

## Update on Tier 1 Activities

This enclosure includes an update on significant activities associated with Tier 1 recommendations. Background and historical information on U.S. Nuclear Regulatory Commission (NRC) and licensee activities on these recommendations can be found in SECY-15-0059, Enclosure 1, "Update on Tier 1 Activities" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15069A552).

### Mitigation Strategies Order (EA-12-049)

On March 12, 2012, the NRC issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12056A045). The order addressed and expanded on Recommendation 4.2 of SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated July 12, 2011 (ADAMS Accession No. ML11186A950, the Near-Term Task Force (NTTF) report). The order requires a three-phased 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 maintained with offsite equipment and support. The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.

Licensees are required to notify the NRC when they achieve full compliance with the order. Once all units at a site are in compliance, the NRC staff will issue a final safety evaluation (SE) (within approximately 6 months). The NRC staff will inspect (within approximately 1 year) for compliance with the order using Temporary Instruction (TI) 2515/191, "Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans" (ADAMS Accession No. ML14273A444), dated October 6, 2014.

Substantial progress towards full implementation of Order EA-12-049 has been made during the previous 6 months:

- The NRC staff completed six audits to review the closeout of open and confirmatory items identified in the interim staff evaluations (ISEs). Audits for a total of 55 of 61 sites have been completed. The NRC staff expects to complete the remaining audits by June 2016.
- The licensees for 22 of the 61 sites have notified the NRC that they are in compliance with Order EA-12-049. The NRC staff expects that most sites will be in compliance no later than December 2016, as originally scheduled, with the exceptions noted in the discussion below.
- The NRC staff completed four final SEs for Clinton Power Station, Unit No. 1; Donald C. Cook Nuclear Plant, Units 1 and 2; North Anna Power Station, Units 1 and 2; and Pilgrim Nuclear Power Station. A total of 5 of 61 SEs have been completed.

- The NRC staff completed a pilot post-compliance inspection per TI 2515/191 at the Watts Bar site in April 2015 to verify the licensee is in compliance with Order EA-12-049. The NRC staff will be conducting post-compliance inspections per TI 2515/191, starting with the North Anna Power Station inspection conducted the week of February 22, 2016.
- On February 29, 2016, the NRC staff issued Japan Lessons-Learned Division (JLD) Interim Staff Guidance (ISG) JLD-ISG-2012-01, Revision 1 (ADAMS Accession No. ML15357A163). This ISG endorses the Nuclear Energy Institute (NEI) guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 2 (ADAMS Accession No. ML16005A625), dated December 2015. The revision reflects lessons learned and acceptable alternatives to the original guidance for Order EA-12-049. Revision 2 includes Appendices E, G, and H to provide guidance for licensees to assess their mitigating strategies against the reevaluated seismic and flooding hazards, as discussed in the staff requirements memorandum (SRM) for COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards," dated March 30, 2015 (ADAMS Accession No. ML15089A236).

The order established a schedule for all licensees to achieve full compliance within two refueling outages after submittal of their integrated plans and no later than December 2016. Licensees for eight sites—boiling-water reactors (BWRs) with Mark I and II containment designs—have asked for, and been granted, schedule relaxation to align with the schedule requirements of 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). For most BWRs with Mark I and II containments, mitigation strategies rely on the installation of the containment vents to remove heat from the containment and maintain the function of equipment used for the initial phase of the order. Schedule relaxation for these nine sites was needed because the final installation of the vents per Order EA-13-109 will not be completed before December 2016. Although the full compliance date for these sites will extend past December 2016 with this schedule relaxation, all other aspects of Order EA-12-049 will be in place before December 2016.

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

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 U.S. nuclear power plants to install reliable water level measurement instrumentation in their SFPs. The order addresses and expands on Recommendation 7.1 of the NTTF report. The instrumentation must remotely monitor at least three distinct SFP water levels:

- (1) normal level
- (2) low level but still high enough to shield workers above the pools from radiation
- (3) a very low level near the top of the spent fuel rods (indicating that more water should be added without delay)

Licensees are required to notify the NRC when full compliance is achieved. Once all units at a site are in compliance, the NRC staff will issue a final SE (within approximately 6 months) and inspect (within approximately 1 year) for compliance with the order using TI 2515/191.

