



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
 WASHINGTON, D. C. 20555

November 5, 1991

The Honorable Ivan Selin
 Chairman
 U.S. Nuclear Regulatory Commission
 Washington, D.C. 20555

Dear Chairman Selin:

SUBJECT: SUMMARY REPORT - THREE HUNDRED AND SEVENTY-EIGHTH MEETING
 OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS,
 OCTOBER 10-12, 1991 - OTHER ACTIVITIES OF THE COMMITTEE

During its 378th meeting, October 10-12, 1991, the Advisory Committee on Reactor Safeguards discussed several matters and completed the reports, letters, and a memorandum noted below. In addition, the Committee authorized Mr. Fraley, ACRS Executive Director, to transmit the memorandum noted.

REPORTS TO THE COMMISSION

- Schedule for ACRS Review of Recent SECY Papers (Report to Chairman Selin, dated October 17, 1991)
- Diablo Canyon Nuclear Power Plant Long Term Seismic Program (Report to Chairman Selin, dated October 18, 1991)

LETTERS

- Regulatory Guides Being Developed in Support of the Revised 10 CFR Part 20 (Letter to James M. Taylor, EDO, dated October 17, 1991)

The Committee provided several comments and recommendations regarding the following four regulatory guides related to the implementation of the revised 10 CFR Part 20, "Standards for Protection Against Radiation," for which it had the lead review responsibility:

- Draft Regulatory Guide DG-8004, "Radiation Protection Programs for Nuclear Power Plants"
- Draft Regulatory Guide DG-8006, "Control of Access to High and Very High Radiation Areas in Nuclear Plants"
- Draft Regulatory Guide 8.N6, "Planned Special Exposures"

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- Draft Regulatory Guide 8.7, Revision 1, "instructions for Recording and Reporting Occupational Radiation Exposure Data"

The Committee stated that it agrees with the conclusion of the ACNW that the scheduled date for implementation of the revised 10 CFR Part 20 may be unrealistic.

- Proposed Paper on Metrication Policy (Letter to Eric S. Beckjord, RES, dated October 17, 1991)

The Committee supported the staff approach, in general, which encourages the use of the metric system by licensees and applicants, and at the same time prepares the NRC staff through education and through cooperative interaction with the industry. It supported also the staff proposal to issue all new actions and supporting documents in dual units. The Committee suggested the use of the metric system for the primary units with the translation into English units in parentheses.

The Committee reserved the right to comment on the final version of the Proposed Policy Statement when it is finally sent to the Commission.

MEMORANDA

- Proposed Resolution of Generic Issue 113, "Dynamic Qualification and Testing of Large Bore Hydraulic Snubbers" (Memorandum for James M. Taylor, EDO, dated October 17, 1991)

The Committee expressed its belief that the proposed resolution of Generic Issue 113 is appropriate, and stated that it would like to be kept informed of progress by the staff and the industry in implementing the actions proposed to resolve this issue.

- ACRS Action Regarding Resolution of Generic Issue 121, "Hydrogen Control for PWR Dry Containments" (Memorandum for W. Minners, RES, from R. F. Fraley, ACRS, dated October 22, 1991)

Mr. Fraley informed Mr. Minners that the Committee would like a briefing by the staff on the proposed resolution of Generic Issue 121 during the November 7-9, 1991 ACRS meeting.

HIGHLIGHTS OF MATTERS CONSIDERED BY THE COMMITTEE• Diablo Canyon Nuclear Power Plant Long-Term Seismic Program

The Committee heard presentations by and held discussions with representatives of the NRC staff, Pacific Gas and Electric Company (licensee), and their consultants regarding the staff's evaluation of the Long Term Seismic Program (LTSP) related to the Diablo Canyon Nuclear Power Plant, Units 1 and 2. The Committee also heard the views of an ACRS consultant regarding this matter.

