



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001

SL-0549

April 6, 2007

The Honorable Dale E. Klein  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Chairman Klein:

SUBJECT: SUMMARY REPORT - 540<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, MARCH 8-9, 2007, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 540<sup>th</sup> meeting, March 8-9, 2007, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letters, and memoranda:

REPORTS:

Reports to Dale E. Klein, Chairman, NRC, from William J. Shack, Chairman, ACRS:

- Assessment of Aircraft Impacts on New Plants, dated March 19, 2007 (Official Use Only)
- Development of the TRACE Thermal-Hydraulic System Analysis Code, dated March 22, 2007

LETTERS:

Letters to Luis A. Reyes, Executive Director for Operations, NRC, from William J. Shack, Chairman, ACRS:

- Proposed Revision to Standard Review Plan Section 15.9, "BWR Stability," dated March 22, 2007
- Proposed Revision 3 to Standard Review Plan Section 15.0, "Introduction - Transient and Accident Analyses," dated March 22, 2007
- Proposed NRC Staff and Industry Activities for Addressing Dissimilar Metal Weld Issues Resulting from the Wolf Creek Pressurizer Weld Inspection Results, dated March 22, 2007

MEMORANDA:

Memoranda to Luis A. Reyes, Executive Director for Operations, NRC, from Frank P. Gillespie, Executive Director, ACRS:

- Proposed Revisions to Standard Review Plan Sections in Support of New Reactor Licensing, dated March 14, 2007
- ACRS Review of Regulatory Guides 5.69 and 5.70 Supporting the 10 CFR 73.1 Design-Basis Threat Rulemaking, dated March 9, 2007 (Official Use Only)
- Comments Regarding Staff Review of Thermal-hydraulic Methodologies, dated March 14, 2007
- Proposed Revision to 10 CFR 50.55a, "Codes and Standards," dated March 9, 2007

HIGHLIGHTS OF KEY ISSUES

1. Technical Basis Associated with the Proposed NRC Staff Action for Dealing with the Dissimilar Metal Weld Issue

The Committee met with representatives of the NRC staff, the Nuclear Energy Institute (NEI), and FirstEnergy to discuss proposed NRC staff and industry activities for addressing dissimilar metal weld issues resulting from the October 2006 inservice inspection of the Wolf Creek pressurizer nozzles. The staff presented an evaluation of the safety significance of the circumferential indications and the implications to other plants with these dissimilar metal butt welds. The results of the analysis performed by the staff revealed that in some cases the flaws may lead to a rupture before any leakage occurs. As a result, the staff has determined that inspections or mitigation activities on these welds at nine plants should be completed by the end of 2007 rather than the spring of 2008. All other plants either do not have these type of welds or will have inspected or performed mitigation activities by December 2007. NEI and FirstEnergy representatives provided the basis for completing the inspections or mitigation activities in 2008 and described an effort to develop an advanced finite element fracture mechanics analysis capability that can provide a more rigorous basis for their arguments. Licensees have committed to complete inspection or mitigation activities by December 2007 if this finite element analysis is unsuccessful at demonstrating leak-before-break. Licensees have also committed to implement enhanced reactor coolant leakage monitoring as a compensatory action in order to ensure timely plant shutdown should leakage occur. The staff stated that confirmatory action letters will be issued in the near future to confirm these commitments. The staff also stated that it is working closely with the industry on the finite element analysis effort such that timely results may be obtained in June 2007.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter dated March 22, 2007, supporting the agreement reached between the staff and the industry on the resolution of dissimilar metal weld issues on pressurizer nozzles. The Committee also recommended that the staff encourage the industry to inspect all inspectable dissimilar metal welds on pressurizer nozzles before performing mitigation activities.

## 2. Proposed Revisions to Standard Review Plan (SRP) Sections

The Committee met with representatives of the NRC staff to discuss proposed modifications to SRP Section 15.0, "Introduction - Transient and Accident Analyses," and SRP Section 15.9, "BWR Stability." SRP Section 15.0 was revised from the 1996 version to clarify event categories and acceptance criteria based on the current regulations. The changes are meant to cover new reactor designs. Events are now classified into Anticipated Operational Occurrences (AOOs) and postulated accidents. The SRP Section stipulates that it is necessary to demonstrate that AOOs will not escalate into postulated accidents. Anticipated transient without scram (ATWS) is put into a separate class.

SRP Section 15.9 is a new Section and incorporates information that was previously included in SRP Section 4.4. It provides guidance to reviewers on reactor stability issues and ensures compliance with the requirements in General Design Criteria 10 and 12. It applies to both new and existing plants. SRP Section 15.9 provides guidance on acceptance criteria for detection and suppression systems and generic stability problems. The guidance focuses on dealing with density wave oscillations, but reviewers are also expected to ensure that other types of oscillations have been suppressed or are not possible.

### Committee Action

The Committee issued two letters to the Executive Director for Operations on this matter dated March 22, 2007, recommending that revisions to SRP Sections 15.0 and 15.9 be issued.

## 3. Final Results of the Chemical Effects Head Loss Tests Related to the Resolution of the PWR Sump Performance Issues

The Committee met with representatives of the NRC staff to discuss the final results of the chemical effects testing that has been performed to support resolution of GSI-191, PWR Sump Performance. The presentations focused on particular tests investigating the effects of an industry-proposed surrogate debris material, as well as the effects of proposed changes to the chemical buffer material in the containment sump. The NRC staff also described a peer review that was performed to evaluate the overall program and recommend improvements and additional technical issues for consideration. The Committee members provided the staff with several suggestions for further use of the peer-review studies. The staff also presented the results of efforts to improve models of the head loss through debris-laden PWR sump screens, based on experiments performed by Pacific Northwest National Laboratory.

