

December 17, 2001

The Honorable Richard A. Meserve  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: SUMMARY REPORT - 487th MEETING OF THE ADVISORY  
COMMITTEE ON REACTOR SAFEGUARDS, NOVEMBER 8-10, 2001,  
AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 487th meeting, November 8-10, 2001, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report. In addition, the Committee authorized Dr. John T. Larkins, Executive Director, ACRS, to transmit the memoranda noted below:

#### REPORT

- Report on the Safety Aspects of the License Renewal Application for the Edwin I. Hatch Nuclear Plant, Units 1 and 2 (Report to Chairman Meserve, NRC, from George E. Apostolakis, Chairman, ACRS, dated November 16, 2001)

#### MEMORANDA

- Core Power Uprates for Dresden and Quad Cities Nuclear Power Stations (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated November 13, 2001)
- Update Rulemaking for 10 CFR Part 52 (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated November 14, 2001)

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## HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

### 1. Final Review of the Hatch License Renewal Application

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the license renewal application of the Edwin I. Hatch Nuclear Plant, Units 1 and 2 and the related final Safety Evaluation Report. The Committee members, the staff, and Southern Nuclear Operating Company discussed quality requirements for corrective action programs, inspection and testing of buried components, the planned research program associated with cast austenitic stainless steel components, and methods for providing guidance to future applicants.

#### Committee Action

The Committee issued a report to Chairman Meserve on this matter dated November 16, 2001.

### 2. Dresden and Quad Cities Power Uprate

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Exelon Generation Company (Exelon) regarding the license amendment request for an increase in core thermal power for the Dresden Nuclear Power Station, Units 2&3, and the Quad Cities Nuclear Power Station, Units 1&2, pursuant to the GE Nuclear Energy Extended Power Uprate (EPU) Program. Exelon has requested power increases for the Dresden and Quad Cities plants of 17 and 17.8%, respectively, under the EPU.

As with the recent Duane Arnold Energy Center EPU request, the Committee's review focused on the issues of: susceptibility of the plant to ATWS (anticipated transients without scram), ATWS recovery, reduction in some of the times available for operator actions because of higher decay heat, material degradation due to irradiation-assisted stress corrosion cracking of reactor internals and flow-assisted corrosion and fatigue of feedwater piping, and containment response to accident events involving higher decay heat levels. The Committee also discussed the NRC staff's open items for this review, including the issue of the need to conduct large transient tests, post EPU operating conditions.

#### Committee Action

The Committee issued a memorandum to the Executive Director for Operations on this matter, dated November 13, 2001. The Committee plans to continue its discussion of this matter, in particular the issue of the need for conducting large transient tests, during its December 5-8, 2001, meeting.

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### 3. NRC Safety Research Program

The Committee heard presentations by and held discussions with representatives of the NRC Office of Nuclear Regulatory Research (RES) regarding RES response to the ACRS report, NUREG 1635, Vol. 4, "Review and Evaluation of the Nuclear Regulatory Commission Safety Research Program," plans for advanced reactor designs, new challenges, and refocusing and reinvigorating research.

The ACRS in its NUREG 1635, Vol. 4 outlined specific recommendations such as the closure of the research programs in the control room design review guidance, the Organization for Economic Cooperation and Development (OECD) lower head failure research, the Common Cause Failure (CCF) program, and the ATHEANA (A Technique for Human Event Analysis) program. The staff has incorporated the first two recommendations in RES budget submittals. Regarding the last two recommendations, the staff is still considering other options such as the continuation of the International Common Cause Failure Data Exchange (ICDE) effort to collect data, and the application of ATHEANA.

RES role for advanced reactor designs includes preparing the NRC technical infrastructure to facilitate effective and efficient licensing reviews of future plants. Some new challenges of RES are expected to be in the materials area.

In addition, RES is developing a process for refocusing and reinvigorating the role of research to meet the NRC demands.

#### Committee Action

The Committee decided to continue its follow-up on the safety research programs in RES during future meetings.

### 4. Proposed Update to 10 CFR Part 52

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Nuclear Energy Institute (NEI) concerning the draft rule language for the proposed update to 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." The Committee discussed experience gained from design certification reviews, early site permits (ESP) and combined license (COL) processes, provision for the use of risk information, detailed changes proposed for the 10 CFR Part 52 update, basis for the staff's determination that no significant changes are needed for future plant designs, and the application of the 10 CFR Part 52 process to the licensing of the Pebble Bed Modular Reactor (PBMR). The Committee also considered the NEI petitions for rulemaking (PRM-52-1 and PRM-52-2) on ESPs and the COL processes.

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### Committee Action

The Committee authorized the ACRS Executive Director to send a memorandum to the NRC Executive Director for Operations, dated November 14, 2001, on this matter.

