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

SL-0474
PDR

September 27, 1999

The Honorable Greta Joy Dicus
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Dicus:

SUBJECT: SUMMARY REPORT - FOUR HUNDRED SIXTY-FIFTH MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, SEPTEMBER 1-3, 1999, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 465th meeting, September 1-3, 1999, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and letter. In addition, the Committee authorized Dr. Larkins, Executive Director, to transmit the memoranda noted below:

REPORTS

- Proposed Final Rule on Use of Alternative Source Term at Operating Reactors, Draft Regulatory Guide, and Standard Review Plan (Report to Greta Joy Dicus, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated September 17, 1999.)

LETTERS

- Interim Letter Related to the License Renewal of Oconee Nuclear Station (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated September 13, 1999)

- Proposed Final Revision 3 to Regulatory Guide 1.105, "Setpoints for Safety-Related Instrumentation" (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated September 13, 1999)

- Safety Evaluation Report Related to Electric Power Research Institute (EPRI) Risk-Informed Methods to Inservice Inspection of Piping (EPRI TR-112657, Revision B, July 1999) (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated September 15, 1999)

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- Proposed Revision 1 to Regulatory Guide 1.78 (DG-1087), Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated September 16, 1999)

- Proposed Resolution of Generic Safety Issue-145, "Actions to Reduce Common Cause Failures" (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated September 17, 1999)

- Modifications Proposed by the Westinghouse Owners Group to the Core Damage Assessment Guidelines and Post Accident Sampling System (PASS) Requirements (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated September 17, 1999)

MEMORANDA

- Proposed Final Revision 4 to Regulatory Guide 1.101 (DG-1075), "Emergency Planning and Preparedness for Nuclear Power Reactors" (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated September 10, 1999)

- Proposed Final NRC Generic Letter 88-18, Supplement 1, "Guidance on Managing Quality Assurance Records in Electronic Media" (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated September 13, 1999)

- Proposed Final Revision 1 to Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection" (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated September 14, 1999)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Safety Evaluation Report Related to the Oconee Nuclear Power Plant License Renewal Application

   The Committee heard presentations by and held discussions with representatives of the NRC staff and the Duke Energy Corporation regarding the renewal of the Oconee Nuclear Station, Units 1, 2, and 3 operating licenses. The Committee

Members and Duke discussed measuring reasonable assurance, new aging management programs, the process for closing open items, and applying insights from the Oconee individual plant examination (IPE) to the license renewal process. The Committee Members and the staff discussed the alloy 600 aging management program, inspection and evaluation of flaws, the reexamination of the intergranular separation degradation mechanism by the French, and the amount of conservatism in bounding analyses used in topical reports. The Committee Members, the staff, and Duke discussed the design-basis events used to identify structures, systems, and components that are within the scope of 10 CFR Part 54. They also discussed void swelling and the contents of the Final Safety Analysis Report supplement.

Conclusion

The Committee sent a letter to the Executive Director for Operations, dated September 13, 1999, on this matter.

2. Proposed Resolution of Generic Safety Issue -145, "Actions To Reduce Common Cause Failures"

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the proposed resolution of Generic Safety Issue (GSI) 145, "Actions To Reduce Common Cause Failures."

The staff presented a brief discussion of the background and proposed resolution of GSI-145. The staff stated that GSI-145 originated from Generic Issue (GI)-125.I.5, "Safety Systems Tested in All Conditions Required by DBA." GI-125.I.5 was one of a series of generic issues initiated as part of the agency's response to the Davis-Besse loss-of-all-feedwater event that occurred in 1985. GI-125.I.5 called for a means to assess the possible benefits of improving in-service, refueling, surveillance, and initial startup test programs, with the intent of discovering and addressing common-cause failures (CCFs). The NRC staff has issued a number of generic communications addressing such problems as those that occurred during the Davis-Besse event. The staff has also taken other actions relevant to identifying and addressing CCFs, such as in the IPE program, station blackout and alternate ac supply requirements, anticipated transient without scram (ATWS), and CCF database and methods. On July 30, 1998, the staff issued NRC Administrative Letter 98-04 to inform the licensees about the availability of CCF data base, CCF analysis software, and associated technical reports. Subsequently, the staff transmitted the multi-volume report NUREG/CR-6268 on CCF through a letter dated July 30, 1998. The staff stated that efforts over the years have been successful and the rate at which CCFs have been occurring has been steadily decreasing.

The staff concluded that the dissemination of this information to licensees in an administrative letter and the existing base of regulations and operating experience review and oversight programs provide insights for NRC inspections and support of consistent and correct treatment of CCFs in licensee probabilistic risk assessments. Therefore, because the staff believes that the database is available along with the staff's evaluation, the staff has proposed to close out this GSI and consider it resolved without recommending any safety enhancements or other regulatory action.

