**POLICY ISSUE**
**NOTATION VOTE**

April 17, 2014 SECY-14-0046

FOR: The Commissioners

FROM: Mark A. Satorius
Executive Director for Operations

SUBJECT: FIFTH 6-MONTH STATUS UPDATE ON RESPONSE TO LESSONS LEARNED FROM JAPAN'S MARCH 11, 2011, GREAT TŌHOKU 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 requests Commission approval of two items: (1) a revised charter for the Japan Lessons-Learned Steering Committee; and (2) a staff proposal to consolidate certain post-Fukushima rulemaking activities. This paper does not address any new commitments or resource implications.

BACKGROUND:

In Staff Requirements Memorandum (SRM)-SECY-11-0117, "Proposed Charter for the Longer-Term Review of Lessons Learned from the March 11, 2011, Japanese Earthquake and Tsunami," dated October 19, 2011 (Agencywide Document Access and Management System (ADAMS) Accession No. ML112920034), the Commission approved a charter that established the structure, scope and expectations for the NRC's longer-term review of the events in Japan. The charter required, among other things, status updates every 6 months for 2 years on the work conducted under the charter.

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In SRM-SECY-13-0095, "Fourth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami," dated November 13, 2013 (ADAMS Accession No. ML13317A271), the Commission directed the NRC staff to continue to provide the Commission a status report every 6 months until completion of the implementation of Tier 1 actions.

The NRC 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" dated February 17, 2012 (ADAMS Accession No. ML12039A103). The second 6-month update was provided as Enclosure 1 to SECY-12-0095 (ADAMS Accession No. ML12165A092). The third update was presented in SECY-13-0020 (ADAMS Accession No. ML13031A512), and the fourth update was provided in SECY-13-0095 (ADAMS Accession No. ML13213A304). This is the staff's fifth 6-month status update, which covers September 2013 through March 2014.

In SECY-11-0137, the NRC 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" dated July 12, 2011 (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. SECY-12-0095 provided assessments and program plans for the Tier 3 items, along with six additional recommendations identified in SECY-11-0137.

On March 12, 2012, the NRC issued Orders EA-12-049 (Mitigation Strategies), EA-12-050 (Hardened Vents), and EA-12-051 (Spent Fuel Instrumentation), and a request for information (RFI) letter to licensees (ADAMS Accession Nos. ML12054A735, ML12054A694, ML12054A679, and ML12053A340, respectively). These regulatory actions addressed most of the Tier 1 items. On June 6, 2013, the NRC issued Order EA-13-109 (Severe Accident Capable Hardened Vents) that modified and superseded Order EA-12-050 on reliable hardened containment vents (ADAMS Accession No. ML13143A321). 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 NRC staff has made progress on the Tier 2 and Tier 3 recommendations.

DISCUSSION:

This update covers the period from September 2013 through March 2014. Status updates specific to each lessons-learned activity are contained within 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. Specifically, those topics that do not fit into one particular lessons-learned activity are discussed below.

Decommissioning Reactors

Four reactor units at three sites have permanently ceased operations and begun the decommissioning process since the Fukushima lessons-learned orders and the RFI letter were issued in March 2012. The licensees for the Kewaunee Power Station (Kewaunee), Crystal River, Unit 3 (Crystal River), and San Onofre Nuclear Generating Station, Units 2 and 3 (San

Onofre), have submitted the certifications required by Title 10 of the *Code of Federal Regulations* Part 50, Section 50.82(a)(1)(i) and (ii), and are no longer authorized to operate the reactor or place or retain fuel in the reactor vessel. Two additional licensees, the Vermont Yankee Nuclear Power Station (Vermont Yankee) and the Oyster Creek Nuclear Generating Station, have also publicly announced plans to permanently shut down. The NRC staff has received requests from the three shutdown sites to relax or rescind the applicable orders and relieve them from the obligations of the RFI letter. The staff also received a request from Vermont Yankee to relax and rescind Order EA-13-109 (severe accident capable hardened vents), and they have informed the staff of its intent to submit additional requests for relief from all the orders and the request for information letter prior to or shortly after shutdown. To date, the staff has rescinded Orders EA-12-049 (mitigation strategies) and EA-12-051 (spent fuel pool instrumentation) for Crystal River (the hardened vents order is not applicable to Crystal River), and Kewaunee, Crystal River and San Onofre have all been relieved of the obligations of the request for information letter. The staff is evaluating the remainder of the requests and expects to make a decision in summer 2014.

Japan Trip

In February 2014, a 14-member delegation of senior NRC leadership traveled to Japan to meet with regulatory and industry counterparts, and conduct site visits. The meetings and site visits included: the Nuclear Regulatory Authority, Japan's nuclear regulator; Japan Institute of Nuclear Safety, Japan's version of the Institute for Nuclear Power Operations, Tokyo Electric Power Company; three manufacturing sites in the Yokohama area, Toshiba, Ishikawajima Harima Heavy Industries Corp., and Keihin; Kashiwazaki-Kariwa nuclear power plant (NPP); Fukushima Daini NPP; and Fukushima Dai-ichi NPP. The senior leadership team identified many lessons-learned from the trip and will provide their reflections and impressions of the trip through a NUREG, knowledge management video, and agency-wide panel session during the month of April 2014.

Revised Charter

On October 19, 2011, the Commission approved a charter (via SRM-SECY-11-0117) that established a Steering Committee to oversee and provide direction for the NRC's activities related to lessons-learned from Fukushima. The Steering Committee defined issues, established plans, and guided the initial implementation of NRC actions related to the accident. Since that charter was approved, the Steering Committee has transitioned oversight of most issues to the NRC line organizations, but still maintains oversight of several others. The Steering Committee also continues to resolve implementation issues, when necessary, and continues to meet with the industry's steering committee. In the previous 6-month update (SECY-13-0095), the NRC staff recommended that the Commission dissolve the charter because most lessons-learned activities had been transitioned to line organization oversight. The Commission, however, disapproved this recommendation. In SRM-SECY-13-0095, the Commission directed the staff "to modify or change the Charter and submit to the Commission for approval" to better characterize the current scope and responsibilities of the Steering Committee. The staff's proposal for a revised charter is in Enclosure 5.

Proposal to Consolidate Rulemaking Activities

On January 28, 2014, the NRC's Fukushima Steering Committee endorsed an NRC staff proposal for integrating related post-Fukushima rulemakings into a single rulemaking activity. Specifically, the Steering Committee endorsed consolidating, into a single rulemaking activity, the Station Blackout Mitigation Strategies rulemaking (NTTF Recommendations 4 and 7) with the Onsite Emergency Response Capabilities rulemaking (NTTF Recommendation 8), as well as the portions of NTTF Recommendations 9, 10, and 11 that are already being addressed as part of Order EA-13-049 (Mitigation Strategies) implementation (NTTF Recommendation 4.2), the Onsite Emergency Response Capabilities rulemaking, and items currently being implemented by industry.

