

Grant Report

NUREG/GR-0013: APPLICATIONS OF A NEW MAGNETIC MONITORING TECHNIQUE TO IN SITU EVAL-UATION OF FATIQUE DAMAGE IN FERROUS COMPONENTS. JILES, D.C.; BINER, S.B.; GOVINDARAJU, M.; et al. Iowa State Univ., Ames, IA. June 1994, 41 pp. 9407250286, 80328:195.

Where the entries are(1) report number, (2) report title, (3) report authors, (4) organizational unit of authors or publisher, (5) date report was published, (6) number of pages in the report, (7) the NRC Document Control System accession number, (8) the report number of the originating organization (if given), (9) the micro-fiche address (for NRC internal use).

International Agreement Report

NUREG/IA-0001: ASSESSMENT OF TRAC-PD2 USING SUPER CANNON AND HDR EXPERIMENTAL DATA. NEUMANN, U. Kraftweek Union. August 1986. 223 pp. 8608270424. 37659:138.

Where the entries are(1) report number, (2) report title, (3) report author, (4) organizational unit of author, (5) date report was published, (6) number of pages in the report, (7) the NRC Document Control System accession number, (8) the report number of the originating organization (if given), and (9) the microfiche address (for NRC internal use).

The following abbreviations are used to identify the document status of a report:

ADD	- addendum
APP	- appendix
DRFT	- draft
ERR	- errata
N	- number
R	- revision
S	- supplement

V - volume

Availability of NRC Publications

Copies of NRC staff and contractor reports may be purchased either from the Government Printing Office (GPO) or from the National Technical Information Service, Springfield, Virginia 22161. To purchase documents from the GPO, send a check or money order, payable to the Superintendent of Documents, to the following address:

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NRC Report Codes

The NUREG designation, NUREG-XXXX, indicates that the document is a formal NRC staff-generated report. Contractor-prepared formal NRC reports carry the report code NUREG/CR-XXXX. This type of identification replaces contractor-established codes such as ORNL/NUREG/TM-XXX and TREE-NUREG-XXXX, as well as various other numbers that could not be correlated with NRC sponsorship or the work being reported.

In addition to the NUREG and NUREG/CR codes, NUREG/CP is used for NRC-sponsored conference proceedings NUREG/GR is used for NRC grant reports, and NUREG/IA is used for international agreement reports.

All these report codes are controlled and assigned by the staff of the Publications Branch of the NRC Office of Information Resources Management.



Main Citations and Abstracts

The report listings in this compilation are arranged by report number, where NUREG-XXXX is an NRC staff-originated report, NUREG/CP-XXXX is an NRC-sponsored conference report, NUREG/CR-XXXX is an NRC contractor-prepared report, and NUREG/IA-XXXX is an international agreement report. The bibliographic information (see Prefice for details) is followed by a brief abstract of this report.

NUREG-0090 V19: REPORT TO CONGRESS ON ABNORMAL OCCURRENCES.Fiscal Year 1996. * Office for Analysis & Evaluation of Operational Data, Director. April 1997. 47pp. 9704250153. 92624:314.

Section 208 of the Energy Reorganization Act of 1974 (PL 93-438) identifies an abnormal occurrence (AO) as an unscheduled incident or event that the Nuclear Regulatory Commission (NRC) determines to be significant from the standpoint of public health or safety. The Federal Reports Elimination and Sunset Act of 1995 (PL 104-66) requires that AOs be reported to Congress on an annual basis. This report includes those events that NRC determined to be AOs during fiscal year 1996. This report addresses eightech AOs at NRC-licensed facilities. Two involved events at nuclear power plants, eleven involved medical brachytherapy misadministrations, and five involved radiopharmaceutical misadministrations. Eight AOs submitted by the Agreement States are included. One involved stolen radiography cameras, one involved a ruptured source, one involved release of radioactive material while being transported, one involved a lost source, two involved medical brachytherapy misadministrations, and two involved radiopharmaceutical misadministrations. Four updates of previously reported AOs are included in this report. Three "Other Events of Interest" events are being reported, and one previously reported "Other Events of Interest" event is being updated.

NUREG-0304 V21 N04: REGULATORY AND TECHNICAL RE-PORTS (ABSTRACT INDEX JOURNAL). Annual Compilation For 1996. * Office of Information Resources Management (Post 890205). April 1997. 93pp. 9705010326. 92697:233.

This journal includes all formal reports in the NUREG series prepared by the NRC staff and contractors; proceedings of conferences and workshops; as well as international agreement reports. The entries in this compilation are indexed for access by title and abstract, secondary report number, personal author, subject, NRC organization for staff and international agreements, contractor, international organization, and licensed facility.

NUREG-0540 V19 N02: TITLE LIST OF DOCUMENTS MADE PUBLICLY AVAILABLE.February 1-28, 1997. * Office of Information Resources Management (Post 890205). April 1997. 370pp. 9706130158. 93345:026.

This document is a monthly publication containing descriptions of information received and generated by the U.S. Nuclear Regulatory Commission (NRC). This information includes (1) docketed material associated with civilian nuclear power plants and other uses of radioactive materials, and (2) nondocketed material received and generated by NRC pertinent to its role as a regulatory agency. The following indexes are included: Personal Author, Corporate Source, Report Number, and Cross Reference of Enclosures to Principal Documents.

NUREG-0540 V19 N03: TITLE LIST OF DOCUMENTS MADE PUBLICLY AVAILABLE.March 1-31, 1997. * Office of Information Resources Management (Post 890205). May 1997. 362pp. 9706130161. 93344:001.

See NUREG-0540,V19,N02 abstract.

NUREG-0540 V19 N04: TITLE LIST OF DOCUMENTS MADE PUBLICLY AVAILABLE.April 1-30, 1997. * Office of Information Resources Management (Fost 890205). June 1997. 405pp. 9707180204. 93804:001.

See NUREG-0540, V19, N02 abstract.

NUREG-0750 V44 102: INDEXES TO NUCLEAR REGULATORY COMMISSION ISSUANCES.July-December 1996. * Office of Information Resources Management (Post *90205). April 1997. 52pp. 9704300062. 92696:262.

Digests and indexes for issuances to the Commission, the Atomic Safety and Licensing Board Panel, the Administrative Law Judges, the Directors' Decisions, and the Decisions on Petitions for Rulemaking are presented.

NUREG-0750 V45 N02: NUCLEAR REGULATORY COMMISSION ISSUANCES FOR FEBRUARY 1997. Pages 49-93. * Office of Information Resources Management (Post 890205). April 1997. 52pp. 9705090049. 92827:001.

Legal issuances of the Commission, the Atomic Safety and Licensing Board Fanel, the Administrative Law Judges, and NRC Program Offices are presented.

- NUREG-0750 V45 N03: NUCLEAR REGULATORY COMMISSION ISSUANCES FOR MARCH 1997.Pages 95-263. * Office of Information Resources Management (Post 890205). May 1997. 175pp. 9706180464. 93393:036. See NUREG-0750,V45,N02 abstract.
- NUREG-0750 V45 N04: NUCLEAR REGULATORY COMM:SSION ISSUANCES FOR APRIL 1997.Pages 265-353. * Office of Information Resources Management (Post 890205). June 1997. 96pp. 9707140026. 93738:001.

See NUREG-0750, V45, N02 abstract.

NUREG-0837 V17 NO1: NRC TLD DIRECT RADIATION MONI-TORING NETWORK.Progress Report. January-March 1997. STRUCKMEYER,R. Region 1 (Post 820201). May 1997. 238pp. 9706160216. 93368:001.

This report provides the status and results of the NRC Thermoluminescent Dosimeter (TLD) Direct Radiation Monitoring Network. It presents the radiation levels measured in the vicinity of NRC licensed facilities throughout the country for the first quarter of 1997.

NURE@-0940 V15 N2 P1: ENFORCEMENT ACTIONS: SIGNIFI-CANT ACTIONS RESOLVED INDIVIDUAL ACTIONS.Semiannual Progress Report,July-December 1996. * Ofc of Enforcement (Post 870413). April 1997. 407pp. 9705230149. 93068:001.

This compilation summarizes significant enforcement actions that have been resolved during the period (July - December 1996) and includes copies of Orders and Notices of Violation sent by the Nuclear Regulatory Commission to individuals with respect to these enforcement actions. It is anticipated that the information in this publication will be widely disseminated to managers and employees engaged in activities licensed by the NRC. The Commission believes this information may be useful to licensees in making enforcement decisions.

2 Main Citations and Abstracts

NUREG-0940 V15 N2 P2: ENFORCEMENT ACTIONS: SIGNIFI-CANT ACTIONS RESOLVED REACTOR

LICENSEES.Semiannual Progress Rept, July-December 1996. * Ofc of Enforcement (Post 870413). April 1997. 400pp. 9705210290. 93063:001.

This compilation summarizes significant enforcement actions that have been resolved during the period (July - December 1996) and includes copies of letters. Notices, and Orders sent by the Nuclear Regulatory Commission to reactor licensees with respect to these enforcement actions. It is anticipated that the information in this publication will be widely usseminated to managers and employees engaged in activities licensed by the NRC, so that actions can be taken to improve pafety by avoiding future violations similar to those described in this publication.

NUREG-0940 V15 N2 P3: ENFORCEMENT ACTIONS: SIGNIFI-CANT ACTIONS RESOLVED MATERIAL LICENSEES.Semiannual Progress Report, July-December 1996. * Ofc of Enforcement (Post 870413). April 1997. 300pp. 9705140378. 92886:001.

This compilation summarizes significant enforcement actions that have been resolved during the period (July - December 1996) and includes copies of letters, Notices, and Orders sent by the Nuclear Regulatory Commission to material licensees with respect to these enforcement actions. It is anticipated that the information in this publication will be widely disseminated to managers and employees engaged in activities licensed by the NRC, so that actions can be taken to improve safety by avoiding future violations similar to those described in this publication.

*UREG-1125 V18: A COMPILATION OF REPORTS OF THE AD-VISORY COMMITTEE ON REACTOR SAFEGUARDS.1996 Annual. * ACRS - Advisory Committee on Reactor Safeguards. April 1997, 128pp. 9706250071. §3502:001.

This compilation contains 47 ACRS reports submitted to the Commission, or to the Executive Director for Operations, during calendar year 1996. It also includes a report to the Congress on the NRC Safety Research Program. All reports have been made available to the public through the NRC Public Document Room, the U.S. Library of Congress, and the internet at http://www.nrc.gov/ACRSACNW. The reports are divided into two groups: Part 1: ACRS Reports on Project Reviews, and Part 2: ACRS Reports on Generic Subjects. Part 1 contains ACRS reports by project name and by chronological order within project name. Part 2 categorizes the reports by the most appropriate generic subject area and by chronological order within subject area.

