



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

April 7, 2010

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

SUBJECT: SUMMARY REPORT - 570th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, MARCH 4-6, 2010

Dear Chairman Jaczko:

During its 570th meeting, March 4-6, 2010, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and memoranda:

REPORTS

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

- Draft Final Revision 1 to Digital Instrumentation and Control Interim Staff Guidance - 07: "Digital Instrumentation and Control Systems in Safety Applications at Fuel Cycle Facilities," dated March 25, 2010
- Draft Final Revision 1 of Regulatory Guide 1.141, "Containment Isolation Provisions for Fluid Systems," dated March 25, 2010
- Draft Revision 2 to Regulatory Guide 4.11 (DG-4016), "Terrestrial Environmental Studies for Nuclear Power Plants," dated March 25, 2010
- Status of Staff Rulemaking Efforts for Depleted Uranium and Other Unique Waste Streams, dated March 18, 2010
- Draft Final Revision 1 of Regulatory Guide 1.62, "Manual Initiation of Protective Actions," dated March 29, 2010

MEMORANDA

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

- Final Interim Staff Guidance ESP/DC/COL-ISG-015, "Post-Combined License Commitments," dated March 11, 2010
- Withdrawal of Regulatory Guide 8.6, dated March 11, 2010

- Draft Final Regulatory Guides 1.11, 1.126, 1.28, 1.65, and 3.39, dated March 11, 2010
- Proposed Revisions to Regulatory Guides 1.152, 2.6, 4.20, 8.10, 8.19, 8.4, and DG-1216, dated March 11, 2010
- Proposed Revision 2 to Regulatory Guide 1.54, dated March 15, 2010

HIGHLIGHTS OF KEY ISSUES

1. Draft Final Interim Staff Guidance (ISG) on Fuel Cycle (ISG-07)

The Committee met with representatives of the NRC staff to discuss Draft Final Revision 1 to ISG-07, "Digital Instrumentation and Control (DI&C) Systems in Safety Applications at Fuel Cycle Facilities," the changes made to this Guide since the August 21, 2009, DI&C Subcommittee meeting, and the resolution of public comments.

Guidance for review of licensing applications of fuel cycle facilities consistent with the risk-informed licensing framework set forth in 10 CFR Part 70 is contained in NUREG 1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility." Neither of these documents contains either analog or DI&C design criteria using industry codes and standards. Therefore, ISG-07 was developed in response to industry and NRC concerns regarding the need for consistency of review of fuel cycle facility applications.

ISG-07 provides guidance for reviewing the management measures for Items Relied on for Safety (IROFS) that use DI&C technology. Specifically, ISG-07 provides guidance on the following: (1) the acceptability of management measures regarding how "Cyber Security" is addressed for the protection of digital safety controls; (2) how redundant controls should be maintained "Independent" to prevent criticality events and other hazards; (3) how "Digital Communications" among safety controls should be isolated or protected; and (4) how the design of "High Quality Software" for DI&C safety applications should be ensured.

Committee Action

The Committee issued a report to the NRC Chairman, dated March 25, 2010, recommending that Revision 1 to DI&C ISG-07 not be issued until it is revised to state that any reduction in the level of rigorous management measures applied to redundant IROFS, relative to sole IROFS with the same design requirements, should be justified by a comprehensive analysis. The Committee also recommended that future efforts include the development of a systematic approach for identifying dependencies and common cause failures in IROFS and the development of an approach for structuring the individual scenario results of an Integrated Safety Assessment (ISA) to facilitate review and understanding of the associated risk significance.

2. Draft Final Regulatory Guide 1.141, "Containment Isolation Provisions for Fluid Systems"

The Committee met with representatives of the NRC staff to discuss Draft Final Revision 1 of Regulatory Guide (RG) 1.141, "Containment Isolation Provisions for Fluid Systems." This Guide

provides updated guidance on acceptable design, testing, and maintenance requirements for the isolation of fluid systems that penetrate the primary containment. The staff described the specific regulatory positions in the RG as well as the associated industry guidance. The proposed changes to RG 1.141 would allow relief valves to serve as containment isolation valves in the forward direction, provided that the lift setpoint is at least 50 percent greater than the containment design pressure. The use of relief valves in the forward flow direction to perform a containment isolation function poses the risk of creating pathways for bypassing containment.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated March 25, 2010, recommending that Revision 1 of RG 1.141 be issued after it is revised to include additional provisions similar to those in the 1989 edition of ANSI/ANS 56.2, Section 4.7.5, "Relief Valves in the Forward Flow Direction." The Committee also recommended that appropriate portions of NUREG-0800 be revised consistent with this recommendation.

