

EMERGENCY PREPAREDNESS AREA

OVERVIEW

On December 12, 2017, the Nuclear Energy Institute (NEI) submitted a letter with recommendations for improving the emergency preparedness (EP) significance determination process (SDP) Agencywide Documents Access and Management System (ADAMS) Accession No. ML17354A094). The U.S. Nuclear Regulatory Commission (NRC) responded in a letter dated February 7, 2018 (ADAMS Accession No. ML18024A427), in which the NRC documented its intent to “take a fresh look at the EP SDP” and to “convene an expert team to evaluate the EP SDP based on the NRC’s experience with the EP SDP as well as inputs from external stakeholders.”

During calendar year 2018, an expert team consisting of selected NRC regional and Headquarters staff conducted a focused self-assessment (FSA) in accordance with Inspection Manual Chapter (IMC) 0307, “Reactor Oversight Process Self-Assessment Program,” dated November 23, 2015. The charter for the EP SDP FSA was developed, approved, and implemented (ADAMS Accession No. ML18149A392). The FSA final report (ADAMS Accession No. ML18331A374) presents results from the FSA with several recommendations for further action and review.

The FSA team assessed the EP SDP by reviewing stakeholder comments, recommendations, and results from NRC inspector questionnaires. In addition, the FSA team focused on opportunities to transform the processes or paradigms associated with the EP SDP and relevant portions of the Reactor Oversight Process (ROP). The scope of the FSA expanded somewhat during the review of stakeholder comments. The overall scope of the FSA was to assess the adequacy of the current program and to provide a fresh look into the program to identify potential enhancement opportunities. The final FSA report distills those comments, suggestions, and recommendations for future consideration.

The overall conclusion from this review was that the EP SDP continues to be adequate. However, several potential enhancement opportunities were developed for consideration and action.

DISCUSSION

The staff began the review of recommendations in the EP area by developing a set of key assumptions and goals to guide this review.

This review had the following key assumptions:

- The present EP ROP/SDP has been working.
- There is an opportunity to rethink certain aspects to enhance the program in certain areas.
- All the recommendations must be considered in an integrated manner.

The following goals guided this review:

- Be more effective and efficient.
- Better risk-inform the procedures.

- Ensure procedures focus on performance.
- Ensure procedures are not ambiguous and can be applied consistently.
- Be consistent with the NRC's Principles of Good Regulation.

A reduction of EP inspector hours was not the goal; however, a reduction in hours resulting from more focused and efficient efforts may be the natural result of these actions.

A common theme from the FSA is that the staff spends a significant amount of time determining whether the safety significance of an inspection finding is Green or White. In addition, certain knowledge areas seem to be inconsistently understood and inconsistently applied. All the recommendations from the FSA are based on one or more of the following subject areas:

- A risk-informed and performance-based approach
- Consistency
- Effective knowledge management and knowledge sharing
- Efficient use of the ROP (as revised) to extend the review frequency in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(t) from 12 months to 24 months (see NEI's white paper, "Performance Indicators for Adjusting the Frequency of Emergency Preparedness Program Reviews," Revision A, dated March 2018 (ADAMS Accession No. ML18114A049)).

STAKEHOLDER INTERACTIONS

The staff held focused public meetings for external stakeholders on June 25, 2018, and January 10, 2019. The staff discussed the FSA charter and review scope during the first meeting. The staff discussed the draft FSA report and provided opportunities for stakeholder input at the second meeting.

The staff held periodic meetings with internal stakeholders to review the results from the focused EP inspector questionnaire.

RECOMMENDATIONS REQUIRING ADDITIONAL EVALUATION

In addition to the proposed change to the EP SDP requiring Commission approval described in the paper, the staff is taking additional actions based on its evaluation of other recommendations. The staff will engage with the Commission as appropriate to address planned staff actions to implement these recommendations, in accordance with Management Directive 8.13.

FSA Recommendation 1.A

Revise the EP SDP to include the status of the other reactor safety cornerstones when assessing significance of an EP performance deficiency. NEI provided a recommendation for this area in their letter dated December 12, 2018 (ADAMS Accession No. ML17354A094). The FSA recommended further review in this area (ADAMS Accession No. ML18331A374). The industry's concern, as discussed in NEI's letter, is that the EP SDP can generate greater-than-Green (GTG) outcomes for performance deficiencies that appear to be less risk significant than those that result in GTG outcomes in other SDPs. This could imply that EP functions are of greater relative importance to the protection of public health and safety than the plant systems and procedures that assure safe operation and prevent the need to implement

the emergency plan. The industry's view is that the significance determination logic in IMC 0609, Appendix B, focuses solely on the potential consequences of an issue without considering the very low likelihood of needing to implement the given planning standard function or program element, and it does not consider the coincident defense-in-depth layer failures in the initiating events, mitigating systems, and barrier integrity cornerstones that would be needed to produce a more consequential, but less likely, Site Area Emergency or General Emergency accident. The perception is that this creates an unbalanced risk assessment that can produce unwarranted GTG findings.