NUREG-1350 V09: NUCLEAR REGULATORY COMMISSION IN-FORMATION DIGEST.1997 Edition. GARVER.M. Division of Budget & Analysis (Post 890205). May 1997. 144pp. 9707180165. 93805:045.

The Nuclear Regulatory Commission Information Digest (digest) provides a summary of information about the U.S. Nuclear Regulatory Commission (NRC), NRC's regulatory responsibilities, NRC licensed activities, and general information on domestic and worldwide nuclear energy. The digest published annually, is a compilation of nuclear and NRC-related data and is designed to provide a quick reference to major facts about the agency and the industry it regulates. In general, the data cover 1975 through 1996, with exceptions noted. Information on generating capacity and average capacity factor for operating U.S. commercial nuclear power reactors is obtained from monthly operating reports that are submitted directly to the NRC by the licensee. This information is reviewed by the NRC for consistency only and no independent validation and/or verification is performed. NUREG-1503 S01: FINAL SAFETY EVALUATION REPORT RE-LATED TO THE CERTIFICATION OF THE ADVANCED BOIL-ING WATER REACTOR DESIGN.Supplement No. 1.Docket No. 52-001.(General Electric Nuclear Energy) * Office of Nuclear Reactor Regulation (Post 941001). May 1997. 49pp. 9706120299. 93337:217.

This report supplements the final safety evaluation report (FSER) for the U.S. Advanced Boiling Water Reactor (ABWR) standard design. The FSER was issued by the U.S. Nuclear Regulatory Commission (NRC) staff as NUREG-1503 in July 1994 to document the NRC staff's review of the U.S. ABWR design. The U.S. ABWR design was submitted by GE Nuclear Energy (GE) in accordance with the procedures of Subpart B to Part 52 of Title 10 of the Code of Federal Regulations. This supplement documents the NRC staffs review of the changes to the U.S. ABWR design documentation since the issuance of the FSER. GE made these changes primarily as a result of first-ofa-kind-engineering (FOAKE) and as a result of the design certification rulemaking for the ABWR design. On the basis of its evaluation, the NRC staff concludes that the confirmatory issues in NUREG-1503 are resolved, that the changes to the ABWR design documentation are acceptable, and that GE's application for design certification meets the requirements of Subpart B to 10 CFR Part 52 that are applicable and technically relevant to the U.S. ABWR design.

NUREG-1516: MANAGEMENT OF RADIOACTIVE MATERIAL SAFETY PROGRAMS AT MEDICAL FACILITIES.Final Report. CAMPER.L.W.; SCHLUETER,J.; WOODS,S.; et al. Division of Industrial & M., ticcl Nuclear Safety (Post 870729). May 1997. 193pp. 9706120304, 93341:100.

A Task Force composed of eight U.S. Nuclear Regulatory Commission and two Agreement State program staff members developed the guidance contained in this report. The purpose of this report is to describe a systematic approach for effective management of radiation safety programs at medical facilities. This is accomplished by emphasizing the roles of institution executive manager. ont, radiation safety committee, and radiation safety officer. Various aspects of program management are discussed and include guidance on selecting the radiation safety officer, determining adequate resources for the program, the use of contractual services such as consultants and service companies, the conduct of audits, the roles of authorized users and supervised individuals, NRC's reporting and notification requirements, and a general description of how NRC's licensing, inspection, and enforcement programs work. Appendices provide detailed guidance on specific aspects of a radiation safety program and the glossary defines terms used throughout the report. The guidance contained herein does not represent new or proposed regulatory requirements and licensees will not be inspected against any portion of it. Additionally, regulatory compliance with all applicable regulations is not assured by licensees who adopt any portion of, or apply the principles described in, this report.

NUREG-1542 V02: ACCOUNTABILITY REPORT FISCAL YEAR 1996. CONNELLY,S.R. Office of the Controller (Post 890205). April 1997. 92pp. 9705210298. 93064:001.

The U.S. Nuclear Regulatory Commission (NRC) is one of six Federal agencies participating in a pilot project to streamline financial management reporting. The goal of this pilot is to consolidate performance-related reporting into a single accountability report in accordance with the Government Management Reform Act (GMRA) of 1994. The NRC's second accountability report consolidates the information previously reported in the NRC's annual financial statement required by the Chief Financial Officers Act of 1990, as amended; the chairman's annual report to the President and the Congress, required by the Federal Managers' Financial Integrity Act of 1982; and the Chairman's semiannual report to the Congress on management decisions and final actions on Office of Inspector General (OIG) audit recommendations, required by the Inspector General Act NUREG-1556 V01: CONSOLIDATED GUIDANCE ABOUT MATE-RIALS LICENSES.Program-Specific Guidance About Portable Gauge Licenses.Final Report. VACCA,P.C.; WHITTEN,J.E.; PELCHAT,J.M.; et al. Division of Industrial & Medical Nuclear Safety (Post 870729). May 1997. 146pp. 9706180459. 93393:214.

As part of its redesign of the materials licensing process, NRC is consolidating and updating numerous guidance documents into a single comprehensive repository as described in NUREG-1539 and draft NUREG-1541. NUREG-1556, Vol. 1, is the first program-specific guidance developed for the new process and will serve as a template for subsequent program-specific guidance. This document is intended for use by applicants, licensees, and NRC staff and will also be available to Agreement States. This document supersedes the guidance previously found in draft Regulatory Guide DG-0008, "Applications for the Use of Sealed Sources in Portable Gauning Devices," and in NMSS Policy and Guidance Directive 2-07, "Standard Review Plan for Applications for Use of Sealed Sources in Portable Gauging Devices." This final report takes a more risk-informed. performance-based approach to licensing portable gauges, and requises the information (amount and level of detail) needed to support an application to use these devices. It incorporates many suggestions submitted during the comment period on draft NUREG-1556, Vol. 1. When published, this final report should be used in preparing portable gauge license applications. NRC staff will use this final report in reviewing these applications.

- NUREG-1572: SAFETY EVALUATION REPORT RELATED TO VHE RENEWAL OF THE OPERATING LICENSE FOR THE RE-SEARCH REACTOR AT NORTH CAROLINA STATE UNIVERSI-TY. * Office of Nuclear Reactor Regulation (Post 9410-1). April 1997. 120pp. 9705280265. 93126:178.
 - This safety evaluation report (SER) summarizes the findings of a safety review conducted by the staff of the U.S. Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation (NRR). The staff conducted this review in response to a timely application filed by North Carolina State University (the iicensee or NCSU) for a 20-year renewal of Facility Operating License R-120 to continue to operate the NCSU PULSTAR research reactor. The facility is located in the Burlington Engineering Laboratory complex on the NCSU campus in Raleigh, North Carolina. In its safety review, the staff considered information submitted by the licensee (including past operating history recorded in the licensee's annual reports to the NRC), as well as inspection reports prepared by NRC Region II personnel and first-hand observations. On the basis of this review, the staff concludes that NCSU can continue to operate the PULSTAR research reactor, in accordance with its application, without endangering the health and safety of the public.
- NUREG-1802 DRFT FC: THE USE OF PRA IN RISK-INFORMED APPLICATIONS.Draft Rept For Comment. * Division of Systems Technology (Post 941217). June 1997. 150pp. §707140029. 93737:167.

In August 1995, the Nuclear Regulatory Commission issued a policy statement proposing improved regulatory decisionmaking "by increasing the use of PRA [probabilistic risk assessment/ analysis] in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data." To support the implementation of the Commission's policy, regulatory guidance documents have been developed by the staff (as drafts for public comment) describing how PRA can be used in specific regulatory activities, many of which relate to licensee-proposed changes to their current licensing basis (CLB). In addition, a more general regulatory guide has been developed which describes an overall approach to using PRA in ... informed regulation. One key aspect of this general guidance is the attributes

of an acceptable PRA for such regulatory activities. Detailed discussion is provided for a full-scope PRA (i.e., a PRA that considers both internal and external events for all modes of operation). In addition, discussions are provided for the use and limitations of importance measures and censitivity studies. Finally, the subject of peer review of a PRA is also discussed.

NUREG-1603 DHFT: INDIVIDUAL PLANT EXAMINATION DATABASE.User's Guide. SU,T.M. Office of Nuclear Regulatory Research (Post 941217). DANZIGER,L.M. Office of Information Resources Management (Post 890205). LIN,C.C.; et al. Brookhaven National Laboratory. April 1997. 150pp. 9705010320. 92697:069.

The individual Plant Examination (IPE) database stores structured information about plant designs, core damage frequency (CDF) and containment performance. It records the presence or absence of hardware in each design, characterizes its functional dependencies, and relates these features to the CDF and containment performance. The IPE database supports detailed inquiries into these characteristics for a specific plant or class of plants. In particular, the IPE database is designed to answer questions that enable interested parties to compare the CDF and containment performance of boiling- and pressurized- water reactors (BWRs and PWRs) as a function of their design features, on the basis of information found in the IPE submittals. To query the IPE database, two programs have been developed. The first is a self-contained, user friendly, menu-driven program written in Microsoft's Visual Basic language. This program answers the "basic queries" most often asked about the IPEs, through a process of sorting records within the IPE database. Queries of this type can be improvised on the spot. Other "advanced gueries" that call for calculations, linking of data files, and ranking or sorting on the basis of calculation can be performed using the programming language within such personal computer data management applications as dBase, Access, or Paradox. This IPE database user's guide provides guidance for formulating basic and advanced queries. The guidance for advanced queries is given in terms of Microsoft Access 2.0.

NUREG-1604: CIRCUMFERENTIAL CRACKING OF STEAM GEN-ERATOR TUBES. KARWOSKI,K.J. Office of Nuclear Reactor Regulation (Post 9410C1). April 1997. 171pp. 9705160211. 93024:113.

On April 28, 1995, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 95-03, "Circumferential Cracking of Steam Generator Tubes." GL 95-03 was issued to obtain information needed to verify licensee compliance with existing regulatory requirements regarding the integrity of steam generator tubes in domestic pressurized-water reactors (PWRs). This report briefly describes the design and function of domestic steam generators and summarizes the staffs assessment of the responses to GL 95-03. The report concludes with several observations related to steam generator operating experience. This report is intended to be representative of significant operating experience pertaining to circumferential cracking of steam generator tubes from April 1995 through December 1996. Operating experience prior to April 1995 is discussed throughout the report, as necessary, for completeness.

NUREG-1606 DRFT FC: PROPOSED REGULATORY GUIDANCE RELATED TO IMPLEMENTATION OF 10 CFR 50.59 (CHANGES, TESTS, OR EXPERIMENTS).Draft Report For Comment. MCKENNA,E.M. Office of Nuclear Reactor Regulation (Post 941001). April 1997. 61pp. 9705140368. 92887:102.

