

**POLICY ISSUE**  
**(Notation Vote)**

September 6, 2013

SECY-13-0095

FOR: The Commissioners

FROM: Mark A. Satorius  
Executive Director for Operations

SUBJECT: FOURTH 6-MONTH STATUS UPDATE ON RESPONSE TO LESSONS  
LEARNED FROM JAPAN'S MARCH 11, 2011, GREAT TOHOKU  
EARTHQUAKE AND SUBSEQUENT TSUNAMI

PURPOSE:

The purpose of this paper is to provide a status update on the U.S. Nuclear Regulatory Commission (NRC) staff's activities related to lessons learned from the March 2011 accident at Japan's Fukushima Dai-ichi facility. This paper also provides a description of the plans and status of transitioning oversight of lessons-learned activities from the Steering Committee to the appropriate line organizations, the plan to document closure of lessons-learned activities as they are completed, and requests Commission approval to dissolve the charter to facilitate transfer of lessons learned to the line organizations. This paper does not address any new commitments or resource implications.

SUMMARY:

The staff continues to work on the Tier 1, Tier 2, and Tier 3 activities related to lessons learned from Fukushima consistent with the schedules established in SECY-11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11272A111), Staff Requirements Memorandum (SRM) SECY-11-0124, "Recommended Actions to Be Taken Without Delay from the Near-Term Task Force Report," (ADAMS Accession No. ML112911571), SRM-SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Tsunami," (ADAMS Accession No. ML120690347), and SECY-12-0095, "Tier 3 Program Plans and 6-Month Status Update in Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami," (ADAMS Accession No. ML12165A092). The staff's principal effort since the last 6-month status update continues to

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focus on the high priority Tier 1 actions, but work on the Tier 2 and Tier 3 activities continues to progress in accordance with established schedules. The staff has also established a process for transitioning oversight of lessons-learned activities from the Steering Committee to the appropriate line organizations. All of the activities have been reviewed by the Steering Committee and it determined that most of the activities are ready for transition to line organization oversight.

#### BACKGROUND:

In SRM-SECY-11-0117, "Proposed Charter for the Longer-Term Review of Lessons Learned from the March 11, 2011, Japanese Earthquake and Tsunami," (ADAMS Accession No. ML112920034), the Commission approved, with modifications, the staff's proposed charter that established the structure, scope and expectations for NRC's longer-term review of the events in Japan.

The charter requires, among other things, status updates every 6 months for two years on the work conducted under the charter. The staff provided its first 6-month status update in SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Tsunami," (ADAMS Accession No. ML12039A103). The second 6-month update was provided as [Enclosure 1](#) to SECY-12-0095. The third update was presented in SECY-13-0020 (ADAMS Accession No. ML13031A512). This is the staff's fourth 6-month status update, which covers February 2013 to August 2013.

In SECY-11-0137, the staff prioritized the Near-Term Task Force (NTTF) recommendations provided in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan" (ADAMS Accession No. ML11186A950), into three tiers. SECY-11-0137 also provided the staff's assessment of the Tier 1 and Tier 2 items, including recommendations for regulatory action on Tier 1 items. Assessments and program plans for the Tier 3 items, along with six additional recommendations identified in SECY-11-0137, were provided in SECY-12-0095.

On March 12, 2012, the NRC issued three orders and a request for information (RFI) letter to licensees (ADAMS Accession Nos. ML12054A735, ML12054A694, ML12054A679, and ML12053A340). These regulatory actions covered most of the Tier 1 items. On June 6, 2013, the NRC issued an order that modified and superseded one of the March 12, 2012, orders (ADAMS Accession No. ML13143A321); this will be discussed further in the section on reliable hardened containment vents in [Enclosure 1](#). Implementation of these regulatory actions, along with additional efforts to employ the rulemaking process for the remaining Tier 1 activities, has remained the primary focus of the staff's effort since the last 6-month update. In addition, the staff has made progress on Tier 2 and Tier 3 recommendations. The status update for each lessons-learned activity is contained in the enclosures, which are organized by tier. [Enclosure 1](#) addresses Tier 1 activities; [Enclosure 2](#) addresses Tier 2 activities; [Enclosure 3](#) addresses Tier 3 activities; and [Enclosure 4](#) addresses activities that are not contained within a tier.

DISCUSSION:***General Status Update***

The staff continues its work on Tier 1, Tier 2, and Tier 3 activities consistent with the schedules established in SECY-11-0137, SRM-SECY-11-0124, SRM-SECY-12-0025, SECY-12-0095, and SRM-SECY-12-0157, "Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments," (ADAMS Accession No. ML13078A017). A status update specific to each lessons-learned activity is contained within the enclosures; however, a general status update on the most significant staff activities is provided here.

***Orders***

In February 2013, the staff received licensees' integrated plans for implementation of the orders issued on March 12, 2012. These plans detail the actions and milestones each licensee will take to achieve full implementation of the orders within two refueling cycles of the submittal. Because a modified order for reliable hardened vent systems was issued subsequent to receipt of licensee integrated plans for the original order, licensees will be preparing revised integrated plans that will supersede their original submittals. The NRC staff is currently reviewing the integrated plan submittals for mitigation strategies and spent fuel pool instrumentation and is preparing draft safety evaluations (SEs) for each site. Any potential staff concerns with the submittals will be documented as open items in the draft SEs, and these open items are expected to eventually be closed through revision of the integrated plan, or through an NRC audit. Once the open items are closed, the staff will issue the final SEs. This process of closing out open items from the draft SEs will occur during the implementation phase and the final SEs are expected to be issued approximately 6 months before each licensee achieves full implementation of the orders. A final SE will document the site-specific regulatory decision that the NRC staff has found the licensees' planned actions acceptable for meeting the requirements of the orders. Following full implementation, the NRC staff will inspect each site to verify that they have met the requirements of the orders. Because the implementation deadlines for each site depend on refueling outage schedules, the NRC staff is preparing the draft SEs on a staggered basis commensurate with the site-specific outage schedules, with the aim to issue draft SEs for the spent fuel pool instrumentation order by November 2013, and for the mitigation strategies order by February 2014.

For the June 6, 2013, modified order related to severe accident capable reliable hardened containment vents for boiling water reactors (BWRs) with Mark I and II containments, implementation will be in phases. Phase 1 will include installation of a wetwell vent by the second refueling outage after June 2014. Phase 2 will include installation of a drywell vent, or a strategy obviating the need for a drywell vent, by the first refueling outage after June 2017.

Guidance for implementation of the modified order is currently under development and on track for issuance by October 2013. Licensees will provide their revised integrated plans for Phase 1 by June 2014 and Phase 2 by December 2015. The NRC staff will follow a similar process for preparing SEs for this modified order.

*Requests for Information*

During the summer and fall of 2012, licensees conducted seismic and flooding hazard walkdowns and submitted the final walkdown reports to the NRC in November 2012. Degraded, nonconforming, or unanalyzed conditions identified during the walkdowns were entered into the licensee's corrective action program, and NRC inspectors are monitoring the resolution under the Reactor Oversight Process. The NRC staff is conducting assessments of the walkdown submittals. During June and July 2013, staff conducted audits of selected plants to gain a better understanding of licensee methods and procedures used to conduct the walkdowns, their consistency with the walkdown guidance, and to assist in the review of the walkdown reports.

For flooding hazard reevaluations, the majority of the first set of plants provided the results of their hazard reevaluations by March 12, 2013. Six sites requested and were approved for extensions, primarily to facilitate use of more accurate models. Several sites stated that the results of their reevaluated hazards indicate they will need to take interim actions (e.g., having standby sandbags in place before a permanent barrier can be constructed), and several sites indicated that they will be performing an integrated assessment to determine if permanent changes are needed. The NRC staff is also reviewing the reevaluated hazards and will issue a safety assessment for each site.

The first submittals for seismic hazard reevaluations will be from plants in the central and eastern United States. These reevaluations were originally due to the NRC by September 2013. During public meetings in the spring of 2013, the industry proposed to update the ground motion model that will be used to perform the reevaluations, which should ultimately yield more accurate results. Furthermore, the industry proposed to apply screening criteria that will require some plants to perform an expedited evaluation and implementation of safety enhancements earlier than the NRC's original schedule. To allow the time needed to develop the updated ground motion model, the staff approved an extension for the model to be developed and for the staff to review and approve it by the end of August 2013. The staff met this deadline by issuing its endorsement on August 28, 2013 (ADAMS Accession No. ML13233A102). Licensees will have until March 2014 to provide their updated seismic hazard reevaluation. The staff will review the seismic reevaluation submittals and issue a safety assessment for each plant. Seismic reevaluations from plants in the western United States are still due in March 2015.

On October 31, 2012, the licensees supplied their responses regarding the assessment of their communications capability for a multiunit prolonged station blackout (SBO) event. The NRC staff has completed its review of the communications assessments and determined that proposed interim actions combined with long-term enhancements will help to ensure that licensees can effectively communicate during a station blackout (SBO) event affecting multiple units. On April 30, 2013, the licensees provided the first part of their staffing assessments regarding the plant personnel needed to respond to a multiunit prolonged SBO. The remaining portions of the staffing and communications request is expected to be impacted by the licensees' mitigation strategies being developed to address Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ADAMS Accession No. ML12056A045). As such, licensees will submit the remaining portions of their response to the Request for Information letter regarding staffing and communications (if needed) four months before the second refueling outage at each site (i.e., 4 months before each site completes full implementation of the mitigation strategies order).

### *Rulemaking Activities*

On March 4, 2013, the Commission issued SRM-COMSECY-13-0002, “Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities,” (ADAMS Accession No. ML13063A548), approving the staff’s proposal to consolidate regulatory activities associated with NTTF Recommendations 4 (SBO mitigation capability) and 7 (spent fuel pool makeup capability) into a single rulemaking referred to as “Station Blackout Mitigation Strategies” (SBOMS). This rulemaking is expected to codify the requirements of Order EA-12-049. The Commission’s SRM also approved a schedule adjustment to enable the rulemaking to be informed by implementation of the mitigation strategies order (EA-12-049); the final rule is now scheduled for completion by December 2016. The final regulatory basis, which supports preparation of a proposed rule, was published in the *Federal Register* on July 23, 2013 (78 FR 44035).

For the Emergency Onsite Response Capabilities rulemaking, initiated as a result of NTTF Recommendation 8, the NRC issued a draft regulatory basis for public comment on January 8, 2013. The staff is currently considering both internal and external feedback and modifying the document. The final rule, when complete, is expected to establish standards that ensure plants can smoothly transition between various emergency procedures, keeping overall strategies coherent and comprehensive. The final rule is scheduled for completion in March 2016.

In SRM-SECY-12-0157, the Commission instructed the staff to initiate rulemaking that considers filtering and confinement strategies for limiting the release of radiological material in the event of a severe accident at BWRs with Mark I and II containments. These strategies would consider, but not be limited to, installation of an external engineered filter. Public meetings are continuing to discuss development of a regulatory basis to support the rulemaking. A final rule, if adequately supported by a regulatory basis and associated rulemaking analyses, is expected in 2017.