IMC 0308, Attachment 3, Appendix B, "Technical Basis for Emergency Preparedness Significance Determination Process," dated December 19, 2012, states, "the probability of a reactor accident requiring implementation of the licensee's emergency plan has no relevance in determining the significance of EP findings." This statement is the focus of NEI's recommendation that the EP SDP consider other defense-in-depth layers (reactor safety cornerstones) in its significance determination. The staff has considered the NEI recommendation and determined that a revision to the EP SDP to include the status of the other reactor safety cornerstones when assessing significance of an EP performance deficiency should be further evaluated. The key to a defense-in-depth approach is creating multiple independent and redundant layers of defense to compensate for potential failures and external hazards so that no single layer is exclusively relied on to protect the public and the environment.

Over the years, numerous SECY papers to the Commission, regulatory guides (RGs) and Advisory Committee on Reactor Safeguards letters have discussed defense-in-depth. These discussions have reiterated that defense-in-depth is a basic element of the NRC's safety philosophy to prevent accidents from happening and to mitigate their consequences. These discussions involving defense-in-depth typically are in terms of multiple barriers, balance among prevention and mitigation, and safety functions not dependent on a single element of design. In addition, the papers mention several elements of defense-in-depth including the single failure criterion, redundancy, diversity, independence, and emergency preparedness¹.

The current EP SDP is predicated upon this defense-in-depth philosophy². The staff contends that a revision to the EP SDP to incorporate the recommendation would be broader than solely assessing significance of an EP finding. It would potentially constitute a change in the premise of all reactor safety cornerstones and their nexus to the NRC's defense-in-depth policy, and could introduce internal inconsistency into how deficiencies are assessed against different cornerstones. Discussion on this proposal has revealed differing views among knowledgeable staff on its merits, as discussed later in this section. Additional evaluation is needed to assess these considerations and perspectives.

FSA Recommendation 1.C

Revise regulations such that only licensee emergency plan changes related to 1) risk-significant planning standard (RSPS) functions and 2) non-RSPS functions that impact the ability to implement RSPS functions, would be required to have a review performed in accordance with 10 CFR 50.54(q) to determine if the change is a reduction in effectiveness (RIE) and continue to

¹ Supporting information regarding emergency preparedness and defense-in-depth can be found in: 1) "Safety Goals for the Operation of Nuclear Power Plants," *Federal Register* (FR) (51 FR 30032) and, 2) "Emergency Planning" (44 FR 75169).

² IMC 0308, Att 3, App B, "Technical Basis for Emergency Preparedness Significance Determination Process."

meet regulatory requirements. If the change is an RIE or does not meet regulatory requirements, it will be required to be submitted to the NRC for approval prior to implementation. This recommendation aligns with the EP request for Commission approval of FSA Recommendation 1.B in the paper. If the Commission approves FSA Recommendation 1.B, then the staff will provide the Commission the applicable RSPS and non-RSPS functions when seeking approval for this recommendation. A licensee proposed EP plan change related to the remaining non-RSPS functions only needs a determination of whether it continues to meet regulatory requirements. If the change is determined to not meet the regulation, it would need to be submitted to the NRC for approval prior to implementation.

This recommendation has two parts. The first part is to revise EP inspection procedures to focus inspection efforts on Emergency Plan changes associated with the RSPS functions and the non-RSPS functions that have an impact on the ability to implement the RSPS functions. The second part is to explore options for reducing the level of prescriptiveness in the 10 CFR 50.54(q) regulation and/or associated guidance document RG 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors." The staff is currently implementing the first part of this recommendation as it will reduce inspection efforts and provide immediate benefits. The staff will consider the second part of this recommendation after the first part is completed.

FSA Recommendation 2.A

Remove EP from the formal problem identification and resolution (PI&R) inspection IP 71152 and maintain it within the EP inspection procedure IP 71114.05, "Maintaining Emergency Preparedness." The review of EP PI&R issues by two different inspection procedures and groups is redundant and inefficient. This recommendation will be considered as part of the staffs planned comprehensive review of the PI&R inspection.