Conclusion

The Committee sent a letter to the Executive Director for Operations, dated September 17, 1999, detailing this matter.

3. Proposed Final Source Term Rule and Associated Draft Regulatory Guide and Standard Review Plan Section

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed final rule on the use of the alternative source term at operating reactors, the associated draft Regulatory Guide DG-1081 and Standard Review Plan Section 15.0.1, and the status of the pilot plant reviews for implementing the alternative source term (AST). The rule was developed to (1) allow licensees to propose technically justifiable alternatives to the source term described in NUREG-1465, (2) facilitate adapting the NUREG-1465 source term to design-basis accidents other than the loss-of-coolant accident, and (3) allow the staff to adjust the revised source term to address extended burnup fuels. The draft Regulatory Guide DG-1081 was developed to establish an acceptable AST and identify the significant attributes of other ASTs that may be acceptable to the staff. Radiological analysis assumptions for use with the accepted AST are also identified.

Conclusion

The Committee sent a report to Chairman Dicus, dated September 17, 1999, on this matter.

4. Proposed Revision to Regulatory Guide 1.78 (DG-1087), "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release"

The Committee heard a presentation by a representative of the NRC staff regarding the proposed revision to draft Regulatory Guide DG-1087 and the proposed Revision 1 to Regulatory Guide 1.78, "Evaluating the Habitability of a Nuclear Power

Plant Control Room During a Postulated Hazardous Chemical Release." The following key points regarding this regulatory guide were identified:

- The proposed Revision 1 to Regulatory Guide 1.78 addresses the following items: specifying toxicity limits, clarifying the term "frequent shipments," and recommending the use of an atmospheric dispersion model.

- This revision incorporates regulatory positions specified in and withdraws Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release."

- Regarding toxicity limits, Regulatory Guide 1.78 references the National Institute for Occupational Safety and Health's (NIOSH's) standards for protection against hazardous chemicals listed as "immediately dangerous to life and health" (IDLH). The IDLH limit is based on a 30-minute exposure level. Operators are expected to don protective equipment within 2 minutes of detecting hazardous chemicals.

- The staff recommends use of an atmospheric dispersion model, either the same or one similar to that described in NUREG/CR-6210, "Computer Codes for Evaluation of Control Room Habitability (HABIT)." This is a puff dispersion model (Gaussian plume), which permits temporal and spatial variations in release terms and concentrations.

The staff plans to issue this regulatory guide for public comment in September 1999.

Conclusion

The Committee sent a letter to the Executive Director for Operations, dated September 16, 1999, on this matter.

5. ACRS Plans for Reviewing the RETRAN-3D Thermal-Hydraulic Transient Analysis Code

The Committee discussed its plans for reviewing the Electric Power Research Institute (EPRI) RETRAN-3D thermal-hydraulic transient analysis code. Individual members of the Committee expressed concern with the RETRAN code and noted the need for accident and transient codes to contain more robust physics, in light of the move to risk-informed regulation. The Committee also discussed the need to develop code review guidelines, taking note of the NRC staff's ongoing efforts in this regard.

Conclusion

The Committee agreed with the Office of Nuclear Reactor Regulation (NRR) staff's suggestion that the ACRS should not initiate further action relative to its review of RETRAN, pending the outcome of NRR's review. In addition, the Committee will meet with the staff when the draft code guideline products (regulatory guide and Standard Review Plan section) are available.

6. Application of the Electric Power Research Institute (EPRI) Risk-Informed Methods to Inservice Inspection of Piping

The Committee heard presentations by and held discussions with representatives of the NRC staff, EPRI, and the Nuclear Energy Institute (NEI) regarding the staff's Safety Evaluation Report (SER) on the topical report EPRI TR-112657, Revision B, regarding application of EPRI risk-informed methods to inservice inspection (ISI) of piping. The Committee discussed the scheduled completion of the SER, major changes resulting from the pilot applications at Arkansas Nuclear One and Vermont Yankee, the relationship to risk-informed guidelines in NRC Regulatory Guides 1.174 (General Guidance) and 1.178 (ISI), requirements of American Society of Mechanical Engineers (ASME) Code Cases, and augmented inspection programs for known degradation mechanisms. The Committee also discussed the potential benefit from risk-informed ISI programs reducing occupational radiation exposure and associated inspection costs.

Conclusion

The Committee sent a letter to the Executive Director for Operations dated September 15, 1999, on this matter.

7. Proposed Guidance for Using Risk Information in the Review of Licensing Actions

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the draft Commission paper titled, "Proposed Guidelines for Applying Risk-Informed Decisionmaking in License Amendment Reviews."