The Nuclear Regulatory Commission is issuing this draft guidance document for public comment that describes current interpretations related to the process by which power reactor licensees may make certain plant changes without prior NRC approval. The draft guidance reaffirms existing regulatory practice in many areas; clarifies the staff's expectations in areas where industry practice or position differs from the staff's and estab-

4 Main Citations and Abstracts

lishes guidance in areas where guidance did not previously exist.

NUREG-1607: SAFETY EVALUATION REPORT RELATED TO THE DEPARTMENT OF ENERGY'S PROPOSAL FOR THE IR-RADIATION OF LEAD TEST ASSEMBLIES CONTAINING TRIT-IUM-PRODUCING BURNABLE ABSORBER RODS IN COM-MERCIAL LIGHT-WATER REACTORS. * Office of Nuclear Reactor Regulation (Post 941001). May 1997. 78pp. 9706190451. 93409:250.

The NRC staff has reviewed a report, submitted by DOE to determine whether the use of a commercial light water reactor (CLWR) to irradiate a limited number of tritium-producing burnable absorber rods (TPBARs) in lead test assemblies (LTAs) raises generic issues involving an unreviewed safety question. The staff has prepared this safety evaluation to address the acceptability of these LTAs in accordance with the provision of 10 CFR 50.59 without NRC licensing action. As summarized in Section 10 of this safety evaluation, the staff has identified issues that require NRC review. The staff has also identified a number of areas in which an individual licensee undertaking irradiation of TPBAR LTAs will have to supplement the information in the DOE report before the staff can determine whether the proposed irradiation is acceptable at a particular facility. The staff concludes that a licensee undertaking irradiation of TPBAR LTAs in a CLWR will have to submit an application for amendment to its facility operating license before inserting the LTAs into the reactor.

NUREG-1608 DRFT FC: CATEGORIZING AND TRANSPORTING LOW SPECIFIC ACTIVITY MATERIALS AND SURFACE CON-TAMINATED OBJECTS.Draft Rept For Comment. * Office of Nuclear Material Safety & Safeguards. * Transportation, Dept. of. June 1997, 60pp. 9707140018. 93738:098.

The primary purpose of this guidance is to assist shippers in preparing low specific activity materials (LSA) and surface containinated objects (SCOs) for shument in compliance with Federal regulations. Guidance is provided in question and answer format on the classification, characterization, packaging and transportation of LSA and SCOs, including the definition of LSA and SCOs, the determination of distribution on of activity in LSA material or on SCO surfaces, mixing LSA and SCOs in a package, radiation level measurements, and various other aspects of transporting LSA and SCOs. There are many requirements, other than those addressed herein, imposed in the shipment of LSA and SCOs. The guidance represents one or more methods of demonstrating compliance with the regulatory requirements for LSA material and SCOs that have been found acceptable to NRC staff; however, additional methods may also be found to be acceptable with adequate justification. This document is being issued for public comment. As a result of the public comments, or internal peer review and discussions, the content of the final guidance may be significantly different from that presented in this document.

NUREG-1610: CONTROLLING THE ATOM.The Beginnings Of Nuclear Regulation, 1946-1962. MAZUZAN,G.T.; WALKER,S. Office of the Secretary of the Commission. May 1997. 558pp. 9707220273. 93827:001.

Controlling the Atom is a study of the early history of nuclear regulation. It focuses on the activities of the U.S. Atomic Energy Commission (predecessor of the Nuclear Regulatory Commission), the agency that exercised primary responsibility for safeguarding public health and safety from the hazards of nuclear power. The book reconstructs the context in which the AEC established its regulatory program, weighing the relationship between the AEC's regulatory programs and its other major functions: developing and testing of nuclear weapons and encouraging expanded use of civilian nuclear energy. A persistent theme is the AEC's effort to ensure adequate protection of public health and safety without imposing restrictive or inflexible regulations that would impede the growth of the nuclear industry. The book provides detailed accounts of key issues such as licensing nuclear power reactors, siting of plants, developing standards for radiation protection, and disposing of radioactive wastes.

NUREG/CP-0155: PROCEEDINGS OF THE SEMINAR ON LEAK BEFORE BREAK IN REACTOR PIPING AND VESSELS. FAIDY,C. France. GILLES,PH. FRAMATOME. April 1997. 774 pp. 9704240208. 92599:001.

The sixth in a series of international Leak-Befc, e-Break (LBB) Seminars was held at Hotel Sofitel in Lyon, France on October 9 through 11, 1995. The seminar updated international policies and supporting research on LBB. Attendees included representatives from regulatory agencies, electric utility representatives, fabricators of nuclear power plants, research organizations, and academic institutions. The objective of the seminar was to present the current state of the art in LBB methodology development, validation, and application in an international forum. With particular emphasis on industrial applications and regulatory policies, the seminar provided an opportunity to compare approaches, experiences, and codifications developed by different countries. The seminar was organized into four topic areas: Status of LBB AL lications, Technical Issues in LBB, Methodology, Complementary Requirements (Leak Detection and Inspection), and LBB Assessment and Margins. In addition to the formal sessions where papers were presented by participants from France, Germany, Japan, Korea, Belgium, the United Kingdom, the Czech Republic, Finland, Russia, Sweden, Canada, the Netherlands, and the United States, informal LBB poster sessions were available outside the presentation hall. As a result of this seminar, better estimates of the limits to the LBB approach should follow, as well as an improvement in coditying methodologies.

NUREG/CP-0158: PROCEEDINGS OF THE OECD/CSNI SPE-CIALISTS MEETING ON BORON DILUTION REACTIVITY TRANSIENTS.Held In State College, Pennsylvania.USA,October 18-20, 1995. * Organization for Economic Cooperation & Development. * Pennsylvania State Univ., University Park, PA. June 1997. 468pp. 9707180208. NEA/CSNI/R(96)3. 93800:001.

A CSNI Specialist Meeting on Boron Dilution Reactivity Transients was held in State College, Pennsylvania, USA, from October 18-20, 1995. The meeting was sponsored by the United States Nuclear Regulatory Commission (USNRC) in collaboration with the Committee on the Safety of Nuclear Installation (CSNI) of the OECD Nuclear Energy Agency (NEA) and the Pennsylvania State University. The objective of the meeting was to bring together experts involved in the different activities related to boron dilution transients, to promote discussion among these experts, and to focus on the technical issues of concern in resolving the safety significance of such events.

NUREG/CR-0200 R5V1P1: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LICENSING EVALUATION.Control Modules C4, C6. * Oak Ridge National Laboratory. March 1997. 599pp. 9705120302. ORNLNUREGCSD2R5. 92830:001.

SCALE-a modular code system for Standardized Computer Analyses Licensing Evaluation-has been developed by Oak Ridge National Laboratory at the request of the U.S. Nuclear Regulatory Commission. The SCALE system utilizes well-established computer codes and methods within standard analysis sequences that (1) allow an input format designed for the occasional user and/or novice, (2) automated the data processing and coupling between modules, and (3) provide accurate and reliable results. System development has been directed at problem-dependent cross-section processing a nalysis of criticality safety, shielding, heat transfer, and depletion/decay problems. Since the initial release of SCALE in 1980, the code system has been heavily used for evaluation of nuclear fuel facility and package designs. This revision documents Version 4.3 of the system.

See NUREG/CR-0200,R5,V1,P1 abstract.

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- NUREG/CR-0200 R5V2P1: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LICENSING EVALUATION.Functional Modules F1 - F8. * Oak Ridge National Laboratory. March 1997. 705pp. 9705120317. ORNLNUREGCSD2R5. 92843:001. See NUREG/CR-0200,R5,V1,P1 abstract.
- NUREG/CR-0200 R5V2P2: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LICENSING EVALUATION.Functional Modules F9 - F11.* Oak Ridge National Laboratory. March 1997. 832pp. 9705120321. ORNLNUREGCSD2R5. 92866:001.

See NUREG/CR-0200,R5,V1,P1 abstract.

- NUREG/CR-0200 R5V2P3: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LICENSING EVALUATION.Functional Modules F16 - F17. * Oak Ridge National Laboratory, March 1997. 606pp. 9705120322. ORNLNUREGCSD2R5. 92869:001. See NUREG/CR-0200,R5,V1,P1 abstract.
- NUREG/CR-0200 R5V3: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LICENSING EVALUATION. Miscellaneous. * Oak Ridge National Laboratory. March 1997. 764pp. 9705120311. ORNLNUREGCSD2R5. 92840:001.

See NUREG/CR-0200,R5,V1,P1 abstract.

- NUREG/CR-4667 V22: ENVIPONMENTALLY ASSISTED CRACK-ING IN LIGHT WATER REACTORS. Semiannual Report, January 1996 - June 1996. CHOPRA, O.K.; CHUNG, H.M.; GAVENDA, D.J.; et al. Argonne National Laboratory. May 1997. 98pp. 9706110115. ANL-97/9. 93318:150.
- This report summarizes work performed by Argonne National Laboratory on fatigue and environmentally assisted cracking (EAC) in light water reactors from January 1996 to June 1996. Topics that have been investigated include (a) fatigue of carbon, low-alloy, and austenitic stainless steels (SSs) used in reactor piping and pressure vrissels, (b) irradiation-assisted stress corrosion cracking of Type 304 SS, and (c) EAC of Alloys 600 and 690. Fatigue tests were conducted on ferritic and austenitic SSs in water that contained various concentrations of dissolved oxygen (DO) to determine whether a slow strain rate applied during various portions of a tensile-loading cycle are equally effective in decreasing fatigue life. Slow-strain-rate-tensile tests were conducted in simulated boiling water reactor (BWR) water at 288 degrees C on SS specimens irradiated to a low fluence in the Halden reactor and the results were compared with similar data from a control-blade sheath and neutron-absorber tubes irradiated in BWRs to the same fluence level. Crack-growth-rate tests were conducted on compact-tension specimens from several heats of Alloys 600 and 690 in air and high-purity, low-DO water.
- NUREG/CR-4674 V23: PRECURSORS TO POTENTIAL SEVERE CORE DAMAGE ACCIDENTS: 1995. A Status Report. BELLES,R.J.; CLETCHER,J.W.; COPINGER,D.A.; et al. Oak Ridge National Laboratory. April 1907. 300pp. 9706120307. ORNL/NOAC-232. 93343:041.
 - Ten operational events that affected ten commercial lightwater reactors (LWRs) during 1995 that are considered to be precursors to potential severe core damage are described. All of these events had conditional probabilities of subsequent core damage greater than or equal to $1.0 \times 10(-6)$. These events were identified by computer-screening the 1995 licensee event reports from commercial LWRs to identify those that could be potential precursors. Candidate precursors were then selected and evaluated in a process similar to that used in previous as-

sessments. Selected events underwent engineering evaluation that identified, analyzed, and documented the precursors. Other events designated by the Nuclear Regulatory Commission (NRC) also underwent a similar evaluation. Finally, documented precursors were submitted for review by licensees and NRC staff to ensure that the plant design and its response to the precursor were correctly characterized. This study is a continuation of earlier work, which evaluated 1969-1981 and 1984-1994 events. The report discusses the general rationale for this study, the selection and documentation of events as precursors, and the estimation of conditional probabilities of subsequent severe core damage for events.