During development of the rulemakings, the NRC staff identified that the Onsite Emergency Response Capabilities rulemaking cannot be issued before the Station Blackout Mitigation Strategies rulemaking because it will need to reference the station blackout mitigation strategies requirements. The staff had also previously identified several areas of overlap between the two rules. The direct links between these post-Fukushima rulemakings imply that, from a practical view, they should be combined into a single rulemaking package. The staff believes that it is more efficient to combine the rulemakings during the development of the proposed rules rather than during the final stage of the rulemaking process. Consolidating the rulemaking will produce a more coherent framework and reduce the potential for inconsistencies between the related actions. Additionally, consolidation into a single rulemaking adds clarity for internal stakeholders as they review and concur on a single rulemaking package, and reduces impact on external stakeholders as they will be able to comment on a single rulemaking package. However, while the Station Blackout Mitigation Strategies requirements and the Onsite Emergency Response Capabilities would be addressed in the same rulemaking, it should be recognized that each has a different scope with respect to an accident, and that combining them will not change their respective scopes. Specifically, they would continue to address a range of accident sequences, such as, loss-of-coolant accidents in addition to station blackout, but with greater capabilities to maintain or restore key functions.

The schedule for a consolidated rulemaking approach will be made consistent with the current overall schedule for the ongoing industry implementation of NRC Order EA-12-049 (i.e., two refueling outages following August 2012 but no later than December 2016). Currently, the Station Blackout Mitigation Strategies proposed rule is due to the Commission by June 30, 2014, and the Onsite Emergency Response Capabilities proposed rulemaking is due July 25, 2014. The current final rule schedule for Station Blackout Mitigation Strategies would be to deliver the final rule to the Commission by December 27, 2016, and the Onsite Emergency Response Capabilities final rule is currently due March 11, 2016. Pending Commission approval of the NRC staff's plans, the staff would deliver the proposed consolidated rule to the Commission by December 31, 2014. A schedule for the final consolidated rulemaking would continue to meet the established milestone for the final Station Blackout Mitigation strategies rule, and be delivered to the Commission on December 27, 2016.

The NRC staff's proposal and rationale for this rulemaking consolidation is described in more detail in Enclosure 6.

RECOMMENDATION:

The NRC staff recommends that the Commission approve: a) the revised charter contained in Enclosure 5; and b) the staff's proposal to consolidate post-Fukushima rulemaking activities as described in Enclosure 6.

COORDINATION:

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

/RA/

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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
5. Charter for the Japan Lessons Learned Steering Committee
6. Staff Proposal to Consolidate Post-Fukushima Rulemaking Activities

**Update on Tier 1 Activities**

Mitigation Strategies Order EA-12-049

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 performed 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 the 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 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.

By February 28, 2013, all licensees submitted their integrated plans to the NRC (except for Crystal River, Unit 3, because of its plan to permanently cease operations). These integrated plans contain each licensee's site-specific implementation details for meeting the requirements of the Order. To accomplish the review of the integrated plans on the desired timeline, the Mitigation Strategies Directorate (MSD) was created on August 12, 2013.

The MSD interacts with industry and other stakeholders to resolve generic concerns and initiated a formal audit process (according to the Office of Nuclear Reactor Regulation's Office (NRR) Instruction LIC-111, "Regulatory Audits") to complete a timely review of licensees' integrated plans. In addition to issuing the associated audit plan (ADAMS Accession No. ML13234A503), MSD developed supplemental staff guidance for the review of beyond-design-basis external events (ADAMS Accession No. ML13238A263). Following the audit plan and associated guidance, MSD reviewed licensees' integrated plans and issued Interim Staff Evaluations (ISEs) between November 22, 2013, and February 26, 2014, for each licensee about whether or not their integrated plan, if implemented as described, would provide a reasonable path for compliance with the Order. For areas in which insufficient information was available, open and confirmatory items were identified for the staff to review as the details become available.

After the issuance of the ISEs, the NRC staff intends to conduct electronic and on-site audits, with close engagement with resident inspectors, before the compliance date for the first unit at a site. Though the scope and specifics of each review may vary, the purpose of these audits will be to review the closeout of the open and confirmatory items identified in the ISEs. In accordance with the requirements of the Order, licensees will notify the NRC when full compliance is achieved. Once all units at a site are in compliance, the NRC staff intends to issue a final safety evaluation (SE) documenting the staff's review of the licensees' last update to their program.

The first operating units are scheduled to comply with the requirements of the Order by the fall of 2014. The Order established a schedule for all licensees to achieve full compliance within two refueling outages after submittal of the integrated plans, and no later than December 2016. A limited number of licensees (two) requested, and have been granted, schedule relaxation to allow three refueling outages until compliance. Additional facilities (six) have requested 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). The staff is currently evaluating these additional six requests.

The NRC staff plans to conduct post-compliance inspections after all units at a site indicate that they are in compliance and an SE is issued for that site. A Temporary Instruction is currently being drafted and onsite inspections are anticipated to begin in late summer 2015.

Lastly, the NRC staff notes that the licensees for Kewaunee, Crystal River, and San Onofre Nuclear Generating Station (SONGS) have notified the NRC of their intent to begin decommissioning those sites. As a result, all three sites have requested relaxation or rescission of Order EA-12-049. The Order has been rescinded for Crystal River, and the requests from Kewaunee and SONGS are under staff review.

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 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 indicating that more water should be added without delay.

On August 29, 2012, the NRC staff issued its guidance document, 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, each of the overall integrated plans (OIPs) for the SFP instrumentation order was received.

The NRC staff issued ISE's for all plants affected by this Order between September 23, 2013, and December 12, 2013, except for Kewaunee, Crystal River, and SONGS (due to their

permanently shut down status). These ISEs included requests for additional information (RAI). Licensees are expected to provide the requested information in their 6-month status update letters as required by the terms of Order EA-12-051, but no later than 6 months before the date when full compliance is required. Prior to each licensee's compliance due date, a subsequent staff evaluation will provide the staff's assessment as to whether the licensees' proposed implementation plans appear consistent with the Order. 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, and the staff has initiated instrument vendor audits for all licensees with compliance due dates this fall. The staff is also drafting the vendor audit report and staff evaluation for the pilot plant (i.e., Watts Bar). Public meetings were held in November 2013 and February 2014 to solicit industry and public comments regarding staff expectations for RAI responses, the conduct of vendor audits, and the level of detail for information provided to allow the staff to complete its assessments efficiently and effectively. Industry and NRC staff have aligned on expectations and the staff does not anticipate further RAIs will be necessary to complete the evaluations. 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. The staff has prepared a draft Temporary Instruction to enable this inspection to take place.

