



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

SL-0535

October 26, 2005

The Honorable Nils J. Diaz  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 526<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE ON  
REACTOR SAFEGUARDS, OCTOBER 6-7, 2005, AND OTHER RELATED  
ACTIVITIES OF THE COMMITTEE

During its 526<sup>th</sup> meeting, October 6-7, 2005, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following letters and memoranda:

LETTERS:

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

- Proposed Recommendation for Resolving Generic Safety Issue-80, "Pipe Break Effects on Control Rod Drive Hydraulic Lines in the Drywells of BWR Mark I and II Containments," dated October 18, 2005
- Interim Report on the Safety Aspects of the License Renewal Application for the Browns Ferry Nuclear Plant Units 1, 2, and 3 dated October 19, 2005

MEMORANDA:

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

- Proposed Rule on Safety/Security Interface, dated October 11, 2005.
- Draft Regulatory Guide DG-1120 (DG-1120), "Transient and Accident Analysis Methods," and Standard Review Plan Chapter 15 Section 15.0.2 (SRP 15.0.2), "Review of Transient and Accident Methods," dated October 13, 2005.

OTHER:

- Letter to Carl J. Paperiello, Director, Office of Nuclear Regulatory Research, from William J. Shack, Acting Chairman, ACRS: ACRS Assessment of the Quality of Selected NRC Research Projects - FY 2005

- Letter to Nancy Burton, Connecticut Coalition Against Millstone, from Graham B. Wallis, Chairman, ACRS, regarding the License Renewal of Millstone Power Station, Units 2 and 3, dated October 18, 2005

### HIGHLIGHTS OF KEY ISSUES

#### 1. Interim Review of the License Renewal Application for the Browns Ferry Nuclear Plant, Units 1, 2, and 3

The Committee met with the NRC staff and representatives of the Tennessee Valley Authority (TVA) to review the license renewal application for the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3 and the related Safety Evaluation Report (SER) with Open Items. The operating licenses for Units 1, 2, and 3 expire on December 10, 2013, June 28, 2014, and July 2, 2016, respectively. TVA has requested approval for continued operation of each unit for a period of 20 years beyond the current license expiration dates. TVA described the layup program for Unit 1 and its plans to restart this unit in 2007 such that all three units will be operationally identical. TVA has not taken credit for the Unit 1 Layup Program as the sole basis for determining the acceptability of components for restart. TVA also described its Periodic Inspection Program for Unit 1 components that have not been replaced. As a result of our review, the staff elevated the issue of the Unit 1 Periodic Inspection Program from a confirmatory item to an open item. The staff described the three other open items identified from its review of this license renewal application. The regional inspectors found that plant equipment was being adequately maintained but another NRC inspection will be performed after TVA has progressed further in its development of aging management programs.

### Committee Action

The Committee issued a letter to the NRC Executive Director for Operations on this matter, dated October 19, 2005. The Committee agreed with the staff's interim evaluation of the license renewal application related to BFN Units 2 and 3 and concluded that the plant-specific operating experience for BFN Unit 1, by itself, does not fully meet the intent of the license renewal rule. The Committee recommended that the final SER include a cohesive discussion of the applicability of operating experience from Units 2 and 3 to Unit 1 as well as a description of the attributes of the Periodic Inspection Program for Unit 1 components that will not be replaced. The Committee also recommended that if an extended power uprate is implemented, the staff require that TVA evaluate operating experience of Units 1, 2, and 3 at the uprated power level prior to entering the period of extended operation.

#### 2. Proposed Recommendation for Resolving Generic Safety Issue (GSI)-80, "Pipe Break Effects on Control Rod Drive Hydraulic Lines in the Drywells of Boiling Water Reactor Mark I and II Containments"

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed recommendation for resolving GSI-80. Damage to the control rod drive (CRD) hydraulic lines by mechanical impact resulting from a loss-of-coolant accident (LOCA) was raised as an issue by the ACRS in 1978 during operating license reviews of certain boiling water reactors (BWRs). The Office of Nuclear Regulatory Research (RES) performed

an assessment to address this issue. The core damage frequencies (CDFs) for the various Residual Heat Removal and Reactor Coolant System pipe break events that could potentially impact Control Rod Drive piping were determined for Mark I and Mark II plants. All of the calculated CDF values were less than the threshold ( $10^{-6}$  event/Reactor Year) specified in the Handbook to Management Directive 6.4, "Generic Issues Program." Therefore, RES recommends that GSI-80 be closed with no changes to the existing regulations or guidance.