While not technically a rulemaking activity, NTTF Recommendation 1 is to establish “a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations” to encompass beyond-design-basis events. The NRC staff continues to engage with stakeholders, including the Advisory Committee on Reactor Safeguards (ACRS), to inform the development of options for Commission consideration. To date, the staff has released three white papers for public comment describing the working group’s proposed regulatory framework improvement activities. The staff plans to provide a discussion of these potential improvement activities, along with options for the Commission’s consideration, in a December 2013 paper.

### *Tier 2 Activities*

Tier 2 activities fall into three main areas: spent fuel pool (SFP) makeup capabilities, emergency preparedness (EP), and reevaluation of other external hazards (that is, hazards other than seismic and flooding, which are being reevaluated under Tier 1). For the first two areas—SFP makeup capabilities and EP—the staff has found that the intent of these recommendations are being accomplished through implementation of mitigation strategies order EA-12-049, with the exception of the multiunit dose assessment capability. These items have thus been consolidated into the mitigation strategies activities, as approved by the Commission in SRM-

COMSECY-13-0002 and SRM-COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons-Learned," (ADAMS Accession No. ML13120A339). The remaining Tier 2 EP item, multiunit dose assessment, is being addressed through each licensee documenting their commitments to obtain multiunit dose assessment capability by the end of 2014. The staff intends to include it in the rulemaking planned for Tier 3 EP-related topics. The final Tier 2 activity, reevaluation of other external hazards, will be informed by the insights gained from implementation of the seismic and flooding reevaluation efforts. The staff primarily focused its resources on seismic and flooding reevaluations due to their potential risk significance. As progress is made and resources become available, staff will commence work on this recommendation by following a similar process as the seismic and flooding reevaluations.

### *Tier 3 Activities*

While much of the staff's effort to date has focused on the high priority Tier 1 actions, work on the Tier 3 activities is progressing in accordance with the longer-term schedules established in the program plans that were issued in July 2012 as part of SECY-12-0095, with two exceptions. The Tier 3 work associated with evaluating the merits of expediting the transfer of spent fuel from pools to dry cask storage has been accelerated to allow coordination with the waste confidence rulemaking activities. The staff intends to deliver a Commission paper on this activity in October 2013. The Tier 3 work associated with EP will be initiated in 2015 and will include the issuance of an advanced notice of proposed rulemaking in 2016. Each Tier 3 activity generally: (A) requires further evaluation before it can be determined if additional regulatory action is necessary, and/or (B) depends on the outcome of another activity before it can be determined what, if any, action should be taken. To date, no determinations for regulatory action have been completed on any of the Tier 3 activities.

### ***Transition of the Longer-Term Review Organization***

In the "Charter for the Nuclear Regulatory Commission Steering Committee to Conduct a Longer-Term Review of the Events in Japan," an attachment to SRM-SECY-11-0117, the structure, scope, and expectations were established for the longer-term review of lessons learned from the Fukushima accident. The charter recognized that a transition away from the crafted organizational structure would eventually become appropriate as the lessons-learned activities matured. Specifically, the charter states that the staff's updates to the Commission should "...provide recommendations regarding the sunset of the Steering Committee, Advisory Committee, and the Project Directorate." The staff has established a plan and process to transition lessons-learned activities back to the line organizations.

The first step toward integrating post-Fukushima activities into the normal agency structure is to start with the transition of oversight from the Steering Committee to the line organizations. As detailed in the charter, the Steering Committee is composed of the Directors of the NRC offices most directly affected by one or more of the lessons-learned activities; two of the four Regional Administrators are also members. The Steering Committee is chaired by the Deputy Executive Director for Reactor and Preparedness Programs (DEDR). According to the charter, the Steering Committee's primary responsibility is to assess and prioritize the Near-Term Task Force's recommendations. This has been accomplished for the Tier 1 activities. Similarly, the Tier 2 and Tier 3 activities have plans in place for further evaluation to determine what, if any, regulatory action should be taken. Given the progress achieved to date, the staff determined it

is an appropriate time to transition oversight to the line organizations for most Fukushima-related activities, but to maintain a reduced scope of activities under Steering Committee oversight.

To make the determinations on whether a lessons-learned activity was ready for transition to the line organization, the Steering Committee developed a methodology for reviewing each activity. This methodology consisted of performing an evaluation of each activity to determine: (A) whether the activity was sufficiently mature and/or had a clear path for completion and (B) whether ownership had been properly established within the line organization(s). The evaluations were performed by staff in the line organization(s) that will assume full ownership. Each evaluation was then presented to and reviewed by the Steering Committee. The Steering Committee discussed each activity, and as described in the enclosures, determined whether or not the activity was ready for transition to line organization oversight. Details on the justifications for these determinations are described within the enclosures in a section that follows each activity's status update. In summary, the Steering Committee determined that all lessons-learned activities, except for four items, are ready for transition to the line organizations. These items are:

- periodic re-confirmation of external hazards (Tier 3);
- reliable hardened vents for containment designs other than BWR Mark I and II (Tier 3);
- hydrogen control and mitigation (Tier 3); and
- applicability of lessons learned to other NRC-regulated facilities (not within a Tier).

The Steering Committee will meet as needed to address the items above, the status of ongoing activities, potential problems, or newly identified issues. It should be noted that for activities that are being transitioned to a line organization, neither their priority nor oversight is lost. The Steering Committee will stay apprised of the transitioned activities to ensure an adequate focus is maintained on their implementation, and because individual Steering Committee members are also the Directors of individual line organizations, each activity will continue to be directly overseen by at least one Steering Committee member. Furthermore, the Steering Committee will continue to interact with the industry's Steering Committee in regularly scheduled public meetings to resolve issues at an executive level. These interactions are mutually beneficial and the staff believes that even after an activity is transitioned, it will continue to be discussed in such a forum for the benefit of all stakeholders. The act of transitioning an activity, however, allows the staff to address that activity within normal agency processes.

The Japan Lessons-Learned Project Directorate (JLD) organization will remain in place for a period of time. The JLD organization will remain within the Office of Nuclear Reactor Regulation (NRR) and continue to serve in a program management and support role to ensure the holistic coordination and awareness of lessons-learned activities as they are implemented within the different line organizations. The JLD will serve as a central liaison for technical and programmatic consistency, especially as it relates to activities that might have ownership across multiple line organizations. This role will minimize any potential duplication of effort or inconsistent application of NRC processes. Once all lessons-learned activities are transitioned to the line organizations, show sufficient progress, and full project management responsibilities are established, the staff will disband the JLD. Once this occurs, the staff recognizes that there will still be a need to maintain holistic cognizance of the group of activities that make up

Fukushima lessons learned; therefore, the staff intends to establish responsibility for this broad awareness and support within one of the line organizations until all activities are completed.

To keep the Commission informed of lessons-learned activities, the JLD will continue to provide semi-annual status updates. These updates will be in addition to the activity-specific policy issues that will be brought to the Commission's attention during the normal course of evaluation or implementation.

### ***Documentation of Final Closeout of Lessons-Learned Activities***

The staff recognizes that as lessons-learned activities are completed, it must clearly and thoroughly document its basis for considering the activity to be complete. In some cases this might be clear; for example, the publication of the Station Blackout Mitigation Strategies (SBOMS) final rule in the FR should provide sufficient justification for a "complete" determination. However, the staff recognizes that some lessons-learned activities, particularly those in Tier 3 that are undergoing longer-term evaluations, might result in no regulatory action. Regardless of the final outcome of a given activity, the staff plans to document its clear and thorough justification when it determines that an activity should be considered complete, and that justification will be provided to the Commission for each activity as determinations are made. Additionally, the staff will include in its semi-annual updates to the Commission the status of items (including responsible line organization, completed work, future milestones, etc.) until they are completed. Furthermore, the staff intends to maintain a publicly available list or table that will cite the document containing the staff's justification for closure of each activity. This will help ensure traceability and consistency as each activity is closed.

### **RECOMMENDATION:**

The staff recommends that the Commission dissolve the Steering Committee charter provided in SRM-SECY-11-0117. The dissolution of the charter will support the transition of lessons-learned oversight from the Steering Committee to the line organizations, including transition of the activities the Steering Committee has already determined are ready for transition (as described in the enclosures).

### **COORDINATION:**

The Office of the General Counsel has reviewed this paper and has no legal objection

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### **Enclosures:**

1. [Update on Tier 1 Activities](#)
2. [Update on Tier 2 Activities](#)
3. [Update on Tier 3 Activities](#)
4. [Update on Activities Not Within a Tier](#)

## Update on Tier 1 Activities

### Mitigation Strategies Order EA-12-049

#### *Status Update*

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12056A045). The order requires a three-phase approach for mitigating beyond-design-basis external events. The initial phase requires the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities. The transition phase requires providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.

As described in the last update, on August 29, 2012, the NRC staff issued interim staff guidance (ISG) JLD-ISG-2012-01, Revision 0, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12229A174). This document assists nuclear power reactor applicants and licensees with the identification of measures needed to comply with requirements of the order. The ISG endorses, with clarifications, the methodologies described in the industry guidance document, Nuclear Energy Institute (NEI) 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0 (ADAMS Accession No. ML12242A378). This industry document outlines one possible approach that can be used by licensees, construction permit holders, and combined license holders to address the requirements of the Order. Both the ISG and NEI 12-06 support implementation of the order by the Commission-directed completion date of December 2016.

Subsequent to issuance of the order, NRC staff determined that the intent of some other lessons-learned activities could be addressed under the purview of the mitigation strategies order. In COMSECY-13-0002, dated January 25, 2013 (ADAMS Accession No. ML13011A037), the staff requested that the Commission approve its plan to address the Tier 2 activities related to spent fuel pool makeup capabilities (NTTF Recommendations 7.2 through 7.5) under this order. The Commission approved this request on March 4, 2013 (ADAMS Accession No. ML13063A548). In COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons-Learned," dated March 27, 2013 (ADAMS Accession No. 12339A262), the staff requested that the Commission approve its plan to address the intent of the Tier 2 emergency preparedness (EP) items related to training and exercises, and EP equipment and facilities, under this order as well. The Commission approved this request on April 30, 2013 (ADAMS Accession No. ML13120A339).

By February 28, 2013, all licensee integrated plans had been received by the NRC (except for Crystal River Unit 3 because of its plan to permanently cease operations). The integrated plans contain each licensee's site-specific implementation details for meeting the requirements of the

order. A technical contract was awarded in April 2013 to support NRC review of the integrated plan submittals. However, the technical complexity of the mitigation strategies order was unforeseen and multiple points of contention arose between the staff and licensees. The points of contention are:

- The use of the Modular Accident Analysis Program (MAAP) codes and the applicability during beyond design basis accidents;
- The use of Combustion Engineering Nuclear Transient (CENTS) code in comparison to CE FLASH codes associated with reactor coolant system (RCS) natural circulation;
- The evaluation of leakage past reactor coolant pump (RCP) seals during an extended SBO event;
- The applicability of the cited boron mixing model and the documented testing of this model across PWR designs;
- Licensee capability to implement FLEX procedures in shutdown and refueling modes;
- The technical bases (i.e., methodology, assumptions, and prerequisites) used to establish the duty cycle for a vented lead-acid battery;
- FLEX procedural reliance on early containment venting for BWRs with Mark I and Mark II containments; and
- Identification of maintenance and testing programs for related equipment and procedures.