Lastly, the staff notes that the licensees for Kewaunee, Crystal River, and SONGS have notified the NRC of their intent to begin decommissioning those sites. As a result, all three sites have requested relaxation or rescission of Order EA-12-051. The order has been rescinded for Crystal River, and the requests from Kewaunee and SONGS are still under staff review.

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

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 U.S. with Mark I and Mark 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 hardened vents to assist in preventing core damage and in addition remain functional during severe accident conditions. 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 to develop a reliable containment venting strategy that makes it unlikely to need to vent from the containment drywell during severe accident conditions, and to submit an OIP by December 31, 2015.

Since the issuance of the revised Order, the NRC staff has held frequent public meetings with the industry to develop guidance for implementation of the new requirements. Significant challenges encountered during the development of the guidance for Phase 1 includes the interactions between Orders EA-12-049 and EA-13-109, and the determination of temperature conditions in the drywell during severe accident conditions. The staff issued the ISG for Phase 1 of Order EA-13-109 on November 14, 2013. The ISG endorses, with exceptions and clarifications, the methodologies described in NEI 13-02, Rev. 0, "Industry Guidance for Compliance with Order EA-13-109," that was prepared by NEI. The ISG and the NEI guidance reflect the broad agreement, with clarifications, that was reached between the industry and the NRC regarding the challenges stated above. The licensees are required to submit an OIP for NRC review by June 30, 2014, including a description of how compliance with Phase 1 requirements will be achieved. The staff is currently holding public meetings with the industry to develop an acceptable OIP template and resolve most foreseeable licensee questions and reduce staff RAIs through the staff's upfront involvement. The NRC staff will issue ISEs to support implementation of the Phase 1 OIPs.

The Phase 2 portion of Order EA-13-109 builds upon the Phase 1 activities and also takes advantage of studies related to the development of a regulatory basis for the accident management and filtering strategies rulemaking. The staff plans to issue the ISG for Phase 2 by April 30, 2015, barring unforeseen technical issues arising during the guidance development. Licensees are required to submit their OIPs for Phase 2 by December 31, 2015.

Accident Management and Filtering Strategies Rulemaking for Boiling Water Reactors with Mark I and Mark II Containments

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 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 Mark II containments. The Commission directed the staff to provide to the Commission the regulatory basis for the rulemaking on March 19, 2014, the proposed rule and draft staff guidance 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 staff has held several public meetings to discuss the Commission's decision and the regulatory basis for the rulemaking. The public meetings included interaction with the public on potential performance measures, probabilistic risk assessments, and accident progression event trees for the regulatory basis.

Currently, the final rulemaking date is in accordance with the schedule provided in SRM-SECY-12-0157. The regulatory basis and proposed rule dates were extended by

9 months. The NRC staff continues to work through normal rulemaking activities and will keep the Commission apprised of any challenges that could impact the schedule.

The NRC staff continues with 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.

Seismic Hazard Walkdowns

On March 12, 2012, the NRC staff asked licensees of U.S. nuclear power plants to perform a detailed inspection, or "walkdown," of their currently installed seismic and flooding protection features. Licensees were also asked to verify the current plant configuration with the current seismic licensing basis and to identify, correct, and report any degraded, non-conforming, or unanalyzed conditions. The walkdowns were completed and reports were submitted to the NRC by November 2012. NRC resident inspectors used a Temporary Instruction (TI-2515/188) to independently verify, using a sampling process, that each licensee's seismic walkdown activities were conducted using the walkdown methodology endorsed by the NRC. Resident inspectors completed the inspection requirements set forth in TI-2515/188 concurrently with the licensee's walkdown activities, and documented the inspection results in their quarterly reports.

Since the last 6-month update paper, the NRC staff has issued the audit reports for the six audited sites: Point Beach, Comanche Peak, DC Cook, Beaver Valley, Seabrook, and Sequoyah. The audits, which were performed during the period from July through September of 2013, were informative to the staff and helped to clarify the process that was to be followed by licensees when conducting the seismic walkdown activities. Two common concerns were identified during the audits which resulted in a request for information (RFI) to all licensees except Comanche Peak, DC Cook, Beaver Valley, Seabrook, and Sequoyah. For the audited sites, the staff discussed these concerns with the licensee during the audit and they agreed to address them in a supplement to their walkdown report. The concerns were discussed in several public meetings and involved the licensees' disposition of potentially adverse seismic conditions and the conduct of peer review activities. All licensees have responded, and the staff is evaluating the responses for inclusion in the staff assessments for each unit's walkdown report and supplemental information. The purpose of the staff assessment is to determine whether conduct of the plant walkdown met the intent of the endorsed guidance, thereby verifying that the walkdowns met the objectives in Enclosure 3 of the 50.54(f) letter.

Several NRC staff assessments have been issued, and the staff continues to assess the remaining walkdown reports and RAI responses. The staff assessments are scheduled to be completed by May 2014.

Originally, some of the licensees indicated a long timeframe (beyond their next refueling outage) was needed to complete delayed walkdowns on items that were inaccessible. As a result of the staff's interactions with those licensees, the completion for the delayed walkdown items has been improved to be within a 180-day response period. The staff expects that all inaccessible items will have had walkdowns completed by the end of calendar year 2014.

Flooding Hazard Walkdowns

On March 12, 2012, the NRC staff asked licensees for the U.S. nuclear power plants to perform a walkdown of their currently installed flooding protection and mitigation features, including a review of associated manual actions. The industry developed—and the NRC endorsed—NEI 12-07, "Guidelines for Performing Verification Walkdowns of Plant Protection Features," to conduct these walkdowns. All plants had to ensure that the features met current licensing basis requirements, and also identify, correct, and report any degraded conditions. The plants completed their walkdowns by November 2012 and the NRC resident inspectors completed their inspections in accordance with TI-2515/187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns," 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 by the NRC resident inspectors, in accordance with normal NRC processes.

As discussed in the previous update, the NRC staff performed seven site audits to evaluate whether the walkdowns were performed in accordance NEI 12-07. Audits were performed at the following plants: Brunswick, Salem, Hope Creek, Quad Cities, Millstone, Vermont Yankee, and Oyster Creek. These plants entered the NRC audit team's observations into their corrective action programs and are working on the appropriate corrective actions. All observations that raised current licensing-basis compliance questions were transitioned into the Reactor Oversight Process for significance determination and resolution.

Since the last 6-month update, the NRC staff has continued to assess 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 requested that all licensees provide additional information regarding the available physical margin methodology. This information is required to complete the walkdown staff reviews. The staff expects most staff assessments to be completed by April 2014, with the timing of a few licensees' responses delaying completion of the staff's assessments until summer 2014.

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.

Seismic Hazard Reevaluations

On March 12, 2012, the NRC staff asked licensees for U.S. 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 was 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 staff has held several public meetings on seismic reevaluations since the last status update paper in early September 2013.