Substantial progress towards full implementation of Order EA-12-051 has been made during the previous 6 months:

- The NRC staff completed six audits to close open items and requests for additional information from the ISEs. Audits for a total of 55 of 61 sites have been completed. The NRC staff expects to complete the remaining audits by June 2016.
- The licensees for 46 of the 61 sites have notified the NRC that they are in compliance with Order EA-12-051. The NRC staff expects that licensee compliance with Order EA-12-051 will be achieved at all sites before the end of December 2016.
- The NRC staff has completed four final SEs for Clinton Power Station, Unit 1; Donald C. Cook Nuclear Plant, Units 1 and 2; North Anna Power Station, Units 1 and 2; and Pilgrim Nuclear Power Station. A total of 5 of 61 SEs have been completed.
- The NRC staff completed a pilot post-compliance inspection per TI 2515/191 at the Watts Bar site in April 2015 to verify the licensee is in compliance with Order EA-12-051. The NRC staff will be conducting post-compliance inspections per TI 2515/191, starting with the North Anna Power Station inspection conducted the week of February 22, 2016.

#### Flooding and Seismic Hazard Walkdowns

On March 12, 2012, the NRC staff issued a request for information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter) asking licensees of U.S. nuclear power plants to walk down their installed flooding-protection, seismic-protection, and hazard-mitigation features and review associated manual actions. This portion of the 50.54(f) letter addresses and expands on Recommendation 2.3 of the NTTF report.

The operating reactor fleet completed the plant walkdowns (except for those portions of the seismic walkdowns that were not accessible at power) and submitted their walkdown reports by November 2012. The NRC staff completed staff assessments of the walkdown reports by July 2014. The NRC staff assessments determined that the plant walkdowns consistently followed the intent of the NRC-endorsed guidance, thereby verifying that the walkdowns met the objectives of the 50.54(f) letter. Subsequently, all seismic walkdowns on inaccessible items were completed. The NRC staff documented the reviews of the inaccessible walkdown items in a memo dated September 25, 2015 (ADAMS Accession No. ML15268A477). All actions to address Recommendation 2.3 are complete, and this recommendation is closed.

#### Seismic Hazard Reevaluations

The NRC's March 12, 2012, 50.54(f) letter requested licensees for the U.S. nuclear power plants to use current regulations and guidance to reevaluate the seismic hazards that could affect their sites. If these newly reevaluated hazards are not bounded by the current design basis, the licensee is required to determine whether interim protection measures are needed

while a longer-term evaluation of the impacts of these hazards is completed. This portion of the 50.54(f) letter addresses and expands on the seismic reevaluations discussed in Recommendation 2.1, "Seismic," of the NTTF report.

The NRC staff has completed its assessment and closed NTTF Recommendation 2.1, "Seismic," for 16 sites. The reevaluated seismic hazards for these sites was either bounded by the site's current design bases or had a limited high-frequency exceedance.

The NRC staff and licensees completed the following seismic hazard evaluation activities during the previous 6 months:

- On September 17, 2015, the NRC staff endorsed (ADAMS Accession No. ML15218A569) the NEI high-frequency application guidance for sites with exceedance above facility licensing and design bases in the high-frequency range (i.e., above 10 Hertz).
- On October 27, 2015, the NRC staff issued a letter providing its final determination of which licensees need to perform a seismic risk evaluation (ADAMS Accession No. ML15194A015). Specifically, the letter completes the NRC staff action included in the May 9, 2014, letter to further assess the need for a seismic probabilistic risk assessment (SPRA) for plants with low-to-moderate hazard exceedances. The letter discusses the rationale for the NRC staff decision that an SPRA was not necessary for 13 sites. The letter also replaced the due dates for SPRAs previously described in letters dated May 9, 2014 for Central and Eastern U.S. (CEUS) plants, and May 13, 2015, for Western U.S. (WUS) plants, with a staggered submittal schedule. The NRC staff anticipates that this schedule will accelerate certain key milestones by 3 months to 1 year and will better address resource challenges in the area of seismic risk assessment for both the NRC staff and industry.
- Based on the October 27, 2015, letter, there are 20 sites that will perform an SPRA. The first SPRAs are due to the NRC in March 2017 and all SPRAs will be received by December 2019. There are 11 sites that screened out and will not need any further seismic evaluation. Of the remaining sites, 30 will perform limited-scope evaluations (i.e., a high-frequency evaluation, low-frequency evaluation, SFP evaluation, or a combination thereof).
- The NRC staff has issued 58 seismic hazard staff assessments. This completes the seismic hazard staff assessments for the CEUS sites.
- All three WUS sites (Columbia Generating Station (Columbia); Diablo Canyon Power Plant, Units 1 and 2 (Diablo Canyon); and Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Palo Verde)) submitted their seismic hazard reports in March 2015. The NRC staff issued requests for additional information for all three sites, and it held public meetings with each licensee to support its review. The NRC staff also conducted two audits to support its review of the Diablo Canyon's seismic hazard report.
- On December 18, 2015, and January 29, 2016, the NRC staff issued letters to Columbia (ADAMS Accession No. ML15329A225) and to Diablo Canyon (ADAMS Accession