Because of these additional issues, the integrated plan reviews will take longer than expected with the original resources. To permit this review to meet the original deadlines, a temporary organization, called the Mitigation Strategies Directorate and consisting of an SES manager and three branches, was created to support these reviews in a timely manner. The new directorate will overcome the new challenges through discussions with the industry in public meetings, many of which have already been held on the new issues. The next steps for the Directorate consist of sending out requests for additional information (RAIs) to licensees to address staff questions, concerns, and incomplete details. The review of the integrated plans is on a staggered basis, with draft safety evaluations (SEs) with open items to be issued to each licensee by February 2014. The open items will need to be addressed by the licensees before full implementation is completed. Once all draft safety evaluations with open items are complete, the Mitigation Strategies Directorate's staff will be reabsorbed back into their line organization.

The first group of licensees is scheduled to complete full implementation by the fall of 2014. In the fall and winter of 2014, NRC staff expects to commence inspections to verify implementation at those sites. All licensees are required to achieve full implementation no later than December 2016.

#### *Transition to Line Organization Oversight*

On June 11, 2013, an evaluation of the readiness for the mitigation strategies order to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within both the Office of Nuclear Reactor Regulation (NRR) and the Office of New Reactors (NRO), with lead responsibility split between issues related to operating reactors and new reactors, respectively. Champions have been designated in both offices.

The staff considers this activity mature; regulatory action has already been taken, implementation is underway, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. Furthermore, the staff recognizes the close relationship of this activity to the Station Blackout Mitigation Strategies (SBOMS) rulemaking activity. In its coordination role, the Japan Lessons Learned Project Directorate (JLD) will help ensure that the working groups and champions for each of these activities exchange information and effectively coordinate actions that might impact one another.

#### Spent Fuel Pool Instrumentation Order EA-12-051

##### *Status Update*

On March 12, 2012, the NRC issued Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (ADAMS Accession No. ML12056A044), requiring all United States nuclear power plants to install water level instrumentation in their spent fuel pools. The instrumentation must remotely report at least three distinct water levels: 1) normal level, 2) low level but still high enough to shield workers above the pools from radiation, and 3) a very low level near the top of the spent fuel rods where more water should be added without delay.

On August 29, 2012, the NRC staff issued ISG JLD-ISG-2012-03, Revision 0, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation" (ADAMS Accession No. ML12221A339). This document provides an acceptable approach for satisfying the requirements of Order EA-12-051. At the end of February 2013, all Spent Fuel Pool Instrumentation Order integrated plans were received. Currently, the staff is reviewing the integrated plans and completed transmitting the first round of RAIs at the end of August 2013.

The NRC staff is currently developing draft SEs with open items and plans to issue the draft SEs with open items for the integrated plans by the end of November 2013. The open items, when closed, will address the actions required to be completed by the reactor's implementation date. Once a licensee has closed out all open items from its SE, the staff will update the draft SE to indicate its approval of that licensee's actions as providing assurance that the order requirements are being met. The licensees for the first affected units are scheduled to complete the required actions by the end of each unit's fall 2014 refueling outage. All plants will complete the order's requirements by December 2016 and the staff currently does not foresee any major technical issues that could extend the final implementation date. Onsite inspections, if needed, will be completed by the appropriate regional or resident inspectors for each facility.

##### *Transition to Line Organization Oversight*

On June 11, 2013, an evaluation of the readiness of the Spent Fuel Pool Instrumentation Order to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within both NRR and NRO, with responsibilities split between issues related to operating reactors and new reactors, respectively. Champions have been designated in both offices.

The staff considers this activity mature; regulatory action has already been taken, implementation is underway, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that NRR, NRO, and the regions exchange information and effectively coordinate actions that might impact one another.

Reliable Hardened Containment Vents for BWR Mark I and II Designs (Order EA-12-050 and Order EA-13-109)

*Status Update*

The NRC issued Order EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents," on March 12, 2012 (ADAMS Accession No. ML12054A696), requiring all operating boiling-water reactors (BWRs) in the United States with Mark I and II containments to install a reliable, hardened vent. After issuing the order, additional NRC evaluations examined the benefits of venting *after* reactor core damage occurs. SECY-12-0157, "Consideration of Additional Requirements for Containment Venting Systems" (ADAMS Accession No. ML12345A030), was submitted to the Commission on November 26, 2012. In the staff requirements memorandum (SRM) for SECY-12-0157 on March 19, 2013 (ADAMS Accession No. ML13078A017), the staff was directed to require licensees with Mark I and Mark II containments to "upgrade or replace the reliable hardened vents required by Order EA-12-050 with a containment venting system designed and installed to remain functional during severe accident conditions." On June 6, 2013, the staff issued the modified Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions" (ADAMS Accession No. ML13130A067), to ensure that those vents will remain functional in the conditions following reactor core damage.

The revised order contains two distinct phases of implementation. Phase 1, which all licensees are required to implement by June 2018, requires licensees to upgrade the venting capabilities from the containment wetwell to provide reliable, severe accident capable hardened vents to assist in preventing core damage and, if necessary, to provide venting capability during severe accident conditions. The licensees are also required to submit an integrated plan by June 30, 2014. Phase 2, which all licensees are required to implement by June 2019, requires licensees to provide additional protections for severe accident conditions through installation of a reliable, severe accident capable drywell vent system or develop a reliable containment venting strategy that makes it unlikely to need to vent from the containment drywell during severe accident conditions, and submit an integrated plan submitted by December 31, 2015.

Currently, the revised order is on schedule; however, the staff foresees a few technical and contracting challenges with notable impacts. These challenges are:

- Initial staff review of the Phase 1 ISG highlighted issues requiring further discussions with the industry. These include:
  - Interactions between Orders EA-12-049 and EA-13-109; and
  - Temperature conditions in the drywell during severe accident conditions.

If these issues are not resolved in a timely manner, a delay could occur in issuing the ISG after the planned October 2013 date, but this would not be expected to impact the implementation schedule; and

- Phase 2 of the Order provides an option to develop a venting strategy to obviate the need of a drywell venting system. This strategy most likely will require additional technical analysis to evaluate its feasibility and acceptability. The completion and staff review of this alternative will provide an additional challenge to timely completion of Phase 2.

Since the issuance of the revised order, the NRC has been holding (and will continue to hold) public meetings frequently with the industry to develop both the industry's and the NRC's guidance document for implementation of the new requirements. The staff plans to issue the ISG for Phase 1 of Order EA-13-109 by October 2013 and issue the ISG for Phase 2 by April 2015, barring any technical issues detailed above.

The NRC staff expects to issue draft SEs for the Phase 1 integrated plans by December 31, 2014, and for the Phase 2 integrated plans by June 30, 2016.

#### *Transition to Line Organization Oversight*

On June 25, 2013, an evaluation of the readiness for the Severe Accident Capable Vents Order to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within NRR, and the Director of NRR's Division of Safety Systems has been designated as champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature; regulatory action has already been taken and a clear path forward has been established. While technical issues for implementation might arise during ongoing guidance development, the staff believes that such issues can be effectively resolved within the line organizations. Communication with stakeholders is expected to continue at a high level. In its coordination role, the JLD will help ensure that information is effectively exchanged and that actions that might impact other offices are coordinated appropriately.

## Accident Management and Filtering Strategies Rulemaking

### *Status Update*

After issuing Order EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents" on March 12, 2012, additional NRC evaluations examined the benefits of venting *after* reactor core damage occurs. SECY-12-0157, "Consideration of Additional Requirements for Containment Venting Systems," was submitted to the Commission on November 26, 2012. In the SRM for SECY-12-0157, dated March 19, 2013, the Commission directed staff to develop the technical basis and proceed with a rulemaking for filtering strategies with drywell filtration and severe accident management of BWRs with Mark I and II containments. The Commission directed the staff to provide to the Commission the technical basis for the rulemaking on March 19, 2014, the proposed rule and draft staff guidance to on March 19, 2015, and the final rule and guidance on March 19, 2017.

Since the issuance of the SRM for SECY-12-0157, the NRC has held several public meetings to discuss the Commission's decision and the technical basis for the rulemaking. The public meetings included interaction with the public on potential performance measures and accident progression event trees for the technical basis.

Currently, the progress of the rulemaking is in accordance with the schedule provided in SRM-SECY-12-0157. The staff continues to work through normal rulemaking activities and will keep the Commission apprised of any challenges that could impact the schedule.

The staff established a Division Director steering committee (DDSC) to guide this activity; this is a normal step taken for complex rulemakings, done in accordance with agency rulemaking procedures. The working group and DDSC will keep senior management informed of progress on this activity.

### *Transition to Line Organization Oversight*

On June 25, 2013, an evaluation of the readiness for the filtering strategies rulemaking to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within both NRR and the Office of Nuclear Regulatory Research (RES), and champions have been designated in both offices. As described above, this activity has also established a DDSC to provide guidance and oversight. Any additional interoffice issues can be coordinated using existing processes.

While this activity is in the early stages of development, the staff considers this activity mature enough for transition to the line organizations because the rulemaking process uses well-established procedures and it provides clear roles and responsibilities, including decisions by the Commission. The staff expects that technical issues might arise during development of the regulatory basis, but that these issues can be effectively resolved within the line organizations and through the DDSC. Also, the rulemaking process will provide for significant stakeholder interaction.

## Seismic Hazard Walkdowns

### *Status Update*

On March 12, 2012, the NRC asked United States nuclear power plants to perform a detailed inspection, or “walkdown,” of their currently installed seismic and flooding protection features. The plants had to ensure that the features met current requirements, and also identify, correct, and report any degraded conditions. The plants completed their walkdowns by November 2012. NRC resident inspectors utilized temporary instruction (TI-2515/188) to independently verify, using a sampling process, that each licensee’s seismic walkdown activities were conducted using walkdown methodology endorsed by the NRC. Resident inspectors completed the inspection requirements set forth in TI-2515/188 concurrent with the licensee’s walkdown activities and documented the inspection results in their quarterly reports.

Since the last 6-month update paper, the staff performed six onsite audits to check the adequacy of their walkdowns at the following plants: Point Beach, Comanche Peak, DC Cook, Beaver Valley, Seabrook, and Sequoyah. The audits were informative to the staff and helped to clarify the actions taken at the plants during the walkdown activities. For example, the common findings from the audits include: housekeeping issues, such as temporary equipment not tied down; spatial interaction issues; missing or loose bolts; and potential degraded conditions such as the accumulation of rust. These findings were referred to the licensee to be included in their corrective action programs. The walkdown reports submitted by several plants did not completely follow the reporting guidelines in the endorsed guidance document or accurately reflect the plant activities. The self-assessment conducted by several licensees as a pre-audit activity also identified similar information gaps. As a result, these plants have decided to update the information in their reports.

