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

March 9, 2011

The Honorable Gregory B. Jaczko
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: SUMMARY REPORT – 580th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, FEBRUARY 10-12, 2011

Dear Chairman Jaczko:

During its 580th meeting, February 10-12, 2011, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letters, and memorandum:

REPORTS

Reports to Gregory B. Jaczko, Chairman, NRC, from Said Abdel-Khalik, Chairman, ACRS:

- Report on the Safety Aspects of the License Renewal Application for the Palo Verde Nuclear Generating Station, dated March 1, 2011

- Report on the Safety Aspects of the South Carolina Electric and Gas Company Combined License Application for V.C. Summer Nuclear Station, Units 2 and 3, dated February 17, 2011

- Comparison of Integrated Safety Analysis (ISA) and Probabilistic Risk Assessment (PRA) for Fuel Cycle Facilities, dated February 17, 2011

- Current State of Licensee Efforts to Transition to National Fire Protection Association (NFPA) Standard 805, dated February 17, 2011

- SECY-11-0014, "Use of Containment Accident Pressure in Analyzing Emergency Core Cooling System and Containment Heat Removal System Pump Performance in Postulated Accidents," dated February 17, 2011

LETTERS

Letters to R. W. Borchardt, Executive Director for Operations, NRC, from Said Abdel-Khalik, Chairman, ACRS:

- Draft Final Regulatory Guides 1.34, 1.43, 1.44, and 1.50, dated February 24, 2011
- Response to the January 21, 2011, EDO Letter Regarding the Safety Culture Policy Statement, dated February 28, 2011

MEMORANDUM

Memorandum to R. W. Borchardt, Executive Director for Operations, NRC, from Edwin M. Hackett, Executive Director, ACRS:

- Proposed Regulatory Guide DG-1254, dated February 17, 2011

HIGHLIGHTS OF KEY ISSUES

1. Final Safety Evaluation Report Associated with the License Renewal Application for the Palo Verde Nuclear Generating Station Units 1, 2, and 3

The Committee met with representatives of the NRC staff and Arizona Public Service Company (APS or the applicant) to discuss the staff's final Safety Evaluation Report (SER) related to the license renewal application for the Palo Verde Nuclear Generating Station (PVNGS). The presentations of the applicant and the staff described efforts to resolve one open item and five confirmatory items identified in the draft SER. The applicant and staff also discussed five additional items identified after the draft SER was issued in August 2010. The open item was related to questions that arose during the staff's review of metal fatigue. The confirmatory items were related to the application of scoping criteria in 10 CFR 54.4(a)(2), the Flow-Accelerated Corrosion Program, one-time inspections of ASME Code Class 1 small-bore piping, wall thinning due to flow-accelerated corrosion, and consistency of aging management reviews with the Generic Aging Lessons Learned Report. The five additional items discussed included the Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program, Buried Piping and Tanks Inspection Program, NUREG/CR-6260 limiting locations and pressurizer heater penetrations, the Selective Leaching Aging Management Program, and steam generator tube denting and welds susceptible to primary water stress corrosion cracking. The applicant and the staff concluded that the applicant's programs and commitments are adequate to close the open and confirmatory items. The staff concluded that the requirements of 10 CFR 54.29(a) have been met.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated March 1, 2011, recommending that the application for renewal of the operating licenses of the Palo Verde Nuclear Generating Station units be approved.

2. Final Safety Evaluation Report Associated with the Virgil C. Summer Units 2 and 3 Combined License Application

The Committee met with representatives of the NRC staff and South Carolina Electric and Gas Company (SCE&G) to discuss the Combined License Application (COLA) for the V.C. Summer Nuclear Station (VCSNS), Units 2 and 3. This application conforms to the design-centered review approach (DCRA). The DCRA is Commission policy which allows the staff to perform one technical review and reach a decision for each COLA standard issue outside the scope of the design certification and to use this review and decision to support decisions on multiple COLAs. The first COLA that receives a complete NRC staff review is designated as the reference COLA (RCOLA). Any subsequent application referencing the same design is designated as a subsequent COLA (SCOLA). The VCSNS COLA is an AP1000 SCOLA.

The VCSNS COLA incorporates by reference the Westinghouse Electric Company AP1000 Design Certification Amendment application. The staff and the SCE&G representatives highlighted the COLA, including departures from the AP1000 design control document (DCD); standard and site-specific exemptions; and the site-specific designs. The applicant presented observations from onsite excavation activities and discussed basic geologic and seismic information, surface faulting, site geotechnical characterization and foundations, and vibratory ground motion. The applicant discussed the only additional exemption of note from the DCD and described its affects on the AP1000 systems due to a change in the maximum, safety, non-incident wet bulb temperature. In the discussion of the interfaces between the Liquid Radwaste and Waste Water System, the applicant explained their design considerations in meeting the regulatory requirements. The Waste Water System design incorporated industry operation experience and lessons learned. The applicant also discussed various aspects of emergency planning including emergency plan design, emergency facilities, emergency response, emergency planning zone, and public awareness.