No. ML15364A530), respectively, informing them that the reevaluated seismic hazard information is suitable for use in the development of an SPRA according to the NRC staff's preliminary review results. Columbia and Diablo Canyon are expected to submit their SPRA by March 31, 2019, and September 30, 2017, respectively. As stated in a letter dated October 27, 2015 (ADAMS Accession No. ML15194A015), Palo Verde screened out from additional seismic evaluations.

- The NRC staff completed the technical review of all CEUS Expedited Seismic Evaluation Process (ESEP) reports and documented its review in response letters to licensees. Thirteen licensees have committed to completing limited plant modifications (e.g., replacement of relays, strengthening of anchorages for components, or removal of structural interference around valves and conduit). The NRC staff expects the modifications not requiring an outage to be completed by December 2016. The NRC staff expects the modifications requiring shutdown to be completed within two refueling outages, no later than December 2018.
- By December 31, 2015, the NRC staff received the high-frequency confirmation letters related to the seismic hazard reevaluation for plants whose ground motion response spectra had low exceedances (on the order of 10 percent or less) in the frequency range above 10 Hertz. The NRC staff issued a response documenting the review of these letters on February 18, 2016 (ADAMS Accession No. ML15364A544). Additionally, as discussed above, the response letter closed Phase 2 of Recommendation 2.1 for identified licensees that have provided sufficient information to complete the response to the recommendation.
- On March 11, 2016, the NRC staff issued a letter (ADAMS Accession No. ML15350A158) to NEI endorsing Electric Power Research Institute guidance for the seismic evaluation of SFPs. Licensees are encouraged to use this guidance to support completion of SFP seismic evaluations for plants where the ground motion response spectrum (GMRS) peak spectral acceleration is less than or equal to 0.8g. Additionally, licensees that use this guidance can demonstrate that SFP spray capability is not necessary as described in NEI 12-06, Rev 2. This guidance supports the sites expected to submit SFP seismic evaluations by December 2016.
- On February 29, 2016, the NRC staff issued JLD-ISG-2012-01, Revision 1. This ISG endorses the NEI guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 2, dated December 2015. The revision reflects lessons learned and acceptable alternatives to the original guidance for Order EA-12-049. Revision 2 includes Appendices E, G, and H to provide guidance for licensees to assess their mitigating strategies against the reevaluated seismic and flooding hazards, as discussed in the SRM for COMSECY-14-0037.

Future work to be completed includes:

- The NRC staff expects to issue seismic hazard staff assessments for two of the three WUS sites by September 2016, and the final staff assessment by December 2016.

- The NRC staff plans to support development or comment on licensee submittal templates for SPRA, high-frequency evaluations, and SFP evaluations during spring 2016.
- By July 31, 2016, the NRC staff expects to issue a response letter to Energy Northwest documenting its review of Columbia's ESEP report.

### Flooding Hazard Reevaluations

The NRC's March 12, 2012, 50.54(f) letter requested all U.S. power reactor licensees and holders of construction permits in active or deferred status to reevaluate the flooding hazards that could affect their sites. This portion of the 50.54(f) letter addresses and expands on the flooding reevaluations discussed in Recommendation 2.1 of the NTTF report.