The staff continues to assess each plant’s seismic walkdown reports. The purpose of the staff assessment of the plant’s seismic walkdown reports is to determine if the plant conducted their walkdown in accordance with the endorsed guidance, thereby verifying that the walkdown met the objectives of the Request for Information letter. Based on the results of the staff’s seismic walkdown audits and review to date of the seismic walkdown reports, the staff is interacting with the industry to communicate potential areas where the staff may need additional information to complete its seismic walkdown report reviews and to determine the most effective way for the industry to provide that information. If a performance deficiency is identified during these reviews, it will be dispositioned through the ROP process.

Some of the plants indicated a long timeframe to complete walkdowns on items that were delayed because they were inaccessible. Improving the timeliness of delayed item closeouts is an ongoing area of discussion between NRC staff and licensees. Several plants submitted information related to using substitute items or approaches to close out delayed walkdown items faster. These submittals are also currently under review by staff.

Additionally, the staff will be developing a lessons-learned report to document insights from the seismic walkdowns. Moreover, any significant generic issues identified during the review of the

walkdown reports and audits will be evaluated to determine the appropriate regulatory course of action.

#### *Transition to Line Organization Oversight*

On July 2, 2013, an evaluation of the readiness for the seismic walkdown activities to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activity is ready for transition.

The line organization ownership will reside within NRR and the technical ownership will reside within NRO. The Director of NRO's Division of Site Safety and Environmental Analysis has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature and ready for transition to line organization management because regulatory action has already been taken, implementation is underway, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that NRR and NRO exchange information and effectively coordinate actions that might impact one another.

#### Flooding Hazard Walkdowns

##### *Status Update*

On March 12, 2012, the NRC asked United States nuclear power plants to perform a detailed inspection, or "walkdown," of their currently installed flooding protection and mitigation features, including a review of associated manual actions. The plants had to ensure the features met current requirements, and also identify, correct, and report any degraded conditions. The plants completed their walkdowns by November 2012 and the NRC resident staff completed their inspections in parallel with the performance of the walkdowns. Inspection reports for the staff walkdowns were issued by February 2013.

If the licensees discovered deficiencies during their walkdowns, the issues were entered into the licensee's corrective action program. These corrective actions are being followed up upon by the NRC residents as with normal NRC processes. After the walkdowns, many corrective actions have been completed and some of the highlighted findings are:

- Licensee identification of degraded seals to prevent water intrusion into safety significant areas of the plant;
- Licensee identification of feasibility concerns related to operator manual actions described in flooding mitigation procedures; and
- Licensee determination of plant available physical flooding margin being potentially not consistent with flooding walkdown guidance.

Since the last 6-month update paper, the staff performed seven site audits to evaluate whether the walkdowns were performed in accordance with NRC-endorsed guidance. Audits were performed at the following plants: Brunswick, Salem, Hope Creek, Quad Cities, Millstone, Vermont Yankee, and Oyster Creek. The audits were informative to the staff. For example, the audits revealed that some licensees might not have:

- clearly understood the site's current licensing-basis flood protection and design-basis flood elevation;
- appropriately evaluated available physical margin;
- comprehensively evaluated timing and feasibility of manual actions; or
- rigorously documented the walkdown process.

Most plants have entered NRC audit team observations in the corrective action program and are working on the appropriate corrective actions. All observations that raised current licensing basis compliance questions were transitioned to the ROP process for significance determination and resolution.

The staff is in the process of assessing each plant's walkdown report. Based on the results of the staff's flooding walkdown audits and review to date of the flooding walkdown reports, the staff is interacting with the industry to communicate potential areas where the staff may need additional information to complete its flooding walkdown report reviews and to determine the most effective way for the industry to provide that information. The staff expects all staff assessments to be completed by November 2013 and doesn't foresee any technical challenges that could delay the review schedule.

Additionally, the staff will be developing a lessons-learned report to document insights from the flooding walkdowns. Moreover, any significant generic issues identified during the review of the walkdown reports and audits will be evaluated to determine the appropriate regulatory course of action.

#### *Transition to Line Organization Oversight*

On July 2, 2013, an evaluation of the readiness for the flooding walkdown activities to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activity is ready for transition.

The line organization ownership will reside within NRR and the technical support from NRO. The Director of NRO's Division of Site Safety and Environmental Analysis has been designated as the champion. Any interoffice issues will be coordinated using existing processes.

The staff considers this activity mature and ready for transition to line organization management because regulatory action has already been taken, implementation is underway, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that NRR and NRO exchange information and effectively coordinate actions that might impact one another.

## Seismic Hazard Reevaluations

### *Status Update*

On March 12, 2012, the NRC asked nuclear power plant licensees to reevaluate the seismic hazards that could impact their site using current regulations and guidance. These newly reevaluated hazards, if they are higher than the plant is designed for, will be analyzed by licensees to determine whether plant structures, systems, and components need to be modified to protect against the updated hazard.

Since the last 6-month update paper, a significant amount of work has been done on seismic reevaluations. The NRC has held several public meetings on seismic reevaluations since the last status update paper in mid-February. On February 15, 2013, the staff endorsed the Electric Power Research Institute (EPRI) document, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic" (ADAMS Accession No. ML123330282). This EPRI report provided detailed guidance on both the initial seismic hazard reevaluations and subsequent seismic plant risk evaluations, if needed.

On May 7, 2013, the staff endorsed the EPRI report, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic" (ADAMS Accession No. ML13107B387). This document provided guidance on an expedited seismic evaluation and potential upgrade of key plant systems and components needed to cope with the SBO conditions when the systems and components are subjected to the updated seismic hazard. This activity will take place while licensees are performing their more detailed and comprehensive seismic plant risk evaluations. Thus, the expedited approach will provide opportunities for early upgrade of some key components, if necessary.

On August 28, 2013, the staff completed its review and issued its endorsement (ADAMS Accession No. ML13233A102) of the seismic ground motion model update for the central and eastern United States (CEUS), which was performed by EPRI and submitted to the NRC in June 2013. As part of the review process, the staff provided written questions to industry at the beginning of July 2013. At the end of July 2013, industry submitted written responses to the NRC staff questions, as well as an errata sheet with corrections to the report resulting from NRC staff comments. In addition, two public meetings were conducted during the review period to facilitate discussions. The staff had been involved in the ground motion modeling update by industry since the project began in early 2012.

The seismic hazard reevaluation submittals from licensees whose plants are located in the CEUS are due in March 2014. Originally, the hazard submittals from CEUS licensees were due in September 2013, but the staff accepted industry's proposal to extend the deadline by six months in order to complete the update of the seismic ground motion models for the CEUS as this effort incorporates a significant amount of new information and data for CEUS seismic hazards. Industry's proposal stated that meeting the March 2014 deadline is contingent upon NRC endorsement of the updated model by the end of August 2013, which the staff has achieved. No other challenges have been expressed during the public meetings on seismic hazard reevaluation efforts that have been conducted since the industry's proposal. The

seismic hazard reevaluation submittals from licensees whose plants are located in the western United States (WUS) are still due on their original due date of March 2015.

The staff will review the seismic hazard reevaluation submittals and issue an assessment for each plant. The staff continues to interact with industry, through public meetings, to address questions that industry has developed as they prepare their seismic hazard reevaluation submittals. In addition, staff has prepared a working example of a seismic hazard reevaluation submittal, discussed at a public meeting at the end of August 2013, which will be a valuable tool to communicate staff expectations on the format and structure of the submittals.

If the reevaluated seismic hazard level is higher than the plant's licensing basis, licensees will perform an expedited seismic plant evaluation and potential plant modifications as well as more detailed and comprehensive seismic probabilistic risk assessment (PRA). The expedited seismic plant evaluations are due in December 2014 for CEUS plants and January 2016 for WUS plants. Plant modifications arising from the expedited seismic evaluations are due in December 2016 for CEUS plants and June 2018 for WUS plants, unless plant outages are required for any of these modifications. The full seismic plant PRAs will be divided into two or more priority groups. The higher priority group of seismic PRAs is due in June 2017 for both CEUS and WUS plants and the second group of seismic PRAs is due in December 2019. On completion of its review of the plant seismic PRAs, the staff will use existing NRR processes to determine whether plant upgrades might be necessary.

#### *Transition to Line Organization Oversight*

On July 2, 2013, an evaluation of the readiness for the seismic reevaluations to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition. The line organization ownership will reside within NRR and the technical ownership will reside within NRO. Champions have been designated in both offices.

The staff considers this activity mature; regulatory action has already been taken, licensees are taking action, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that the working groups and champions for each of these activities exchange information and effectively coordinate actions that might impact one another.

#### Flooding Hazard Reevaluations

##### *Status Update*

On March 12, 2012, the NRC asked all power reactor licensees and holders of construction permits in active or deferred status to reevaluate the flooding effects—or hazards—that could impact their site. If the reevaluated flood hazard at a site is not bounded by the current design basis, respondents are requested to perform an assessment of the plant's collective ability to cope with the reevaluated flood hazard. The NRC staff will review the responses to the request

for information and determine whether regulatory actions are necessary to provide additional protection against flooding.

Since the last 6-month update SECY paper, many steps have been taken in the flooding reevaluations. The NRC has held 10 public meetings on flooding reevaluations since the last status update paper in mid-January. On March 12, 2013, the first set of plants submitted their flooding hazard reports. Six sites requested and were approved for extensions, primarily to allow usage of a different model that will yield more accurate results. The second set of flooding hazard reports is due on March 12, 2014, the third (final) set of reports is due on March 12, 2015, and due date extensions are not expected for either set. The staff is currently reviewing the first set of submittals and will be issuing staff assessments for the respective plants by March 2014. From the first set of hazard submittals, several sites indicated that they are taking interim actions (e.g., having standby sandbags in place before a permanent barrier can be constructed), and the staff plans to issue a temporary instruction to facilitate inspection of those actions. The majority of sites indicated that they will be performing an integrated assessment. The staff will coordinate with the industry on a lead plant for the integrated assessment and the public will have multiple opportunities for participation in the process through public meetings. After the integrated assessments are received from the required plants, the staff will use existing NRR processes to document, review, and act on the information received.

On March 1, 2013, the staff transmitted a supplemental information letter to licensees (ADAMS Accession No. ML13044A561) to clarify operability, reportability, interim actions and extension requests. This letter was in response to concerns discussed at the February 11, 2013, public meeting. Additionally, on July 29, 2013, the staff transmitted JLD-ISG-13-01, "Guidance for Assessment of Flooding Hazards Due to Dam Failure" (ADAMS Accession No. ML13151A153), which described methods acceptable to the staff for reevaluating flooding hazards caused by dam failure for the purpose of responding to the March 2012 request for information letter (ADAMS Accession No. ML12053A340).

#### *Transition to Line Organization Oversight*

On July 2, 2013, an evaluation of the readiness for the flooding reevaluations to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activity is ready for transition.

The line organization ownership will reside within both NRR and NRO, with responsibilities split between issues related to operating reactors and new reactors, respectively, with NRO serving as the technical lead for both operating and new reactors. The Director of NRO's Division of Site Safety and Environmental Analysis has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature and ready for transition to line organization management because regulatory action has already been taken, licensees are taking action, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that NRR and NRO exchange information and effectively coordinate actions that might impact one another.