By September 13, 2013, licensees of nuclear plants in the Central and Eastern United States were to have submitted information related to the characterization of their sites in support of performing seismic hazard reevaluations (NTTF Recommendation 2.1 – Seismic). All licensees have responded to the 50.54(f) letter, Enclosure 1, and are in the process of submitting the seismic hazard re-evaluations. These submittals are being processed through document control and sensitive unclassified non-safeguards information review, and are expected to be publically available in April 2014. Only one plant (Monticello) requested a delayed submittal, but provided a letter on time informing the staff of the expected submittal date (May 14, 2014), acknowledged that they will screen-in, and provided an interim evaluation.

As planned, the NRC staff's screening groups comprised of geophysicists, structural engineers, and risk analysts are in the process of reviewing the submittals in accordance with the NRC-endorsed industry guidance document, which specifies the screening, prioritizing, and implementation details.

By the licensees' determination, about half of the sites (approximately 30) have screened out of performing a detailed risk evaluation. Of those, approximately 12 sites have self-screened out of any further analysis (i.e., the safe shutdown earthquake remains higher than the new ground motion response spectra for the entire range of frequencies); and approximately 12 have applied to use their individual plant examination of external events (IPEEE) results to screen out of the detailed risk evaluation. Additionally, licensees have indicated that the Expedited Approach will be completed for approximately 40 sites, which includes those sites that licensees have determined screen out from further risk evaluation based on their IPEEE. The Expedited Approach is intended to identify if any site modifications are needed to assure that specified equipment and systems can withstand the new seismic hazard, and safely shutdown during a loss of all alternating-current (AC) power or ultimate heat sink accident.

As planned, if the NRC staff is unable to make a determination of the screening to perform a detailed risk evaluation, the plant will temporarily (or conditionally) screen in, while further staff-licensee interactions take place such that the staff has sufficient information to make a final determination. Until then, sites that temporarily screen in will provide an interim evaluation, and will be informed they should perform and submit the Expedited Approach by December 2014. The Expedited Approach will evaluate equipment and systems at the new seismic hazard level that are necessary for a safe shutdown following a loss of all AC power or ultimate heat sink accidents.

In May 2014, the NRC staff plans to complete the screening and prioritization, as described above, and will keep all internal stakeholders apprised of progress to the extent practical. The screening results and prioritization will be shared with applicable stakeholders prior to issuance.

Note, SONGS, Kewaunee, and Crystal River have ceased operation and notified the NRC of their intent to decommission, and have therefore submitted requests for relief from further responding to the obligations of the March 12, 2012, RFI. The NRC staff approved these requests on January 22, 2014 (ADAMS Accession Nos. ML13329A826, ML13322B255, and ML13325A847, respectively).

Flooding Hazard Reevaluations

On March 12, 2012, the NRC staff asked all U.S. power reactor licensees and holders of construction permits in active or deferred status to reevaluate the flooding hazards that could impact their site. If the reevaluated flooding hazard at a site is not bounded by the current design basis, respondents are requested to perform an assessment of the plant's ability to cope with the reevaluated flood hazard (referred to as the integrated assessment). 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 activities have been completed associated with the flooding reevaluations. For example, the NRC staff has held numerous public meetings associated with either the flooding hazard reevaluations or the integrated assessment. In March 2013, the first set of plants submitted their flooding hazard reports. Six sites requested and were approved for extensions, primarily to allow usage of different numerical models that will yield more accurate results. Two of the six sites for which an extension was granted have since submitted their flood hazard reevaluation reports. The second set of flooding hazard reports is due in March 2014, and the third (final) set of reports is due in March 2015. The staff is currently reviewing the first set of submittals and will be issuing staff assessments for the respective plants.

Based on the first set of hazard submittals, several sites indicated that they will be taking interim actions (e.g., procuring sandbags or other temporary barriers) to address the reevaluated hazard if the reevaluated hazard exceeds the capability of existing flood protection or mitigation. The NRC staff issued temporary instruction 2515/190, "Inspection of The Licensee's Proposed Interim Actions as a Result of the Near-Term Task Force Recommendation 2.1 Flooding Reevaluation," to facilitate inspection of those actions.

The majority of sites indicated that they will be performing an integrated assessment following interim staff guidance JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding." The integrated assessments are due to the NRC 2 years after the submittal of the hazard reevaluation. The NRC staff is continuing to work with industry to support the development of several examples applying the new staff guidance. After the integrated assessments are received from the required plants, the staff will use existing NRR processes to document and, if appropriate, take actions based on the information received.

The NRC staff received requests for assistance from licensees to obtain information on dams upstream of eight nuclear power plants in order to complete their flooding hazard reevaluations at these sites. These requests were received between August and December of 2013. All eight sites had flooding hazard reevaluations due to the NRC by March 12, 2014. The NRC entered into an interagency agreement with the U.S. Army Corps of Engineers to have them compute the water height at these eight sites should these upstream dams fail. All calculations will be performed in accordance with NRC's guidance document JLD-ISG-2013-01, "Guidance for Estimating Flooding Hazards Due to Dam Failure." Because of the dates of the assistance request letters, the U.S. Army Corps of Engineers was not able to complete their assessments by March 2014, and thus the eight sites have submitted hazard reevaluation extension requests. The NRC staff is currently reviewing the extension requests.

SONGS, Kewaunee, and Crystal River have ceased operation and notified the NRC staff of their intent to decommission, and have therefore, submitted requests for relief from further responding to the obligations of the March 12, 2012, RFI letter. The staff approved these requests on January 22, 2014 (ADAMS Accession Nos. ML13329A826, ML13322B255, and ML13325A847, respectively).

Emergency Preparedness Staffing and Communications

The March 12, 2012, RFI letter asked licensees to assess a large-scale event that causes the loss of all AC power and might affect multiple reactors at their site. It also requested licensees to assess and implement enhancements to help ensure that communications can be maintained during such an event.

All licensees submitted their communications assessments by October 31, 2012. Safety assessments were issued documenting the staff's review to each licensee by July 2013, with the exception of SONGS, which has ceased operation.

On April 30, 2013, licensees submitted their staffing assessments based on existing station blackout (SBO) coping strategies with an assumption of multiple reactors being affected concurrently. The NRC staff issued the Phase 1 staffing assessment response letters on October 23, 2013, for the multiunit sites except Arkansas Nuclear One (ANO), Indian Point, and SONGS. The staff intends to issue letters for ANO and Indian Point once it receives and reviews responses to a request for additional information.

SONGS, Kewaunee, and Crystal River have ceased operation and notified the NRC staff of their intent to decommission, and have therefore submitted requests for relief from further responding to the obligations of the March 12, 2012, RFI letter. The staff approved these requests on January 22, 2014 (ADAMS Accession Nos. ML13329A826, ML13322B255, and ML13325A847, respectively).