In COMSECY-14-0037, the NRC staff requested Commission direction to more clearly define the relationship between Order EA-12-049, the related mitigation of beyond-design-basis events (MBDBE) rulemaking, and the flood hazard reevaluations and assessments. In the SRM to COMSECY-14-0037, the Commission affirmed that licensees for operating nuclear power plants need to address the reevaluated flooding hazards within their mitigating strategies. The Commission also directed the NRC staff to provide a plan for achieving closure of the flooding portion of NTTF Recommendation 2.1 to the Commission for its review and approval. On June 30, 2015, the NRC staff provided a plan to the Commission in COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession No. ML15153A104). On July 28, 2015, the Commission approved the plan in the SRM to COMSECY-15-0019 (ADAMS Accession No. ML15209A682).

The action plan identifies two primary activities that define the response to flooding issues. These are:

- (1) Ensure licensees put into effect mitigating strategies to address reevaluated flooding hazards.
- (2) Develop a graded approach to identify the need for, and prioritization and scope of, plant-specific integrated assessments and evaluation of plant-specific regulatory actions.

The NRC staff is implementing the plan for ensuring that the reevaluated flooding hazards are addressed within mitigating strategies, as described in COMSECY-15-0019.

- On February 29, 2016, the NRC staff issued JLD-ISG-2012-01, Revision 1. This ISG endorses the NEI guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 2, dated December 2015. The revision reflects lessons learned and acceptable alternatives to the original guidance for Order EA-12-049. Revision 2 includes Appendices E, G, and H to provide guidance for licensees to assess their mitigating strategies against the reevaluated seismic and flooding hazards, as discussed in the SRM for COMSECY-14-0037.
- The NRC staff issued 45 of 61 letters to licensees providing feedback on the staff's review of the licensees' flood hazard reevaluations. The NRC staff anticipates issuing

five additional letters by the end of March 2016. Some sites have requested assistance from the U.S. Army Corps of Engineers for dam failure assessments or are finalizing calculations because of licensee analysis changes or site layout changes. The NRC staff expects letters will be issued to majority of these licensees by the end of calendar year 2016, except for those sites that submit their flood hazard reevaluation report in late 2016.

- If necessary, licensees are modifying or upgrading their mitigating strategies to ensure they can be implemented under the reevaluated flood hazard conditions. The NRC staff expects that most licensees will complete their mitigating strategies assessment by December 2016 and pursue related actions. Implementation of the modifications will vary depending on the complexity. A large number of sites are expected to be bounded by current mitigating strategies design or only require procedural modifications.
- The NRC staff is documenting the technical bases for its conclusions by continuing to issue staff assessments. To date, the staff has completed 14 of 61 staff assessments.

The plans for closing NTTF Recommendation 2.1 are also described in COMSECY-15-0019. The NRC staff is addressing the issues associated with the flooding hazard reevaluations (Phase 1) and related decisionmaking (Phase 2) of NTTF Recommendation 2.1 by using a graded approach to narrow the list of potential plants subject to an integrated assessment.

Key elements of the plan include:

- Revise the guidance for performing the integrated assessments for external flooding by June 2016. On March 9, 2016, NEI submitted NEI 16-05, "External Flooding Assessment Guidelines," as draft guidance on the focused evaluation and revised integrated assessment for flooding. The NRC staff will complete review of the industry guidance document and inform the Commission by May 29, 2016. If appropriate, the NRC staff will endorse the industry guidance by means of a new interim staff guidance, with any necessary exceptions and clarifications.
- It is expected that most sites will screen out from the integrated assessments, and licensees will instead do focused evaluations to ensure appropriate actions are identified and taken to protect the plant from the reevaluated flood hazard, and that these actions are reasonable, effective, and implemented in a timely manner. These focused evaluations will be submitted by June 2017.
- A limited number of plants will submit integrated assessments by December 2018.
- The NRC staff will evaluate the integrated assessments and determine the need for further regulatory action. The final plan for the decisionmaking criteria as part of Phase 2 will be established following development of guidance and further stakeholder interactions. The NRC staff plans to complete the Phase 2 guidance and inform the Commission by September 30, 2016.

### Emergency Preparedness Staffing and Communications

The NRC's March 12, 2012, 50.54(f) letter requested licensees to assess their means to power communications equipment on site and off site during a prolonged station blackout event and to assess and implement enhancements to help ensure that communications can be maintained during such an event. Also, licensees were requested to assess the staffing required to fill all necessary positions to respond to a multiunit event with impeded access to the site. This portion of the 50.54(f) letter addresses and expands on the emergency preparedness staffing and communications discussed in Recommendation 9.3 of the NTF report.