## Emergency Preparedness (EP) Staffing and Communications

### *Status Update*

The March 12, 2012, request for information letter asked licensees to assess the staff needed to respond to a large-scale event that causes the loss of all ac power and might affect multiple reactors at their site, and also to assess and implement enhancements to help ensure that communications can be maintained during such an event.

As described in the last update, licensees submitted their communications assessments on October 31, 2012, and the staff subsequently identified eight items generic to those submittals that needed clarification. These items were discussed at public meetings and licensees provided supplements to clarify the issues. The NRC staff has since completed its review of the communications assessments and determined that proposed interim actions (e.g., portable satellite phones), combined with long-term enhancements (e.g., new radio systems, utilizing sound powered telephones, battery-powered radio repeaters, and satellite phone systems) will help to ensure that licensees can effectively communicate during a station blackout (SBO) event affecting multiple units. All safety assessments were issued documenting these determinations to each licensee by July 2013, with the exception of San Onofre (ceased operation). In coordination with the mitigation strategies, the staff plans on following up with licensees to confirm that the enhancements to the site's communication systems are completed.

On April 30, 2013, licensees submitted their staffing assessments based on existing SBO coping strategies with an assumption of multiple reactors being affected concurrently. The staff is currently reviewing these submittals and expects to issue the results of the staff's review no later than December 2013.

Additionally, the staff coordinated the remaining portions of the staffing assessment with the order for mitigation strategies (EA-12-049). In accordance with EA-12-049, each licensee must develop strategies for mitigating the effects of beyond-design-basis external events. To ensure accurate assessment results, the staffing assessment for response functions must include those related to the mitigation strategies. The staff determined that given the need to assess potential mitigation strategies staffing during the first refueling outage and time required to develop subsequent procedures, training, and guidelines, licensees could provide the staffing assessments 4 months prior to the beginning of their second refueling outage. The staff will review and determine whether licensees have identified the staff needed to respond to a large-scale event that causes the loss of all A/C power and might affect multiple reactors at their site.

### *Transition to Line Organization Oversight*

On June 18, 2013, an evaluation of the readiness for the EP staffing and communications activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activity is ready for transition.

The line organization ownership will reside within NSIR, and the Director of NSIR's Division of Preparedness and Response has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature and ready for transition to line organization management because regulatory action has been taken, licensees are taking action, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organization. In its coordination role, the JLD will help ensure that outcomes from the mitigation strategies order, to the extent that they impact EP staffing and communications, are effectively communicated and coordinated with NSIR.

### Station Blackout Mitigation Strategies (SBOMS) Rulemaking

#### *Status Update*

The principal objective of the NRC's SBOMS rulemaking effort would be to establish requirements, in the form of mitigation strategies, guidance, and relied on equipment that provide additional mitigation capability (i.e., beyond the current capabilities that stem principally from implementation of requirements in GDC 17 and 10 CFR 50.63) for extreme external events that lead to extended loss of alternating current (ac) power that might also include loss of normal access to the ultimate heat sink. These requirements will reflect the requirements imposed in Order EA-12-049, issued on March 12, 2012, along with insights gleaned from implementation of the order as well as information on external hazards from the ongoing seismic and flooding reevaluations and stakeholder feedback solicited throughout the rulemaking process.

In SRM-SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011 (ADAMS Accession No. ML11272A111), the Commission approved the staff's proposed prioritization of NTTF Recommendation 4.1 on strengthening SBO mitigation capability. The advanced notice of proposed rulemaking (ANPR) was published in the *Federal Register* (FR) on March 20, 2012 (77 FR 16175), and the comment period on the ANPR closed on May 4, 2012. On January 25, 2013, the staff submitted COMSECY-13-0002, "Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities" (ADAMS Accession No. ML13011A034), to engage the Commission in several aspects of the rulemaking, which included combining NTTF Recommendations 4 and 7 and revising the rulemaking schedule to accommodate Commission direction to incorporate the lessons learned from the mitigation strategies order. The Commission approved the COMSECY-13-0002 proposal on March 4, 2013 (ADAMS Accession No. ML13063A548).

On April 10, 2013, the staff issued the draft SBOMS regulatory basis for public comment. The public comment period closed on May 28, 2013. The staff received 15 comment letters, considered the comments, and finalized the regulatory basis. The final SBOMS regulatory basis was issued on July 23, 2013 (78 FR 44035). The Commission's approval of COMSECY-13-0002 resulted in a revised schedule for the rulemaking activity. The revised due date for the proposed rule and the supporting draft guidance is June 30, 2014. Correspondingly, the revised due date for the final rule and supporting guidance is December 27, 2016. At present this rulemaking activity continues to be on track with no identified issues or challenges to the schedule.

### *Transition to Line Organization Oversight*

On June 11, 2013, an evaluation of the readiness for the SBOMS rulemaking to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within both NRR and NRO, and champions have been designated in both offices. Any additional interoffice issues can be coordinated using existing processes.

The staff considers this activity mature and ready for transition to line organization oversight because the rulemaking process uses well-established procedures and it provides clear roles and responsibilities. Furthermore, the rulemaking process will provide for significant stakeholder interaction. The staff recognizes that the SBOMS rulemaking is closely related to mitigation strategies order EA-12-049, specifically with regard for the need to consider insights from the implementation of EA-12-049 in the SBOMS rulemaking, but it believes that these insights can be effectively coordinated within the line organizations. In its coordination role, the JLD will help ensure that information is exchanged and actions that might impact this activity are effectively coordinated.

### Emergency Onsite Response Capabilities Rulemaking

#### *Status Update*

The NRC's Emergency Onsite Response Capabilities rulemaking effort is expected to strengthen and integrate the various emergency response capabilities at nuclear power plants. The new rule is expected to require plants to improve strategies for large-scale events to promote effective decision making at all levels. The new rule is also expected to include training, qualification, and evaluation requirements for the key personnel expected to implement the procedures and strategies.

This lessons-learned activity originated from NTTF Recommendation 8. As described in the last update, an ANPR was published for this rulemaking in the FR on April 18, 2012 (77 FR 23161), and the public comment period closed on June 18, 2012. There were 18 comment letters received for the ANPR. On January 8, 2013, the staff issued a draft regulatory basis for public comment. The public comment period closed on February 22, 2013, and seven comment letters were received. To provide additional time to address issues raised by staff members, the staff requested and received Office of the Executive Director for Operations (EDO)/Office of the Secretary (SECY) approval to extend the regulatory basis completion date to October 4, 2013.

The SECY due date for the proposed rule and supporting guidance is July 25, 2014. The due date for the final rule and guidance is March 11, 2016.

### *Transition to Line Organization Oversight*

On June 18, 2013, an evaluation of the readiness for the Emergency Onsite Response Capabilities rulemaking to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within NRR for both project management and technical expertise. Champions have been designated. An interoffice Division Director Steering Committee (DDSC) has been formed to provide direction and guidance to the rulemaking working group and facilitate the concurrence process; this is a common practice for complex rulemaking activities. Any interoffice issues can be coordinated using the DDSC and existing processes.

The staff considers this activity mature and ready for transition to line organization oversight because the rulemaking process uses well-established procedures and it provides clear roles and responsibilities. Furthermore, the rulemaking process will provide for significant stakeholder interaction. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that information is effectively exchanged and that actions that might impact other offices are coordinated appropriately.

### Enhancements to the Capability To Prevent or Mitigate Seismically Induced Fires and Floods

#### *Status Update*

This lessons-learned activity originated from NTF Recommendation 3. It is intended to evaluate potential enhancements to the capability to prevent or mitigate seismically induced fires and floods.

In SRM-SECY-11-0137, the Commission directed the staff to initiate development of a PRA methodology to evaluate potential enhancements to plants' capability to prevent or mitigate seismically induced fires and floods as part of Tier 1 activities. However, consistent with the program plan in SECY-12-0095, "Tier 3 Program Plans and 6-Month Status Update in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami" (ADAMS Accession No. ML12165A092), for NTF Recommendation 3, carrying out the broader evaluation (i.e., beyond the PRA methodology) of potential enhancements to the capability to prevent or mitigate seismically induced fires and floods would remain a longer term Tier 3 activity. In SECY-12-0095, the staff supplied the following schedule and milestones to address Recommendation 3 for seismically induced fires and floods:

- Continue development of PRA methodology for seismically induced fires and floods. This will include two main subtasks:
  - (1) engagement with PRA standards development organizations to develop the technical elements and standards for the PRA method (ongoing); and

(2) completion of a feasibility scoping study to evaluate PRA approaches for assessing multiple concurrent events (December 2014); and

- Reevaluate Recommendation 3 based on information obtained from Tier 1 activities and PRA method development activities as well as recommend further activities (December 2016).

The staff continues to engage the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) Joint Committee on Nuclear Risk Management (JCNRM) to support the working group considering future standards development activities associated with concurrent initiating events, such as seismically induced fires and floods. The decision to include concurrent initiating events in a future revision of the ASME/ANS PRA standard is currently under ballot with the JCNRM. If this issue passes the balloting process, the staff will continue engagement with ASME/ANS to support development of standards in this area and to effectively leverage stakeholders' expertise to better focus future method development efforts.

Although staff resources for conducting a feasibility study to investigate methods for addressing multiple concurrent events continue to be limited because of higher priority work (e.g., the level 3 PRA project directed by SRM-SECY-11-0089, "Options for Proceeding with Future Level 3 Probabilistic Risk Assessment (PRA) Activities," dated September 21, 2011 (ADAMS Accession No. ML112640419), and development of external hazard risk tools to support the reactor oversight process), the staff has obtained contractor assistance to support this effort. A preliminary technical work plan has been developed in collaboration with the contractor, and a workshop that will include both internal and external stakeholders is being planned for early fiscal year 2014. However, budget limitations associated with continued sequestration or other funding reductions might impact the continued progress of this work.

Finally, the staff continues to monitor the progress of other NTF recommendations related to this issue to appropriately factor additional information related to seismic and flooding hazards and mitigation strategies into the eventual resolution of Recommendation 3.

#### *Transition to Line Organization Oversight*

On July 16, 2013, an evaluation of the readiness for this lessons-learned activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within RES, and the Director of the Division of Risk Assessment has been designated as the champion. The staff expects that any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature. The Tier 1 portion of this lessons-learned activity—development of a PRA methodology to evaluate seismically-induced fires and floods—is technically complex. However, the staff has defined a clear path forward to accomplish this activity, and once complete, the staff intends to leverage the well-established Generic Issues Program to assess the broader implications for potential enhancements to mitigate seismically-induced fires and floods. Therefore, the staff believes any issues that arise can be effectively resolved by the line organization using existing processes.



