



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

November 20, 2013

The Honorable Allison M. Macfarlane
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: DRAFT COMMISSION PAPER, "NRC STAFF RECOMMENDATION FOR THE DISPOSITION OF RECOMMENDATION 1 OF THE NEAR-TERM TASK FORCE REPORT"

Dear Chairman Macfarlane:

During the 609th meeting of the Advisory Committee on Reactor Safeguards (ACRS), November 7-8, 2013, we reviewed the Draft Commission Paper, "NRC Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force (NTTF) Report," dated October 31, 2013. Our Fukushima Subcommittee also reviewed this matter on August 15 and December 4, 2012, and on May 23, September 4, and November 5, 2013. During these reviews, we had the benefit of discussions with representatives of the NRC staff, the Nuclear Energy Institute, the Union of Concerned Scientists, and other members of the public. We also had the benefit of the documents referenced.

CONCLUSIONS AND RECOMMENDATIONS

1. The staff's proposed approach to disposition NTTF Recommendation 1 will provide limited improvement to the current regulatory structure.
2. We concur with the staff's conclusion that rulemaking is not needed to establish a new design-basis extension category. Developing guidance to assure consistency in the regulatory treatment of issues assigned to that category has merit.
3. Establishing the Commission's expectations for defense in depth through a Commission Policy Statement that includes the definition, objectives, and principles of defense in depth is valuable only if there also is clear direction to move forward with a regulatory framework which includes development of a risk-informed, performance-based, defense-in-depth concept. The staff's proposed disposition of NTTF Recommendation 1 does not fully embrace this fundamental concept. Commission direction on the long term plan for a risk management regulatory framework is needed.
4. Enhanced monitoring and documentation of future industry initiatives is a necessary process improvement. The regulatory inspection requirements should be designed carefully to optimize valuable inspection resources.

5. The staff should reconsider the preliminary characterizations presented on the costs and value of site-specific and generic probabilistic risk assessment (PRA) applications. The discussions appear to be biased toward limited application of PRA in Improvement Activities 1 and 2 and may inappropriately marginalize and inadvertently prejudice the value of proceeding with a risk management regulatory framework for operating reactors.

BACKGROUND

In response to the accident at Fukushima Dai-ichi Nuclear Power Station, the NRC Chairman issued a tasking memorandum directing the staff to “establish a senior level agency task force to conduct a methodical and systematic review of our processes and regulations to determine whether the agency should make additional improvements to our regulatory system and make recommendations to the Commission for its policy direction.” As expected given the context, the major focus was the re-examination of regulations for protection against severe accidents. A general finding of the Near-Term Task Force (NTTF) report was that “the Commission’s longstanding defense-in-depth philosophy, supported and modified as necessary by state-of-the-art probabilistic risk assessment techniques, should continue to serve as the primary organizing principle of its regulatory framework. However, the Task Force concluded that the application of the defense-in-depth philosophy could be strengthened by including explicit requirements for beyond-design-basis events.” NTTF Recommendation 1 states:

“The Task Force recommends establishing a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.”

The Commission in its staff requirements memorandum (SRM) to SECY-11-0093 did not direct the staff to initiate work related to implementing Recommendation 1, but directed the staff “to engage promptly with stakeholders to review and assess the recommendations of the NTTF in a comprehensive and holistic manner for the purpose of providing the Commission with fully-informed options and recommendations.”

In particular, Recommendation 1 was to be pursued independently of activities associated with the review of the other NTTF recommendations and the staff was to “provide the Commission a separate notation vote paper within 18 months, providing options and a staff recommendation to disposition this recommendation.”

The Commission reaffirmed its position on the disposition of Recommendation 1 in its SRM to SECY-11-0124 by stating that:

“As the staff evaluates Fukushima lessons-learned and proposes modifications to NRC’s regulatory framework, the Commission encourages the staff to craft recommendations that continue to realize the strengths of a performance-based system as a guiding principle. In order to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the ‘loss of large area’ event under its B.5.b program.”