NUREG/CR-4674 V24: PRECURSORS TO POTENTIAL SEVERE CORE DAMAGE ACCIDENTS: 1982-83.A Status Report. FORESTER, J.A.; SCHRINER, H.K.; et al. Sandia National Laboratories. MINARICX, J.W. Science Applications International Corp. (formerly Science Applications, Inc.). April 1997. 515pp. 9706120352. SAND97-0807. 93338:001.

This study is a continuation of earlier work that evaluated 1969-1981 and 1984-1994 events affecting commercial lightwater reactors. One-hundred nine operational events that affected 51 reactors curing 1982 and 1983 and that are considered to be precursors to potential severe core damage are described. All these events had conditional probabilities of subsequent severe core damage greater than or equal to 1.0 x 10(-6). These events were identified by first computer screening the 1982-83 licensee event reports from commercial light-water reactors to select events that could be precursors to core damage. Candidates underwent engineering evaluation that identified, analyzed, and documented the precursors. This report discusses the general rationale for the study, the selection and documentation of events as precursors, and the estimation of conditional probabilities of subsequent severe core damage for the events.

NUREG/CR-5591 V07 N1: HEAVY-SECTION STEEL IRRADIA-TION PROGHAM.Semiannual Progress Report For October 1995 Through March 1996. CORWIN,W.R. Oak Ridge National Laboratory. April 1997. 63pp. 9705120292. ORNL/TM-11560. 92828:054.

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The goal of the Heavy-Section Steel Irradiation Program is to provide a thorough, quantitative assessment of effects of neutron irradiation on material behavior, and in particular the fracture toughness properties, of typical pressure vessel steels as they relate to light-water reactor pressure-vessel integrity. Effects of specimen size, material chemistry, product form and microstructure, irradiation fluence, flux, temperature and spectrum, and post-irradiation annealing are being examined on a wide range of fracture properties. The HSSI Program is arranged into 14 tasks: (1) program management, (2) fracture toughness (K(Ic)) curve shift in high-copper welds, (3) crack-arrest toughness (K(la)) curve shift in high-copper welds, (4) irradiation effects on cladding, (5) K(Ic) and K(Ia) curve shifts in low uppershelf welds, (6) annealing effects in low upper-shelf welds, (7) irradiation effects in a commercial low upper-shelf weld, (8) microstructural analysis of irradiation effects, (9) in-service aged material evaluations, (10) correlation monitor materials, (11) special technical assistance, (12) JPDR steel examination, (13) technical assistance for JCCCNRS Working Groups 3 and 12. and (14) additional requirements for materials. This report provides an overview of the activities within each of these tasks from October 1995 Through March 1996.

NUREG/CR-5661: RECOMMENDATIONS FOR PREPARING THE CRITICALITY SAFETY EVALUATION OF TRANSPORTATION PACKAGES. DYER,H.R.; PARKS,C.V. Oak Ridge National Laboratory. April 1997. 58pp. 9705160214. ORNL/TM-11936. 93024:284.

This report provides recommendations on preparing the criticality safety section of an application for approval of a transportation package containing fissile material. The analytical approach to the evaluation is emphasized rather than the performance standards that the package must meet. Where performance standards are addressed, this report incorporates the requirements of 10 CFR Part 71.

NUREG/CR-6037: MEASUREMENT OF RESIDUAL RADIOAC-TIVE SURFACE CONTAMINATION BY 2-D LASER HEATED TLD. JONES,S.C. Keithley Instruments, Inc. June 1997. 100pp. 9706240042. 93499:001.

The feasibility of applying and adapting a two-dimensional laser heated thermoluminescence dosimetry system to the problem of surveying for radioactive surface contamination was studied. The system consists of a CO(2) laser-based reader and monolithic arrays of thin dosimeter elements. The arrays consist of 10,201 thermoluminescent phosphor elements of 40 micron thickness, covering a 900 CM(2) area. Array substrates are 125 micron thick polyimide sheets, enabling them to easily conform to regular surface shapes, especially for survey of surfaces that are inaccessible for standard survey instruments. The passive, integrating radiation detectors are sensitive to alpha and beta radiation at contamination levels below release guideline limits. Required contact times with potentially contaminated surfaces are under one hour to achieve detection of transuranic alpha emission at 100 dpm/100 cm(2). Positional information obtained from array evaluation is useful for locating contamination zones. Unique capabilities of this sy 'em for survey of sites, facilities and material include measurement inside pipes and other geometrical configurations that prevent standard surveys, and below-surface measurement of alpha and beta emitters in contaminated soils. These application "'y a reduction of material that must be classified as waste by virtue of its possibility of contamination, :. avings in soil sampling at contaminated sites

NUREG/CR-6074 V03: SEALED SOURCE AND DEVICE DESIGN SAFETY TESTING. Technical Report On The Findings Of Task 4. Investigation Of A Failed Brachytherapy Needle Applicator. LUKEZICH, S.J. Southwest Research Institute. May 1997. 77pp. 9706110126. 04-4448-012. 93335:225.

As a result of an incident in which a radioactive brachytherapy treatment source was temporarily unable to be retracted, an analysis was performed on the needle applicator used during the treatment. In this report, the results of laboratory evaluations of the physical, mechanical, and metallurgical condition of the subject applicator and two additional applicators are presented. A kink formed in the subject applicator during the incident. The laboratory investigation focused on identifying characteristics which would increase the susceptibility of an applicator to form a kink when subjected to bending loads. The results obtained during this investigation could not conclusively identify the cause of the kink. The subject applicator exhibited no unique features which would have made it particularly susceptible to forming a kink. The three applicators examined represent two methods of manufacturing. A number of characteristics inherent to the method used to manufacture the subject applicator which could lead to an increased susceptibility to one tunnation of a kink were observed. The use of an insertion device, such as the biopsy needle used during this incident, could also dramatically increase the likelihood of the formation of a kink if the applicator is subjected to bending loads

NUREG/CR-6153: A SIMPLIFIED MODEL OF DECONTAMINA-TION BY BWR STEAM SUPPRESSION POOLS. POWERS,D.A. Sandia National Laboratories. May 1997. 463pp. 9706120310. 93340:001.

An uncertainty analysis of aerosol removal by nuclear reactor steam suppression pools is described. Uncertainties considered in the analyses include uncertainties in boundary conditions dictated by accident progression, uncertainties in bubble behavior, and uncertainties in aerosol properties. Uncertainty distribution for decontainnation factors, aerosol particle sizes, and the geometric standard deviation of the size distributions are developed as functions of suppression pool depth. Resulte of the uncertainty distribution are used to construct a simplified model of decontamination by steam suppression pools.

NUREG/CR-6167: LATE-PHASE MELT PROGRESSION EXPERI-MENT MP-2.Results And Analysis. GASSER,R.D.; GAUNTT,R.O.; BOURCIER,S.C.; et al. Sandia National Laboratories. May 1997. 275pp. 9707180201. SAND93-3931. 93801:105.

A series of in-pile experiments addressing the phenomenology associated with Late-Phase processes in Light Water Reactors (LWRs) has been performed in the Annular Core Research Reactor (ACRR) at Sandia National Laboratories. The Melt Progression (MP) experiments were designed to provide information as part of the effort to develop and verify computer models for the LWR core damage during severe accidents. The MP-2 experiment is the second experiment in this series. The '1P-2 experiment examine the formation and movement of ceramic molten pools that form in the disrupted regions of a reactor core. The MP-2 experiment assembly consisted of three regions: (1) a rubble bed composed of enriched UO(2) and ZrO(2) that simulated the severely disrupted regions of the reactor core, (2) a composite ceramic/metallic crust which represented the blockage formed by the early phase melting, relocation, and refreezing of mostly metallic core components, and (3) an intact rod stub region that remained in place below the blockage region. The test assembly was fission heated in the central cavity of the ACRR at an average rate of ~0.2 K/s ultimately achieving a peak temperature in the molten pool of - 3400 K. As ACRR power levels were increased over time, the crust gradually remelted and reformed, penetrating into and attacking the ceramic/metallic blockage. The metallic components of the blockage region melted and relocated downward to the bottom of the intact rod stub region. The ceramic pool penetrated halfway into the blockage region at the end of the experiment. Postexperiment examination of the assembly with the associated material interactions and metallurgy are discussed in detail together with the analyses and interpretation of the results.

NUREG/CR-6233 V02: STABILITY OF CRACKED PIPE UNDER SEISMIC/DYNAMIC DISPLACEMENT-CONTROLLED STRESSES.Subtask 1.2 Final Report. KRAMER.G.; VIETH.P.; MARSCHALL.C.; et al. Battelle Memorial Institute, Columbus Laboratories. June 1997. 170pp. 9707140055. BMI-2177. 93737:001.

Results of displacement-controlled pipe fracture experiments, analyses, and material characterization efforts performed within the International Piping Integrity Research Group, IPIRG, Program Subtask 1.2 are discussed. Effects of dynamic versus quasi-static and monotonic versus cyclic loading were evaluated for ductile tearing of two materials, A106 Grade B ferritic steel and TP304 austenitic steel. Twelve through-wall-cracked pipe experiments were conducted on 6-inch diameter Schedule 120 pipe at 288 C (550 F). The results indicated dynamic loading at seismic strain rates marginally increased the load-carrying capacity of austenitic steel. The 'arritic steel tested was sensitive to dynamic strain-aging, and consequently, its load-carrying capacity decreased at dynamic strain rates. Two parameters were found to affect the apparent ductile crack growth resistance during cyclic loading, load ratio (R) and incremental plastic displacement that occurs in a cycle. Cyclic (R = 0) loading had minimal effect on ductile tearing for both materials. However, fully reversed loading decreased the load-carrying capacity and toughness for both materials. The incremental plastic displacement can be as important as the load ratio; however, it is harder to quantify from design stress reports. Large plastic displacements will minimize the effect of negative load ratios.