Committee Action

The Committee issued a letter to the NRC Chairman on this matter dated February 17, 2011, concluding that there is reasonable assurance that VCSNS, Units 2 and 3, can be built and operated without undue risk to the health and safety of the public and recommended that the SCOLA for VCSNS be approved following its final revision. The Committee also concluded that recommendations 2 through 5 in the January 24, 2011, letter concerning the Vogtle Electric Generating Plant, Units 3 and 4, RCOLA are also applicable to the VCSNS, Units 2 and 3, SCOLA. Finally, the Committee recommended that the staff limit the use of the current version of the HABIT code to neutral density gas dispersion modeling.

3. Comparison of Integrated Safety Analyses (ISAs) for Fuel Cycle Facilities and Probabilistic Risk Assessments (PRAs) for Reactors

The Committee met with representatives of the NRC staff and the Nuclear Energy Institute (NEI) to discuss the staff's white paper entitled "A Comparison of Integrated Safety Analysis (ISA) and Probabilistic Risk Assessment (PRA)." In a May 12, 2010, Staff Requirements Memorandum (SRM), the Commission directed the staff to prepare this paper and present it to the ACRS for their review. The staff's presentation described the functions of ISAs, the functions of PRAs, safety evaluations performed under 10 CFR Part 70, and risk significance determinations for fuel cycle facilities. The staff concluded that ISAs are adequate for establishing the safety basis for fuel facilities and that case-by-case analyses to determine risk significance is efficient. The staff discussed possible future directions for the fuel cycle oversight process. The NEI representative expressed confidence in the current usage of ISAs.

Committee Action

The Committee issued a letter to the NRC Chairman on this matter dated February 17, 2011, concluding that ISAs, in combination with practices required by current regulations, are adequate for the protection of the health and safety of workers and the public, and for licensing fuel cycle facilities. The Committee also concluded that for more complex facilities, the use of a PRA approach is advantageous because it provides a basis for prioritization of safety systems and maintenance activities. The Committee also recommended that the staff continue to develop and test the use of PRA-like analyses to help assess the risk significance of inspection findings for fuel cycle facilities.

4. Current State of Licensee Efforts to Transition to National Fire Protection Association (NFPA) Standard 805

The Committee met with representatives of the Nuclear Energy Institute (NEI), Electric Power Research Institute (EPRI), and NRC staff to discuss the issues which impact the fire protection program transition to NFPA 805. The NEI representative noted that industry is very supportive of achieving closure of fire protection issues. In January 2008, industry identified "lack of realism" in NUREG/CR-6850 (EPRI 1011989) as a concern. The subsequent Frequently Asked Questions (FAQs) process clarified portions of the guidance in NUREG/CR-6850, but concluded that further work is needed. In December 2009, NEI notified the Commission of industry's continued concerns and initiated the EPRI fire PRA action matrix. In December 2010, NEI submitted a report documenting industry's basis for the concern that fire PRA results are not consistent with plant operating experience. This report also outlined fire PRA areas requiring improvement in order to achieve enhanced realism in fire PRA methods. NEI and industry representatives presented a comparison of PRA results with operating experience. The EPRI representative identified areas in need of additional realism and described a research plan to achieve these improvements.

The staff's presentation described the history, current status, and path forward for performance-based fire protection guidance. The staff stated that pilot plant activities are complete and infrastructure documents have been prepared. The Office of Nuclear Reactor Regulation (NRR) plans to begin receiving and reviewing license amendment request (LAR) from non-pilot plants in mid-year 2011. The staff believes that fire PRAs have matured sufficiently to make regulatory decisions in support of implementing 10 CFR 50.48(c). The staff stated that NUREG/CR-6850 is a guidance document, not a regulatory requirement. Therefore, licensees can deviate from these methods, and a process exists to allow these methods to be refined. However, proposed methods must have a sound technical basis. The staff stated that FAQs were established to provide interim staff approval of changes to NEI 04-02 guidance. PRA-related FAQs were incorporated in a supplement to NUREG/CR-6850. Lessons learned during pilot-plant reviews were reflected in revisions to RG 1.205, the LAR template, and the safety evaluation template. The staff plans to develop a paper on additional lessons learned from the pilot process. In conclusion, the staff stated that fire PRA methods will continue to evolve and they will continue to work interactively and collaboratively with industry.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated February 17, 2011, concluding that the methods and guidance in NUREG/CR-6850, supplemented by the clarifications and enhancements in NUREG/CR-6850 Supplement 1, provide a sound technical basis for the development of fire PRA models and analyses to support the transition to a risk-informed licensing framework in accordance with NFPA 805 and 10 CFR 50.46(c). The Committee also recommended that the staff consider establishment of a mutually-agreed-upon firm schedule for sequential submittals of LARs. The February 17, 2011, report contains several other specific recommendations regarding fire PRA models, methods, and databases.