In its July 14, 1978 report to the Commission on the operating license application for Diablo Canyon Units 1 and 2, the ACRS recommended that the seismic design of Diablo Canyon be reevaluated in about ten years taking into account applicable new information. As a result of this recommendation, the NRC included a license condition in the operating license for Diablo Canyon requiring that the licensee develop and implement a program to reevaluate the seismic design bases of the Diablo Canyon plant.

The licensee started the LTSP in July 1985 and completed it in July 1988. The staff and its consultants reviewed the results of the LTSP and documented their findings and conclusions in NUREG-0675, "Safety Evaluation Report Related to the Operation of Diablo Canyon Nuclear Power Plant, Units 1 and 2, Supplement 34," dated June 1991. The staff's conclusions included the following:

- Major plant structures and equipment at Diablo Canyon have adequate seismic margins against the earthquake loading subject to quantitative confirmation of certain structures and equipment that may be affected by ground motion exceedances.
- Seismic contribution to the mean core damage frequency (CDF) is about 20 percent or less.
- There appear to be no weak links in the plant that dominate the CDF.
- The largest contribution to seismically induced CDF comes from earthquakes with average spectral accelerations in the 2.0 G to 3.0 G range.
- The Diablo Canyon license condition has been met.

- The Diablo Canyon seismic design has been validated and continues to be acceptable. One confirmatory item will be closed soon.

The Committee provided a report to the Commission, dated October 18, 1991, on this matter.

- Implementation of Revised 10 CFR Part 20, "Standards for Protection Against Radiation"

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding twelve Regulatory Guides that are being developed to provide guidance to the industry in implementing the requirements of the revised 10 CFR Part 20. The primary objectives of these Guides are to:

- Provide additional explanation of the provisions of the revised 10 CFR Part 20.
- Specify acceptable format for data submission to the NRC.
- Specify acceptable methods for demonstrating compliance with 10 CFR Part 20.
- Provide examples of calculations required by 10 CFR Part 20.
- Provide a format that can be updated and modified more quickly and easily than rulemaking.

The Committee provided a letter to the EDO, dated October 17, 1991, commenting on four Regulatory Guides for which it had the lead review responsibility.

- Proposed Resolution of Generic Issue 113, "Dynamic Qualification and Testing of Large Bore Hydraulic Snubbers"

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed resolution of Generic Issue 113. Key points noted included the following:

- Large Bore Hydraulic Snubbers (LBHSS) are defined as those units with rated loads of 50 kips or greater. These snubbers were exempt from testing prior to 1980. The results of the inspection and testing performed in accordance with a Generic Letter issued in November 1980 revealed numerous cases where the LBHSS were either out of specified tolerances or completely inoperable due to

various problems, including inadequate design, inadequate functional specifications, inadequate environmental and/or dynamic qualification, and lack of requirements for functional testing.

- Generic Issue 113 was established with the objective of evaluating the reliability of LBHSSs used in commercial nuclear power plants.
- The actions proposed to resolve Generic Issue 113 include the following:
 - Request the ASME Committee for the Qualification of Mechanical Component (ASME/QME) to develop a national standard to provide details of acceptable environmental qualification methods applicable to LBHSSs.
 - Request the ASME/OM Code Committee to revise the Inservice Inspection and Inservice Testing requirements applicable to LBHSSs to incorporate the lessons learned through the operating experience of LBHSSs.
 - Revise the applicable Standard Review Plan Sections and issue a Regulatory Guide to provide guidance for dealing with the LBHS problems.

The Committee provided a letter, dated October 17, 1991, to the EDO on this matter.

- Potential Criticality Incident at the GE-Wilmington Fuel Facility

Representatives of the NRC staff briefed the Committee regarding the May 28, 1991 potential criticality incident at the GE-Wilmington Fuel Facility and the results of the investigation of this event by an Incident Investigation Team (IIT). On May 28, 1991, control of a Uranium Recovery Unit at the GE-Wilmington Fuel Facility was lost due to the malfunction of a level control valve. Consequently, about 150 kg of 3.2 percent enriched uranium was transferred into a waste accumulation tank of unfavorable geometry which created the potential for a criticality incident.