Enclosure 6 to this SECY further discusses a proposal to include, in part, staffing and communications as part of a consolidated rulemaking activity.

Station Blackout Mitigation Strategies (SBOMS) Rulemaking

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 General Design Criterion (GDC) 17 and 10 CFR 50.63, "Loss of All Alternating Current Power") for extreme external events that lead to extended loss of 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* 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 NRC 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.

The staff notes that if the proposal to consolidate post-Fukushima rulemakings, as described in Enclosure 6, is approved by the Commission. The proposed rule due date to the Commission would change from June 30, 2014, to December 31, 2014; but the final rule due date would remain the same (December 27, 2016).

Onsite Emergency Response Capabilities Rulemaking

The NRC's Onsite Emergency Response Capabilities rulemaking effort is expected to strengthen and integrate the various onsite 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 decisionmaking 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 *Federal Register* on April 18, 2012 (77 FR 23161), and a draft regulatory basis was issued for comment on January 8, 2013.

The final regulatory basis was issued on October 25, 2013 (78 FR 63901). On November 4, 2013, the staff briefed the Rulemaking Steering Committee (comprising interoffice division directors) about the preliminary proposed rule language. The staff issued the rule language on November 11, 2013 (78 FR 68774), and held a public meeting on November 19, 2013, to give the public an opportunity to ask questions about the language. The staff is now developing the proposed rule package and supporting regulatory documents.

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

supporting guidance for the rule that cites industry guidance currently under development by NEI. The staff continues to work closely with industry to ensure that supporting guidance is developed on a timeline commensurate with the rule schedule.

Note, that if the proposal to consolidate post-Fukushima rulemakings, as described in Enclosure 6, is approved by the Commission, the proposed rule due date to the Commission would change from July 25, 2014, to December 31, 2014; and the final rule due date would change from March 11, 2016, to December 27, 2016.

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

This lessons-learned activity originated from NTTF 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 probabilistic risk assessment (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 for NTTF Recommendation 3 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), 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:

1. Continue development of PRA methodology for seismically induced fires and floods. This will include two main subtasks:

    a) Engagement with PRA standards development organizations to develop the technical elements and standards for the PRA method (ongoing)

    b) Completion of a feasibility scoping study to evaluate PRA approaches for assessing multiple concurrent events (December 2015)

2) 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 engagement with the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) Joint Committee on Nuclear Risk Management (JCNRM) to leverage external stakeholders' expertise and to better focus future method development efforts. As a result of a recent balloting initiative on a number of crosscutting issues in the ASME/ANS PRA standard, JCNRM approved continuing development of standards for concurrent initiating events, such as seismically induced fires and floods. Based on the decision to include concurrent initiating events in a future revision of the PRA standard, the staff will continue engagement with ASME and ANS to support development of standards in this area.

The staff has continued the feasibility scoping study to better define the objectives and potential approaches for a PRA method suitable for assessing seismically induced fires and floods. As one part of the technical work plan developed for this project, a public workshop was held on December 11 and 12, 2013, in Rockville, Maryland. The workshop addressed a number of significant topics associated with seismically induced fires and floods, including:

1. Identification of failure mechanisms;
2. Availability of operating experience data and fragility information;
3. Adequacy of current PRA methods for assessing concurrent events;
4. Screening approaches;
5. Relationship of this topic with other post-Fukushima initiatives;
6. Relationship to ongoing PRA standard efforts for concurrent initiating events.

Approximately 30 experts in the areas of PRA, seismic analysis, fire protection, and flooding attended the workshop. These experts represented 16 external organizations and several NRC offices. The workshop provided the staff with valuable feedback on several key issues, including approaches for screening concurrent events and the use of qualitative risk assessment approaches to gain insights on risk-significant accident scenarios. The meeting summary documenting the results of the workshop is available in ADAMS at Accession No. ML14022A249. The NRC staff will continue PRA method development activities (including consideration of both quantitative and qualitative approaches) during fiscal year 2014.

Finally, the NRC staff will continue to monitor the progress of other NTTF 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.

## Update on Tier 2 Activities

Emergency Preparedness

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

(1) To conduct periodic training and exercises for multi-unit and prolonged station blackout (SBO) scenarios and to practice (simulate) the identification and acquisition of offsite resources, to the extent possible.

(2) To ensure that EP equipment and facilities are sufficient for dealing with multi-unit and prolonged SBO scenarios.

(3) To add guidance to the emergency plan that documents how to perform a multi-unit dose assessment (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

Although items 1 and 2 above are being addressed through the implementation of mitigation strategies, on November 19, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a combined public meeting with the working group for the Onsite Emergency Response Capabilities rulemaking. This meeting discussed a draft version of the Nuclear Energy Institute's (NEI's) guidance document NEI 13-06, "Guidance for the Closure of Tier 2 Emergency Preparedness Enhancements from the NRC Near-Term Task Force Report," which is intended to address emergency-preparedness equipment, facilities, training, drills, and multi-unit dose assessment. Additionally, on March 4, 2014, the staff conducted a combined public meeting with the consolidated rulemaking working group to discuss additional comments on the revised draft NEI 13-06 and the new draft NEI 14-01 "Emergency Response Procedures and Guidelines for Extreme Events and Severe Accidents." Given the level of integration between mitigation strategies, onsite emergency response procedures, and items 1 and 2 above; the staff intends to conduct additional public meetings to finalize both guidance documents. These public outreach activities also support a proposed consolidated rulemaking activity, which is further discussed in Enclosure 6 to this SECY.

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 NRC staff informed the Commission that licensees would provide information about their current multi-unit/multi-source capability, or a schedule for implementing such capability for those licensees who do not currently have it, and that implementation of the dose-assessment capability would occur by the end of 2014. The staff has received all licensee submittals on this topic and issued a response letter to the majority of licensees, dated January 29, 2014 (ADAMS Accession No. ML13233A205), that acknowledges that licensees intend to have multi-unit and/or multi-source dose assessment capabilities by December 31, 2014. The staff is in the process of issuing response letters to several remaining licensees with which clarifying public teleconferences were conducted and subsequent supplemental responses were submitted to the NRC. The staff issued the remaining response letters by April 2, 2014. All response letters note that as part of the implementation of new multi-unit/multi-source

dose-assessment capabilities, there is a need for an appropriate level of site procedures and training to ensure adequate integration and licensee staff familiarity, and that implementation of dose-assessment capabilities would be verified through the inspection program.

Consideration of Other Natural External Hazards

The Advisory Committee on Reactor Safeguards recommended expanding Near Term Task Force Recommendation 2.1 to include natural external hazards other than seismic and flooding hazards 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 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-12-0025. The project plan calls for the staff to follow the same process as used for the Tier 1 seismic and flooding reevaluations. The NRC 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 under 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.

No work was done this period; however, the NRC 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.