All licensees submitted their communications assessments, and the NRC staff issued safety assessments documenting the staff's review.

Licensees are responding to the staffing portion of the 50.54(f) letter in two phases to account for the implementation of mitigation strategies. Phase 1 staffing assessments are based on existing station blackout coping strategies with an assumption of multiple reactors being affected concurrently. All Phase 1 staffing assessments have been submitted, and the NRC staff has issued all Phase 1 staffing assessment response letters.

In Phase 2, licensees will assess the staffing necessary to carry out the mitigating strategies developed in response to NTF Recommendation 4.2. Thus, Phase 2 of the staffing assessment will occur in conjunction with the implementation of Order EA-12-049.

Substantial progress toward completion of the emergency preparedness staffing assessments has been made during the previous 6 months:

- The NRC staff received six additional Phase 2 staffing assessments. Five Phase 2 staffing assessments remain to be submitted, of the total 61 expected.
- The NRC staff issued 22 of 61 Phase 2 staffing assessment response letters. These letters document the NRC staff's conclusion that the Phase 2 staffing submittals adequately address the strategies needed to respond to a beyond design basis event. Nine Phase 2 staffing assessment response letters remain to be issued.
- The NRC staff completed a pilot inspection per TI 2515/191 at the Watts Bar site in April 2015 to verify that communications and staffing plans and multi-unit dose assessment capabilities have been implemented. The NRC staff will be conducting inspections per TI 2515/191, starting with the North Anna Power Station inspection conducted the week of February 22, 2016.

Future work to be completed includes:

- The NRC staff expects to receive the remaining five Phase 2 staffing assessments by August 31, 2016.
- The NRC staff will issue response letters within approximately 4 months of receiving the assessment.



- The staff will use TI 2515/191 to inspect activities completed in this area in conjunction with the inspections for Orders EA-12-049 and EA-12-051.

Proposed requirements concerning emergency preparedness staffing and communications are included in the MBDBE rulemaking activity approved in the SRM to SECY-14-0046, "Staff Requirements: Fifth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami" (ADAMS Accession No. ML14218A703).

#### Mitigation of Beyond-Design-Basis Events

The NRC staff continues to make progress on the MBDBE rulemaking. The NRC staff provided the proposed rule to the Commission on April 30, 2015, in SECY-15-0065, "Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49)" (ADAMS Accession No. ML15049A201). The NRC staff subsequently briefed the Commission on July 9, 2015, and the Commission issued its SRM on August 27, 2015 (ADAMS Accession No. ML15239A767). The proposed rule, including its supporting guidance, was revised to reflect the Commission direction. The revised proposed rule was published in the *Federal Register* (80 FR 70609) for a 90-day public comment period on November 13, 2015. The proposed rule issued for public comment consolidates a significant number of ongoing regulatory actions that the NRC initiated as a result of NTF Recommendations 4, 7, 8 and portions of Recommendations 9, 10, and 11. The proposed rule would:

- make Orders EA-12-049 and EA-12-051 generically applicable,
- establish new requirements for an integrated response capability,
- establish new requirements for actions related to onsite emergency response, and
- address a number of petitions for rulemaking submitted to the NRC following the March 11, 2011, Fukushima Dai-ichi event.

The following are major MBDBE rulemaking milestones:

- The proposed rule public comment period closed on February 11, 2016. Twenty comment letters were received.
- The NRC staff is currently reviewing the public comments. The NRC staff will revise the rulemaking package as needed and provide the draft final rule to the Commission by December 16, 2016.

In the SRM to SECY-15-0065 addressing the MBDBE rulemaking, the Commission also directed the staff to "update the Reactor Oversight Process (ROP) to explicitly provide periodic oversight of industry's implementation of the SAMGs" [Severe Accident Management Guidelines]. NEI submitted a letter (ADAMS Accession No. ML15335A442), dated October 26, 2015, describing the industry initiative to update and maintain the SAMGs. The industry's Nuclear Strategic Issues Advisory Committee approved this initiative. As specified in

the letter, all 100 operating plant licensees have submitted site-specific regulatory commitments on the docket. These commitments ensure the following:

- (1) Maintenance of SAMG strategies.
- (2) Integration with emergency operating procedures and other guideline sets.
- (3) Timely incorporation of owners group revisions.
- (4) Establishment of configuration controls.