The findings of the IIT included the following:

- There were three interrelated root causes attributed to this event:

- Pervasive attitude of the licensee that a nuclear criticality accident is not credible.
- Failure of the licensee to provide effective management oversight to ensure safe operation.
- An overemphasis on production rather than on safety by the licensee's organization.
- Weaknesses in the NRC's regulatory oversight include the following:
 - NRC's regulatory guidance for fuel facilities regarding emergency planning and incident reporting is vague.
 - A mutual understanding did not exist between the licensee and the NRC Regional Office/Headquarters personnel concerning the licensee's criticality control commitments related to the Uranium Recovery Unit.
 - The NRC's inspection program related to fuel facilities has limited focus.

The NRC staff has established a Task Force to address the weaknesses in the regulatory process identified by the IIT.

This was an information briefing -- the Committee took no action.

- Meeting with the Director of the Office of Nuclear Material Safety and Safeguards (NMSS)

Mr. Bernero, Director of NMSS, and his staff briefed the Committee on the following matters:

Louisiana Energy Services Uranium Enrichment Plant

Mr. Bernero stated that on November 15, 1990, the President signed into law the "Solar, Wind, Waste, and Geothermal Power Production Incentives Act of 1990" (Public Law 101-575). Section 5 of that Act, entitled "Licensing of Uranium Enrichment Facilities," amends several provisions of the Atomic Energy Act of 1954, as amended, and adds a new section establishing new licensing procedures for uranium enrichment facilities.

According to this amended Act, uranium enrichment facilities are not considered to be "production" facilities and therefore will not be licensed under 10 CFR Part 50. These will be considered as material facilities and will be licensed under 10 CFR Parts 40 and 70. As a result, the ACRS does not have a statutory responsibility to review these facilities.

In accordance with the law, the one-step licensing process will be used for the Uranium Enrichment Facilities. An Environmental Impact Statement must be prepared before the licensing hearing is completed. Prior to commencement of operation, the Commission must verify by inspection that the facility has been constructed in accordance with the license and a notice of the inspection results must be published in the *Federal Register*.

Mr. Arnold, President of the Louisiana Energy Services, briefed the Committee regarding the details of the proposed enrichment facility and the schedule for operation.

NRC-Licensee Interaction During the Potential Criticality Incident at the GE-Wilmington Fuel Facility

Mr. Bernero discussed briefly the actions taken by the NRC staff after hearing about the potential criticality incident at the GE-Wilmington Fuel Facility, including the activation of the Incident Response Centers in Bethesda and in the Region, and subsequent formation of an IIT by the EDO to investigate this incident.

Security Threat at Nuclear Facilities

Mr. Bernero and Mr. Burnett discussed the existing rules, regulatory guides, and industry standards that delineate requirements and guidance for protection against industrial sabotage and design basis threats at nuclear facilities.

This was an information briefing -- the Committee took no action.

• Yankee Rowe Reactor Pressure Vessel Integrity

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Yankee Atomic Electric Company (licensee) regarding the Yankee Rowe reactor pressure vessel integrity issues and their impact on the plant operation. Key points noted included the following:

- In July 1991, the Commission required that the licensee propose additional measures (e.g., a mix of hardware modifications and operating procedure modifications) to reduce the probability of vessel failure from a pressurized thermal shock (PTS) challenge by a factor of 5 to 10 and submit the information to the NRC staff for review.
- The licensee submitted the required information to the NRC staff in August 1991. While reviewing this information, the staff learned that the licensee had used a revised thermal hydraulic model. Based on its evaluation, the staff decided that it could no longer conclude, with confidence, that the vessel failure probability estimates are conservative. Also, it could not estimate with confidence that the reactor coolant pumps could operate with reliability to reduce the probability of vessel failure by a factor of 5 to 10. Consequently, on September 30, 1991, the staff recommended to the Commission that the Yankee Rowe plant be shut down until the NRC could be satisfied that the Yankee reactor vessel had adequate margin against failure from a PTS event.
- Representatives of the licensee stated that they voluntarily shut down the plant. They believe that they provided a technically defensible argument for restarting the plant. They have a high degree of confidence that the vessel will not fail if subjected to a PTS event.