NUREG/CR-6233 V03: CRACK STABILITY IN A REPRESENTA-

This report presents the results from Subtask 1.3 of the International Piping Integrity Research Group (IPIRG) program. The objective of Subtask 1.3 is to develop data to assess analysis methodologies for characterizing the fracture behavior of circumferentially cracked pipe in a representative piping system under combined inertial and displacement-controlled stresses. A unique experimental facility was designed and constructed. The piping system evaluated is an expansion loop with over 30 meters of 16-inch diameter Schedule 100 pipe. The experimental facility is equipped with special hardware to ensure system boundary conditions could be appropriately modeled. The test matrix involved one uncracked and five cracked dynamic prpesystem experiments. The uncracked experiment was conducted to evaluate piping system damping and natural frequency characteristics. The cracked-pipe experiments evaluated the fracture behavior, pipe system response, and stability characteristics of five different materials. All cracked-pipe experiments were conducted at PWR conditions. Material characterization efforts provided tensile and fracture toughness properties of the different pipe materials at various strain rates and temperatures. Pasults from all pipe-system experiments and material characterization efforts are presented. Results of fracture mechanics analyses. dynamic finite element stress analyses, and stability analyses are presented and compared with experimental results

NUREG/CR-3233 V04: INTERNATIONAL PIPING INTEGRITY RESEARCH PROGRAM (IPIRG) PROGRAM.Program Final Report. WILKOWSKI,G.; SCHMIDT,R.; SCOTT,P.; et al. Battelle Memorial Institute, Columbus Laboratories. June 1997. 320pp. 9707140072. BMI-2177. 93736:001.

This is the final report of the International Piping Integrity Research Group (IPIRG) Program. The IPIRG Program was an international group program managed by the U.S. Nuclear Regulatory Commission and funded by a consortium of organizations from nine nations: Canada, France, Italy, Japan, Sweden, Switzerland, Taiwan, the United Kingdom, and the United States. The program objective was to develop data needed to verify engineering methods for assessing the integrity of circumferentially cracked nuclear power plant piping. The primary focus was an experimental task that investigated the behavior of circumferentially flawed piping systems subjected to high-rate loadings typical of seismic events. To accomplish these objectives a pipe system fabricated as an expansion loop with over 30 meters of 16-inch diameter pipe and five long radius elbows was constructed. Five dynamic, cyclic, flawed piping experiments were conducted using this facility. This report: (1) provides background information on leak-before-break and flaw evaluation procedures for piping, (2) summarizes technical results of the program, (3) gives a relatively detailed assessment of the results from the pipe fracture experiments and complementary analyses, and (4) summarizes advances in the state-ofthe-art of pipe fracture technology resulting from the IPIRG program.

NUREG/CR-6331 R01: ATMOSPHERIC RELATIVE CONCEN-TRATIONS IN BUILDING WAKES. RAMSDELL,J.V.; SIMONEN,C.A. Battelle Memorial Institute, Pacific Northwest National Laboratory. May 1997. 150op. 9706120318. PNNL-12521. 93339:152.

This report documents the ARCON96 computer code developed for the U.S. Nuclear Regulatory Commission Office Of Nuclear Reactor Regulation for use in control room habitability assessments. It includes a user's guide to the code, a description of the technical basis for the code, and a programmer's guide to the code. The ARCON96 code uses hourly meteorological data and recently developed methods for estimating dispersion in the vicinity of buildings to calculate relative concentrations at control room air intakes that would be exceeded no more than five percent of the time. These concentrations are calculated for averaging periods ranging from one hour to 30 days in duration. ARCON96 is a revised version of ARCON95, which was developed for the NRC Office of Nuclear Regulatory Research. Changes in the code permit users to simulate releases from area sources as well as point sources. The method of averaging concentrations for periods longer than 2 hours has also been changed. The change in averaging periods in general, the increase in concentrations is less than a factor of two. The increase is greatest for relatively short averaging periods, for example 0 to 8 hours and diminishes as the duration of the averaging period increases.

NUREG/CR-6361: CRITICALITY BENCHMARK GUIDE FOR LIGHT-WATER-REACTOR FUEL IN TRANSPORTATION AND STORAGE PACKAGES. LICHTENWALTER; BOWMAN,S.M.; DEHART,M.D.; et al. Oak Ridge National Laboratory. March 1997. 358pp. 9705120283. ORNL/TM-13211. 92829:001.

This report is designed as a guide for performing criticality benchmark calculations for light-water-reactor (LWR) fuel applications. The guide provides documentation of 180 criticality experiments with geometries, materials, and neutron interaction characteristics representative of transportation packages containing LWR fuel or uranium oxide pellets or powder. These experiments should benefit the U.S. Nuclear Regulatory Commission (NRC) staff and licensees in validation of computational methods used in LWR fuel storage and transportation concerns. The experiments are classified by key parameters such as enrichmont, water/fuel volume, hydrogen-to-fissile ratio (H/X), and lattice pitch. Groups of experiments with common features such as separator plates, shielding walls, and soluble boron are also identified. In addition, a sample validation using these experiments and a statistical analysis of the results are provided. Recommenciations for selecting suitable experiments and determination of calculational bias and uncertainty are presented as part of this benchmark guide.

NUREG/CR-6363: EFFECTS OF THERMAL AGING AND NEU-TRON IRRADIATION ON THE MECHANICAL PROPERTIES OF THREE-WIRE STAINLESS STEEL WELD OVERLAY CLAD-DING. HAGGAG, F.M.; NANSTAD, R.K. Oak Ridge National Laboratory. May 1997. 39pp. 9705280200. ORNL/TM-13047. 93126:289.

Thermal aging of three-wire series-arc stainless steel weld overlay cladding at 288 degrees C for 1605 h resulted in an appreciable decrease (16%) in the Charpy V-notch (CVN) uppershelf energy (USE), but the effect on the 41-J transition temperature shift was very small (3 degrees C). The combined effect of aging and neutron irrudiation at 288 degrees C to a fluence of 5 x 10(19) neutrons/cm(2) (> 1 MeV) was a 22% reduction in the USE and a 29 degrees C shift in the 41-J transition temperature. The effect of thermal aging on tensile properties was very small. However, the combined effect of irradiation and aging was an increase in the yield strength (6 to 34% at test temperatures from 288 to -125 degrees C) but no apparent change in ultimate tensile strength or total elongation. Neutron irradiation reduced the initiation fracture toughness (J(lc)) much more than did thermal aging alone. Irradiation slightly decreased the tearing modulus, but no reduction was caused by thermal aging alone. Other results from tensile, CVN, and fracture toughness specimens showed that the effects of thermal aging at 288 or 343 decrees C for 20,000 h each were very small and similar to those at 288 degrees C for 1605 h. The effects of long-term thermal exposure time (50,000 h and greater) at 288 degrees C will be investigated as the specimens become available in 1996 and beyond.

8 Main Citations and Abstracts

NUREG/CR-6372 V01: RECOMMENDATIONS FOR PROBABI-LISTIC SEISMIC HAZARD ANALYSIS: GUIDANCE ON UNCER-TAINTY AND USE OF EXPERTS.Main Report. BUDNITZ.R.J.; APOSTOLAKIS,G.; BOORE,D.M.; et al. Lawrence Livermore National Laboratory. April 1997. 277pp. 9705280207. UCRL-ID-122160. 93137:001.

Probabilistic Seismic Hazard Analysis (PSHA) is a methodology that estimates the likelihood that various levels of earthguake-caused ground motion will be exceeded at a given location in a given future time period. Due to large uncertainties in all the geosciences data and in their modeling, multiple model interpretations are often possible. This leads to disagreement among experts, which in the past has led to disagreement on the selection of ground motion for design at a given site. The Senior Seismic Hazards Analysis Committee (SSHAC) reviewed past studies, including the Lawrence Livermore National Laboratory and the EPRI landmark PSHA studies of the 1980's and examined ways to improve on the present state-of-the-art. The Committee's most important conclusion is that differences in PSHA results are due to procedural rather than technical differences. Thus, in addition to providing a detailed documentation on state-of-the-art elements of a PSHA, this report provides a series of procedural recommendations. The role of experts is analyzed in detail. Two entities are formally defined - the Technical Integrator (TI) and the Technical Facilitator Integrator (FI) to account for the various levels of complexity in the technical issues and different levels of efforts needed in a given study.

NUREG/CR-6372 V02: RECOMMENDATIONS FOR PROBABI-LISTIC SEISMIC HAZARD ANALYSIS: GUIDANCE ON UNCER-TAINTY AND USE OF EXPERTS Appendices. BUDNITZ,R.J.; APOSTOLAKIS,G.; BOORE,D.M.; et al. Lawrence Livermore National Laboratory. April 1997. 750pp. 9705280212. UCRL-ID-122160. 93127:001.

See NUREG/CR-6372,V01 abstract.

NUREG/CR-6399: RESULTS OF CHARPY V-NOTCH IMPACT TESTING OF STRUCTURAL STEEL SPECIMENS IRRADIATED AT 30 DEGREES C TO 1 X 10(16) NEUTRONS/ CM(2) IN A COMMERCIAL REACTOR CAVITY. ISKANDER,S.K.; STOLLER,R.E. Oak Ridge National Laboratory. April 1997. 51pp. 9705120288. ORNL-6886. 92828:001.

A capsule containing Charpy V-notch (CVN) and mini-tensile specimens was irradiated at ~ 30 degrees C (~ 85 degrees F) in the cavity of a commercial nuclear power plant to a fluence, of 1 x 10 (16) neutrons/cm(2) (> 1 MeV). The capsule included six CVN impact specimens of archival High Flux Isotope Reactor A212 grade B ferritic steel and five CVN impact specimens of a well-studied A36 structural steel. This irradiation was part of the ongoing study of neutron-induced damage effects at the low temperature and flux experienced by reactor supports. The plant operators shut down the plant before the planned exposure was reached. The exposure of these specimens produced no significant irradiation-induced embrittlement.

NUREG/CR-6404: AN EXPERIMENTAL SCALE-MODEL STUDY OF SEISMIC RESPONSE OF AN UNDERGROUND OPENING IN JOINTED ROCK MASS. KANA,D.D.; FOX,D.J.; HSIUNG,S.; et al. Center for Nuclear Waste Regulatory Analyses. February 1997. 200pp. 9704250163. CNWFIA 95-012. 92625:095.