3. Draft Revision 2 to Regulatory Guide 4.11, "Terrestrial Environmental Studies for Nuclear Power Plants"

The Committee met with representatives of the NRC staff to discuss Draft Revision 2 to RG 4.11 [Draft Guide (DG) - 4016], "Terrestrial Environmental Studies for Nuclear Power Plants." The staff described their basis for revising RG 4.11 and its relationship to other NRC environmental guidance. DG-4016 updates guidance for the conduct of terrestrial environmental studies to support analyses presented in a licensee's environmental report in support of siting new nuclear power plants. DG-4016 addresses siting support, baseline investigations, identification of important species and habitats, impact analyses, monitoring, and decommissioning. The Committee was interested in the guidance because no revisions of the guide have been issued since 1977. The Committee learned that there is no guidance document that addresses aquatic environmental studies.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated March 25, 2010, recommending that the Guide be issued for public comment after certain revisions are made. The Committee also recommended that the staff develop a complementary guide on aquatic environmental studies.

4. Status of Rulemaking for Disposal of Depleted Uranium and Other Unique Waste Streams

The Committee met with representatives of the NRC staff to discuss the status of rulemaking for Depleted Uranium (DU) and other unique waste streams. In 2005 the Commission directed the staff to consider whether the quantities of DU in the waste streams from uranium enrichment facilities warrant amending 10 CFR Part 61.55(a)(6) or the waste classification tables of section 61.55(a). The staff conducted technical analyses for a variety of site characteristics and concluded that near-surface disposal of large quantities of DU can be appropriate in some cases, but cannot be done at all sites. The staff recommended a limited rulemaking to revise 10 CFR Part 61 to require a licensee or applicant to conduct site-specific analyses that address

the characteristics of the site and the proposed waste form prior to disposal of large quantities of DU. In September 2009, the staff conducted workshops in Bethesda, Maryland, and Salt Lake City, Utah, to inform the public about the rulemaking status and the issues regarding unique low-level waste streams, including DU. The staff plans to develop interim guidance for use until the rulemaking is complete and to offer public demonstrations of the models that support their efforts to date. The staff plans to respond to requests for technical assistance from Agreement States.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated March 18, 2010, recommending that the staff continue their efforts to risk-inform the regulations for disposal of depleted uranium based on site-specific, realistic performance assessments with appropriate consideration of uncertainties.

5 Draft Final Revision 1 of Regulatory Guide 1.62, "Manual Initiation of Protective Actions"

This item was discussed during the Committee's February 4, 2010, meeting. However, because of inclement weather, the committee did not have the opportunity to complete its review at that time. During the February 4, 2010, meeting, the Committee met with representatives of the NRC staff to discuss Draft Final Revision 1 to RG 1.62, "Manual Initiation of Protective Actions."

The staff provided an overview of the proposed changes to the regulatory guide which included: referencing the current IEEE Standard 603-1991 in addition to IEEE Standard 279-1971, changing "system level" to "division level" as the reference point for manual initiations, removing the "minimum-common-equipment guidance", and addressing manual initiation of digital control systems. Regulatory Guide 1.62 is also being revised to expand its scope with two new positions to include guidance for Diversity and Defense-in-Depth (D3) in accordance with NUREG-800 and Branch Technical Position 7-19, and to include an option to pursue either safety-related and non-safety manual actions separately, or as a single safety manual initiation. Also addressed by the staff was the resolution of public comments regarding the proposed regulatory guide.

Committee Action

The Committee completed its review of this regulatory guide during its March 8-10, 2010, meeting and issued a report to the NRC Chairman dated March 29, 2010, recommending that RG 1.62 not be issued as final until it is revised to specify that protective actions initiated solely by manual controls are subject to consideration of: (1) the time required for the operator to analyze and manually respond to an adverse condition and (2) the time available for actions to be taken to mitigate adverse plant conditions. The Committee also recommended that RG 1.62 be revised to state explicitly that a system level actuation of all divisions which meets the requirements of IEEE 603-1991 is acceptable.

6. ACRS Report on the NRC Safety Research Program

The ACRS provides the Commission a biennial report presenting the Committee's observations and recommendations concerning the overall NRC Safety Research Program. During the March 2010 meeting, the Committee completed its biennial review and evaluation of the Reactor Safety Research Program sponsored by the NRC.

Committee Action

The Committee will issue its 2010 biennial report to the Commission entitled, "Review and Evaluation of the Nuclear Regulatory Commission Safety Research Program," by April 15, 2010. The final report will be published as NUREG-1635, Vol. 9.