## Update on Tier 2 Activities

### Spent Fuel Pool Instrumentation and Makeup Capability

#### *Status Update*

The Tier 2 activities related to spent fuel pool instrumentation and makeup capability come directly from the Near-Term Task Force (NTTF) report. These activities are:

- |                    |  |
|--------------------|--|
| Recommendation 7.2 | Order licensees to provide safety-related alternating current (ac) electrical power for the spent fuel pool makeup system;   |
| Recommendation 7.3 | Order licensees to revise their technical specifications to address requirements to have one train of onsite emergency electrical power operable for spent fuel pool makeup and spent fuel pool instrumentation when there is irradiated fuel in the spent fuel pool, regardless of the operational mode of the reactor; |
| Recommendation 7.4 | Order licensees to have an installed seismically qualified means to spray water into the spent fuel pools, including an easily accessible connection to supply the water (e.g., using a portable pump or pumper truck) at grade outside the building; and  |
| Recommendation 7.5 | Initiate rulemaking or licensing activities or both to require the actions related to the spent fuel pool described in detailed recommendations 7.1–7.4.   |

In COMSECY-13-0002, “Consolidation of Japan Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities,” dated January 25, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13011A034), the staff proposed that these Tier 2 items be addressed within the implementation activities for the mitigation strategies order, as well as be addressed in the Station Blackout Mitigation Strategies (SBOMS) rulemaking. The staff made this proposal because it found that the new mitigation strategies could satisfy the underlying purpose of these Tier 2 items for enhanced spent fuel pool makeup and spray capability. The Commission approved the staff’s proposal on March 4, 2013. Therefore, with these activities now subsumed within the mitigation strategies activities, the staff no longer intends to provide updates on these items as independent Tier 2 activities.

#### *Transition to Line Organization Oversight*

On June 11, 2013, an evaluation of the readiness for the Tier 2 spent fuel pool makeup capabilities items to be fully transitioned to line organization oversight was presented to the Steering Committee as part of the broader evaluation for the mitigation strategies order because

these items have been subsumed. The Steering Committee determined that the activities are ready for transition.

The line organization ownership will reside within both the Office of Nuclear Reactor Regulation (NRR) and Office of New Reactors (NRO), with lead responsibility split between issues related to operating reactors and new reactors, respectively. Champions have been designated in both offices.

The staff considers this activity mature; regulatory action (the mitigation strategies order) has already been taken, implementation is underway, and a clear path forward has been established. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organization(s). Furthermore, the staff recognizes the close relationship of these activities to the SBOMS rulemaking activity. In its coordination role, the Japan Lessons-Learned Project Directorate (JLD) will help ensure that the working groups and champions for each of these activities exchange information and effectively coordinate actions that might impact one another.

### Emergency Preparedness

#### *Status Update*

Three items related to emergency preparedness (EP) were prioritized as Tier 2. These items are:

- (1) Conduct periodic training and exercises for multiunit and prolonged station blackout (SBO) scenarios. Practice (simulate) the identification and acquisition of offsite resources, to the extent possible;
- (2) Ensure that EP equipment and facilities are sufficient for dealing with multiunit and prolonged SBO scenarios; and
- (3) Add guidance to the emergency plan that documents how to perform a multiunit dose assessment (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

In COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned," dated March 27, 2013 (ADAMS Accession No. ML12339A262), the staff requested Commission approval to implement the first and second items under the mitigation strategies order; the staff found that these items were already being adequately addressed by the ongoing implementation efforts for mitigation strategies and therefore did not need to be addressed as independent Tier 2 items. For the third item, the staff requested Commission approval to implement it by having each licensee document their commitment to obtain multiunit dose assessment capability by the end of 2014. The Commission approved the staff's requests in Staff Requirements Memorandum (SRM)-COMSECY-13-0010, dated April 30, 2013 (ADAMS Accession No. ML13120A339). Licensees have already provided the staff submittals outlining their current multiunit/multisource capability as well as a schedule (for those who did not have the capability) and intent to achieve implementation of the dose assessment

capability by the end of 2014. To make this capability an NRC requirement, the staff intends to include it in the rulemaking planned for Tier 3 EP-related topics.

Note that the staff no longer intends to provide independent updates on the first and second items because they have been subsumed by the mitigation strategies order activities.

#### *Transition to Line Organization Oversight*

On June 11, 2013, an evaluation of the readiness for the first and second EP items to be fully transitioned to line organization oversight was presented to the Steering Committee as part of the broader evaluation for the mitigation strategies order because these items are now being fully addressed under that order. On June 18, 2013, an evaluation of the readiness for the multiunit dose assessment item to be fully transitioned to line organization oversight was presented to the Steering Committee. For all of the items, the Steering Committee agreed that they are ready for transition.

The line organization ownership will reside within NRR and the Office of Nuclear Security and Incident Response (NSIR), with NRR having responsibility for the items incorporated under the mitigation strategies order and NSIR having responsibility for the multiunit dose assessment item. Champions have been designated in both offices. Any interoffice issues can be coordinated using existing processes.

The staff considers these items mature and ready for transition to line organization management because a clear path forward has been established and licensees are beginning to take action to achieve implementation. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that appropriate offices exchange information and effectively coordinate actions that might impact one another.

#### Consideration of Other Natural External Hazards

##### *Status Update*

The Advisory Committee on Reactor Safeguards (ACRS) recommended expanding NTF Recommendation 2.1 to include natural external hazards other than seismic and flooding in a letter dated October 13, 2011 (ADAMS Accession No. ML11284A136). The Consolidated Appropriations Act, Public Law 112-074, directed the NRC to require reactor licensees to reevaluate the external hazards at their sites and to require updates to their design basis, if necessary. Reevaluation of other natural external hazards was prioritized as a Tier 2 activity because of the lack of availability of the critical skill sets for both the NRC staff and external stakeholders, and because the NRC staff considered the seismic and flooding reevaluations to be of higher priority.

The project plan for this activity was provided in Enclosure 3 of SECY-12-0095. The project plan calls for the staff to follow the same process as used for the Tier 1 seismic and flooding reevaluations. The staff expects to restart stakeholder interactions that occurred in February 2012 to discuss the technical basis and acceptance criteria for conducting a reevaluation of site-

specific external natural hazards to help define the guidelines for the application of current regulatory guidance and methodologies at operating reactors. The staff plans to develop and issue a request for information to licensees pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(f) to (1) reevaluate site-specific external natural hazards using the guidance discussed above, and (2) identify actions that have been taken, or are planned, to address plant-specific issues associated with the updated natural external hazards (including potential changes to the licensing or design basis of a plant). Licensee responses will then be evaluated and appropriate regulatory action taken to resolve issues associated with updated site-specific natural external hazards.

The staff expects to begin work on this topic as soon as significant resources become available, following implementation of Tier 1 actions related to seismic and flooding hazard walkdowns and reevaluations.

#### *Transition to Line Organization Oversight*

On July 2, 2013, an evaluation of the readiness for the Other External Hazards recommendation to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activity is ready for transition.

The line organization ownership will reside within both NRR and NRO, with NRR taking the programmatic lead and NRO taking the technical lead. The Director of NRO's Division of Site Safety and Environmental Analysis Division has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity ready for transition to line organization management because it will follow the regulatory process used for the flooding and seismic reevaluations. Communication with stakeholders is expected to resume using existing processes. The staff believes that issues that might arise can be effectively resolved within the line organizations. In its coordination role, the JLD will help ensure that NRR and NRO exchange information and effectively coordinate actions that might impact one another.

## **Update on Tier 3 Activities**

### Periodic Confirmation of Seismic and Flooding Hazards

#### *Status Update*

Recommendation 2.2 of the Near-Term Task Force (NTTF) report suggests a periodic update of the reevaluated hazards based on any new and significant information since the most recent reevaluation. 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. ML11272A111), the staff prioritized Recommendation 2.2 as Tier 3 because it will be developed from Recommendation 2.1, Seismic and Flooding Reevaluations, a Tier 1 item requiring licensees to reevaluate the flooding and seismic hazards using present-day methodologies and guidance. The Periodic Confirmation of Hazards recommendation depends on the insights gained from the seismic and flooding reevaluations and, because those evaluations are not complete, no updates are currently available to report.

When sufficient insights are gained from the seismic and flooding reevaluations and a periodic reevaluation of external hazards is deemed necessary, the staff plans to start rulemaking using the standard rulemaking process. The staff expects to first develop a technical basis, then engage stakeholders for public participation.

#### *Transition to Line Organization Oversight*

On July 2, 2013, an evaluation of the readiness for the Periodic Confirmation of Hazards recommendation to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is not ready for transition to the line organization because of the possibility of policy issues related to the scope of the recommendation that might expand beyond power reactors. The staff also noted that this recommendation cannot be fully developed without insights from seismic and flooding reevaluations. The Steering Committee will maintain oversight until further information is available to resolve the potential policy issues and gather insights from the seismic and flooding reevaluations.

### Enhancements to the Capability To Prevent or Mitigate Seismically Induced Fires and Floods

This activity is unique in that it has a Tier 1 aspect and a Tier 3 aspect. The status update and the discussion on transition to line organization oversight for all parts of this activity are included in Enclosure 1 under the same heading as this section.

### Reliable Hardened Vents for Other Containment Designs; and

### Hydrogen Control and Mitigation Inside Containment or Other Buildings

#### *Status Update*

Both of these lessons-learned activities originated from the NTTF report. Recommendation 5.2 was to reevaluate the need for hardened vents for containment designs other than boiling-water reactor (BWR) Mark I and Mark II containments (which are being addressed under Tier 1).

NTTF Recommendation 6 was to identify insights from Fukushima related to hydrogen control and mitigation inside containment or in other buildings, and to determine if additional regulatory action is warranted. While these activities are separate, the staff expects that insights from implementation of the order related to severe accident capable vents for Mark I and II containments (Order EA-13-109, ADAMS Accession No. ML13130A067) will inform further evaluation and action for both activities.

Currently, the staff plans to continue development of interim staff guidance for implementation of Order EA-13-109, as well as continue development of a technical and regulatory basis for the accident management and filtering strategies rulemaking. The staff will evaluate existing plans for other containment designs (e.g., Mark III, ice condenser, and large dry containments) and hydrogen control as progress is made with the Mark I and II issues. Once the staff has determined that sufficient insights have been gained from the Mark I and II work, it will commence evaluation of other containment designs and hydrogen control to determine whether regulatory action is warranted for either or both activities. These evaluations, however, might be delayed because of staff resource limitations.

#### *Transition to Line Organization Oversight*

On June 25, 2013, an evaluation of the readiness for these two activities to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activities are not ready for transition to the line organization because the activities' evaluations are not mature and there appears to be a high likelihood for significant technical and policy issues to arise. Additionally, the actions for these two activities will depend on the outcome of ongoing activities such as the rulemaking for Mark I and Mark II containments and the updates to the guidance for performing regulatory analyses. Therefore, the Steering Committee determined that both of these activities should remain under its oversight until further insights are gained and progress is made on the evaluations.

#### Activities Related to Emergency Preparedness

##### *Status Update*

In SECY-12-0095 (ADAMS Accession No. ML12165A092), the following four Tier 3 items were included within one program plan:

- (1) Emergency preparedness (EP) enhancements for prolonged Station Blackout (SBO) and multiunit events;
- (2) Emergency Response Data System (ERDS) capability;
- (3) Additional EP topics for prolonged SBO and multiunit events; and
- (4) EP topics for decisionmaking, radiation monitoring, and public education.