On June 14, 2012, the NRC Chairman issued a tasking memorandum directing the NRC staff to also consider, when developing options for the disposition of Recommendation 1, the regulatory framework recommendations for power reactors in the Risk Management Task Force (RMTF) report, NUREG-2150. The Office of Nuclear Regulatory Research RMTF working group is coordinating closely with the Office of Nuclear Reactor Regulation NTTF Recommendation 1 working group to evaluate NUREG-2150. The anticipated outcome from that RMTF working group will be a Commission paper with a preliminary draft policy statement and an integrated plan on the potential implementation of any Commission directed RMTF recommendations. On the current schedule the Commission is to be provided this paper within six months of the SRM on the NTTF Recommendation 1 notation vote paper. The Chairman's tasking memorandum further stated:

"The RMTF benefited from the discussion accompanying Recommendation 1 and their report noted that their proposed modifications to the regulatory framework could contribute to the implementation of the NTTF's recommendation. In SRM-SECY-11-0124, the Commission encouraged the staff to craft recommendations that continue to realize the strengths of a performance-based system as a guiding principle. In consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient, site-specific mitigation strategies."

DISCUSSION

The ACRS has long advocated a regulatory framework that embodies the concepts of risk and defense-in-depth as fundamental elements of a rational, objective, and integrated decision-making process. The principles that are espoused in Recommendation 1 are consistent with that vision.

Some readers of Recommendation 1 may interpret the words "appropriately balances defense-in-depth and risk considerations" as an implication that those concepts are separable and must be considered in counterpoint fashion. We disagree with that interpretation. These concepts cannot be considered in isolation, or as potentially opposing elements in a modern regulatory framework that provides assurance of public health and safety. Decisions regarding an appropriate level of protection against a broad variety of threatening hazards must entail an objective and transparent assessment of those hazards and the effectiveness of feasible protection measures. That decision-making process should be informed by our current understanding of the risk from each hazard, our uncertainty about that risk, and consideration of defense-in-depth measures that can compensate for those uncertainties. In this integrated context, public health and safety are not assured by an evaluation of any of these fundamental elements in isolation or by regulatory criteria that examine each without the others.

The staff's proposed improvement activities dissociate these concepts and perpetuate a notion that each may be addressed individually. From our perspective, those proposals are neither responsive to the intent of Recommendation 1 nor a fully integrated regulatory decision-making process.

In the following discussion, we address each of the staff's proposed improvement activities in the context of its development in the draft SECY paper. It is important to keep in mind the overarching perspective of an integrated process that treats the concepts of risk, uncertainty, and defense-in-depth not as counterpoints, but as inseparable elements of a rational regulatory decision-making framework.

SECY Proposed Improvement Activities

In preparing the draft SECY paper, the staff initially reviewed each of the individual recommendation elements to Recommendation 1, as well as the underlying rationale developed by the NTTF. Several candidate initiatives were winnowed to three potential activities through public meetings, white papers, public comments, and interactions with the Japan Lessons Learned Project Directorate (JLD) Steering Committee and the ACRS. These regulatory improvement activities as documented in the draft SECY paper include:

- Activity 1 - establish a design extension category of events and associated regulatory requirements,
- Activity 2 - establish Commission expectations for defense in depth, and
- Activity 3 - clarify the role of voluntary industry initiatives in the NRC regulatory process.

The staff has recommended that all three candidate improvement activities be approved for development on parallel schedules. We propose additional considerations and actions for each improvement activity.

Improvement Activity 1

In Improvement Activity 1, the staff recommends developing a NUREG report to define a new category of "design-basis extension" events and to specify how future requirements for this new category should be written. This improvement activity is intended to address the recommendations of the NTTF and RMTF with respect to establishing a category of beyond design-basis events. However in contrast to both RMTF and NTTF recommendations, the staff does not propose to develop and implement new processes and criteria to identify the events in this new category. In Enclosure 1 to the draft SECY paper the staff acknowledges "Development of such criteria was recommended explicitly in the RMTF report and implicitly by the description of the new regulatory framework envisioned by the NTTF." Instead, the staff relies on current regulatory processes to identify and evaluate potential safety concerns to determine the need for new regulation. The staff proposes a forward-looking approach that would not require explicit new criteria for identifying when additional design-basis extension rules should be promulgated. In addition the staff recommends that the design-basis extension category be applied on a generic basis. Therefore, the staff does not envision the need for plant-specific PRAs for implementing proposed Improvement Activity 1.