## Update on Tier 3 Activities

Periodic Confirmation of Seismic and Flooding Hazards

Recommendation 2.2 of the Near-Term Task Force (NTTF) report suggests that the U.S. Nuclear Regulatory Commission (NRC) require licensees to periodically update external 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 NRC 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 flooding and seismic hazards using present-day methodologies and guidance. This 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.

No work was done this period; however, when sufficient insights are gained from the seismic and flooding reevaluations, the NRC staff plans to start the rulemaking process. The staff expects to first develop a technical basis and then engage stakeholders for public participation.

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 for all parts of this activity is 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

Both of these lessons-learned activities originated from the NTTF report. NTTF Recommendation 5.2 stated a need was to reevaluate 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 whether additional regulatory action is warranted. While these activities are separate, the NRC 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. Additionally, the staff of the Office of Nuclear Regulatory Research is participating as a working group member in a study related to hydrogen generation, transport, and risk management organized by the Organization for Economic Co-operation and Development (OECD). The outcome of this task group will be a status paper that reviews the approaches for hydrogen management under severe accident conditions within the OECD member countries. The paper would include safety requirements, mitigation systems and their implementation status, analysis codes and their validation status, and severe accident management strategies. This will allow identifying advantages and drawbacks of the various approaches.

The NRC staff issued the interim staff guidance (ISG) for Phase 1 (JLD-ISG-2013-02) of Order EA-13-109 on November 14, 2013 (ADAMS Accession No. ML13304B836). The licensees are required to submit an overall integrated plan (OIP) by June 30, 2014. Currently, the staff is holding meetings with the Nuclear Energy Institute industry group to develop an acceptable OIP template for implementation of Order EA-13-109, as well as to 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 Mark II issues. Once the staff has determined that sufficient insights have been gained from the Mark I and Mark II work and other related activities, it will commence evaluation of other containment designs and hydrogen control to determine whether regulatory action is warranted for either or both activities.

Activities Related to Emergency Preparedness

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 multi-unit events;

(2) Emergency Response Data System capability;

(3) Additional EP topics for prolonged SBO and multi-unit events;

(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 staff to solicit early written stakeholder input on a new potential rulemaking effort. The staff still intends to take this approach for certain Tier 3 EP activities (9.2, 9.3, and 10.3 related to Emergency Response Data Systems (ERDS); 10.1; 11.2; 11.3; and 11.4) and expects to use the ANPR feedback to help determine if there is a need for rulemaking; and, if so, what its scope and content should be.

No work was done this period; however, the staff expects to issue the ANPR in fiscal year 2016. Several of the Tier 3 EP activities (9.1, 9.2, 9.3 (with the exception of maintenance of ERDS capability throughout an accident), 9.4, 10.2, and 11.1) could be addressed through a proposed consolidated rulemaking effort, as is further discussed in Enclosure 6 to this SECY.

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

This lessons-learned activity originated from NTTF 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

NTTF Recommendation 1. Therefore, implementation of this activity largely depends on the outcome of work on Recommendation 1, which is ongoing.

However, the NRC 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 (i.e., conducting Temporary Instructions to verify Order compliance and responses to requests for information) can be incorporated in the same manner.

NRC Staff Training on Severe Accidents and Severe Accident Management Guidelines

This lessons-learned activity originated from NTTF Recommendation 12.2 to enhance NRC staff training on severe accidents, including resident inspector training on severe accident management guidelines (SAMGs). Because the Onsite Emergency 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:

1. Increasing the frequency of severe accident courses, including exporting the courses to the regional offices;

2. Updating courses with lessons learned from the Fukushima accident;

3. Modifying existing qualification programs to include requirements for severe accident courses;

4. Adding SAMG courses to qualification program training;

5. Developing new, additional courses that focus on severe accidents.

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

While part of this activity depends on the outcome of the Onsite Emergency Response Capabilities rulemaking, the NRC staff currently has information on severe accidents to update the training and believes that increasing its knowledge in this area is beneficial.

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

Both of these lessons-learned activities originated as “additional issues” in SECY-11-0137. The first activity involves the NRC 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,

it 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 were gained from the ongoing Level 3 PRA study and a planned United Nations assessment of Fukushima. The staff expects it will be several years before these other activities are complete.

The second activity involves the NRC staff's evaluation of whether potassium iodide should be pre-staged beyond the current 10-mile zone. As was the case for the EPZ activity, the staff determined in its 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. Currently, the staff is engaged with the Nuclear Energy Agency, International Atomic Energy Agency (IAEA), and scientific forums to actively study the impact of releases from Fukushima on public health, the use of KI, and thyroid disease.

Expedited Transfer of Spent Fuel to Dry Cask Storage

On October 9, 2013, the staff provided SECY-13-0112, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor" (ADAMS Accession No. ML13256A334), to the Commission. The purpose of the study was to help the agency determine whether accelerated transfer of spent fuel from the spent fuel pool (SFP) to dry cask storage significantly reduces risks to public health and safety. The study provided consequence estimates of a hypothetical spent fuel pool accident initiated by a low-likelihood seismic event at a reference plant based on the Peach Bottom BWR Mark I spent fuel pool. The study compared high-density and low-density loading conditions and assessed the benefits of post-9/11 mitigation measures. One of the objectives of the current study was to inform the Japan lessons-learned Tier 3 activities.

On November 12, 2013, the staff provided COMSECY-13-0030, "Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel" (ADAMS Accession No. ML13329A918), to the Commission. In COMSECY-13-0030, the NRC staff completed a regulatory analysis to determine whether additional study of this issue was warranted, after considering a broad history of NRC oversight of spent fuel storage, SFP operating experience (domestic and international), past studies of SFP safety, and the October 2013 SFP study (SECY-13-0112). In addition, the staff considered international practices related to the transfer of spent fuel from wet to dry storage, as well as stakeholder comments received during two public meetings. The staff concluded that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit (i.e., less than safety goal screening criteria), and that its expected implementation costs would not be justified. The staff recommended to the Commission that additional studies and further regulatory analyses of this issue not be pursued, and that this Tier 3 Japan lessons-learned activity be closed.

On January 6, 2014, the Commission held a meeting entitled, "Spent Fuel Pool Safety and Consideration of Expedited Transfer of Spent Fuel to Dry Cask Storage." The Commissioners were briefed by industry representatives (Dominion Nuclear and the Electric Power Research

Institute (EPRI)), non-governmental organizations (Union of Concerned Scientists and Institute for Resource and Security Studies), and NRC staff. The industry representatives and non-governmental organizations provided their respective views on this issue, and the staff provided an overview of documents previously provided to the Commission. As directed by SRM-M140106A, the staff is interacting with EPRI and international counterparts to gather information on international spent fuel management practices.

At this time, the NRC staff is awaiting further direction from the Commission on whether to pursue any additional activities related to expedited transfer of spent fuel to dry cask storage.