#### Committee Action

The Committee issued a letter to the NRC Executive Director for Operations on this matter, dated October 18, 2005, agreeing with the staff's proposed recommendation to close GSI-80 without any changes to the regulations or guidance.

#### 3. Resolution of ACRS Comments on the Draft Final Regulatory Guide, "Risk-Informed, Performance-Based Fire Protection for Existing Light Water Nuclear Power Plants"

The Committee heard presentations by and held discussions with representatives of the staff regarding the resolution of the ACRS comments and recommendations, included in its June 14, 2005 letter, on the draft final Regulatory Guide, "Risk-informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," and NEI document, NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48 (c)."

The staff stated that it agrees with all the ACRS recommendations except one regarding definitions of the term maximum expected fire scenario and limiting fire scenario. The staff provided a status of the licensee implementation of National Fire Protection Association (NFPA) 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition. The staff stated the Regulatory Guide and the Nuclear Energy Institute (NEI) 04-02 are being revised to address the ACRS comments. The staff did not seek endorsement of the Regulatory Guide at this meeting, because the staff wants to ensure compatibility with other staff documents, such as 10 CFR 50.69, 10 CFR 50.46(a), and 10 CFR 50.48 (c). The staff said that it will provide the final draft Regulatory Guide and NEI 04-02 document to the ACRS and seek endorsement to issue the Regulatory Guide after all the changes are made.

#### Committee Action

The Committee did not write a letter at this time at the staff's request. The Committee plans to review the revised Guide and the NEI document in the future.

#### 4. Davis-Besse Reactor Pressure Vessel Head Integrity Calculations

The Committee met with representatives of the NRC staff to discuss calculations performed to support the Accident Sequence Precursor (ASP) analysis of the 2002 Davis-Besse events. Specifically, at the April 2005 meeting, the Committee requested more information regarding calculations that supported the determination of LOCA frequencies for the ASP analysis. The RES staff agreed to provide this briefing on the probabilistic structural mechanics calculations that supported the analysis. The staff discussed the details of the structural mechanics testing

program and calculations that assessed the as-found condition of the reactor pressure vessel head, predictions of vessel head failure if the plant had not been taken off-line, and postulated vessel head conditions during the year before the plant was taken off-line. As part of this last discussion, the staff also addressed the expert elicitation results that supported the ASP analysis of potential loss-of-coolant accidents. Several Members praised the staff regarding the quality of this work and the quality of the presentation.

Committee Action:

This was an information briefing. The Committee plans to review the staff's annual report to the Commission on the status of the ASP Program, including quantitative ASP results.

5. Quality Assessment of the Selected NRC Research Projects

The NRC Strategic Plan that was developed in accordance with the requirements of the Government Performance and Results Act (GPRA) requires that RES have an independent evaluation of the quality of its research programs. The Committee has agreed to assist RES in assessing the quality of selected research projects. The Committee completed its report on the assessment of the quality of selected research projects on: Station Blackout Risk Evaluation of Nuclear Power Plants; Steam Generator Tube Integrity Program at the Argonne National Laboratory; and Analysis of Rod Bundle Heat Transfer Facility Two-Phase Interface Drag at the Penn State University.

Committee Action

The Committee approved the letter transmitting the report on ACRS Assessment of the Quality of Selected NRC Research Projects to the Director of RES. The Committee anticipates receiving from RES a list of candidate projects for review during the next twelve months.

6. Licensees' Responses to the Bulletin on, "Emergency Preparedness and Response Actions for Security-Based Events"

The Committee met with representatives of the NRC staff to discuss licensees' responses to NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events." During the June 2005 meeting, the Committee considered the proposed bulletin and decided to hold any review until the staff's reconciliation of the licensees' responses. The staff discussed the licensee's responses to the Bulletin. The purpose of the Bulletin was to gather together information on actions licensees have taken in this area in response to the many orders, advisories, lessons-learned, and non-regulatory communications. From the responses, nearly all licensees intend to address the issues raised in the Bulletin in their emergency preparedness plans. The staff noted that several of the issues discussed in the Bulletin were related to previous ACRS recommendations. One issue discussed in detail with the staff related to how to escalate the emergency action levels for security-based events and their relationship to the traditional accident-based emergency action levels. A portion of this session was closed to the public to discuss more sensitive information related to the progression of events during security-related emergencies.