We do not consider the staff's proposal to address NTTF Sub-Recommendations 1.1 and 1.2 (Listed in Enclosure 1 to this letter) with Improvement Activity 2 on defense in depth to be responsive absent criteria to identify extended design-basis requirements. Through these sub-recommendations, the NTTF envisioned a new and dedicated portion of the regulations that

would allow the Commission to “re-characterize its expectations for safety features beyond design basis more clearly and more positively as ‘extended design-basis’ requirements.” The staff has determined that a *de facto* category of requirements to address what would be termed “design-basis extension events” already exists. This category includes NRC requirements that address events or conditions that do not meet NRC criteria for inclusion in the plant safety analysis. Thus, the staff concludes it is unnecessary for the NRC to undertake rulemaking to establish such a category. We agree with this conclusion.

The staff proposes to address Sub-Recommendation 1.1 with Improvement Activity 2 that provides decision criteria to determine whether a given plant design has sufficient defense in depth. These preliminary decision criteria will have to be augmented to be of benefit to further articulate an extended design-basis category.

The staff proposes to develop a NUREG designed to specify guidance for design features, documentation, operation, maintenance, and related outcomes from rulemaking activities. Improvement Activity 1 is a useful approach for developing guidance to assure consistency in the regulatory treatment of issues assigned to the design-basis extension category.

Improvement Activity 2

In Improvement Activity 2, the staff recommends establishing the Commission’s expectations for defense in depth through a Commission Policy Statement that will develop the definition, objectives, and principles of defense in depth. Revisions to the Regulatory Analysis Guidelines and conforming changes to several existing regulatory guides would be part of this improvement activity. The staff recommends that the new policy and promulgation of any associated regulatory requirements be forward-looking and only apply the Commission’s expectations for defense in depth to new issues as they arise. Details of the proposed Commission Policy Statement and its associated implementation guidance are yet to be developed. However, establishing such a Commission Policy Statement is valuable only if there is clear direction to move forward with a regulatory framework which includes development and quantitative application of a risk-informed, performance-based, defense-in-depth concept. The staff’s proposed disposition of NTTF Recommendation 1 does not fully embrace this fundamental concept. Commission direction on the long term plan for a risk management regulatory framework is needed.

Improvement Activity 3

We endorse the staff’s recommendation to enhance monitoring and documentation of future industry initiatives as a necessary process improvement, even though the staff expects only a modest safety improvement. The regulatory inspection requirements should be designed carefully to optimize valuable inspection resources. The staff recommends revising policies and procedures to ensure that the staff monitors the implementation of future industry initiatives that may be used to provide safety enhancement without the need for regulatory action. The staff also recommends evaluation of the current status of implementation for those existing industry

initiatives which the staff believes are most risk significant or safety significant and to verify (e.g., via one-time audit) the effectiveness of licensee implementation of such initiatives that are not already monitored under an existing NRC oversight activity. As a part of this improvement activity, the staff would also update the Regulatory Analysis Guidelines to credit only those industry initiatives that are determined to be “highly likely” to be effectively implemented and maintained over time.

PRA and its Application

The staff should reconsider their characterizations presented in the draft SECY paper on the costs and value of site-specific and generic PRA applications. The discussions are biased toward a limited application of PRA in Improvement Activities 1 and 2. They have the potential to inappropriately marginalize and inadvertently prejudge the value of proceeding with a risk management regulatory framework. The draft SECY paper states:

“The staff recommends that the design-basis extension category be applied on a generic basis ... rather than on a plant-specific basis. Hence, a requirement for plant-specific PRAs is not needed to implement this improvement activity. Nonetheless, it is still expected that plant-specific PRAs would continue to be used for regulatory risk-informed activities including the implementation of the improvement activities discussed in this paper even though the staff is not proposing that plant-specific PRAs be required.”

In addition, in Attachment 2 of Enclosure 1 to the draft SECY paper, the staff suggests that safety benefits attributable to development and application of plant-specific PRAs have diminished due to:

- safety improvement actions taken as a result of previous PRA activities, generic issue resolution, industry and/or Owners Group initiatives;
- actions taken (or anticipated to be taken) in response to Fukushima lessons learned; and
- other industry and regulatory actions for prevention or mitigation of severe accidents.