This report describes an experimental investigation conducted by the Center for Nuclear Waste Regulatory Analyses (CNWRA) to (i) obtain a better understanding of the seismic response of an underground opening in a highly-fractured and jointed rock mass and (ii) generate a data set that can be used to evaluate the capabilities (analytical methods) to calculate such response. This report describes the design and implementation of simulated seismic experiments and results for a 1/15 scale model of a jointed rock mass with a circular tunnel in the middle. The discussion on the design of the scale model includes a description of the associated similitude theory, physical design rationale, model material development, preliminary analytical evaluation, instrumentation design and calibration, and model assembly and pretest procedures. The thrust of this discussion is intended to provide the information necessary to understand the experimental setup and to provide the background necessary to understand the experimental results. The discussion on the experimental procedures and results includes the seismic input test procedures, test runs, and measured excitation and response time histories. The closure of the tunnel due to various levels of seismic activity is presented. A threshold level of seismic input amplitude was required before significant rock mass motion occurred. The experiment, the gli designed as a two-dimensional representation of a rock mass, behaved in a somewhat threedimensional manner, which will have an effect on subsequent analytical model comparison.

NUREG/CR-6504 V01: AN UPDATED NUCLEAR CRITICALITY SLIDE RULE.Technical Basis. BROADHEAD,B.L.; HOPPER,C.M.; CHILDS,R.L.; et al. Oak Ridge National Laboratory. April 1997. 95pp. 9705090043. ORNL/Twi-13322. 92826:233.

In January 1974, a limited distribution report, entitled "A S de Rule for Estimating Nuclear Criticality Information," was written by C.M. Hopper for the Oak Ridge Y-12 Plant as a tool for emergency response to nuclear criticality accidents. Because of several shortcomings of the original slide rule, work began recently to update the slide rule using modern computational tools. Volume 1 of this report describes the analyses performed in support of this updated slide-rule tool and includes a sample, nonfunctioning version of the new slide rule. Volume 2 contains the functional version of the slide rule. The new slide-rule tool provides capabilities for the continued updating of accident information during the evolution of emergency response, including victim exposure information; potential exposures to emergency reentry personnel; estimates of future radiation fields; and fission-vield estimates.

NUREG/CR-6505 V01: THE POTENTIAL FOR CRITICALITY FOL-LOWING DISPOSAL OF URANIUM AT LOW-LEVEL WASTE FACILITIES.Uran:um Blended With Soil. TORAN,L.E.; HOPPER,C.M.; NANEY,M.T.; et al. Oak Ridge National Laboratory. June 1997. 137pp. 9707180200. ORNL/TM-13323. 93805:187.

The purpose of this study was to evaluate whether or not fissile uranium in low-level-waste (LLW) facilities can be concentrated by hydrogeochemical processes to permit nuclear criticality. A team of experts in hydrology, geology, geochemistry, soil chemistry, and criticality safety was formed to develop achievable scenarios for hydrogeochemical increases in concentration of special nuclear material (SNM), and to use these scenarios to aid in evaluating the potential for nuclear criticality. The team's approach was to perform simultaneous hydrogeochemical and nuclear criticality studies to (1) identify some achievable scenarios for uranium migration and concentration increase at LLW disposal facilities, (2) model groundwater transport and subsequent concentration increase via sorption or precipitation of uranium, and (3) evaluate the potential for nuclear criticality resulting from potential increases in uranium concentration over disposal limits. The analysis of SNM was restricted to (235)U in the present scope of work. The outcome of the work indicates that criticality is possible given established regulatory limits on SNM disposal. However, a review based on actual disposal records of an existing site operation indicates that the potential for criticality is not a concern under current burial practices.

NUREG/CR-6507: CRITICAL HEAT FLUX (CHF) PHENOMENON ON A DOWNWARD FACING CURVED SURFACE. CHEUNG,F.B.; HADDAD,K.H.; L'U,Y.C. Pennsylvania State Univ., University Park, PA. June 1997, 171pp. 9706200256. PSU/ME-97-7321, 93422:007.

This report describes a theoretical and experimental study of the boundary layer boiling and critical heat flux phenomena on a downward facing curved heating surface, including both hemispherical and toroidal surfaces. A subscale boundary layer boil-

ing (SBLB) test facility was developed to measure the spatial variation of the critical heat flux and observe the underlying mechanisms. Transient guenching and steady-state boiling experiments were performed in the SBLB facility under both saturated and subcooled conditions to obtain a complete database on the critical heat flux. To complement the experimental effort, an advanced hydrodynamic CHF model was developed from the conservation laws along with sound physical arguments. The model provides a clear physical explanation for the spatial variation of the CHF observed in the SBLB experiments and for the weak dependence of the CHF data on the physical size of the vessel. Based upon the CHF model, a scaling law was established for estimating the local critical heat flux on the outer surface of a heated hemispherical vessel that is fully submerged in water. The scaling law, which compares favorably with all the available local CHF data obtained for various vessel sizes, can be used to predict the local CHF limits on large commercial-size vessels.

NUREG/CR-6511 V01: STEAM GENERATOR TUBE INTEGRITY PROGRAM.Semiannual Report, August 1995 - March 1996. DIERCKS,D.R.; BAKHTIARI,S.; CHOPRA,O.K.; et al. Argonne National Laboratory. April 1997. 114pp. 9705120295. ANL-96/ 17. 92828:117.

This report summarizes work performed by Argonne National Laboratory on the Steam Generator Tube Integrity Program from the inception of that program in August 1995 through March 1996. The program is divided into five tasks, namely (1) Assessment of Inspection Reliability, (2) Research on ISI (inservice-inspection) Technology, (3) Research on Degradation Modes and Integrity, (4) Development of Methodology and Technical Requirements for Current and Emerging Regulatory Issues, and (5) Program Management. Under Task 1, progress is reported on the preparation of and evaluation of Nondestructive evaluation (NDE) techniques for inspecting a mock-up steam generator for round-robin testing, the development of better ways to correlate burst pressure and leak rate with eddy current (EC) signals, the inspection of sleeved tubes, workshop and training activities, and the evaluation of emerging NDE technology. Under Task 2, results are reported on closed-form solutions and finite element electromagnetic modeling of EC probe response for various probe designs and flaw characteristics. Under Task 3, facilities are being designed and built for the production of cracked tubes under aggressive and near-prototypical conditions and for the testing of flawed and unflawed tubes under normal operating, accident, and severe accident conditions. In addition, crack behavior and stability are being modeled to provide guidance on test facility design, to develop an improved understanding of the expected rupture beha or of tubes with circumferential cracks, and to predict the behavior of flawed and unflawed tubes under severe accident conditions. Task 4 is concerned with the cracking and failure of tur as that have been repaired by sleeving, and with a review of literature on this subject.

NUREG/CR-6514: ANALYSIS OF POTENTIAL SELF-GUARAN-TEE TESTS FOR DEMONSTRATING FINANCIAL ASSURANCE BY NON-PROFIT COLLEGES, UNIVERSITIES, AND HOSPI-TALS AND BY BUSINESS FIRMS THAT DO NOT ISSUE BONDS. BAILEY,P.; DEAN,C.; COLLIER,J.; et al. ICF, Inc. June 1997. 70pp. 9706200262. 93422:175.

This report describes potential financial tests which could be used by NRC as a basis for allowing certain financially strong nonprofit licensees, and also non-bond issuing licensees, to use self-guarantee as a mechanism for meeting NRC financial assurance requirements. The analysis focuses on three categories of licensees; colleges or universities, hospitals, and commercial firms that do not issue bonds. The report assesses the financial assurance risk of various financial tests, and also estimates the number of licensees which could qualify for self-guarantee under different financial test alternatives. NUREG/CR-6515: BLT-EC (BREACH, LEACH, AND TRANS-PORT-EQUILIBRIUM CHEMISTRY) DATA INPUT GUIDE.A Computer Model For Simulating Release And Coupled Geochemical Transport Of Contaminants From A Subsurface Disposal Facility. MACKINNON.R.J. Ecodynamics Research Associates, Inc., SULLIVAN.T.M.; KINSEY,R.R. Brookhaven National Laboratory. May 1997. 240pp. 9706180471. BNL-NUREG-52516. 93484:001.

The BLT-EC computer code has been developed, implemented, and tested. BLT-EC is a two-dimensional finite element computer code capable of simulating the time-dependent release and reactive transport of aqueous phase species in a subsurface soil system. BLT-EC contains models to simulate the processes (container degradation, waste-form performance, transport, chemical reactions, and radioactive production and decay) most relevant to estimating the release and transport of contaminants from a subsurface disposal system. Water flow is provided through tabular input or auxiliary files. Container degradation considers localized failure due to pitting corrosion and general failure due to uniform surface degradation processes. Waste-form performance considers release to be limited by one of four mechanisms: rinse with partitioning, diffusion, uniform surface degradation, and solubility. Chemical reactions accounted for include complexation, sorption, dissolution-precipitation, oxidation-reduction, and ion exchange. Radioactive production and decay in the waste form is simulated. Transport considers the processes of advection, dispersion, diffusion, chemical reaction, radioactive production and decay, and sources (waste form releases). To improve the usefulness of BLT-EC, a pre-processor, ECIN, which assists in the creation of chemistry input files, and a post-processor, BLTPLOT, which provides a visual display of the data have been developed. BLT-EC also includes an extensive database of thermodynamic data that is also accessible to ECIN. This document reviews the models implemented in BLT-EC and serves as a guide to creating input files and applying BLT-EC.

NUREG/CR-6530: DELIBERATE IGNITION OF HYDROGEN-AIR-STEAM MIXTURES IN CONDENSING STEAM ENVIRON-MENTS. BLANCHAT,T.K. Sandia National Laboratories. STAMPS,D.W. Evansville, Univ. of, Evansville, IN. May 1997. 93pp. 9706240048. SANL94-1676. 93489:266.

Large scale experiments were performed at the Surtsey Test Facility for the Nuclear Regulatory Commission to determine the effectiveness of thermal glow igniters to burn hydrogen in a rapidly condensing steam environment due to the presence of water sprays. The experiments were designed to determine if a detonation or an accelerated flame could occur in a hydrogenair-steam mixture which was initially nonflammable due to steam dilution but was subsequently rendered flammable by rapid condensation of steam due to water sprays. The experiments were conducted under conditions scaled to be nearly prototypic of those expected in Advanced Light Water Reactors (such as the Combustion Engineering (CE) System 80+), with prototypic spray drop diameter, spray mass flux, steam condensation rates, hydrogen injection flow rates, and using the actual proposed plant igniters. The lack of any significant pressure increase during the majority of the burn and condensation events. signified that localized, benign hydrogen deflagration(s) occurred with no significant pressure load on the Surtsey containment vessel. This report describes these experiments, gives the experimental results, and provides interpretation of the results.

NUREG/CR-6535: DEVELOPMENT OF CONFORMAL RESPIRA-TOR MONITORING TECHNOLOGY. SHONKA,J.J.; WEISMANN,J.J.; LOGAN,R.J.; et al. Affiliation Not Assigned. April 15 '7. 28pp. 9705210294. 93061:317.