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

During its review of the NTTF recommendations in SECY-11-0124 and SECY-11-0137, the Advisory Committee on Reactor Safeguards 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 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 to be enhanced to withstand beyond-design-basis accident conditions. This activity was prioritized as Tier 3 because it requires further staff study and depends 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 NTTF 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 NRC staff has performed, or is performing, the following tasks to develop new information and insights: (1) It reviewed the DOE modeling of the Fukushima event, (2) met with DOE and EPRI regarding research activities, (3) is participating in the development of the IAEA Nuclear Energy series document expected to be issued in 2014, (4) met with the American Nuclear Society Standards Board, and (5) is interfacing with the Institute of Electrical and Electronics Engineers (IEEE) Standards Committee for IEEE-497, “Standard Criteria for Accident Monitoring Instrumentation for Nuclear Power Generating Stations.” The International Electrotechnical Commission standards organization has designated working group 9 under Subcommittee 45B to explore the publication of a possible joint logo standard on accident monitoring with the IEEE-497 standard.

The next steps for this recommendation will be to meet with appropriate Tier 1 teams to review instrumentation-needs formulations and review pertinent licensee submittals for instrumentation-needs identification. The NRC staff will continue work with the standards-development organizations to identify criteria for severe accident instrumentation, support IAEA in issuing its document on accident-monitoring instrumentation, and research collaboration with EPRI and DOE. 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 NRC staff plans on making a regulatory determination by December 2015.

## Update on Activities Not Within a Tier

Near-Term Task Force (NTTF) Recommendation 1 – Regulatory Framework

This lessons-learned activity originated from 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 December 6, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff sent to the Commission SECY-13-0132, "U.S. Nuclear Regulatory Commission Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report" (ADAMS Accession No. ML13277A413). The SECY paper requested the Commission's approval of the staff's recommendation to move forward on three potential regulatory improvement activities to disposition NTTF Recommendation 1. These potential improvement activities were developed after evaluation of the considerations underlying the NTTF's recommendation and consideration of the Risk Management Task Force's recommendations for power reactors, and included:

(1) Establishing a new design-basis extension category of events and requirements and associated internal NRC guidance, policies, and procedures;

(2) Establishing Commission expectations for defense in depth through the development of a policy statement;

(3) Clarifying the role of voluntary industry initiatives in the NRC regulatory process.

The NRC staff's effort was informed by extensive interaction with external stakeholders, including the Advisory Committee on Reactor Safeguards. Additionally, the staff briefed the Commission in a public meeting on January 10, 2014.

Other NRC-Regulated Facilities

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 NRC staff to consider the applicability of lessons-learned from the event to "non-operating reactor and non-reactor facilities."

The NRC 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 include the Office of Nuclear Reactor Regulation (NRR), the Office of Nuclear Material Safety and Safeguards (NMSS), and the Office of Federal and State Materials and Environmental Management Programs (FSME), while the 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 NRC staff has completed inspections at fuel cycle facilities in accordance with 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 NRC 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 fourth quarter of fiscal year (FY) 2014.

National Academy of Sciences Study on Fukushima

The National Academy of Sciences (NAS) is continuing their work on the NRC-funded study entitled, "Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants." Since the last 6-month update, a NAS study committee (Committee) has held several information-gathering meetings and visited two nuclear power plants (Oyster Creek and Hatch). The NRC staff recently provided briefing materials to the Committee regarding the NRC's oversight of spent fuel safety and security. Because of unforeseen delays, the Committee has separated the spent fuel safety and security portion of the report. The Committee has completed gathering the needed information on Fukushima lessons-learned and is in the process of drafting the report. The staff understands that NAS is currently scheduled to issue the report in the third quarter of FY 2014.

Comparison Study of U.S. and Japanese 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 before the Commission's SRM. However, in response to the SRM and similar interest expressed by various external stakeholders, the staff (with contractor support) performed a broader comparison of regulatory requirements that were in effect in the U.S. and Japan at the time of the Fukushima accident. The comparison study was completed in November 2013 and has been made available to the public (ADAMS Accession No. ML13326A991).

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. The staff is participating in several working groups within the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) 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. One of those working groups is preparing the "IAEA Fukushima Report," which is expected to be finalized by the end of 2014. Activities related to addressing lessons learned from the Fukushima accident were a significant focus area in the Convention on Nuclear Safety scheduled for March–April 2014.

In February 2014, the IAEA conducted its follow-up Integrated Regulatory Review Service (IRRS) mission at the NRC. That follow-up mission found that "…the NRC has acted promptly and effectively after the Tokyo Electric Power Company Fukushima Dai-ichi accident in the interests of the public health and safety in both the U.S. and Japan." The results of the Near-Term Task Force represent a sound and ample basis for taking into account the lessons-learned from the accident. The IRRS Team considered that the actions related to inspection taken by the regulatory body were exemplary and that the necessary further actions have been initiated. The full preliminary report of the IRRS follow-up mission can be found at http://www.nrc.gov/reactors/operating/ops-experience/preliminary-report.pdf.

The NRC staff is also participating in the Organization for Economic Co-operation and Development (OECD) NEA Benchmark Study of the Accident at the Fukushima Daiichi (BSAF) nuclear power station project. The BSAF project used plant data ("as built"), operational data (from operational record), measured data, and boundary conditions (best guess) to analyze what happened at Fukushima, Units 1 through 3, for approximately the first 6 days after the earthquake on March 11, 2011. This benchmarking exercise provided a better understanding of the severe accident phenomena that took place at Fukushima, and provided guidance to an international effort on post-accident recovery that aims to validate boiling water reactor accident analysis.

Additionally, the NRC staff is participating on the OECD Working Group on Analysis and Management of Accidents (WGAMA). In the past year, WGAMA has initiated three coordinated action projects with the objective of developing status reports on filtered containment venting systems (FCVS), hydrogen risk management, and spent fuel pool cooling in OECD member countries. Each of these efforts will help inform the NRC's related lessons-learned activities.

The status report on FCVS compiles information on containment venting strategies already implemented or currently planned in OECD countries, including a discussion of regulatory requirements in various countries as well as design, operation, and performance of different

FCVS. The report also discusses benefits and possible drawbacks of FCVS and identifies, from an accident management perspective, areas of hardware and operational improvements. The draft report is currently being reviewed by WGAMA.

The status report on hydrogen reviews the approaches for hydrogen management under severe accident conditions within the OECD member countries, including safety requirements, mitigation systems and their implementation status, analysis codes and their validation status, and severe accident management strategies. This will allow identifying advantages and drawbacks of the various approaches. The draft report is currently being reviewed by WGAMA.