The staff proposes to use the safety principles and integrated decisionmaking process described in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," to establish the threshold for judging when special circumstances exist. The staff defines these "special circumstances" as conditions under which there is reason to question adequate protection of public health and safety. When

special circumstances are believed to exist, the staff would ask licensees to address the safety principles and numerical guidelines in Regulatory Guide 1.174 through a request for additional information. If a licensee chooses not to address the risk, the staff may deny the license amendment request.

The Committee and the staff discussed the need for additional staff guidance on this subject, the lack of requirements for licensees to perform risk analyses in support of licensing actions, and the availability of the necessary tools for the staff to perform quantitative risk analyses to reach licensing decisions.

Conclusion

The Committee will prepare a report to the Commission during the September 30-October 2, 1999, ACRS meeting.

8. Proposed Final Revision 3 to Regulatory Guide 1.105, "Setpoints for Safety-Related Instrumentation"

The Committee heard presentations by and held discussions with representatives of the NRC staff, the author of the differing professional opinion (DPO), and representatives of Westinghouse Electric Company regarding the proposed final Revision 3 to Regulatory Guide 1.105, "Setpoints for Safety-Related Instrumentation."

The NRC staff presented the background regarding the proposed final regulatory guide and described a method acceptable to the staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within, and remain within, the technical specification limits. The proposed final Revision 3 to Regulatory Guide 1.105 endorses ANSI/ISA S67.04-Part I-1994, "Setpoints for Nuclear Safety-Related Instrumentation." This standard serves as a basis for establishing setpoints for nuclear instrumentation for safety systems and will address known errors in the instrumentation channel. The standard states that the limiting safety system setting (LSSS) may be the trip setpoint, an allowable value, or both. For the standard technical specifications, the staff designated the allowable value as the LSSS.

The author of the DPO disagrees with the staff on the definition of an LSSS. He stated that the trip point is the only setting to which an instrumentation technician adjusts the channel. It's the "leave alone" or "as left" setting required by plant setting sheets. He stated that an allowable value is not a setting. It is an acceptance value on the "as found" trip value for a specific test or measurement of a channel's setpoint. Typically, there are no plant procedures that require a channel

to be set to an allowable value; plant procedures require a channel to be set within a small tolerance around the setpoint.

He further stated that the trip setpoint is the only setting that accounts for all the instrumentation uncertainties in an associated setpoint methodology. Therefore, it is the only setting that is so chosen (by the setpoint methodology) that the automatic protective action corrects the abnormal situation before a corresponding safety limit is exceeded, as explicitly required by 10 CFR 50.36(c)(1)(ii)(A). The allowable value does not account for uncertainties encountered during testing, such as drift and calibration tolerances. Therefore, a channel with an "as-left" setting at the allowable value may not trip at a value that will correct (within the probability assumptions of the setpoint methodology) the abnormal situation because it does not account for such a drift.

The representatives of the Westinghouse Electric Company also disagree with the staff's position that the LSSS is defined as the allowable value. Westinghouse believes that the original intent of the 10 CFR 50.36 LSSS definition was satisfied by trip setpoint and further suggested that changing the LSSS definition is not appropriate without entering a formal rulemaking process.

Conclusion

The Committee sent a letter to the Executive Director for Operations, dated September 13, 1999.

9. Office of Nuclear Regulatory Research (RES) Self-Assessment Program

Representatives of the Office of Nuclear Regulatory Research (RES) briefed the Committee on the RES self-assessment and prioritization processes.

In its staff requirements memorandum (SRM) dated June 9, 1999, the Commission directed the staff to develop a paper that describes the vision for RES, its role, and how it complements the frontline regulatory activities involving licensing, inspection, and oversight. In that SRM, the Commission also asked the staff to describe how RES is independently examining evolving technology and anticipated issues.

The RES staff prepared a draft vision statement of its role in accomplishing the statutory mission of the NRC. The draft vision states that RES will maintain a center of excellence that will serve as the technical basis for informed regulatory decisions related to the safe and efficient use of nuclear materials. It also states that RES will ensure NRC's decisions have a robust technical basis and are clearly understood by the public.

The objective of RES's self-assessment is to increase RES's contribution to the agency mission by defining desired outcomes, systematically examining work options to achieve outcomes, and budgeting for work with the highest outcome leverage. The RES self-assessment process is being facilitated by the Arthur Andersen firm.

RES has identified the following eight new program areas (planned accomplishments):

- Develop the technical bases to address identified or potential safety issues.
- Develop and employ risk information and insights to improve regulatory effectiveness.
- Improve program/process efficiency and product quality.
- Determine the regulatory significance of new technical information.
- Improve analytical tools and data to support sound realistic decisions.
- Prepare NRC to make timely future decisions.
- Develop the technical bases to allow reductions to unnecessary licensee burden.
- Strengthen public confidence.