This report summarizes the results of a Small Business Innovative Research Phase II project to develop a modular, surface conforming respirator monitor to improve upon the manual survey techniques presently used by the nuclear industry. Research was performed with plastic scintillator and gas propor-

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tional modules in an effort to find the most conducive geometry for a surface conformal, position sensitive monitor. The respirator monitor prototype developed is a computer controlled, position-sensitive detection system employing 56 modular proportional counters mounted in molds conforming to the inner and outer surfaces of a commonly used respirator (Scott Model 801450-40). The molds are housed in separate enclosures and hinged to create a "waffle-iron" effect so that the closed monitor will simultaneously survey both surfaces of the respirator. The proportional counter prototype was also designed to incorporate Shonka Research Associates' previously developed charge-division electronics. This research provided valuable experience into pixellated position sensitive detector systems. The technology developed can be adapted to other monitoring applications where there is a need for deployment of many traditional radiation detectors.



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Hydrogen Combustion NUREG/OP 6530: DELIBERATE IGNITION OF HYDROC. N-AIR-STEAM MIXTURES IN CONDENSING STEAM ENVIRONMENTS.

Hydrogeochemical Modeling

NUREG/CR-6505 V01: THE POTENTIAL FOR CRITICALITY FOLLOW-ING DISPCSAL OF URANIUM AT LOW-LEVEL WASTE FACILITIES.Uranium Blended With Soil.

Ignition

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INDIVIDUAL PLANT EXAMINATION DATABASE.User's Guide.

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Irradiation

- NUREG/CR-6363: EFFECTS OF THERMAL AGING AND NEUTRON IR-RADIATION ON THE MECHANICAL PROPERTIES OF THREE-WIRE
- STAINLESS STEEL WELD OVERLAY CLADDING. NUREG/CR-6399: RESULTS OF CHARPY V-NOTCH IMPACT TESTING OF STRUCTURAL STEEL SPECIMENS IRRADIATED AT 30 DE-GREES C TO 1 X 10(16) NEUTRONS/ CM(2) IN A COMMERCIAL RE-ACTOR CAVITY.

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- NUREG/CR-4667 V22: ENVIRONMENTALLY ASSISTED CRACKING IN LIGHT WATER REACTORS. Semiannual Report, January 1996 - June
- UREG/CR-6361: CRITICALITY BENCHMARK GUIDE FOR LIGHT-WATER-REACTOR FUEL IN TRANSPORTATION AND STORAGE PACKAGES.

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NUREG/CP-0155: PROCEEDINGS OF THE SEMINAR ON LEAK BEFORE BREAK IN REACTOR PIPING AND VESSELS.

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- 1.2 Final Report. NUREG/CR-6233 V04: INTERNATIONAL PIPING INTEGRITY RE-
- SEARCH PROGRAM (IPIRG) PPOGRAM.Program Final Report.

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- NUREG-0750 V45 NO2: NUCLEAR REGULATORY COMMISSION IS-SUANCES FOR FEBRUARY 1997. Pages 49-93. NUREG-0750 V45 NO3: NUCLEAR REGULATORY COMMISSION IS-SUANCES FOR MARCH 1997. Pages 95-263. NUREG-0750 V45 NO4: NUCLEAR REGULATORY COMMISSION IS-
- SUANCES FOR APRIL 1997 Pages 265-353.

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NUREG CR-4674 V23: PRECURSORS TO POTENTIAL SEVERE CORE DAMAGE ACCIDENTS: 1995. A Status Report. NUREG/CR-4674 V24: PRECURSORS TO POTENTIAL SEVERE CORE

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- NUREG/CR-6361: CRITICALITY BENCHMARK GUIDE FOR LIGHT-WATER-REACTOR FUEL IN TRANSPORTATION AND STORAGE PACKAGES

Low-Level Waste

NUREG/CR-6505 V01: THE POTENTIAL FOR CRITICALITY FOLLOW-DISPOSAL OF URANIUM AT LOW-LEVEL ING WASTE FACILITIES.Uranium Blended With Soil.

Low-Specific Activity Material NUREG-1608 DRFT FC: CATEGORIZING AND TRAMSPORTING LOW SPECIFIC ACTIVITY MATERIALS AND SURFACE CONTAMINATED **OBJECTS.Draft Rept For Comment.**

Lower Head Integrity

NUREG/CR-6507: CRITICAL HEAT FLUX (CHF) PHENOMENON ON A DOWNWARD FACING CURVED SURFACE

Materiula Licenses

NUREG-1556 VO1: CONSOLIDATED GUIDANCE ABOUT MATERIALS LICE'NSES.Program-Specific Guidance About Portable Gauge Licer ses. Final Report.

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Melt Progression

NUREG/OR-6167: LATE-PHASE MELT PROGRESSION EXPERIMENT MP-2.Results And Analysis

Molten Pool

NUREG/CR-6167: LATE-PHASE MELT PROGRESSION EXPERIMENT MP-2.Results And Analysis.

Needle Applicator

NUREG/CR-6074 V03: SEALED SOURCE AND DEVICE DESIGN SAFETY TESTING Technical Report On The Findings Of Task 4.Investigation Of A Failed Brachytherapy Needle Applicator.

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Nuclear Regulation

NUREG-1610: CONTROLLING THE ATOM. The Beginnings Of Nuclear Regulation, 1946-1962.

PRA

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NUREG/CR-6233 VO4: INTERNATIONAL PIPING INTEGRITY RE-SEARCH PROGRAM (IPIRG) PROGRAM.Program Final Report.

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Plastic Scintillator

NUREG/CR-6535: DEVELOPMENT OF CONFORMAL RESPIRATOR MONITORING TECHNOLOGY

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Probabilistic Risk Assessment

NUREG-1602 DRFT FC: THE USE OF PRA IN RISK-INFORMED APPLICATIONS.Draft Rept For Comment.

Probabilistic Seismic Hazard Analysis

- NUREG/CR-6372 V01: RECOMMENDATIONS FOR PROBABILISTIC SEISMIC HAZARD ANALYSIS: GUIDANCE ON UNCERTAINTY AND
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Reactor Piping

NUREG/CP-0155: PRUCEEDINGS OF THE SEMINAR ON LEAK BEFORE BREAK IN REACTOR PIPING AND VESSELS.

Reactor Pressure Vessel

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Regulatory And Technical Report NUREG-0304 V21 N04: REGULATORY AND TECHNICAL REPORTS (ABSTRACT INDEX JOURNAL). Annual Compilation For 1996.

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NUREG-1606 DRFT FC: PROPOSED REGULATORY GUIDANCE RE-LATED TO IMPLEMENTATION OF 10 CFR 50.59 (CHANGES, TESTS, OR EXPERIMENTS). Draft Report For Comment.

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NUREG/CR-6535: DEVELOPMENT OF CONFORMAL RESPIRATOR MONITORING TECHNOLOGY

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Rock Mass

NUREG/CR-6404: AN EXPERIMENTAL SCALE MODEL STUDY OF SEISMIC RESPONSE OF AN UNDERGROUND UPENING IN JOINTED ROCK MASS

SCALE

- NUREG/CR-0200 R5V1P1: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LI-
- CENSING EVALUATION Control Modules C4, C6. NUREG/CR-0200 R51/1P2: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LI-
- CENSING EVALUATION CONTRO MODULES S1 H1. NUREG/CR-0200 R5V2P1: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LI-
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NUREG 1607: SAFETY EVALUATION REPORT RELATED TO THE DE-PARTMENT OF ENERGY'S PROPOSAL FOR THE IRRADIATION OF LEAD TEST ASSEMBLIES CONTAINING TRITIUM-PRODUCING BURNABLE ABSORBER RODS IN COMMERCIAL LIGHT-WATER RE-ACTORS

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NUREG/CR-6074 V03: SEALED SOURCE AND DEVICE DESIGN SAFETY TESTING Technical Report On The Findings Of Task 4.Investigation Of A Failed Brachytherapy Needle Applicator

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NUREG/CR-6404: AN EXPERIMENTAL SCALE-MODEL STUDY OF SEISMIC RESPONSE OF AN UNDERGROUND OPENING IN JOINTED ROCK MASS

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NUREG/CR-6167: LATE-PHASE MELT PROGRESSION EXPERIMENT MP-2.Results And Analysis.

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- NUREG/CR-0200 R5V2P1: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LI-
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- CENSING EVALUATION Functional Modules F16 F17. NUREG/CR-0200 R5V3: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LI-CENSING EVALUATION. Miscellaneous.

Stainless Steel

NUREG/CR-6363: EFFECTS OF THERMAL AGING AND NEUTRON IR-RADIATION ON THE MECHANICAL PROPERTIES OF THREE-WIRE STAINLESS STEEL WELD OVERLAY CLADDING.

Steam Condensation

NUREG/CR-6530: DELIBERATE IGNITION OF HYDROGEN-AIR-STEAM MIXTURES IN CONDENSING STEAM ENVIRONMENTS.

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NUREG/CR-4667 V22: ENVIRONMENTALLY ASSISTED CRACKING IN LIGHT WATER REACTORS. Semiannual Report, January 1996 - June

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Surface Crack

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Surtsey Test Facility

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Thermal Aging

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Thermal-Hydraulic

NURSG/CP-0158: PROCEEDINGS OF THE OECD/CSNI SPECIALISTS MEETING ON BORON DILUTION REACTIVITY TRANSIENTS.Held In State College, Pennsylvania, USA,October 18-20, 1995.

Thermoluminescent Dosimeter

NUREG-0837 V17 N01: NRC TLD DIRECT RADIATION MONITORING NETWORK.Progress Report. January-March 1997.

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- NUREG-0540 V19 N02: TITLE LIST OF DOCUMENTS MADE PUBLICLY AVAILABLE February 1-28, 1997. NUREG-0540 V19 N03: TITLE LIST OF DOCUMENTS M. ...YE PUBLICLY
- AVAILABLE.March 1-31, 1997. NUREG-0540 V19 N04: TITLE LIST OF DOCUMENTS MADE PUBLICLY
- NUHEG-0540 V19 N04: TITLE LIST OF DOCUMENTS MADE PUBLICLY AVAILABLE April 1-30, 1997.

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NUREG-1608 DRFT FC: CATEGORIZING AND TRANSPORTING LOW SPECIFIC ACTIVITY MATERIALS AND SURFACE CONTAMINATED OBJECTS.Draft Rept For Comment.

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NUREG/CR-5661: RECOMMENDATIONS FOR PREPARING THE CRITI-CALITY SAFETY EVALUATION OF TRANSPORTATION PACKAGES.