This was an information briefing -- the Committee took no action.

- Operator Regualification Program

Representatives of the NRC staff briefed the Committee regarding the reactor operator requalification program. Key points noted included the following:

- The questions for the requalification examination are developed by individual facilities and approved by the NRC staff.
- Results of the evaluation of the requalification programs at all operating facilities revealed that 90 percent have satisfactory programs.

- Of the 2425 operators who took the requalification examination, 88 percent have obtained passing grades.
- Ongoing initiatives include: a study to reduce operator stress, an evaluation of the stability of the programs, and an evaluation of the consistency in the composition of requalification examinations conducted by various NRC Regional Offices.

This was an information briefing -- the Committee took no action.

- Report by the Instrumentation and Control (I&C) Systems Subcommittee Chairman

Dr. Kerr, Chairman of the I&C Systems Subcommittee, provided a report to the Committee regarding the August 29, 1991 meeting of this Subcommittee at which the following matters were discussed:

- Set-Point Methodology developed by the Electric Power Research Institute (EPRI).
- Transient Response Implementing Plan (TRIP) developed by the Philadelphia Electric Company.
- Electrical Distribution System Functional Inspections (EDSFIs) being performed by the NRC staff.

This was an information report -- the Committee took no action.

- Report by the Advanced Boiling Water Reactors Subcommittee Chairman

Mr. Michelson, Chairman of the Advanced Boiling Water Reactors Subcommittee, provided a report to the Committee regarding the September 18, 1991 meeting of this Subcommittee at which the staff's Draft Safety Evaluation Reports (DSERs) corresponding to Chapters 1 through 6 and Chapter 17 of the General Electric Standard Safety Analysis Report for the ABWR design was discussed. Key points reported by Mr. Michelson included the following:

- There appears to be no organized and documented process to ensure quality control of the staff's evaluation process related to the GE ABWR design.

- It is not clear from the wording used by the staff in the DSERS whether the staff is evaluating an actual design, a conceptual design, or a design to be developed.
- It is not clear whether the staff has performed an adequate evaluation of the Reactor Water Cleanup System.
- Overall, the staff's review of the GE ABWR design, as documented in the DSERS, is inadequate and incomplete.

This was an information report -- the Committee took no action.

- Key Technical Issues for Future Nuclear Power Plants

The Committee continued its discussion of, and assignment of priority rankings to, a set of key technical issues related to evolutionary, passive, and advanced reactor designs that are in need of early resolution. The Committee decided to discuss this matter further during the November 7-9, 1991 ACRS meeting and select a set of preeminent issues for discussion during a meeting of an ACRS Ad-Hoc Subcommittee that is scheduled to be held in Baltimore, Maryland, on November 22-24, 1991.

- ACRS Review of Certain SECY Papers

In its October 17, 1991 report to the Commission regarding the Schedule for ACRS Review of Recent SECY Papers, the Committee committed to complete a report to the Commission during its February 1992 meeting on the following SECY Papers:

- SECY-91-262, "Resolution of Selected Technical and Severe Accident Issues for Evolutionary Light Water Reactor (LWR) Designs"
- SECY-91-270, "Interim Guidance on Staff Implementation of the Commission's Safety Goal Policy"
- SECY-91-272, "Role of Personnel and Advanced Control Rooms in Future Nuclear Power Plants"
- SECY-91-273, "Review of Vendors' Test Programs to Support the Design Certification of Passive Light Water Reactors"

Subsequently, as a result of a request for early ACRS consideration of these papers, the Committee has scheduled to consider SECY-91-273 during its November 7-9, 1991 meeting and the other SECY Papers (262, 270, and 272) during its December 12-14, 1991 meeting.