#### 5. Circumferential Cracking of PWR Vessel Head Penetrations

The Committee heard presentations by and held discussions with representatives of the Industry and the NRC staff on the status of activities related to circumferential cracking of PWR vessel head penetrations (VHP) that have occurred since the issuance of Bulletin 2001-01. The industry was represented by EPRI, NEI, and Davis-Besse nuclear power plant.

The industry is making substantial progress on reactor vessel head penetration activities since the issuance of the Bulletin. Currently 69 plants have responded to the Bulletin and 10 have performed bare metal visual inspections. Davis-Besse will perform a visual inspection during its March 2002 refueling outage. The Expert Panel issued a draft report on its findings on crack growth rates in Alloy 600/182 at the end of October; a final report is expected shortly.

### Committee Action

This was an information briefing and no Committee action was expected.

#### 6. Licensing Approach for the Pebble Bed Modular Reactor Design

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the staff's assessment of Exelon Generation Company's proposed licensing approach for the Pebble Bed Modular Reactor (PBMR).

In June 2001, Exelon submitted its initial proposed licensing approach for the PBMR that consists of three major parts. The first part involves a top-down effort that combines deterministic and risk-informed techniques to determine necessary acceptance criteria and functional requirements. The second part is an applicability screening of existing regulations. The third part involves the comparison of the first two parts to determine which regulations are applicable, which are partially applicable, and which are not applicable. This process was conducted by Exelon on a trial basis using an expert elicitation panel.

The staff has identified potential policy issues such as the use of quantified probabilistic criteria to select events, and the use of probabilistic criteria to make design decisions (e.g., the role of a containment in the design and emergency preparedness). In its preliminary assessment, the staff believes that Exelon's proposed licensing approach

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has the potential to be a reasonable process. The staff will continue to assess Exelon's proposal during the pre-application reviews.

#### Committee Action

The Committee will continue its review and follow-up on this matter during future meetings.

#### RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee considered the response from the EDO, dated October 18, 2001, to comments and recommendations included in the ACRS report dated September 17, 2001, concerning the application of the GE Nuclear Energy TRACG Code to Anticipated Operational Occurrences.

The Committee decided it was satisfied with the EDO response.

- The Committee discussed the response from the EDO dated October 17, 2001 to the recommendation included in the ACRS letter dated September 14, 2001, regarding the Generic Safety Issue-191, "Assessment of Debris Accumulation on PWR Sump Pump Performance."

The Committee was satisfied with the EDO's response.

- The Committee considered the response from the EDO, dated October 3, 2001, to comments and recommendations included in the ACRS letter dated July 20, 2001, concerning the draft NUREG-1742, "Perspectives Gained From the Individual Plant Examination of External Events (IPEEE) Program."

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

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#### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from October 4, 2001, through November 7, 2001, the following Subcommittee meetings were held:

- Plant License Renewal - October 25, 2001

The Subcommittee discussed the Safety Evaluation Report for the Southern Nuclear Operating Company, Inc., license renewal application for Hatch Units 1 and 2, and the NRC license renewal appeals process.

- Thermal-Hydraulic Phenomena - October 25-26, 2001

The Subcommittee reviewed the application by the Exelon Generation Company for core power uprates for the Dresden Nuclear Power Station, Units 2 & 3, and the Quad Cities Nuclear Power Station, Units 1 & 2.

- Planning and Procedures - November 7, 2001

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 EXECUTIVE DIRECTOR FOR OPERATIONS

- The Committee will continue its review of the application of the Exelon Generation Company for an increase in core thermal power for the Dresden Nuclear Power Station, Units 2&3, and the Quad Cities Nuclear Power Station, Units 1&2, pursuant to the GE Nuclear Energy Extended Power Uprate Program during its December 2001 Meeting.
- The ACRS plans to review the proposed final version of 10 CFR Part 52 following the reconciliation of public comments.

#### PROPOSED SCHEDULE FOR THE 488<sup>th</sup> ACRS MEETING

The Committee will discuss the following topics during the 488th ACRS meeting:

- Dresden and Quad Cities Core Power Uprates
- Discussion of Topics for Meeting with the NRC Commissioners
- Meeting with the NRC Commissioners
- Risk-Informed 10 CFR Part 50 Pilot Program (Option 2)
- NEI 97-06, "Steam Generator Program Guidelines"

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- Proposed Rulemaking for Risk-Informed Revisions to 10 CFR 50.44
- ACRS/ACNW Office Retreat
- Thermal-Hydraulic Phenomena, Materials and Metallurgy, and Reliability and Probabilistic Risk Assessment, and Joint Subcommittee Reports

Sincerely,

**/RA/**

George E. Apostolakis  
Chairman