The planned accomplishments are linked to the NRC Strategic Plan goals of maintaining safety, reducing unnecessary regulatory burden, increasing internal effectiveness and efficiency, and increasing public confidence.

Under each planned accomplishment are research activities and issues. Some examples are: risk-informing 10 CFR Part 50, accident sequence precursor program, standards development for PRA quality, revision of pressurized thermal shock rule 10 CFR 50.61, debris and sump blockage, acceptance criteria for high-burnup fuel, regulatory effectiveness, risk-informed inspection and assessment, deregulation, and generic safety issues.

In addition to the self-assessment process, RES is developing a prioritization process. The objective of the prioritization process is to rank the technical research activities based largely on their relative contributions to outcomes. RES plans to employ an analytical hierarchy process, which involves numerical pairwise comparisons of choices to quantify the relative importance of these choices, to prioritize research activities. RES plans to use evaluation factors based on objective criteria to avoid vague terms such as "high," "medium," and "low."

Conclusion

This briefing was for information only.

10. Plan for Preparation of the Annual ACRS Report to the Commission

The Committee continued its discussion regarding proposed plan and schedule for completing the Year 2000 ACRS report to the Commission on the NRC Safety Research Program. The Committee discussed the conceptual visions on how the Office of Nuclear Regulatory Research (RES) can provide the needed technical support for the NRC to meet its mission and performance goals. The Committee identified potential key decision areas in need of robust technical support from RES.

Conclusion

The Committee plans to expedite its review and completion of the annual report to the Commission on the NRC Safety Research Program.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

The Committee decided to continue its discussion of EDO responses to ACRS reports and letters during the September 30-October 2, 1999, ACRS meeting.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from July 14, 1999 through August 31, 1999, the following Subcommittee meetings were held:

- Severe Accident Management - August 9-10, 1999

  The Subcommittee reviewed: (1) the proposed final revision of the Source Term Rule and draft versions of the associated regulatory guide and Standard Review Plan Section; (2) the proposed revision to Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release"; and (3) the status of issues associated with the Office of Nuclear Regulatory Research Severe Accident Research Program.

- Planning and Procedures - August 31, 1999

  The Planning and Procedures Subcommittee discussed proposed ACRS activities, practices, and procedures for conducting Committee business and organizational and personnel matters relating to ACRS and its staff.

PROPOSED SCHEDULE FOR THE 466TH ACRS MEETING

The Committee agreed to consider the following during the 466th ACRS Meeting, September 30-October 2, 1999:

NRC Safety Research Program
Briefing by and discussions with representatives of NRC on the Research Mission.

Combustion Engineering Owners Group (CEOG) Proposal to Eliminate the Post-Accident Sampling System Requirements
Briefing by and discussions with representatives of CEOG and the NRC staff regarding CEOG proposal to eliminate the post-accident sampling system requirements.

Rulemaking and Review Plans Associated with the Development of Risk-Informed Revisions to 10 CFR Part 50
Briefing by and discussions with representatives of the staff and the Nuclear Energy Institute regarding the proposed rulemaking and review plans associated with the development of risk-informed revisions to 10 CFR Part 50 "Domestic Licensing of Production and Utilization Facilities.

Proposed Resolution of Generic Safety Issue (GSI)-148, "Smoke Control and Manual Fire Fighting Effectiveness"
Briefing by and discussions with representatives of the staff regarding the proposed resolution of GSI-148.

Joint ACRS/ACNW Report on the Proposed Framework for Risk-Informed Regulation in NMSS
Discussion of the Joint ACRS/ACNW Report.

Proposed Resolution of Generic Safety Issue (GSI)-23, "Reactor Coolant Pump Seal Failures"
Briefing by and discussions with representatives of the staff regarding the proposed resolution of GSI-23.

Status of the Proposed Final Amendment to 10 CFR 50.55a, "Codes and Standards"
Briefing by and discussions with representatives of the staff, Nuclear Energy Institute, and the American Society for Mechanical Engineers regarding the proposed final amendment to 10 CFR 50.55a related to elimination of the requirement to update the inservice inspection and inservice testing programs every 120 months, and the resolution of the issues associated with the volume examination of the small-bore piping of the high-pressure safety injection system.

Strategy for Reviewing License Renewal Applications
Discussion of the proposed strategy for ACRS review of the license renewal applications and related matters.

Proposed Regulatory Guide on Design Bases Information
Briefing by and discussions with representatives of the staff and the Nuclear Energy Institute regarding the proposed regulatory guide, endorses NEI 97-04 document, "Design Bases Program Guidelines," and related matters.

Proposed Resolution of Generic Safety Issue B-55, "Improved Reliability of Target Rock Safety Relief Valves"
Briefing by and discussions with representatives of the staff resolution of GSI B-55.

Sincerely,

Dana A. Powers

Dana A. Powers
Chairman