The staff also suggests that since PRAs reflect known events and sequences, they may have limited added value in evaluations and improvement recommendations for design-basis extension events and issues. Given these points of view, the staff evaluation of PRA value focuses on deriving costs of plant-specific PRA development and downplays the short term and long term value of PRA capability.

We disagree with these assertions. Safety improvements, however they may be defined and implemented, do not diminish the value of a plant-specific PRA. Updated PRA capability will characterize the plant-specific value of changes and likely assess and identify additional insights and improvement opportunities to further improve performance. PRA technology should be used to characterize the value of the performance improvement programs developed within the design-basis extension event category and be a necessary part of implementation for Improvement Activities 1 and 2.

We look forward to working with the staff on all important matters related to the Fukushima efforts.

Sincerely,

/RA/

J. Sam Armijo
Chairman

Enclosure:
As stated

REFERENCES

1. SECY-13-XXXX, "NRC Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report," Pre-Decisional Draft Working Group Document, October 31, 2013 (ML13305A229)
2. Recommendations for Enhancing Reactor Safety in the 21st Century, The Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, July 12, 2011 (ML111861807)
3. Staff Requirements Memorandum to SECY-11-0093, Near Term Report and Recommendations for Agency Actions Following the Events in Japan, August 19, 2011 (ML112310021)
4. Staff Requirements Memorandum to SECY-11-0124, Recommended Actions to be Taken Without Delay From the Near-Term Task Force Report, October 18, 2011 (ML112911571)
5. Tasking Memorandum to R. W. Borchardt, "Evaluating Options Proposed for a More Holistic Risk-Informed, Performance-Based Regulatory Approach," June 14, 2012 (ML121660102)
6. Staff Requirements Memorandum to R. W. Borchardt, "Briefing on Economic Consequences, held 9:00 A.M., Tuesday, September 11, 2012, Commissioners' Conference Room," dated October 4, 2012 (ML12278A395)
7. NUREG-2150, "A Proposed Risk Management Regulatory Framework," April 2012 (ML12109A277)
8. ACRS Letter to the Honorable Shirley Ann Jackson, Chairman, U.S. NRC, "The Role of Defense in Depth in a Risk-Informed Regulatory System," May 19, 1999 (ML091280427)
9. ACRS Letter to the Honorable Richard A. Meserve, Chairman, U.S. NRC, "Reactor Safety Goal Policy Statement," April 17, 2000 (ML003704537)
10. NUREG-1860, "Feasibility Study for a Risk-Informed and Performance-Based Regulatory Structure for Future Plant Licensing," December 2007
11. Idaho National Laboratory, "Next Generation Nuclear Plant Defense-in-Depth Approach," INL/EXT-09-17139, December 2009 (ML093480191)
12. NUREG/BR-0058, "Regulatory Analysis Guidelines of the U. S. Nuclear Regulatory Commission," Revision 4, September 2004

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12. NUREG/BR-0058, "Regulatory Analysis Guidelines of the U. S. Nuclear Regulatory Commission," Revision 4, September 2004

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Recommendation 1 of the Near-Term Task Force Report

From Page 22 of The Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, Recommendations for Enhancing Reactor Safety in the 21st Century, July 12, 2011 (ML111861807).

The Task Force recommends establishing a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.

The Task Force recommends that the Commission direct the staff to initiate action to enhance the NRC regulatory framework to encompass beyond-design-basis events and their oversight through the following steps:

- 1.1.1 *Draft a Commission policy statement that articulates a risk-informed defense-in-depth framework that includes extended design-basis requirements in the NRC's regulations as essential elements for ensuring adequate protection.*
- 1.2 *Initiate rulemaking to implement a risk-informed, defense-in-depth framework consistent with the above recommended Commission policy statement.*
- 1.3 *Modify the Regulatory Analysis Guidelines to more effectively implement the defense-in-depth philosophy in balance with the current emphasis on risk-based guidelines.*
 - The Task Force believes that the Regulatory Analysis Guidelines could be modified by implementing some of the concepts presented in the technology-neutral framework (NUREG-1860) to better integrate safety goals and defense-in-depth.
- 1.4 *Evaluate the insights from the IPE and IPEEE efforts as summarized in NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," issued December 1997, and NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program," issued April 2002, to identify potential generic regulations or plant-specific regulatory requirements.*