In a February 23, 2016, letter to NEI (ADAMS Accession No. ML16032A029), the NRC staff outlined its approach for making changes to the ROP in accordance with the Commission direction. The NRC staff has begun to engage NEI and other stakeholders to identify the near-term and longer-term changes to the ROP consistent with the Commission direction and the near-term and longer-term commitments that licensees have made regarding SAMGs.

Reliable Hardened Containment Vents for Boiling-Water Reactors with Mark I and II Designs (Orders EA-12-050 and EA-13-109)

On March 12, 2012, the NRC issued Order EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents" (ADAMS Accession No. ML12054A696), requiring all operating BWRs in the United States with Mark I and II containments to install a reliable hardened vent. Subsequently, the NRC staff considered the possibility of venting after reactor core damage occurs and provided its recommendation to the Commission in SECY-12-0157, "Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments," dated November 26, 2012 (ADAMS Accession No. ML12345A030). In the SRM to SECY-12-0157 (ADAMS Accession No. ML13078A017), the Commission directed the NRC staff to require licensees with Mark I and 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." In response to that SRM, the NRC staff issued 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 that could exist in the event of reactor core damage. Order EA-13-109 supersedes Order EA-12-050 and addresses and expands on Recommendation 5.1 of the NTTF report.

Order EA-13-109 contains two distinct phases of implementation. Phase 1 requires affected licensees to upgrade the venting capabilities from the containment wetwell to provide a reliable hardened vent to help prevent core damage. The vent must also remain functional during severe accident conditions. Phase 2 requires affected licensees to do one of the following:

- Increase protection for severe accident conditions through installation of a reliable severe-accident-capable drywell vent system
- Develop a reliable containment venting strategy that makes it unlikely that there would be the need to vent from the containment drywell during severe accident conditions.

For both phases, licensees will submit an overall integrated plan (OIP). The NRC staff then will conduct any necessary audits and issue an ISE. In accordance with the requirements of the order, licensees will notify the NRC when full compliance is achieved with Phases 1 and 2. Once all units at a site are in compliance, the NRC staff will issue a final SE and inspect compliance with the order.

Substantial progress towards full implementation of Order EA-13-109 has been made during the previous 6 months:

- The NRC staff previously issued 18 of the 19 Phase 1 ISEs. In lieu of a Phase 1 OIP, on June 2, 2014, Exelon Generating Company, LLC, (Exelon), the licensee for Oyster Creek, submitted a request for an extension to comply with both phases of Order EA-13-109 until January 31, 2020. Oyster Creek is expected to be permanently shut down at that time. On November 16, 2015, the NRC staff issued a letter (ADAMS Accession No. ML15092A159) approving Exelon's requested schedule relaxation from Phase 1 of the order at Oyster Creek. Exelon submitted additional information regarding the Phase 2 relaxation request on February 15, 2016 (ADAMS Accession No. ML16047A094). Exelon's request for relaxation from Phase 2 of the order remains under review.
- The NRC staff issued a letter (ADAMS Accession No. ML15271A148) to NEI on October 8, 2015, endorsing the OIP submittal template and responses to a number of frequently asked questions associated with Phase 2 of the hardened containment vent order. The purpose of this template and the questions is to assist licensees when using NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109," Revision 1, published April 2014 (ADAMS Accession No. ML15113B318), in meeting the requirements of Order EA-13-109.
- The NRC staff issued a letter (ADAMS Accession No. ML15240A072) to NEI on September 14, 2015, endorsing an NEI/Industry Working Group white paper HCVS-WP-04, "Missile Evaluation for HCVS Components 30 Feet above Grade," Revision 0, dated August 18, 2015 (ADAMS Accession No. ML15231A491). The purpose of the white paper is to supplement guidance provided in NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109" (ADAMS Accession No. ML15113B318), regarding reliable hardened containment vent systems capable of performing under severe accident conditions at BWR with Mark I and Mark II containments.
- The NRC received all Phase 2 OIPs by December 31, 2015, except for Oyster Creek. As discussed below, the NRC staff is reviewing the Oyster Creek extension request for Phase 2 of the order.