### Committee Action

This was an information briefing. No Committee action was necessary. The Committee intends to review the status of efforts associated with the resolution of GSI-191 in a future meeting.

## 4. Technology-Neutral Licensing Framework and Related Matters

The staff described the framework, or process, for developing new reactor licensing requirements documented in draft NUREG-1860 and published as an Advance Notice of Proposed Rulemaking (ANPR). The framework provides guidance and criteria for creating a

comprehensive set of risk-derived and performance-based requirements that can be either technology-neutral or technology-specific. The ANPR sought stakeholder input on several technical and policy issues (e.g., level of safety, integrated risk, containment versus confinement). Public comments were generally supportive of the framework, but stakeholders did not want this work to encumber new reactor licensing activities. There were mixed stakeholder views with regard to whether and when the staff should be pursuing technology-neutral versus technology-specific requirements and guidance. The Committee members commented that the framework represented a major advancement in the development of a coherent risk-informed approach to develop regulatory requirements for new reactors.

#### Committee Action

The Committee plans to continue its discussion of the framework document for future plant licensing during a future meeting.

#### 5. Proposed Revisions to Regulatory Guides and Standard Review Plan Sections in Support of New Reactor Licensing

The Committee discussed “high-priority” SRP Sections that are being revised or developed in support of new reactor licensing. The Committee noted that it is awaiting receipt of additional high-priority SRP Sections from the staff.

#### Committee Action

The Committee plans to conduct an accelerated review of all SRP Sections that it determines warrants ACRS review.

#### 6. Safeguards and Security Matters (Closed)

The Committee met with representatives of the NRC staff to discuss its work to address a recommendation included in the April 24, 2006 ACRS report on ongoing security-related activities. The staff described the status of an options paper submitted to the Commission, the key information gathered to support this work, and plans for additional research.

#### Committee Action:

The Committee issued a report to the NRC Chairman on this matter dated March 19, 2007, concluding that the staff’s planned activities adequately respond to its recommendation.

#### RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/ STAFF COMMITMENTS

- The Committee considered the RES response of February 6, 2007, to the October 17, 2006 ACRS letter providing the findings of an assessment of the quality of selected NRC research projects. The Committee decided that it was satisfied with the RES response.

The following commitments will be followed up by the appropriate Offices:

**The staff plans to include a separate section in future research reports to summarize the relevant uncertainties and their treatment.**

**The staff plans to use ACRS comments and observations on a project entitled “MCCI Program at the Argonne National Laboratory” as a guidance for the follow-on MCCI-2 program that is under way.**

#### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from February 4, 2007 through March 7, 2007, the following Subcommittee meetings were held:

- Thermal-Hydraulic Phenomena Subcommittee - February 27, 2007

The Subcommittee reviewed the final reports related to chemical effects testing that was performed to support the resolution of GSI-191, PWR Sump Performance.

- Thermal-Hydraulic Phenomena Subcommittee - February 28, 2007

The Subcommittee reviewed proposed revisions to SRP Section 15.0, “Introduction - Transient and Accident Analyses,” and SRP Section 15.9, “BWR Stability.”

- Materials, Metallurgy, and Reactor Fuels Subcommittee - March 6, 2007

The Subcommittee reviewed proposed NRC staff and industry activities for addressing dissimilar metal weld issues resulting from the Wolf Creek pressurizer weld inspection results.

- Future Reactor Designs - March 7, 2007

The Subcommittee reviewed draft NUREG-1860, “Framework for Development of a Risk-Informed, Performance-Based Alternative to 10 CFR Part 50,” and the associated Advance Notice of Proposed Rulemaking.

- Planning and Procedures - March 7, 2007

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

#### LIST OF MATTERS FOR THE ATTENTION OF THE EDO

- The Committee would like to be kept informed of any significant changes made to the SRP Sections, prior to issuing them in final form, listed in the March 14, 2007 memorandum from Frank P. Gillespie, Executive Director, ACRS, to Luis A. Reyes, Executive Director for Operations, NRC.

- The Committee is awaiting receipt of additional high-priority SRP Sections from the staff.
- The Committee would like to be informed of the disposition of issues raised by Ms. Carmen DeLong regarding NRC staff practices in evaluating thermal-hydraulic methods for nuclear reactors.
- The staff agreed to address comments made by the Committee members during the Subcommittee and Full Committee meetings regarding SRP Section 15.9, "BWR Stability."
- The staff agreed to make additional modifications to SRP Section 15.0, "Introduction - Transient and Accident Analyses," to address comments made by the Committee members concerning the types of analyses that would be considered to be "Postulated Accidents" as opposed to "Anticipated Operational Occurrences," and the assumption of a single failure as part of these analyses.
- The Committee plans to continue its discussion of the framework document for future plant licensing during a future meeting.

#### PROPOSED SCHEDULE FOR THE 541<sup>st</sup>ACRS MEETING

The Committee agreed to consider the following topics during the 541<sup>st</sup> ACRS meeting, to be held on April 5-7, 2007:

- Human Reliability Analysis Modes
- Proposed Revisions to Standard Review Plan Section 4.2, "Reactor Fuels"
- Risk-Management Technical Specification Initiative 4b - Flexible Completion Times
- Format and Content of the ACRS Report on the NRC Safety Research Program
- Meeting with Commissioner Jaczko
- Response to November 8, 2006 Commission SRM Regarding Development of a Technology-Neutral Licensing Framework for Future Plant Designs

Sincerely,

*/RA/*

William J. Shack  
Chairman

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*/RA/*

William J. Shack

Distribution:

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ADAMS ML070880755

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DATE	03/29/2007	0406/2007

Letter to The Honorable Dale E. Klein, Chairman, NRC, from W. Shack, Chairman, ACRS  
Dated April 6, 2007.

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