

## **Summary of Closed Tier 2 and 3 Activities and Updates on Ongoing Work**

In SECY-11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11269A204), the U.S. Nuclear Regulatory Commission (NRC) staff prioritized the Near-Term Task Force (NTTF) recommendations. These recommendations were published in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated July 12, 2011 (ADAMS Accession No. ML11186A950), and are grouped into three tiers.

In 2015, the NRC staff re-evaluated its plans to resolve the Tier 2 and Tier 3 recommendations in light of the safety benefit that will be achieved through the Tier 1 recommendations and insights gained from related Commission decisions. The NRC staff provided its recommendations to the Commission in SECY-15-0137, "Proposed Plans for Resolving Open Fukushima Tier 2 and 3 Recommendations" (ADAMS Accession No. ML15254A006), on October 29, 2015, with updated plans and closeout recommendations for some of the Tier 2 and 3 items. This enclosure provides the current status of the Tier 2 and Tier 3 items.

The NRC staff sorted the resolution plans for the Tier 2 and 3 recommendations into the following three groups:

- (1) Recommendations that should be closed now.
- (2) Recommendations that the NRC staff's initial assessment has concluded should be closed, but for which stakeholder interaction is warranted before finalizing the NRC staff's assessment.
- (3) Recommendations for which the NRC staff has not yet completed its assessment, stakeholder interactions, and/or documentation.

Notwithstanding closure of these items, the NRC staff noted that work will continue in some of these areas for many years. For example, the NRC staff will continue to engage with the international community on long-term health studies in the areas around Fukushima Dai-ichi and will continue work to ensure post-Fukushima safety enhancements are appropriately incorporated into the NRC's existing oversight programs. The NRC research activities related to improving the understanding and modeling of reactor behavior during severe accidents will likewise continue. The NRC staff intends to use established programs and processes to conduct these activities, including engagement with the Commission, if appropriate. For example, the Office of Nuclear Security and Incident Response will keep the Commission informed using the annual report to the Commission on emergency preparedness and incident response.

### **Summary of Tier 2 and Tier 3 Items Included in Rulemaking Activities**

In COMSECY-13-0002, "Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities," dated January 25, 2013 (ADAMS Accession No. ML13011A034), the NRC staff proposed that the Tier 2 activities related to spent fuel pool (SFP) instrumentation and makeup capability be addressed within the implementation activities

for mitigating strategies in Order EA-12-049, “Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” dated March 12, 2012 (ADAMS Accession No. ML12054A735), as well as in the station blackout (SBO) mitigation strategies rulemaking (which was subsequently consolidated into the mitigation of beyond-design-basis events (MBDBE) rulemaking).

The Commission approved the NRC staff’s proposal on March 4, 2013, in the staff requirements memorandum (SRM) to COMSECY-13-0002 (ADAMS Accession No. ML13063A548). As a result, the NTTF recommendations below are no longer tracked as separate Tier 2 items.

| <b>Tier</b> | <b>Description</b>   | <b>Source of Action</b> |
|-------------|--|-------------------------|
| 2           | Require safety-related alternating current electrical power for the SFP makeup system    | NTTF Recommendation 7.2 |
| 2           | Maintain one train of onsite emergency power operable for SFP makeup and instrumentation | NTTF Recommendation 7.3 |
| 2           | Seismically qualified SFP spray system   | NTTF Recommendation 7.4 |
| 2           | Initiate rulemaking  | NTTF Recommendation 7.5 |

In SECY-14-0046, “Fifth 6-Month Status Update on Response to Lessons-Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami,” dated April 17, 2014 (ADAMS Accession No. ML14218A703), the NRC staff proposed that the following Tier 2 and 3 emergency preparedness (EP) items be addressed through the implementation of the mitigating strategies Order EA-12-049 and the MBDBE rulemaking. The Commission approved the NRC staff’s proposal on July 9, 2014, in the SRM to SECY-14-0046 (ADAMS Accession No. ML14190A347). Since these are also being addressed through the MBDBE rulemaking, these NTTF recommendations below are no longer tracked as separate Tier 2 or 3 items.