Tube

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NUREG/CR-6511 V01: STEAM GENERATOR TUBE INTEGRITY PROGRAM.Semiannual Report, August 1995 - March 1996.

Underground Disposal

NUREG/CR-6515: BLT-EC (BREACH, LEACH, AND TRANSPORT-EQUI-LIBRIUM CHEMISTRY) DATA INPUT GUIDE.A Computer Model For Simulating Release And Coupled Geochemical Transport Of Contaminants From A Subsurface Disposal Facility.

Uranium

NUREG/CR-6505 V01: THE POTENTIAL FOR CRITICALITY FOLLOW-ING DISPOSAL OF URANIUM AT LOW-LEVEL WASTE FACILITIES.Uranium Blended With Soil.

Weld Overlay

NUREG/CR-6363: EFFECTS OF THERMAI, AGING AND NEUTRON IR-RADIATION ON THE MECHANICAL PROPERTIES OF THREE-WIRE STAINLESS STEEL WELD OVERLAY CLADDING.



NRC Originating Organization Index (Staff Reports)

This index lists those NRC organizations that have published staff reports. The index is arranged alphabetically by major NRC organizations (e.g., program offices) and then by subsections of these (e.g., divisions, branches) where appropriate. Each entry is followed by a NUREG number and title of the report(s). If further information is needed, refer to the main citation by NUREG number.

ADVISORY COMMITTEE(S)

ACRS - ADVISORY COMMITTEE ON REACTOR SAFEGUARDS NUREG-1125 V18: A COMPILATION OF REPORTS OF THE ADVISO-RY COMMITTEE ON REACTOR SAFEGUARDS 1996 Annual

OFFICE OF EXECUTIVE DIRECTOR FOR OPERATIONS (EDO)

REGION 1 (POST 820201) NUREG-0837 V17 H01: NRC TLD DIRECT RADIATION MONITORING

- OFC
- NETWORK Progress Report January-March 1997. FC OF ENFORCEMENT (POST 870413) NUREG-0940 V15 N2 P1: ENFORCEMENT ACTIONS: SIGNIFICANT ACTIONS RESOLVED INDIVIDUAL ACTIONS Semiannual Progress
- Report, July-December 1996. NUREG-0940 V15 N2 P2: ENFORCEMENT ACTIONS: SIGNIFICANT ACTIONS RESOLVED REACTOR LICENSEES.Semichnual Progress Rept, July-December 1996. NUREG-0940 V15 N2 P3: ENFORCEMENT ACTIONS: SIGNIFICANT
- ACTIONS RESOLVED MATERIAL LICENSEES. Semiannual Progress Report.July-December 1996

EDO - OFFICE OF THE CONTROLLER (PRE 820418 & POST 890205) OFFICE OF THE CONTROLLER (POST 890205) NUREG-1542 V02: ACCOUNTABILITY REPORT FISCAL YEAR 1996. DIVISION O" BUDGET & ANALYSIS (POST 890205) NUREG-1350 V09: NUCLEAR REGULATORY COMMISSION INFOR-

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EDO - OFFICE FOR ANALYSIS & EVALUATION OF OPERATIONAL

- DATA OFFICE FOR ANALYSIS & EVALUATION OF OPERATIONAL DATA, DI-
 - NUREG-0090 V19: REPORT TO CONGRESS ON ABNORMAL OCCURRENCES.Fiscal Year 1996

EDO - OFFICE OF INFORMATION RESOURCES MANAGEMENT & ARM (POST 861109) OFFICE OF INF

INFORMATION RESOURCES MANAGEMENT (POST 890205) NUREG-0304 V21 N04: REGULATORY AND TECHNICAL REPORTS

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NUREG-1603 URFT: INDIVIDUAL PLANT EXAMINATION DATABASE User's Guide.

EDD - OFFICE OF NUCLEAR MATERIAL SAFETY & SAFEGUARDS OFFICE OF NUCLEAR MATERIAL SAFETY & SAFEGUARDS NUREG-1608 DRFT FC. CATEGORIZING AND TRANSPORTING LOW SPECIFIC ACTIVITY MATERIALS AND SURFACE CONTAMINATED

- OBJECTS. Draft Rept For Comment. DIVISION OF INDUSTRIAL & MEDICAL NUCLEAR SAFETY (POST 870729)
- NUREG-1516: MANAGEMENT OF RADIOACTIVE MATERIAL SAFETY PROGRAMS AT MEDICAL FACILITIES.Final Report. NUFIEG-1556 V01: CONSOLIDATED GUIDANCE ABOUT MATERIALS
- LICENSES.Program-Specific Guidance About Portable Gauge LICENSES FINAL REPORT
- 940403)

NUREG/CR-6505 V01: THE POTENTIAL FOR CRITICALITY FOLLOW-DISPOSAL OF URANIUM AT LOW-LEVEL WASTE ING FACILITIES Uranium Blended With Soil

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF THE SECRETARY OF THE COMMISSION NUREG-1610: CONTROLI ING THE ATOM THE Beginnings Of Nuclear Regulation, 1946-1962.

EDO - OFF. C OF & CLEAR REGULATORY RESEARCH (POST 820405) OFFICE (NUCLEAR REGULATORY RESEARCH (POST 941217) NUREG-1603 DRFT: INDIVIDUAL PLANT EXAMINATION DATABASE User's Guide.

DIVISION OF SYSTEMS TECHNOLOGY (POST 941217) NUREG-1602 DRFT FC: THE USE OF PRA IN RISK-INFORMED APPLICATIONS Draft Rept For Commercia

EDO - OFFICE OF NUCLEAR REACTOR REGULATION (POST 800428)

- OFFICE OF NUCLEAR FEACTOR REGULATION (POST 941001) NUREG-1503 S01: FINAL SAFETY EVALUATION FEPORT RELATED TO THE CERTIFICATION OF THE ADVANCED DOILING WATER REACTOR DESIGN. Supplement No. 1. Docket No. 52-001. (General Electric Nuclear Energy) NUREG-1572: SAFETY EVALUATION REPORT RELATED TO THE
- RENEWAL OF THE OPERATING LICENSE FOF THE RESEARCH REACTOR AT NORTH CAROLINA STATE UNIVERSITY

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- NINEG-1004 CINCOMPENENTIAL CHARGES OF THE ALL AND A CONTRACT OF THE ALL AND A CONTRACT. AND A CONTRACT OF THE ALL AND A CONTRACT. AND A CONTRACT OF THE ALL AND A CONTRACT OF THE ALL AND A CONTRACT OF THE ALL AND A CONTRACT. AN
- OF LEAD TEST ASSEMBLIES CONTAINING TRITIUM-PRODUCING BURNABLE ABSORBER RODS IN COMMERCIAL LIGHT-WATER REACTORS.

NRC Originating Organization Index (International Agreements)

This index lists those NRC organizations that have published international agreement reports. The index is arranged alphabetically by major NRC organizations (e.g., program offices) and then by subsections of these (e.g. divisions, branches) where appropriate. Each entry is followed by a NUREG number and title of the report(s). If further information is needed, refer to the main citation by NUREG number.

There were no NUREG/IA reports published this guarter.



NRC Contract Sponsor Index (Contractor Reports)

This index lists the NRC organizations that sponsored the contractor reports listed in this compilation. It is arranged alphabetically by major NRC organization (e.g., program office) and then by subsections of these (e.g., divisions) where appropriate. The sponsor organization is followed by the NUREG/CR number and title of the report(s) prepared by that organization. If further information is needed, refer to the main citation by the NUREG/CR number.

EDO - OFFICE FOR ANALYSIS & EVALUATION OF OPERATIONAL DATA

DIVISION OF SAFETY PROGRAMS (POST 870413)

- NUREG/CR-4674 V23: PRECURSORS TO POTENTIAL SEVERE CORE DAMAGE ACCIDENTS: 1995. A Status Report. NUREG/CR-4674 V24: PRECURSORS TO POTENTIAL SEVERE
- CORE DAMAGE ACCIDENTS: 1982-83.A Status Report.

- EDO OFFICE OF NUCLEAR MATERIAL SAFETY & SAFEGUARDS OFFICE OF NUCLEAR MATERIAL SAFETY & SAFEGUARDS NUREG/CR-0200 R5V1P1: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR
 - LICENSING EVALUATION.Control Modules C4, C6. NUREG/CR-0200 R5V1P2: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LICENSING EVALUATION. Control Modules S1 - H1. NUREG/CR-0200 R5VZP1: SCALE: A MODULAR CODE SYSTEM
 - FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR
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 - LICENSING EVALUATION. Functional Modules F16 F17. NUREG/CR-0200 R5V3: SCALE: A MODULAR CODE SYSTEM FOR PERFORMING STANDARDIZED COMPUTER ANALYSES FOR LI-CENSING EVALUATION Miscellaneous. NUREG/CR-5661: RECOMMENDATIONS FOR PREPARING THE
 - CRITICALITY SAFETY EVALUATION OF TRANSPORTATION PACKAGES
 - NUREG/CR-6361: CRITICALITY BENCHMARK GUIDE FOR LIGHT-WATER-REACTOR FUEL IN TRANSPORTATION AND STORAGE PACKAGES
 - DIVISION OF INDUSTRIAL & MEDICAL NUCLEAR SAFETY (POST 870729)
 - NUREG/CR-8074 V03: SEALED SOURCE AND DEVICE DESIGN SAFETY TESTING Technical Report On The Findings Of Task 4.In-
 - vestigation Of A Failed Brachytherapy Needle Applicator. DIVISION OF WASTE MANAGEMENT (NMSS 940403) NUREG/CR-6505 V01: THE POTENTIAL FOR CRITICALITY FOLLOW-ING DISPOSAL OF URANIUM AT LOW-LEVEL WASTE FACILITIES.Uranium Blended With Soil.
- EDO OFFICE OF NUCLEAR REGULATORY RESEARCH (POST 820405) FFICE OF NUCLEAR REGULATORY RESEARCH (860726-9412 NUREG/CR-6530: DELIBERATE IGNITION OF HYDROGE HYDROGEN-AIR-
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- IN LIGHT WATER REACTORS. Semiannual Report, January 1996 -

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- NUREG/CR-4667 V22 ENVIRONMENTALLY ASSISTED CRACKING IN LIGHT WATER REACTORS. Semiannual Report January 1996 - June 1996
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- NUREG-1603 DRIFT: INDIVIDUAL PLANT EXAMINATION DATABASE.User's Guide.
- NUREG/CR-6515: BLT-EC (BREACH, LEACH, AND TRANSPORT-EQUI-LIBRIUM CHEMISTRY) DATA INPUT GUIDE.A Computer Model For Simulating Rulease And Courlied Geochemical Transport Of Contaminants From A Subsurface Disposal Facility

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