

July 5, 2016

Dr. Dennis C. Bley, Chairman  
Advisory Committee on  
Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: RESPONSE TO THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS LETTER, "DRAFT INTERIM STAFF GUIDANCE JLD-ISG-2016-01, GUIDANCE FOR ACTIVITIES RELATED TO NEAR-TERM TASK FORCE RECOMMENDATION 2.1, FLOODING HAZARD REEVALUATION; FOCUSED EVALUATION AND INTEGRATED ASSESSMENT"

Dear Dr. Bley:

I am responding to your letter dated May 18, 2016 (Agencywide Documents Access Management System (ADAMS) Accession No. ML16130A453). In your letter, the Advisory Committee on Reactor Safeguards (ACRS) provided its conclusions and recommendations concerning the Japan Lessons-Learned Division (JLD) Interim Staff Guidance (ISG) JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force [NTTF] Recommendation 2.1, Flooding Hazard Reevaluation; Focused Evaluation and Integrated Assessment."

In your letter, you provided the following five recommendations and conclusions:

1. Except for the treatment of flooding from local intense precipitation [LIP], the graded approach that is endorsed in JLD-ISG-2016-01 provides an appropriate framework to evaluate the plant-specific effects from reevaluated flooding hazards.
2. If mitigation strategies are needed to maintain or restore key safety functions during a flood caused by local intense precipitation, the staff should review those evaluations in the same manner as the integrated assessments that are performed for other flooding mechanisms.
3. The staff should better specify expectations for assurance of reliable personnel performance in the integrated assessments that are performed according to the guidance for the higher frequency scenarios in Path 5 and all scenarios in Path 4.
4. The staff should develop guidance to ensure that the evaluations examine external flooding scenarios that result from seismic events which also cause damage at the plant site.

5. It would be challenging to conduct comprehensive and timely independent peer reviews of these flooding assessments according to the guidance and expectations.

The U.S. Nuclear Regulatory Commission (NRC) staff appreciates the ACRS review of the document and the comments. A discussion of the NRC staff's response to each conclusion and recommendation follows.

#### NRC Staff Response to ACRS Conclusions and Recommendations 1 and 2

The Commission direction provided in the staff requirements memorandum (SRM) to COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession No. ML15209A682), included approval to exclude LIP from the revised integrated assessment process. The NRC staff's conclusion in this area is not a generic conclusion, but instead reflects the unique nature of the hazard posed by LIP when compared to other flooding mechanisms. Specifically, unlike more severe flooding mechanisms, LIP estimates are based on a limited event duration (typically a few hours) and limited impact area (typically one square mile), resulting in limited severity flooding.

Consequently, compared to other flooding mechanisms, LIP is not expected to render both redundant on-site and off-site coping capabilities ineffective. As such, in its Commission-approved action plan in COMSECY-15-0019, the staff revised the integrated assessment process to focus on higher-severity flooding events, while continuing to ensure appropriate licensee response to LIP through a focused evaluation. The NRC staff does agree that it will be necessary to apply reasoned judgment of the adequacy of a licensee's response to LIP, and has incorporated the need for such judgment into JLD-ISG-2016-01. The ISG also includes guidance for licensees to consider flood protection for key structures, systems, and components in the context of the LIP hazard, and to mitigate the effects of the LIP hazard if protection is impractical. This approach is consistent with that described in COMSECY-15-0019 and approved by the Commission.

In your letter, you state that "the supporting discussion [of COMSECY-15-0019] seems to clearly imply an intent that licensees will provide protection against flooding damage by accounting for more realistic estimates of precipitation rates, site topography, fixed and portable barriers, availability of engineered drains, etc." These provisions have been incorporated in the current guidance through several considerations that address both protection and mitigation of floods:

1. The discussion of treatment of LIP in COMSECY-15-0019 allows licensees to take advantage of warning time for LIP by reference to a Nuclear Energy Institute (NEI) White Paper, "Warning Time for Maximum Precipitation Events," dated April 8, 2015 (ADAMS Accession No. ML15104A157), and the related NRC endorsement letter dated April 23, 2015 (ADAMS Accession No. ML15110A080). The process to take advantage of warning time for LIP clearly contemplates the use of mitigation, as well as flood protection measures, to address the LIP hazard.