Future work to be completed includes:

- The NRC staff will review the Phase 2 OIPs, conduct audits (if necessary) of licensee progress toward compliance with Phase 2, and then issue ISEs. The staff plans to

complete the ISE reviews in two groups. The staff expects to complete the first group of ISEs (12 sites) by June 30, 2016, and the second group (7 sites) by December 31, 2016.

- The NRC staff will inspect compliance with the order.

Order EA-13-109 established a schedule for applicable licensees to achieve full compliance with Phase 1 of the order by June 30, 2018, and full compliance with Phase 2 of the order by June 30, 2019. The NRC has rescinded Order EA-13-109 for the Vermont Yankee Nuclear Power Station, which has permanently shut down. As discussed above, for Oyster Creek, the NRC staff approved Exelon's requested schedule relaxation from Phase 1 of the order and is reviewing the Phase 2 relaxation request. The NRC staff expects that all other applicable licensees will meet the compliance dates specified in the order.

#### Containment Protection and Release Reduction Rulemaking

In addition to directing the NRC staff to require installation of severe-accident-capable venting systems for Mark I and II containments (discussed above) in the SRM to SECY-12-0157, the Commission directed the NRC staff to develop the regulatory basis and proceed with a rulemaking for filtering strategies with drywell filtration and severe accident management of BWRs with Mark I and II containments.

Using the normal rulemaking process, the NRC staff developed a Commission paper and the draft containment protection and release reduction rulemaking regulatory basis, which were provided to the Commission on June 18, 2015, in SECY-15-0085 (ADAMS Accession No. ML15022A218). In the SRM to SECY-15-0085 (ADAMS Accession No. ML15231A471), dated August 19, 2015, the Commission approved Alternative 1, which discontinued rulemaking activities and left Order EA-13-109 in place without additional regulatory actions. The NRC's Office of Nuclear Regulatory Research is preparing a NUREG report to document the technical analysis completed, including risk evaluation, accident progression and source term calculations, and offsite consequence calculations.

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

This lessons-learned activity originated from NTF Recommendation 3, and was intended to evaluate potential enhancements to the capability to prevent or mitigate seismically-induced fires and floods (SIFF). In the SRM to SECY-11-0137, "Staff Requirements: Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons Learned" (ADAMS Accession No. ML113490055), dated December 15, 2011, the Commission directed the staff to start the development of probabilistic risk analysis (PRA) methods to evaluate potential enhancements to plants' capabilities to prevent or mitigate SIFFs as part of Tier 1 activities. However, to be consistent with the program plan for NTF Recommendation 3 in Enclosure 3 to 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. ML12208A210), and as directed by the Commission, carrying out the broader evaluation (i.e., beyond the PRA methods) of potential enhancements to the capability to prevent or mitigate SIFFs would remain a longer-term Tier 3 activity.

The NRC staff evaluation and closeout plan for this recommendation is contained in SECY-15-0137, Enclosure 3, "Proposed Resolution Plan for Tier 3 Recommendation Potential Enhancements to the Capability to Prevent or Mitigate Seismically Induced Fires and Floods" (ADAMS Accession No. ML15254A013). With respect to the Tier 1 portion of this recommendation, the staff contracted with Brookhaven National Laboratory to finalize a feasibility study on the development of a PRA methodology for SIFFs. The final feasibility study was documented in the report entitled, "Brookhaven National Laboratory Report—Scoping Study for a PRA Method for Seismically Induced Fires and Floods," dated December 2015 (ADAMS Accession No. ML16004A250). The feasibility study identified a number of key issues associated with the development of qualitative or quantitative PRA methods for SIFFs.

Through the workshops and expert consultation, the NRC staff has identified several technical issues that would need further evaluation to develop a fully usable PRA methodology. As discussed in SECY-15-0137, the staff determined that the potential benefits of fully developing and piloting a PRA approach for SIFFs will not justify the costs of continuing this effort. The Commission approved the staff's recommendation to close this recommendation in the SRM to SECY-15-0137 (ADAMS Accession No. ML16039A175). Therefore, the staff has closed the Tier 1 activity to develop a PRA method for evaluating the risk of SIFFs.