| <b>Tier</b> | <b>Description</b>  | <b>Source of Action</b>           |
|-------------|---|-----------------------------------|
| 3           | Initiate rulemaking to require EP enhancements for multiunit events                 | NTTF Recommendation 9.1           |
| 3           | Initiate rulemaking to require EP enhancements for prolonged SBO                    | NTTF Recommendation 9.2           |
| 2/3         | Order licensees to perform various EP enhancements until the rulemaking is complete | NTTF Recommendation 9.3 (partial) |
| 3           | Improve command and control structures  | NTTF Recommendation 10.2          |
| 3           | Enhance resources to bring response equipment on site                               | NTTF Recommendation 11.1          |

### **Summary of Group 1 Items**

In the SRM to SECY-15-0137 (ADAMS Accession No. ML16039A175), the Commission approved the closure of the following Group 1 recommendations:

| <b>Tier</b> | <b>Description</b>   | <b>Source of Action</b>                          |
|-------------|--|--|
| 3           | Capabilities to prevent seismically induced fires and floods                                     | NTTF Recommendation 3                            |
| 3           | Evaluation of EP zone size and pre-staging of potassium iodide beyond 10 miles (16 kilometers)   | NRC staff  |
| 3           | Enhancements to the Reactor Oversight Process  | NTTF Recommendation 12.1                         |
| 3           | Enhancements to NRC staff training on severe accidents and severe accident management guidelines | NTTF Recommendation 12.2                         |
| 3           | Various EP activities (with the exception of Recommendation 11.3)                                | NTTF Recommendations 9, 10, and 11 (except 11.3) |

“Potential Enhancements to the Capability to Prevent or Mitigate Seismically-Induced Fires and Floods” (Enclosure 3 to SECY-15-0137) was evaluated as a Group 1 item to be closed immediately. However, the NRC staff noted that work would continue to finalize the probabilistic risk assessment (PRA) feasibility study, with a goal of completing that study by the end of calendar year 2015. The NRC staff committed to inform the Commission if any insights obtained as part of the completion of that study change the results of its assessment.

The final feasibility study has been completed and is documented in the Brookhaven National Laboratory report entitled, “Brookhaven National Laboratory Report—Scoping Study for a PRA Method for Seismically Induced Fires and Floods,” dated December 2015 (ADAMS Accession No. ML16004A250). The feasibility study identified a number of key issues associated with the development of qualitative or quantitative PRA methods for seismically induced fires and floods (SIFFs). Through the workshops and expert consultation, a number of unresolved technical issues have been identified that will require further evaluation to develop a fully usable PRA methodology.

Before receiving the feasibility study, the NRC staff believed that the potential benefits of fully developing and piloting a PRA approach for SIFFs would not justify the costs of continuing this effort. The NRC staff from the Office of Nuclear Regulatory Research completed its review of the Brookhaven National Laboratory PRA feasibility study. The technical challenges noted in the report prevent modeling and quantifying the probabilistic risk with a level of confidence that is comparable to the “state-of-the-art” of current PRAs. Based on the NRC staff’s review, no additional insights were provided in the study that would challenge the NRC staff’s conclusions in Enclosure 3 to SECY-15-0137.

**Summary of Group 2 Items**

In SECY-15-0137, the activities below were evaluated as Group 2 items, meaning the NRC staff's initial assessment concluded that they should be closed, but for which additional interaction with the Advisory Committee on Reactor Safeguards (ACRS) or external stakeholders was warranted. These recommendations include the following:

| <b>Tier</b> | <b>Description</b>  | <b>Source of Action</b> |
|-------------|---|-------------------------|
| 3           | Reliable vents for other containment designs other than Mark I and Mark II      | NTTF Recommendation 5.2 |
| 3           | Hydrogen control and mitigation   | NTTF Recommendation 6   |
| 3           | Enhanced reactor and containment instrumentation for beyond-design-basis events | ACRS                    |

The NRC staff proposed to interact with stakeholders, complete the assessments, and inform the Commission of the final results of its evaluation as soon as practicable and by no later than the end of March 2016. In the SRM for SECY-15-0137, the Commission approved the staff's plan.

The NRC staff's assessments and final results of its evaluation have been documented in SECY-16-0041 "Closure of Fukushima Tier 3 Recommendations Related to Containment Vents, Hydrogen Control, and Enhanced Instrumentation" (ADAMS Accession No. ML16049A079). The additional interactions conducted since the completion of SECY-15-0137 did not change the NRC staff's initial conclusions and recommendations, and the NRC staff determined that no additional regulatory action was warranted. These three Tier 3 items are closed.

