

May 30, 2012

Dr. J. Sam Armijo, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: RISK-INFORMED REGULATORY FRAMEWORK FOR NEW REACTORS

Dear Dr. Armijo:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter dated April 26, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12107A199), about the recommendations of the Advisory Committee on Reactor Safeguards (ACRS) on the draft Commission paper, "Risk-Informed Regulatory Framework for New Reactors." The Committee received the draft Commission paper, sent by memorandum, dated February 3, 2012 (ADAMS Accession No. ML12011A191). The NRC staff discussed the draft paper with ACRS on April 12, 2012. The NRC staff's response to the conclusions and recommendations in your letter is discussed below.

ACRS Conclusion/Recommendation 1

Approvals for the implementation of risk-informed licensing applications that address structures, systems, and components (SSCs) which do not have a unique design or different function from those in currently operating reactors should not require the compilation of additional new reactor operating experience as a prerequisite.

NRC Response

In general, the NRC staff agrees with the ACRS recommendation. The staff continues to work with stakeholders to address implementation details (such as the lack of plant-specific operating experience) on several near-term initiatives including risk-informed technical specification initiative 4b. However, the staff also notes that there are some programs such as risk-informed inservice inspection of piping, in which conducting a service history review and incorporating operating experience is a key element of the methodology.

ACRS Conclusion/Recommendation 2

We concur with the staff's recommendation of Option 1B to close a potential gap in the reviews of changes to Tier 2 design certification information regarding SSCs for the mitigation of non-ex-vessel severe accidents.

NRC Response

The NRC staff appreciates the Committee's concurrence on the staff's recommendation to the Commission to close the potential gap as discussed above. The staff notes that the final version of the Commission paper will continue to propose this as a recommendation to the Commission, but will no longer delineate Options 1A and 1B.

ACRS Conclusion/Recommendation 3

We concur with the staff's recommendation of Option 2C for transition from use of the conditional containment failure probability and large release frequency metrics to the use of only large early release frequency metric at or prior to initial fuel load.

NRC Response

The NRC staff appreciates the Committee's concurrence with the staff's recommendation to the Commission to implement Option 2C. The staff reiterates that core damage frequency will be a metric that will continue to be measured regardless of which option the Commission approves. Also, under Option 2C, the combined license holder would continue to meet the containment performance objective following core damage per SECY-90-016, "Evolutionary Light Water Reactor (LWR) Certification Issues and Their Relationship to Current Regulatory Requirements," dated January 12, 1990 (ADAMS Accession No. ML003707849), and SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs," dated April 2, 1993 (ADAMS Accession No. ML003708021).

ACRS Conclusion/Recommendation 4

The staff should assess what effort is necessary to ensure that the scope and level of detail in the Level 2 offsite release categories and Level 3 consequence categories from the evolving consensus probabilistic risk assessment (PRA) standards and their supporting methods are adequate to support metrics that address aspects of societal risk.

NRC Response

The American Nuclear Society and the American Society of Mechanical Engineers have drafted standards for a Level 2 and Level 3 PRA which will support PRA efforts to evaluate offsite consequences. NRC staff is participating in the development of these standards and eventually will endorse them once they are finalized and published. The NRC has the opportunity to provide input through the staff's participation in these consensus standards development organizations and the endorsement process. Additionally, the staff notes that the Office of Nuclear Regulatory Research's work on the Level 3 PRA project may help inform the

development or revisions to these standards. Although the Level 3 PRA project will rely on the current state-of-practice for the offsite release and consequence metrics, the results of this study may provide a useful benchmark when considering other potential metrics that address societal risk.

ACRS Conclusion/Recommendation 5

A fourth Option 3D should be developed for Commission consideration with regard to risk significance determinations to support the Reactor Oversight Process (ROP) and other risk-informed applications. That option should employ relative measures of the change in risk as a metric for safety significance, rather than absolute measures. Use of these relative measures should also be clarified in an update to Regulatory Guide 1.174.

NRC Response

While the staff understands the Committee's recommendation, the staff believes that an approach involving relative risk was previously considered but was not pursued for reasons discussed below. In addition, the staff's proposed approach to use deterministic backstops to supplement the risk insights is a simpler approach to achieving the desired outcome and remains consistent with the existing ROP framework and program goals of being objective, risk-informed, understandable, and predictable.

In the February 12, 2009, white paper on options for risk metrics for new reactors (Enclosure 1 to SECY-10-0121 "Modifying the Risk-Informed Regulatory Guidance for New Reactors"), the staff considered the merits of a relative risk metric. Impediments to this approach were perceived by both internal and external stakeholders. Therefore, the staff did not consider this option further or include it in SECY-10-0121. In its staff requirements memorandum to SECY-10-0121, dated March 2, 2011 (ADAMS Accession No. ML110610166), the Commission did not approve the development of lower numeric thresholds for new reactors in which the ACRS recommendation would effectively result. The Commission directed the staff to conduct tabletop exercises to either confirm the adequacy of current regulatory tools or identify areas for improvement. The ROP tabletop exercises confirmed the adequacy of the current ROP framework and risk thresholds. However, the staff acknowledged that the current significance determination process and reactive inspection guidance may not be sufficient by itself to support an appropriate regulatory response to licensee performance deficiencies and events because of the lower risk profiles associated with new reactor designs. Therefore, the staff proposes deterministic backstops to ensure regulatory responses are appropriate. The existing ROP framework provides for deterministic considerations in regulatory decision-making in accordance with RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Deterministic backstops for new reactors would provide a clear, efficient, and reliable way of ensuring appropriate and predictable regulatory responses within the existing ROP framework, consistent with the principles of good regulation.

J. S. Armijo

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We appreciate the comments and recommendations ACRS has provided and look forward to continue working with the Committee as we begin to draft detailed guidance as directed by the Commission.

Sincerely,

/RA/

R. W. Borchardt
Executive Director
for Operations

cc: Chairman Jaczko
Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff
SECY

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