7. Digital Instrumentation and Control Design Acceptance Criteria (DAC) Inspection Methodology

The Committee met with representatives of the NRC staff to review the proposed DI&C Design Acceptance Criteria (DAC) inspection methodology and the plans for piloting this approach at the South Texas Project (STP). The DAC Working Group in NRO has developed a viable methodology for DAC review/inspection/resolution, and the staff plans to apply it to an actual DI&C DAC product at STP Units 3/4. The staff provided an overview of DI&C DAC inspection strategies which generally mirror the digital system/software development lifecycle found in the Standard Review Plan, Branch Technical Position 7-14 (Guidance for Review of Digital I&C Systems). The Inspection Strategy Documents borrow from industry standards, regulatory guidance and staff expertise, and feature descriptions, key attributes, and inspection techniques. These documents are intended to support lifecycle phase-oriented inspection and provide a technical basis for subsequent development of a new ITAAC Inspection Procedure (IP 65000 series) for I&C DAC. Following completion of the pilot effort, the DAC Working Group will identify and incorporate necessary enhancements into a generic methodology for future application.

Committee Action

This was an information briefing. No Committee action was necessary. The Committee plans to continue its review of DAC inspection guidance at a future meeting. The Committee has requested that, upon completion, copies of the Inspection Strategy Documents be provided by the staff for the Committee's review.

8. New Advanced Reactor Designs

The Committee met with representatives of the NRC staff to discuss the Agency's Advanced Reactor Program. The reactor technologies addressed by the Advanced Reactor Program include high-temperature gas-cooled reactors (i.e. the Next Generation Nuclear Plant), integral pressurized water reactors (PWRs), and sodium-cooled fast reactors. The high-temperature gas-cooled reactors are associated with the Energy Policy Act of 2005 and the Next Generation Nuclear Plant (NGNP). The staff's current NGNP activities include evaluating existing requirements and guidance to identify needed changes, identifying significant policy and technical issues, and developing an overall licensing plan. The staff is also reviewing NGNP white papers associated with issues such as defense-in-depth, fuel design, high temperature materials, and analytical code verification and validation. Integral pressurized water reactors are PWRs with nuclear steam supply components (e.g. steam generator, reactor coolant pumps, etc.) housed within the reactor vessel. The staff is in pre-application discussions with vendors regarding the Westinghouse IRIS, NuScale, and B&W mPower designs. The NRC's activities associated with sodium fast reactors are limited, but the staff has had some pre-application interactions with vendors regarding the Toshiba 4S and General Electric PRISM designs.

The staff described some of the policy and technical issues associated with licensing these new reactor designs. The staff concluded their presentation by identifying topics for future ACRS interactions such as the high-temperature gas-cooled-reactor research plan and the resolution of specific policy or technical issues,

Committee Action

This was an information briefing. No Committee action was necessary.

9. Meeting with the NRC Executive Director for Operations (EDO)

The ACRS met with the EDO and Deputy EDOs to discuss items of mutual interest including the Agency's budget priorities, oversight and licensing of reactors, new fuel cycle facilities, nuclear materials users, spent fuel management, decommissioning, and enhancing public participation.

Committee Action

This was an information briefing. No Committee action was necessary.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the EDO's response of February 1, 2010, to comments and recommendations included in the December 10, 2009, ACRS report on the draft final Revision 1 of Regulatory Guide 1.151, "Instrument Sensing Lines." The Committee decided that it was satisfied with the EDO's response.
- The Committee considered the EDO's response of December 11, 2009, to comments and recommendations included in the November 13, 2009, ACRS report on the status of the ACRS review of the Westinghouse AP1000 Design Certification Amendment. The Committee decided that it was satisfied with the EDO's response.
- The Committee considered the EDO's response of January 13, 2010, to comments and recommendations included in the December 10, 2009, ACRS report on the safety aspects of the license renewal application for the Prairie Island Nuclear Generating Plant, Units 1 and 2. The Committee decided that it was satisfied with the EDO's response.
- The Committee considered the EDO's response of December 3, 2009, to comments and recommendations included in the October 22, 2009, ACRS report on the closure of Steam Generator Action Plan Items 3.1k, 3.4, 3.5, 3.10, 3.11, and 3.12 and staff closeout of the Steam Generator Action Plan. The Committee decided that it was satisfied with the EDO's response.

SCHEDULE FOR THE 571st ACRS MEETING

The following topics are scheduled for the 571st ACRS meeting, to be held on April 8-10, 2010:

- Draft Final Interim Staff Guidance (ISG) DC/COL-ISG-016, “Compliance with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d)”
- Selected Chapters of the Safety Evaluation Report (SER) with Open Items Associated with the Review of the U.S. Evolutionary Power Reactor (USEPR) Design Certification Application
- Supplement 3 to the General Electric (GE) topical report NEDC-33173PA, “Applicability of GE Methods to Expanded Operating Domains”
- Final ISG ESP/DC/COL-ISG-015, “Post-Combined License Commitments”

Sincerely,

/RA/

Said Abdel-Khalik
Chairman

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/RA/

Said Abdel-Khalik
Chairman

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