SUBCOMMITTEE MEETINGS

Since the last summary report of ACRS activities, the following Subcommittee meetings have been held:

- Structural Engineering, October 9, 1991

The Subcommittee reviewed the proposed resolution of Generic Issue 113, "Dynamic Qualification and Testing of Large Bore Hydraulic snubbers."

- Advanced Boiling Water Reactors, October 23, 1991

The Subcommittee reviewed the Draft Safety Evaluation Reports related to Chapters 3, 9, 10, 11, and 13 of the GE Standard Safety Analysis Report for the Advanced Boiling Water Reactor Design and other related matters.

- Severe Accidents, October 24-25, 1991

The Subcommittee discussed elements of the Severe Accident Research Program.

FUTURE ACTIVITIES

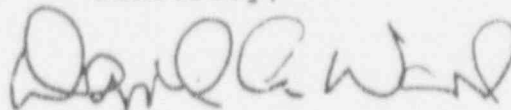
The Committee agreed to consider the following during the 379th, November 7-9, 1991 ACRS meeting:

- Reactor Operating Experience - Briefing and discussion of recent operating events and incidents at nuclear facilities, including the loss of power event that occurred (August 13, 1991) at the Nine Mile Point nuclear station. Representatives of the NRC staff and the nuclear industry will participate, as appropriate.
- Level of Design Detail - Briefing and discussion of the level of design detail required to conduct regulatory reviews and evaluations of standardized nuclear power plant designs in accordance with 10 CFR Part 52. Representatives of the NRC staff and the nuclear industry will participate, as appropriate.
- General Electric Advanced Boiling Water Reactor (ABWR) - Discussion of Subcommittee activities related to review of the General Electric ABWR. Representatives of the NRC staff and the General Electric Company will participate, as appropriate.

- Steam Generator Tube Degradation and Inspection - Report and discussion regarding experience with steam generator tube performance and inspection methods. The bases for plugging/sleeving of individual tubes will also be discussed and compared with foreign experience. Representatives of the NRC staff and nuclear industry will participate, as appropriate.
- Key Technical Issues for Future Nuclear Power Plants - Discussion among members of key technical issues related to evolutionary, passive, and advanced reactor designs that are in need of early resolution. A mechanism for dealing with these issues will also be discussed.
- Severe Accident Research Program - Report and discussion regarding the NRC Severe Accident Research Program. Representatives of the NRC staff and the nuclear industry will participate, as appropriate.
- Generic Issue 121, Hydrogen Control for PWR Dry Containments - Briefing and discussion regarding the NRC staff's proposed resolution of this generic issue. Representatives of the NRC staff and the nuclear industry will participate, as appropriate.
- Vendors' Test Programs for Passive Nuclear Plants - Briefing and discussion regarding SECY-91-273, "Review of Vendors' Test Programs to Support the Design Certification of Passive Light Water Reactors." Representatives of the NRC staff and industry will participate, as appropriate.
- Control of Nuclear Power Plant Switchyard Activities - Discussion of proposed ACRS action/comments regarding the impact of switchyard control on the initiation and/or course of nuclear power plant transients and incidents. (Note: This item has been postponed to the December 12-14, 1991 ACRS meeting.)
- Yankee Rowe Nuclear Power Station - Briefing and discussion regarding issues related to the Yankee Rowe reactor pressure vessel integrity and their impact on plant operations. Representatives of the NRC staff and the licensee will participate, as appropriate. Portions of this session may be closed as necessary to discuss Proprietary and/or Classified Information related to this matter. (Note: This item has been postponed indefinitely since the licensee has decided not to seek NRC approval for the restart of the Yankee Rowe plant.)

- ACRS Subcommittee Activities - Reports and discussion regarding the status of designated subcommittee activities including planning and procedures for conduct of Committee activities.

Sincerely,

A handwritten signature in dark ink, appearing to read "David A. Ward". The signature is fluid and cursive, with the first name "David" being the most prominent.

David A. Ward
Chairman