Committee Action:

This was an information briefing. The Committee plans to continue its review of selected security-related issues in the future.

7. NRC Staff's Response to the ACRS Letter on the Proposed Revision 4 to Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident"

The Committee heard a presentation by the staff concerning its plans to further revise its proposed Regulatory Guide 1.82, Rev. 4, to incorporate more risk-informed practices to granting containment overpressure credit, and to apply those practices for the first time as part of its review of the Vermont Yankee power uprate request. The Committee questioned how this approach would reconcile its concerns about maintaining sufficient defense-in-depth as part of the design of the containment and emergency core cooling systems. The staff stated that it would require licensees that propose to apply this method to demonstrate that the five key principles of risk-informed decisionmaking in RG 1.174 are met. The staff will clarify its requirements and describe its expectations for licensees who submit risk-informed license amendments to credit containment overpressure. The staff intends to provide the ACRS with a revised Regulatory Guide 1.82 for review and comment.

Committee Action

The Committee plans to review the revised Revision 4 to Regulatory Guide 1.92.

8. Format and Content of the NRC Safety Research Program Report to the Commission

During the October 6-8 2005 ACRS meeting, the Committee discussed the format and content of the ACRS biennial report to the Commission on review and evaluation of the NRC safety research program.

Committee Action

The Committee plans to discuss a draft report on NRC safety research program during its November 3-5, 2005 meeting.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee considered the EDO's response of September 12, 2005, to ACRS's July 15, 2005 report responding to an April 25, 2005 Staff Requirement Memorandum (SRM), requesting the Committee to "provide the Commission a list of research projects it intends to review in the short term as part of its assessment of research quality, with an indication of the methodology the Committee will use for the reviews."

The Committee decided that it was satisfied with the EDO's response.

#### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from September 8, 2005, through October 5, 2005, the following Subcommittee meetings were held:

- Plant License Renewal and Plant Operations - Browns Ferry Unit 1 - September 21, 2005

The Subcommittees reviewed the license renewal, power uprate, and restart activities associated with Browns Ferry Unit 1.

- Plant License Renewal - Browns Ferry Nuclear Plant - October 5, 2005

The Subcommittee reviewed the License Renewal Application and associated SER with Open Items for the Browns Ferry Nuclear Plant, Units 1, 2, and 3.

- Planning and Procedures - October 5, 2005

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 requested an information briefing regarding the FERRET reactor vessel fluence methodology.
- The Committee plans to review the license renewal application for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 and the related draft final SER.
- The Committee plans to review the draft final Regulatory Guide, "Risk-Informed, Performance-Based Fire Protection for Existing Light Water Nuclear Power Plants."
- The Committee plans to review the staff's annual report to the Commission on the status of the ASP Program, including quantitative ASP results.
- The Committee plans to continue its review of selected security-related issues in the future.
- The Committee plans to review the Revision 4 to Regulatory Guide 1.82, "Water Sources for Long-term Recirculation Cooling Following a Loss-of-Coolant Accident."
- The Committee would like an information briefing on the staff's review of the FERRET reactor vessel fluence methodology.

PROPOSED SCHEDULE FOR THE 527<sup>TH</sup> ACRS MEETING

The Committee agreed to consider the following topics during the 527<sup>TH</sup> ACRS meeting, to be held on November 3-5, 2005:

- Final Review of the License Renewal Application for the Point Beach Nuclear Plant, Units 1 and 2
- Draft Final Generic Letter 2005-xx, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power"
- Economic Simplified Boiling Water Reactor (ESBWR) Design
- Draft ACRS Report to the Commission on the NRC Safety Research Program
- Digital Systems Research Plan
- Status of Rulemaking on Post-Fire Operator Manual Actions

Sincerely,

**/RA/**

Graham B. Wallis  
Chairman