



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

SL-0547

January 17, 2007

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

Dear Chairman Klein:

SUBJECT: SUMMARY REPORT - 538<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, DECEMBER 7-8, 2006, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 538<sup>th</sup> meeting, December 7-8, 2006, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report, letters, and memoranda:

REPORT

Report to Dale E. Klein, Chairman, NRC, from Graham B. Wallis, Chairman, ACRS:

- Draft Final Regulatory Guide DG-1145, Combined License Applications for Nuclear Power Plants (LWR Edition), dated December 12, 2006

LETTERS

Letters to Luis A. Reyes, Executive Director for Operations, NRC, from Graham B. Wallis, Chairman, ACRS:

- Proposed Revision to Standard Review Plan Section 13.3, "Emergency Planning," dated December 15, 2006
- Draft Final Regulatory Guide 1.207 (DG-1144), "Guidelines for Evaluating Fatigue Analyses Incorporating the Life Reduction of Metal Components Due to the Effects of the Light-Water Reactor Environment for New Reactors," dated December 18, 2006

MEMORANDA

Memoranda to Luis A. Reyes, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS:

- Proposed Revisions to Standard Review Plan Sections in Support of New Reactor Licensing, dated December 15, 2006
- Anonymous Letter Concerning Changes to 10 CFR Part 52 Rulemaking Package (SECY-06-0220), dated December 8, 2006

## HIGHLIGHTS OF KEY ISSUES

### 1. Draft Final Regulatory Guide, DG-1145, "Combined License Applications for Nuclear Power Plants"

The Committee met with representatives of the NRC staff to discuss DG-1145, "Combined License Applications for Nuclear Power Plants." DG-1145 provides a roadmap to help Combined License (COL) applicants identify the appropriate content of a COL application submitted under 10 CFR Part 52. It is structured to address COL applications that reference an early site permit (ESP), a certified design, neither, or both. DG-1145 is meant to be consistent with proposed final revisions to 10 CFR Part 52 and with the new and revised Regulatory Guides and Standard Review Plan (SRP) Sections being developed in support of new reactor licensing. DG-1145 was based on the guidance previously published in Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)," and was updated based on operating experience (as reflected in NRC Bulletins and Generic Letters), lessons learned from design certification and ESP reviews, and guidance in SECY Papers and related Staff Requirements Memoranda. There was extensive industry involvement in the development of DG-1145. The members and staff held a detailed discussion on the appropriate content of a COL application related to probabilistic risk assessments (PRAs).

#### Committee Action

The Committee issued a report to the NRC Chairman on this matter dated December 12, 2006, recommending that the final rule, 10 CFR Part 52, retain the requirements that a design-specific PRA be submitted with the design certification application and that a plant-specific PRA be submitted with the COL application. The Committee also recommended that DG-1145 be issued as a final Regulatory Guide after the staff ensures that it is consistent with the final 10 CFR Part 52 rule and with the Regulatory Guides and SRP Sections/Chapters being revised or developed in support of new reactor licensing.

### 2. Draft Final Regulatory Guide 1.207 (DG-1144), "Guidelines for Evaluating Fatigue Analyses Incorporating the Life Reduction of Metal Components Due to the Effects of the Light-Water Reactor Environment for New Reactors"

The Committee met with representatives of the NRC staff, the American Society of Mechanical Engineers (ASME), and AREVA to discuss the draft final Regulatory Guide 1.207 (DG-1144), "Guidelines for Evaluating Fatigue Analyses Incorporating the Life Reduction of Metal Components Due to the Effects of the Light-Water Reactor Environment for New Reactors." The staff and representatives from Argonne National Laboratory (ANL) described the objective, technical basis, and regulatory positions of Regulatory Guide 1.207. This Guide uses an environmental correction factor,  $F_{en}$ , to account for the effects of the light water reactor coolant environment on fatigue life. The technical basis for this Guide is described in NUREG/CR-6909, "Effect of LWR Coolant Environments on the Fatigue Life of Reactor Materials." Regulatory Guide 1.207 also addresses the non-conservatism of the current ASME stainless steel air design curve in the mid-to-high cycle fatigue range by recommending the use of a new stainless steel air design curve in NUREG/CR-6909. Representatives of ASME and AREVA commented that the existing ASME design curves and methodology are adequate, that there is no need for a new regulatory guide, that the new guide will result in more detailed and costly

analysis in the design of new plants, and that the use of the new guide will also result in the need for an excessive number of snubbers and pipe whip restraints.

#### Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter dated December 18, 2006, recommending that Regulatory Guide 1.207 be issued as final. The Committee suggested that the staff interact with ASME in the development of a Code Case related to reactor coolant environmental effects on fatigue.

#### 3. Proposed Revisions to Standard Review Plan Section 13.3, "Emergency Planning"

The Committee met with representatives of the NRC staff and Nuclear Energy Institute (NEI) to discuss proposed revisions to NUREG-0800, SRP Section 13.3, "Emergency Planning." The staff described the use of emergency planning inspections, tests, analyses, and acceptance criteria (EP-ITAAC) which would address the features of a complete and integrated emergency plan that cannot be described in the required detail at the time of the application. The criteria in the EP-ITAAC need to be met before initial fuel loading. The members noted the benefit of learning from the good practices of Countries with major nuclear programs and the need to develop guidance on planning for severe external events, like a major earthquake, that could eliminate the transportation and communication network. The staff also described its effort to incorporate lessons learned from recent major public evacuation events. Representatives of NEI discussed industry comments on draft SRP Section 13.3 and industry efforts to develop emergency action levels for new advanced light water reactor designs.

#### Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter dated December 15, 2006, recommending that NUREG-0800, SRP Section 13.3, "Emergency Planning," be issued.

#### 4. State-of-the-Art Reactor Consequence Analysis Project

The Committee met with representatives of the NRC staff to discuss the status of the staff's efforts associated with the state-of-the-art reactor consequence analysis project. The staff briefed the committee on a number of topics related to this project including plans for MELCOR and MACCS code improvement, plant grouping, and selection of scenarios to use for consequence analysis. The staff also briefed the Committee on its plan for a site-specific simulation of offsite emergency response for this project.

#### Committee Action

This was an information briefing. The Committee plans to continue its review of this project as further progress has been made by the staff.

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

The Committee discussed “high-priority” Regulatory Guides and SRP Sections that are being revised or developed in support of new reactor licensing and decided on the need for ACRS review of these Guides and SRP Sections. The Committee’s decision is documented in a memorandum dated December 15, 2006, from John T. Larkins, ACRS Executive Director to Luis A. Reyes, NRC Executive Director for Operations.

Committee Action

The Committee plans to conduct an accelerated review of all Regulatory Guides and SRP Sections that it determines warrant ACRS review.

6. Subcommittee Report on Thermal-Hydraulic Phenomena

The Chairman of the Thermal-Hydraulic Phenomena Subcommittee provided a report to the Committee summarizing the results of the December 5, 2006 meeting with the NRC staff and its contractors concerning the development of the TRACE computer code. Members expressed concern about the state of the code documentation and noted that the staff’s progress in establishing the TRACE code as the standard NRC tool for evaluating light water reactor behavior is slow. The staff described its response to an anonymous letter that had been received by the Committee concerning the numerical solution scheme for the code. Members noted that the staff’s efforts to address the underlying technical issues raised in the anonymous letter should be improved.

Committee Action

The Committee plans to consider a letter to the Executive Director for Operations on this matter during its February 2007 meeting.

7. Election of ACRS Officers for CY 2007

The Committee elected William J. Shack as ACRS Chairman, John D. Sieber as ACRS Vice Chairman, and Mario V. Bonaca as Member-at-Large for the Planning and Procedures Subcommittee for CY 2007.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the EDO’s response of November 27, 2006, to comments and recommendations included in the October 25, 2006 ACRS letter on the draft final NUREG-1824, “Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications.” The Committee decided that it was satisfied with the EDO’s response.
- The Committee considered NRR’s response of December 1, 2006, to the November 6, 2006 memorandum from the ACRS Executive Director regarding the Browns Ferry

Nuclear Plant, Unit 1 - Extended Power Uprate Application and Supplemental Application. The Committee decided that it was satisfied with the NRR's response.

- The Committee considered the EDO's response of December 6, 2006, to comments and recommendations included in the November 27, 2006 ACRS Report on the Safety Aspects of License Renewal Application for the Palisades Nuclear Plant. The Committee decided that it was satisfied with the EDO's response.

#### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from November 4, 2006 through December 6, 2006, the following Subcommittee meetings were held:

- Future Plant Designs - November 30, 2006

The Subcommittee reviewed DG-1145, "Combined License Applications for Nuclear Power Plants."

- Thermal-Hydraulic Phenomena - December 5, 2006

The Subcommittee discussed the development of the TRACE computer code.

- Materials, Metallurgy, and Reactor Fuels - December 6, 2006

The Subcommittee reviewed draft final Regulatory Guide 1.207 (DG-1144), "Guidelines for Evaluating Fatigue Analyses Incorporating the Life Reduction of Metal Components Due to the Effects of the Light-Water Reactor Environment for New Reactors."

- Planning and Procedures — December 6, 2006

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 informed of any significant changes made to DG-1145 prior to publishing it in final form.
- 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 December 15, 2006 memorandum from John T. Larkins, 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 the anonymous letter related to changes to 10 CFR Part 52 rulemaking.

- The staff committed to provide the Committee with a description of research activities associated with fatigue degradation mechanisms.
- The Committee plans to continue its review of the State-of-the-Art Reactor Consequence Analysis Project as further progress has been made by the staff.

PROPOSED SCHEDULE FOR THE 539<sup>th</sup> ACRS MEETING

The Committee agreed to consider the following topics during the 539<sup>th</sup> ACRS meeting, to be held on February 1-3, 2007:

- Final Review of the Power Uprate Application for the Browns Ferry Nuclear Plant, Unit 1
- Final Review of the License Renewal Application for the Oyster Creek Generating Station
- Development of TRACE Thermal-Hydraulic System Analysis Code
- Proposed Revision to 10 CFR 50.46 LOCA Criteria for Fuel Cladding Materials
- Draft Final Revision 1 to Regulatory Guide 1.189 (DG-1170), "Fire Protection for Nuclear Power Plants," and SRP Section 9.5.1, "Fire Protection Program"
- Wolf Creek Pressurizer Weld Flaws
- Proposed Revisions to Regulatory Guides and SRP Sections in Support of New Reactor Licensing

Sincerely,

*/RA/*

Graham B. Wallis  
Chairman

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Sincerely,

*/RA/*

Graham B. Wallis  
Chairman

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