FSA Recommendation 2.B

Eliminate the alert and notification system (ANS) performance indicator (PI). The ANS PI was developed to provide insight into a licensee's ability to maintain EP equipment important to public health and safety by collecting data on siren activation reliability. The staff evaluated this recommendation and concluded that the ANS PI has not resulted in significant insight into EP equipment maintenance. Additionally, offsite response organizations provide annual siren reliability data to the Federal Emergency Management Agency (FEMA) in their Annual Letter of Certification (ALC). Thus, the ANS PI is redundant to the ALC siren data. The inspection program would continue to validate that the testing for siren activation reliability is in accordance with the FEMA approved design report to ensure the efficacy of the ALC siren data. Further, since not all licensees use sirens in totality as their primary means of alerting the public, the ANS PI does not provide a uniform assessment between licensees. In addition, with the increased interest by licensees in migrating to FEMA's integrated public alert and warning system (IPAWS)³, the ANS PI for siren reliability may eventually be inapplicable for most or all licensees. This recommendation is complementary to FSA recommendation 2.C. The staff will develop an emergency response facility (ERF) readiness PI to measure licensee performance in the maintenance of EP equipment as part of addressing Recommendation 2.C.

³ FEMA's IPAWS is an internet-based capability that federal, state, local, tribal, and territorial authorities can use to issue critical public alerts and warnings using the Emergency Alert System, Wireless Emergency Alerts, the National Oceanic and Atmospheric Administration Weather Radio, and other public alerting systems from a single interface.

The staff plans to seek Commission approval after the proposed new PI is developed and stakeholder input obtained, and before eliminating the ANS PI.

FSA Recommendation 2.C

Develop new ROP EP PIs to satisfy the requirements of 10 CFR 50.54(t)(1)(ii) to extend the 12-month review frequency to a 24-month review frequency of a licensee's EP program. NEI's white paper (ADAMS Accession No. ML18114A049) provides the NRC staff additional suggested PIs to allow licensees the option of a 24-month review frequency.

The staff implemented the ROP EP PIs after the rulemaking that provided requirements in 10 CFR 50.54(t)(1)(ii) for what is necessary for a 24-month review frequency (as documented in 64 FR 14814-14818, Final Rule RIN 3150-AF63). The Statements of Consideration provided the following examples of the types of PIs that may justify a 24-month audit frequency:

- ERF availability
- completeness of EP duty roster personnel training
- quality of response to declared plant emergencies
- timeliness of corrective actions
- measures of State and local interface
- percentage of drill objectives that are successfully demonstrated

IMC 0308, Attachment 1, "Technical Basis for Performance Indicators," dated November 8, 2007, states that the "ANS PI was developed out of the recognition that some measure of licensee performance in the maintenance of EP related equipment was appropriate." Instead of using the ANS PI as a measure of licensee performance, the staff will develop the aforementioned ERF readiness PI with the implementation of this recommendation. The ERF readiness PI would, if approved by the Commission, measure the ability of the licensee to maintain emergency facilities and equipment in a state of functional readiness. The staff believes this PI would appropriately address the NEI white paper recommendation while improving efficiency and effectiveness.

If the Commission approves the staff's future submittal of new ROP EP PIs, the staff believes that revising NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013 (ADAMS Accession No. ML13261A116), and associated EP program documents to address the new ROP EP PIs would provide adequate justification to permit licensees to utilize the ROP EP PIs to satisfy the requirements of 10 CFR 50.54(t)(1)(ii) to extend the 12-month review frequency to a 24-month review frequency of a licensee's EP program.

The staff does not foresee the need for a future revision to 10 CFR 50.54(t) to address this recommendation. The staff will conduct public meetings to develop the new ROP EP PIs and will seek Commission approval of these PIs at the appropriate time in accordance with management directive MD 8.13.

STAKEHOLDER VIEWS

An alternative view was raised regarding FSA recommendation 1.A which would revise the EP SDP to include the status of the other reactor safety cornerstones when assessing significance of an EP performance deficiency. This was also an NEI recommendation in their December 12, 2017, letter. The alternative view (held by several knowledgeable staff and managers) asserts that this recommendation will essentially reclassify EP as no longer a stand-alone cornerstone of the ROP and would make the ROP internally inconsistent. Further, the alternative view holds that other ROP EP cornerstone enhancement project recommendations will provide further clarity and focus to ensure only those performance deficiencies which have the potential to degrade the safety margin to the public have the potential to be assessed as GTG. These actions should be sufficient to allay industry concerns that EP findings carry outsized weight for their actual impact to public health and safety while preserving the existing ROP framework. In response to the alternative view, the staff has concluded that a revision to the EP SDP to incorporate the recommendation would be broader than solely assessing significance to an EP finding and would potentially constitute a change in the ROP framework. Therefore, the staff will further evaluate the merits of FSA recommendation 1.A.