5. Draft Final Regulatory Guide (RG)1.34, "Control of Electroslag Weld Properties;" RG 1.43, "Control of Stainless Steel Weld Cladding of Low-Alloy Steel Components;" RG 1.44, "Control of the Processing and Use of Stainless Steel;" and RG 1.50, "Control of the Preheat Temperature for Welding of Low-Alloy Steel"

The Committee met with representatives of the NRC staff to discuss the proposed changes to RG 1.34, RG 1.43, RG 1.44, and RG 1.50. The staff's presentation described the proposed changes to these RGs, the resolution of public comments, and the staff's response to comments on RG 1.44 made by members during an earlier ACRS subcommittee meeting. The draft final RGs provide detailed and up-to-date guidance on welding processes and materials for fabrication of reactor components and guidance to help alleviate cracking caused by welding processes. RG 1.34 deals with weld solidification cracking and weld toughness, RG 1.43 deals with underclad cracking, and RG 1.50 deals with delayed hydrogen cracking. RG 1.44 focuses on the prevention of Intergranular Stress Corrosion Cracking (IGSCC) caused by sensitization of stainless steel. The staff addressed comments made by members during an ACRS

subcommittee meeting on RG 1.44 concerning the lack of sufficient data to indicate that standard grade stainless steels experience significant IGSCC in Pressurized Water Reactor (PWR) environments and the dissolved oxygen levels associated with the onset of IGSCC. In response to these comments, the staff discussed several editorial clarifications made to the text in Section B and Section C of RG 1.44.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter dated February 24, 2011, recommending that RG 1.34, 1.43, and 1.50 be issued as final. The Committee recommended that RG 1.44 not be issued until the following changes are made: (1) the language proposed by the staff during the February 10-12, 2011 meeting be incorporated into the guide to address the Committee's concerns on the use of standard grade stainless steels and the description of PWR water chemistry; and (2) guidance should be added to address the deleterious effects of cold work caused by post weld grinding on IGSCC and Irradiation Assisted Stress Corrosion Cracking susceptibility of welded AISI Type 300 stainless steel components.

6. SECY-11-0014, "Use of Containment Accident Pressure in Analyzing Emergency Core Cooling System and Containment Heat Removal System Pump Performance in Postulated Accidents"

The Committee met with representatives of the NRC staff to discuss SECY-11-0014. This document responds to an SRM that directed the staff to discuss the areas in which the staff aligns with the ACRS and disagrees with the ACRS regarding crediting of containment accident pressure (CAP) in the calculation of the net positive suction head of the emergency core cooling system and containment heat removal system pumps. The staff summarized their analysis of three specific issues identified in the SRM. On the defense-in-depth issue, the staff position is that regulations do not require independence of barriers. On the issue of the use of risk information, the staff position is that for operating plants there is no basis to require risk information if license applications are not risk-informed and the staff has not identified any "special circumstances" that could rebut the presumption of adequate protection. For new reactors, the staff acknowledges that supplemental risk information can be requested. The third issue relates to the practicality of plant modifications that eliminate the need for CAP credit. The staff asserts that it is not within their regulatory authority to judge the practicality of a design. Moreover, the staff has never asked licensees whether it was impractical to alter the design.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated February 17, 2011, concluding that they continue to support the recommendations and positions described in their May 19, 2010, letter report. The Committee also noted that the disagreement between their position and that of the staff appears to have increased.

7. Proposed Regulatory Guide DG-1254

The Committee has no objection to the staff's proposal to issue Draft Regulatory Guide DG-1254, "Qualification of Connection Assemblies for Nuclear Power Plants," for public comments but would like an opportunity to review the draft final version of this guide after the reconciliation of public comments.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the Office of Nuclear Regulatory Research response of January 25, 2011, to conclusions and recommendations included in the November 15, 2010, ACRS letter on the ACRS assessment of the quality of selected NRC research projects – FY 2010. The Committee decided that it was satisfied with the response.

- The Committee considered the EDO's response of December 7, 2010, to conclusions and recommendations included in the October 20, 2010, ACRS letter on draft final digital instrumentation and control Interim Staff Guidance-06, "Licensing Process." The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of November 23, 2010, to conclusions and recommendations included in the October 26, 2010, ACRS report on the safety aspects of the license renewal application for the Cooper Nuclear Station. The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of January 26, 2011, to conclusions and recommendations included in the December 20, 2010, ACRS report on the long-term core cooling for the Westinghouse AP1000 pressurized water reactor. The Committee decided that it was satisfied with the EDO's response

- The Committee considered the EDO's response of January 21, 2011, to conclusions and recommendations included in the December 15, 2010, ACRS report on the safety culture policy statement. The Committee issued a response letter to the Executive Director for Operations on this matter, dated February 28, 2011.

SCHEDULED TOPICS FOR THE 581st ACRS MEETING

The following topics are scheduled for the 581st ACRS meeting, to be held on March 10-12, 2011:

- Commission Paper on the Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews
- Point Beach, Units 1 and 2, Extended Power Uprate Application
- Status of Groundwater Protection Task Force Efforts
- Improvements to the Generic Issue Program

Sincerely

/RA/

Said Abdel-Khalik
Chairman

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Letter to the Honorable Gregory B Jaczko, Chairman, NRC, from Said Abdel-Khalik, Chairman, ACRS, dated March 8, 2011

SUBJECT: SUMMARY REPORT – 580th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, February 10-12, 2011

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