These four items collectively originated from NTTF Recommendations 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, 11.1, 11.2, 11.3, and 11.4. The program plan outlined in SECY-12-0095 described an approach to collectively address these items using an advance notice of proposed rulemaking (ANPR). An ANPR is a tool that allows the NRC to solicit early written stakeholder input on a new potential rulemaking effort. The staff still intends to take this approach and expects to use the ANPR feedback to help determine if there is a need for rulemaking and, if so, what the scope and content should be. The staff now expects to issue the ANPR in fiscal year 2016.

### *Transition to Line Organization Oversight*

On June 18, 2013, an evaluation of the readiness for these Tier 3 EP items to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activities are ready for transition.

The line organization ownership will reside within the Office of Nuclear Security and Incident Response (NSIR), and the Director of NSIR's Division of Preparedness and Response has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature and ready for transition to line organization management because a clear path forward has been established. Furthermore, ANPRs—and the rulemaking process, if ultimately pursued—are existing, well-established processes that can adequately support this activity and also provide for significant stakeholder interaction. Policy issues that arise can be brought to the Commission through these processes as well, and the staff believes that any other issues that might arise can be effectively resolved within the line organization.

### Reactor Oversight Process Modifications to Reflect Recommended Defense-in-Depth Framework

#### *Status Update*

This lessons-learned activity originated from NTF Recommendation 12.1 to expand the scope of the annual Reactor Oversight Process (ROP) self-assessment and biennial ROP realignment to include more fully any defense-in-depth considerations that might result from resolution of NTF Recommendation 1. Therefore, implementation of this activity largely depends on the outcome of work on Recommendation 1, which is ongoing.

However, the staff is identifying and incorporating improvements to the ROP based on insights from implementing other lessons-learned activities. For example, NRC inspectors have identified areas for improvement in the inspection program—a key component of the ROP—as a result of conducting inspections to review licensee walkdowns of flooding protection features. These insights are evaluated and incorporated as part of the existing ROP self-assessment and ROP realignment processes. The staff expects that insights from additional lessons-learned activities can be incorporated in the same manner.

### *Transition to Line Organization Oversight*

On July 16, 2013, an evaluation of the readiness for this lessons-learned activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within the Office of Nuclear Reactor Regulation (NRR), and the Director of the Division of Inspection and Regional Support has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature. While the activity largely depends on the outcome of work on Recommendation 1, clear and well-established processes exist to implement changes to the ROP after the direction on Recommendation 1 is determined. These processes include

communication with stakeholders. The staff believes that any issues that might arise can be effectively resolved by the line organization. In its coordination role, the Japan Lessons Learned Project Directorate (JLD) will help ensure that the outcomes from Recommendation 1 are effectively communicated to the working group for this activity to ensure timely and accurate implementation of ROP modifications.

### NRC Staff Training on Severe Accidents and Severe Accident Management Guidelines

#### *Status Update*

This lessons-learned activity originated from NTF Recommendation 12.2 to enhance NRC staff training on severe accidents, including resident inspector training on severe accident management guidelines (SAMGs). Because the Emergency Onsite Response Capabilities rulemaking (Tier 1) is expected to require better integration of emergency procedures, including SAMGs, this activity partially depends on the final outcome of that rulemaking activity.

However, the staff is working toward implementing several potential enhancements related to severe accident training:

- Increasing the frequency of severe accident courses, including exporting the courses to the regional offices;
- Updating courses with lessons-learned from the Fukushima accident;
- Modifying existing qualification programs to include requirements for severe accident courses;
- Adding SAMG courses to qualification program training; and
- Developing new, additional courses that focus on severe accidents.

The staff recognizes that additional changes could be developed as a result of the ongoing SOARCA (State of the Art Reactor Consequence Analysis) study, the Level 3 PRA study, and any future Fukushima lessons-learned insights.

#### *Transition to Line Organization Oversight*

On July 16, 2013, an evaluation of the readiness for this lessons-learned activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within NRR, and the Director of the Division of Risk Assessment has been designated as the champion. The staff expects that any interoffice issues can be coordinated using existing processes.

The staff considers this activity mature. While part of the activity is dependent on the outcome of the Emergency Onsite Response Capabilities rulemaking, other aspects related to severe accident training are in the process of implementation. The ongoing activities are leveraging existing processes to evaluate and modify training programs. This includes mechanisms for stakeholder communication, where appropriate. The staff does not anticipate any significant technical or policy issues with regard to training enhancements. In its coordination role, the JLD will help ensure that developments with the Emergency Onsite Response Capabilities rulemaking are effectively communicated to the champion for this lessons-learned activity.

## Basis of Emergency Planning Zone Size and Pre-Staging Potassium Iodide beyond 10 Miles

### *Status Update*

Both of these lessons-learned activities originated as “additional issues” in SECY-11-0137. The first activity involves the staff evaluating the basis of the plume exposure pathway emergency planning zone (EPZ) size. In the staff’s early post-Fukushima reviews of the event, the staff determined that there was no immediate information to suggest that the NRC’s existing basis for EPZ size was inadequate. However, the staff decided to add this activity as an “additional issue” so that it could perform a confirmatory analysis once additional insights are gained from the ongoing Level 3 PRA study and a planned United Nations assessment of Fukushima. The staff expects it will be several years until these other activities are complete.

The second activity involves the staff evaluating whether potassium iodide should be pre-staged beyond the current 10-mile zone. Similar to the EPZ activity, the staff determined in early post-Fukushima reviews that there was no immediate information to suggest that the NRC’s existing requirements regarding potassium iodide distribution were inadequate. However, this activity was also added as an “additional issue” to allow a confirmatory analysis to be conducted based on information obtained from studies proposed by the Japanese Government. These studies are expected to take 5 to 7 years before useful data is obtained.

### *Transition to Line Organization Oversight*

On June 18, 2013, an evaluation of the readiness for the EPZ size and potassium iodide activities to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee agreed that the activities are ready for transition.

The line organization ownership will reside within NSIR, and the Director of NSIR’s Division of Preparedness and Response has been designated as the champion. Any interoffice issues can be coordinated using existing processes.

While these activities are not mature in the sense that no actions are currently underway, the staff believes that they are still ready for transition to line organization oversight because a clear path forward has been established. Furthermore, existing processes can be leveraged within the line organization to accomplish the activities when they become actionable. The staff also believes that issues that might arise can be effectively resolved within the line organization.

## Expedited Transfer of Spent Fuel to Dry Cask Storage

### *Status Update*

This lessons-learned activity originated as an “additional issue” in SECY-11-0137 and involves the NRC evaluating whether regulatory action should be taken to require licensees to expedite transfer of spent fuel from spent fuel pools to dry cask storage. The staff provided the original program plan for this activity in SECY-12-0095. The staff subsequently provided an updated plan in a memorandum to the Commission, entitled, “Updated Schedule and Plans for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel,” dated May 7, 2013 (ADAMS Accession No. ML13105A122).

The staff has developed a three phase program plan to determine whether regulatory action is needed to require expedited transfer of spent fuel to dry cask storage. Phase 1 of the program

plan provides a regulatory analysis in accordance with the NRC's normal decisionmaking process. The regulatory analysis will use the recently completed Spent Fuel Pool Consequence Study and the current agency regulatory analysis policies and guidance. At the conclusion of Phase 1, the staff will provide the Commission with the analysis of whether a substantial increase in public health and safety could be achieved by moving to a low-density spent fuel pool loading.

Currently, the staff is working expeditiously to complete Phase 1 of the program plan. The staff held a public meeting to solicit stakeholder feedback in August 2013 and is scheduling an additional public meeting in September 2013. In addition, the staff will meet with the Advisory Committee on Reactor Safeguards to discuss the Phase 1 analysis in October 2013. The staff's goal is to complete the Phase 1 analysis and associated Commission paper in October 2013.

If directed by the Commission, the staff will proceed with Phase 2. Phase 2 of the program plan would include a detailed analysis of the risks and detailed costs and benefits of expedited transfer of spent fuel to dry cask storage to be provided to the Commission by July 31, 2015. If directed following the completion of Phase 2, the staff will continue on to Phase 3 of the program plan, which includes consideration of factors such as ongoing criticality research, lessons learned from the implementation of mitigation strategies (from Order EA-12-049, "Order Modifying Licenses in Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12056A045)), and, as appropriate, possible other changes to the overall regulatory framework. If this avenue is pursued, the staff expects to complete the Phase 3 analysis by July 31, 2017.

#### *Transition to Line Organization Oversight*

On July 9, 2013, the Steering Committee discussed the readiness of this Tier 3 issue to be fully transitioned to line organization oversight. The Steering Committee determined that this activity is ready for transition.

Because this Tier 3 activity pertains primarily to nuclear power plant spent fuel pools, the line organization ownership will reside within NRR. The Office of Nuclear Regulatory Research (RES) and the Office of Nuclear Material Safety and Safeguards (NMSS) are continuing to provide a support role in conducting the analyses. Champions have been designated in the three offices.

The staff considers this activity mature because a clear path forward has been established. The major policy issues have not been resolved, but are expected to be resolved by Commission direction. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes that issues that might arise in the completion of this program plan can be effectively resolved within the line organization. In its coordination role, the JLD will help ensure that the working groups and champions for each of these activities exchange information and effectively coordinate actions that might impact one another.

#### Enhanced Reactor and Containment Instrumentation for Beyond-Design-Basis Conditions

##### *Status Update*

During its review of the NTTF recommendations in SECY-11-0124 and SECY-11-0137, the ACRS noted that Section 4.2 of the NTTF report discusses how the Fukushima operators faced significant challenges in understanding the condition of the reactors, containments, and spent

fuel pools (SFPs) because the existing design-basis instrumentation was either lacking electrical power or providing erroneous readings. As a result, an additional recommendation was developed to address the regulatory basis for requiring reactor and containment instrumentation, enhanced to withstand beyond-design-basis accident conditions. This activity was prioritized as Tier 3 because it requires further staff study and is dependent on the outcome of other lessons-learned activities. The program plan for this recommendation was detailed in SECY-12-0095.

The program plan for Enhanced Reactor and Containment Instrumentation outlined several steps needed to achieve a basis for a regulatory decision. The first step was to ensure that licensees are appropriately considering instrumentation needs during implementation of actions for NTF Recommendations 2.3, 4.1, and 8, and Orders EA-12-049, EA-12-051, and EA-13-109. The next, and current, step is to obtain and review information from previous and ongoing research efforts for severe accident management analysis, and to monitor the results of U.S. Department of Energy (DOE) and international research activities and guidance being developed by domestic and international organizations. The staff has performed the following tasks to develop new information and insights: reviewed the DOE modeling of the Fukushima event, met with DOE and the Electric Power Research Institute (EPRI) regarding research activities, is participating in the International Atomic Energy Agency (IAEA) Nuclear Energy series document development, met with the American Nuclear Society (ANS) Standards Board, and is interfacing with the Institute of Electrical and Electronics Engineers (IEEE) Standards Committee (SC) for IEEE-497, "Standard Criteria for Accident Monitoring Instrumentation for Nuclear Power Generating Stations."