**Status of Group 3 Items**

In SECY-15-0137, the activities below were evaluated as Group 3 items, meaning that the NRC staff's assessment and final documentation of their conclusions was not completed, and that additional ACRS and external stakeholder interaction was needed before the NRC staff could complete its assessment:

| <b>Tier</b> | <b>Description</b>   | <b>Source of Action</b>                            |
|-------------|--|--|
| 2           | Evaluation of natural external hazards other than seismic and flooding | ACRS and the Consolidated Appropriations Act, 2012 |
| 3           | Periodic confirmation of natural hazards                               | NTTF Recommendation 2.2                            |
| 3           | Efficacy of real-time radiation monitoring in EP zone and on site      | NTTF Recommendation 11.3                           |

The status of the NRC staff's activities on these Group 3 items is provided below.

**Evaluation of Other Natural Hazards (Enclosure 1 to SECY-15-0137)**

The NRC staff is further evaluating the risk to U.S. nuclear sites from other natural external hazards to determine if the associated risks warrant regulatory action. The NRC staff will provide the results of this evaluation to the Commission by the end of 2016. The final assessment will also consider the outcome of interactions with ACRS and external

stakeholders. Before completing its review of this recommendation, the NRC staff plans to discuss the results of this review with external stakeholders, including the industry and members of the public. The NRC staff will then conduct a focused briefing on this issue with ACRS, if appropriate, before providing its final assessment to the Commission.

The evaluation process includes four tasks described in SECY-15-0137:

- (1) Define natural hazards other than seismic and flooding to determine those hazards that should be reviewed generically (complete).
- (2) Determine and apply screening criteria to appropriately exclude certain natural hazards from further generic evaluations, or exclude some licensees from considering certain hazards.
- (3) Perform a technical evaluation to assess the need for additional actions if the hazard or licensee was not screened out generically in Task 2.
- (4) Determine if additional actions are needed.

As specified in the SRM to SECY-15-0137, the NRC staff is preparing an interim paper for the Commission on the results of the screening conducted in accordance with Task 2 of the evaluation process. The NRC staff will hold a Category 3 public meeting, brief the ACRS Fukushima subcommittee, and brief the ACRS full committee to receive feedback on the results of the screening. The interim report will be provided to the Commission no later than the end of May 2016.

The NRC staff notes that the safety benefit achieved through Order EA-12-049 has been and continues to be considered in the evaluation of potential regulatory requirements to determine whether additional changes are necessary using the NRC staff's risk-informed decision-making process.

#### **Periodic Reconfirmation of External Natural Hazards (Enclosure 2 to SECY-15-0137)**

The NRC staff has formed a working group and has begun work to develop and enhance internal processes to address the NTF Recommendation 2.2. As discussed in SECY-15-0137, the NRC staff will leverage the information gained through the recent reevaluation of seismic and flooding hazards to develop a process to proactively obtain new information and assess its significance. The NRC staff intends to discuss the results of this review and development of the process with industry and other stakeholders. The NRC staff plans to have the process developed by December 2016.

#### **Efficacy of Real-Time Radiation Monitoring in Emergency Planning Zone and on site (Enclosure 7 to SECY-15-0137):**

The NRC staff is on track to provide their conclusions and recommendations to the Commission before the end of calendar year 2016. This will allow time for further documentation or stakeholder interactions as part of the process for closing this item. The NRC staff will further evaluate the lessons learned from Fukushima with regard to the radiation monitoring systems in use at the time of the event to discern whether this experience warrants reconsideration of the

actions taken with Regulatory Guide 1.97, Revision 3, "Instrumentation for Light-Water-Cooled Nuclear Power Plants To Assess Plant and Environs Conditions during and following an Accident," dated May 1983 (ADAMS Accession No. ML003740282), and subsequent revisions. As part of stakeholder interactions, the NRC staff will be making presentations at several public conferences, including the joint NRC and Federal Emergency Management Agency Integrated Progress Review meeting at NRC headquarters; the National Radiological Emergency Preparedness conference in Charleston, SC; and the Nuclear Energy Institute Emergency Preparedness Forum in Indianapolis, IN. The presenters will discuss the NRC staff effort on the recommendation and the status of that effort and solicit input from these stakeholders.