COMSECY-15-0019 draws upon the meaning of the term "flood protection" in discussions of the approach to be taken in consideration of flood protection and available physical margin, specifically citing the meaning from Regulatory Guide

(RG) 1.102, "Flood Protection for Nuclear Power Plants" (ADAMS Accession No. ML003740308). However, this discussion is separate from and follows the treatment of LIP and is not intended to be related back to the discussion of LIP treatment.

2. Phase 1 of mitigating strategies under Order EA-12-049 relies on the use of installed plant equipment. This installed equipment is protected from the reevaluated hazard. Moreover, mitigating strategies maintain or restore (i.e., protect) key safety functions under beyond-design-basis events, including LIP.

### NRC Staff Response to ACRS Conclusion and Recommendation 3

The NRC staff agrees that better clarity on the performance expectations for operator actions could be provided and has modified the guidance to include consideration of the degree of available time margins, consequences, and qualitative treatment of the factors that could affect the ability of personnel to perform each task reliably. These considerations would be subject to NRC staff review using engineering and operational judgment.

The NRC staff notes that the manual action validation guidance of NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," builds upon Commission policy established with regard to the evaluation of operator manual actions under Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.48, "Fire Protection." The fire protection standard incorporated by reference in 10 CFR Section 50.48(c) establishes that recovery actions credited to achieve the nuclear safety performance criteria shall be feasible. Because of the parallels with the recovery actions under 10 CFR 50.48(c), the NRC staff continues to conclude that the demonstration of feasibility of operator manual actions for the development of mitigating strategies under Order EA-12-049 is appropriate.

The NRC staff does recognize that, depending on the estimated risk posed by the reevaluated flood hazard developed in response to the March 12, 2012, requests for information under 10 CFR 50.54(f), there may be circumstances where greater rigor in the review of operator manual actions would be appropriate. For these circumstances, the NRC staff will exercise engineering judgment, in conjunction with the assessments of reliability of equipment and assessments of manual actions, in making Phase 2 regulatory decisions. Because licensees have already been using NEI 12-06 in the development of their mitigating strategies, the NRC staff believes that the option for licensees to rely on data gathered for the assessment of manual actions in the development of the mitigating strategies is a more efficient and effective process than the development of further guidance to quantify standards for manual action between feasibility and reliability.

### NRC Staff Response to ACRS Conclusion and Recommendation 4

The NRC staff notes that while there are explicit limitations in the guidance that eliminate consideration of concurrent, unrelated events (e.g., NEI 12-06, Section 3.2.1.3.9), there is no limitation that would make consequential failures out-of-scope for consideration within the mitigating strategies. The NRC-endorsed guidance in NEI 12-06, Appendix B, builds on the current state of the art in probabilistic risk assessment standards and states that licensees should use the screening process of the current American Society of Mechanical Engineers and American Nuclear Society probabilistic risk standard in order to determine specific hazards

that should be addressed for a particular site. Therefore, licensees that may be subject to consequential seismic failures resulting in flooding, such as the examples cited by the ACRS, have taken that potential into account in developing their mitigating strategies and ensuring that they can reasonably meet the time constraints for execution of the strategies under NEI 12-06, Section 3.2.1.7.6.

The issue of seismically-induced fires and flooding was separately considered under NTF Recommendation 3. Work accomplished on that recommendation is described in SECY-15-0137, "Proposed Plans for Resolving Open Fukushima Tier 2 and 3 Recommendations" (ADAMS Accession No. ML15254A006), and closure of the item was approved in the SRM to SECY-15-0137 (ADAMS Accession No. ML16039A175).

#### NRC Staff Response to ACRS Conclusion and Recommendation 5

The ACRS notes that, based on the experience in the assembly of appropriately qualified independent peer review teams for fire protection submittals, it seems unrealistic to anticipate that comprehensive and timely independent peer reviews of these flooding assessments can be performed according to the guidance and expectations that typically apply for other analyses. The staff agrees with this conclusion and has modified the guidance to address the fact that such detailed peer reviews are not necessary in all cases. In particular, NEI 16-05 has been revised to include simplified elements of the approach that was previously included as Enclosure 2 to JLD-ISG-2016-01.

D. Bley

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The NRC staff appreciates the ACRS's review of JLD-ISG-2016-01. The NRC staff looks forward to continued engagement with the ACRS as the staff finalizes the assessment of this Fukushima-related activity.

Sincerely,

***/RA Michael R. Johnson Acting for/***

Victor M. McCree  
Executive Director  
for Operations

cc: Chairman Burns  
Commissioner Svinicki  
Commissioner Baran  
SECY

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