The next steps for this recommendation will be to work with the ANS standards development organization (SDO) to identify criteria for severe accident instrumentation, support IAEA in issuing its document on accident monitoring instrumentation, collaborate with EPRI and DOE (held a July 2013 meeting), support the IEEE SC on accident monitoring efforts, and identify criteria arising from the Tier 1 outcomes. Once the staff has accumulated sufficient knowledge and data, if a safety significant instrumentation performance gap is identified, regulatory action will be taken through the appropriate mechanism (rulemaking, generic communication, etc.).

The staff plans on making a regulatory determination by December 2015.

#### *Transition to Line Organization Oversight*

On July 30, 2013, an evaluation of the readiness for this activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition.

The line organization ownership will reside within RES, NRR, and the Office of New Reactors (NRO), because each of these offices has responsibilities for aspects of this activity: RES for international and domestic standards development, and NRO and NRR for technical expertise as it relates to reactor and containment instrumentation in new and existing plants, respectively. Champions have been designated in all three offices.

The staff considers this activity mature; while no regulatory action has been taken, a clear path forward has been established to garner the information necessary to make an informed regulatory decision, and actions are underway to obtain that information. Communication with stakeholders is expected to continue at a high level using existing processes. The staff believes

that issues that might arise can be effectively resolved within the line organizations. The three offices involved with this activity are expected to continue their high level of interoffice coordination, but the JLD will serve to ensure continued coordination and exchange of information as needed.

## Update on Activities Not Within a Tier

### Recommendation 1 – Regulatory Framework

#### *Status Update*

This lessons-learned activity originated from Near-Term Task Force (NTTF) Recommendation 1, to establish “a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.” In Staff Requirements Memorandum (SRM)-SECY-11-0093, “Near-Term Report and Recommendations for Agency Actions Following the Events in Japan,” dated August 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112310021), the Commission directed that NTTF Recommendation 1 be pursued independently of activities associated with the review of the other NTTF recommendations.

On February 26, 2013, the staff working group released its second white paper on Recommendation 1 which discussed a wide range of possible approaches for implementing three regulatory framework improvement activities:

- (1) Establish a new category of beyond design basis events and associated regulatory requirements.
- (2) Establish a decision-making process and criteria for considering defense-in-depth, risk, and safety margins.
- (3) Clarify the role of voluntary industry initiatives in the NRC regulatory process.

On April 30, 2013, the Nuclear Energy Institute submitted a letter providing industry views on the improvement activities being considered by the staff.

On May 15, 2013, the staff issued another white paper for public comment that provided the staff's recommended approach for implementing each of the three regulatory framework improvement activities. These proposals were discussed at an Advisory Committee on Reactor Safeguards subcommittee meeting in May and at a public meeting in June. The NRC accepted public comments on the proposals through August 15 at [www.regulations.gov](http://www.regulations.gov) under docket ID NRC-2012-0173. The public comments will help to inform the staff's final options and recommendations to the Commission in December 2013.

#### *Transition to Line Organization Oversight*

On July 16, 2013, an evaluation of the readiness for this lessons-learned activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that the activity is ready for transition, but that the previously established Recommendation 1 Office Director Oversight Committee composed of Office Directors from cognizant offices should remain at least until the staff receives Commission direction on the options it will present for Commission consideration in December 2013.

Line organization ownership is being established for each of the three framework improvement activities currently proposed by the staff. The “design basis extension category” proposal will have a champion within the Office of Nuclear Reactor Regulation (NRR) and the Office of New Reactors (NRO); the “defense-in-depth” proposal will have a champion within NRR, NRO, and the Office of Nuclear Regulatory Research; and the “voluntary industry initiatives” proposal will have primary ownership in NRR. The staff will continue to discuss line organization ownership following receipt of the Commission direction on the upcoming December Commission paper. Any interoffice issues not already preempted by the ownership structure can be coordinated using existing processes.

The staff considers this activity mature. While the implementation of current staff proposals depends on a Commission decision, a path forward using clear regulatory processes has been established. These processes include communication with internal and external stakeholders. Furthermore, the oversight provided by the Recommendation 1 Office Director Oversight committee established specifically for this activity will provide additional support and guidance for issues that might arise.

#### Other NRC-Regulated Facilities

##### *Status Update*

This lessons-learned activity originated from the SRM to the Chairman’s tasking memorandum COMGBJ–11–0002, “NRC Actions Following the Events in Japan,” dated March 23, 2011 (ADAMS Accession No. ML110820875). The Commission directed the staff to consider the applicability of lessons learned from the event to “non-operating reactor and non-reactor facilities.”

The staff has developed a process to evaluate the potential applicability of lessons-learned activities to nonpower reactor facilities. The NRC offices responsible for classes of licensees other than power reactors have created working groups to perform the evaluations. The offices and associated licensees include:

- NRR: research reactors; test reactors; medical isotope production facilities
- NMSS: fuel cycle facilities; spent fuel storage; transportation
- FSME: materials decommissioning facilities; decommissioning reactors; uranium recovery and uranium milling facilities; low-level waste; waste treatment; irradiators; medical facilities; academic and industrial use licensees

As described in the last update, the staff has completed inspections at fuel cycle facilities per Temporary Instruction 2600/015, “Evaluation of Licensee Strategies for the Prevention and/or Mitigation of Emergencies at Fuel Facilities” (ADAMS Accession No. ML111030453). The process developed to evaluate all types of nonpower reactor licensees against the full scope of Fukushima lessons learned will still be performed for fuel cycle facilities.

The evaluations of each type of facility or licensee are currently underway. The staff will document the results of each evaluation and expects to present the results to the Commission, along with a proposed path forward to address any identified issues, in a paper scheduled for the second quarter of fiscal year (FY) 2014.

### *Transition to Line Organization Oversight*

On July 23, 2013, an evaluation of the readiness for this lessons-learned activity to be fully transitioned to line organization oversight was presented to the Steering Committee. The Steering Committee determined that, given that the fuel cycle facilities have already had inspections conducted and several aspects of the lessons learned have therefore been reviewed, the fuel cycle facilities are ready for transition. However, because the other classes of licensees and facilities are undergoing their first detailed review of the applicability of lessons-learned activities, the Steering Committee determined that these facilities should remain under its oversight. Once the Commission makes a decision on the paper scheduled for the second quarter of FY 2014 and the staff begins to implement actions, the Steering Committee expects to reevaluate the need for continued oversight.

The line organization ownership will reside within the offices responsible for each type of facility or licensee. In both Offices of Federal and State Materials and Environmental Management Programs and Nuclear Materials Safety and Safeguards, a champion has been designated at the office level to coordinate the review of each type of facility or licensee under its office's purview. In NRR, the Deputy Director of the Division of Policy and Rulemaking has been designated as the champion. The Japan Lessons-Learned Project Directorate (JLD) will coordinate interoffice communication and consistency, especially as it relates to conducting the evaluations and preparing the Commission paper.

The staff does not yet consider this activity fully mature; evaluations are ongoing and, therefore, potential technical and policy issues have not been identified. Furthermore, the implementation of any potential actions that might result from the evaluations is still unknown. However, the staff has developed a clear path forward for the evaluations, and has established a clear process for documenting and communicating the results. Interoffice issues have also been effectively coordinated to create and implement the evaluation process, and the staff expects this to continue. Therefore, once the evaluations are complete and decisions for potential action have been made, the staff expects this activity to become sufficiently mature for full transition to line organization oversight.

### National Academy of Sciences Study

As directed by the U.S. Congress, the NRC issued a grant to the National Academy of Sciences (NAS) to conduct a study on lessons learned from the Fukushima Dai-ichi accident. Since the previous 6-month update, NAS has held several information-gathering meetings with NRC participation. One of the Congressionally mandated charges directs NAS to reevaluate conclusions from their 2006 study on spent fuel safety and security. The NRC recently participated in a closed meeting with NAS to discuss classified information related to spent fuel security. Future NAS activities include conducting tours of nuclear power plants and holding additional meetings to prepare a final report with recommendations. The NRC staff is fully engaged with NAS and is providing the requested assistance for NAS to complete their report by mid-2014.

### Comparison Study of U.S. and Japan Regulations

In SRM-SECY-12-0110, "Consideration of Economic Consequences within the U.S. Nuclear Regulatory Framework," dated March 20, 2013 (ADAMS Accession No. ML13079A055), the

Commission directed the NRC staff to: (1) document its comparison of U.S. and Japanese regulatory requirements that were in effect at the time of the accident, focused on those areas most relevant to the sequence of events and accident mitigation capabilities at Fukushima; and (2) describe how those differences were factored into post-Fukushima actions taken by the NRC. The staff had assessed specific areas, such as the regulatory approaches to defining requirements for plant responses to losses of electrical power, as part of its activities prior to the Commission's SRM. However, in response to the SRM and similar interest expressed by various external stakeholders, the staff (with contractor support) has undertaken a broader comparison of regulatory requirements that might provide insights into the accident and the subsequent NRC actions. The staff plans to complete and document the assessment in late 2013, and make the report available to the Commission (via an Office of International Programs note) and then subsequently to the public.

#### Support of International Activities

The NRC staff continues to be actively engaged in various international activities related to the evaluation and response to lessons learned from the Fukushima accident. In December 2012, the NRC and Japan Nuclear Regulatory Authority established a joint Steering Committee to address specific technical issues of mutual interest. A meeting of that joint Steering Committee was held in August 2013. The NRC staff is participating in several working groups within the International Atomic Energy Agency and the Nuclear Energy Agency on efforts to better understand the accident and develop appropriate changes in nuclear power plants to improve their ability to cope with severe natural events. Activities related to addressing lessons learned from the Fukushima accident are also expected to be a significant focus area in the Convention on Nuclear Safety scheduled for April 2014.

#### Communications Activities

The NRC has held 63 public meetings in FY 2013 related to Japan lessons-learned activities. Most of these meetings enabled wider public participation through webinars, webcasting and teleconferencing. Many of these meetings centered on guidance development or implementation issues related to Tier 1 actions. Additionally, the NRC Steering Committee has continued to meet publicly with the industry's steering committee at least quarterly to discuss and resolve issues related to lessons-learned activities. The staff expects these meetings and interactions to continue during and after transition of oversight to the line organizations.

In the last 6 months, the JLD's strategic communications team has evaluated and implemented tools for enhancing stakeholder understanding of Japan lessons-learned activities. The team's most significant effort was redesigning the NRC public website's Japan lessons-learned section. An icon-based navigation approach and plain-language editing focused on improving public access to relevant information; the updated section went live in June. The communications team also supported the regions with both PowerPoint and printed material on lessons-learned information for annual assessment meetings. Additionally, the JLD has used the NRC's public blog and YouTube channel to highlight Japan lessons-learned activities. The communications team will continue examining communication needs and developing relevant tools, with a focus on upcoming events and milestones.