The status report on spent fuel pools (SFPs) is intended to summarize the current understanding of the behavior of SFPs under loss of cooling accident conditions. All aspects of a loss of cooling accident are addressed (i.e., accident progression, criticality, hydrogen combustion and fission product release), and the report identifies areas where model improvements in tools are needed including a discussion on the uncertainties during a severe accident. The draft report is currently being reviewed by WGAMA.

WGAMA has also initiated a new coordinated action project to compile information on the use of analytical tools to provide a basis for informing severe accident management actions. This activity will describe existing practices, aiming to assure the correctness, usability, and efficiency of severe accident management through the use of desk-top exercises, drills, simulators, field training, and analytical simulations. The product will be a status report on the best and recommended practices on the use of analytical tools to inform severe accident management actions.

Finally, WGAMA, in cooperation with other NEA activities, is performing a benchmark of fast-running software tools used to estimate fission product releases during accidents in nuclear power plants. The benchmarking is intended to identify strengths and weaknesses of the tools used for source term prediction and identify the knowledge gaps, as well as to propose improvements in modelling capabilities. The product will be a report summarizing and comparing the software examined, scenarios used for benchmarking, results of benchmark exercises, and identifying areas of improvement in modelling and software capabilities.

Communications Activities

The NRC staff held over 25 public meetings from September 2013 to February 2014 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 approximately once a month 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 Japan Lessons-Learned Project Directorate's (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 posting on the public website a plain language document explaining the current water situation

at Fukushima Dai-ichi. Additionally, the JLD has used the NRC's public blog 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.

**Charter for the Japan Lessons-Learned Steering Committee**
**March 2014**

Objective

The purpose of this charter is to define the scope, roles, and responsibilities of the Japan Lessons-Learned Steering Committee (hereafter "Steering Committee") as the U.S. Nuclear Regulatory Commission (NRC) staff continues to address lessons-learned from the March 11, 2011, nuclear accident in Japan. This charter supersedes the original Steering Committee charter approved by the Commission on October 19, 2011, in Staff Requirements Memorandum (SRM)-SECY-11-0117 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112920034).

Background

The NRC staff established the Steering Committee in accordance with the charter defined in SRM-SECY-11-0117 to oversee the longer-term review of the agency's assessment and response to the accident at the Fukushima Dai-ichi nuclear power facility in March 2011. The Steering Committee helped to define issues, establish plans, and guide the initial implementation of NRC actions related to the accident. SECY-13-0095, "Fourth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami" (ADAMS Accession No. ML13213A304), described the transitioning of many issues to the NRC line organizations, defined several items requiring decisions by the Steering Committee, and proposed to dissolve the Steering Committee Charter. In its SRM related to SECY-13-0095, the Commission instructed the staff to modify the Charter and submit it to the Commission for approval.

This Charter was prepared and approved by the Commission to provide the appropriate structure for the Steering Committee until such time as its activities are closed.

Organization

The overall review efforts to identify and resolve lessons-learned from the Fukushima Dai-ichi accident will be led by a Steering Committee.

The Steering Committee will consist of the following members:

- Deputy Executive Director for Reactor and Preparedness Programs (Chair)
- Director, Office of Nuclear Reactor Regulation (NRR)
- Director, Office of Nuclear Regulatory Research
- Director, Office of New Reactors
- Director, Office of Nuclear Security and Incident Response
- Director, Office of Nuclear Material Safety and Safeguards
- Director, Office of Federal and State Materials and Environmental Management Programs
- Regional Administrator, Region I
- Regional Administrator, Region II

As appropriate, the Steering Committee may assign activities to specific line organizations to develop or complete plans to resolve specific issues. A Japan Lessons-Learned Project Directorate, within NRR, will support the Steering Committee, coordinate activities, and provide periodic reports to the Commission.

Scope

In SECY-13-0095, dated September 6, 2013, the NRC staff described how the majority of lessons-learned activities have been transitioned to line organization oversight. However, the paper also noted how the Steering Committee determined that four issues should remain under its oversight:

(1) Periodic re-confirmation of external hazards (Tier 3);
(2) Reliable hardened vents for containment designs other than boiling water reactor Mark I and Mark II (Tier 3);
(3) Hydrogen control and mitigation (Tier 3); and
(4) Applicability of lessons-learned to other NRC-regulated facilities (not within a Tier).

These four issues establish the primary scope of the Steering Committee under this revised charter. However, in addition to overseeing these four issues and managing their transition to the appropriate line organizations, the Steering Committee shall also stay apprised of the transitioned activities to ensure adequate focus is maintained on implementation; and, to continue interactions with the industry's Steering Committee to resolve issues at an executive level.

Roles and Responsibilities

The Steering Committee establishes overall direction for the NRC staff in addressing the lessons-learned from the Fukushima Dai-ichi accident, assessing emerging issues, and interfacing with stakeholders. As described above, the Steering Committee will continue to oversee several specific lessons-learned activities until those issues progress to a point where they can transition to the line organizations. The Steering Committee's role is to assess, provide direction, and help the staff overcome challenges on the issues within its scope. The Steering Committee will also determine when an activity is ready for transition to line organization oversight. The Steering Committee interacts with industry executives, organizations, and other stakeholders regarding the development and implementation of the NRC's activities related to lessons-learned from the accident and subsequent studies.

At the discretion of the Chair, and in consultation with other members, the composition of the Steering Committee can be modified to suit the evolving needs of the lessons-learned activities under its purview. Furthermore, the Chair has the authority to dissolve the Steering Committee when it determines that all four remaining lessons-learned activities under its oversight have been transitioned to the line organizations, implementation of lessons-learned activities is proceeding without major issues, and interactions with the industry Steering Committee are no longer needed. The Chair shall notify the Commission when a determination to dissolve the Steering Committee has been made, and such notification would constitute closure of this Charter. Notwithstanding the eventual dissolution of the Steering Committee and in accordance with normal agency practice, any proposed regulatory actions or policy matters related to Japan lessons-learned activities would continue to be brought to the Commission's attention.

The Japan Lessons-Learned Project Directorate (or its eventual derivative organization) will continue to support the Steering Committee as needed. Support to the Steering Committee includes arranging meetings, coordinating the development of policy or technical proposals, and preparing routine status reports. Other agency organizations are also expected to continue to support the Steering Committee as lessons-learned issues might necessitate. Such intra-agency support could include legal, international, financial, Congressional, or public affairs advice. If the need for the Japan Lessons-Learned Project Directorate extends after the activities of the Steering Committee are closed, its makeup and functions would be determined by the Director of NRR.

Expected Products and Schedule

The activities and decisions of the Steering Committee are documented in agency records such as meeting summaries, memoranda and letters, and Commission papers. Action items specific to lessons-learned activities are assigned directly to line organizations within the agency, and responsibility for delivering on those items will remain within those organizations' normal management hierarchy. It should also be noted that Steering Committee members might become involved in issues outside the scope of this charter, but that involvement would be within their normal line management capacity. For example, the Director of NRR will continue to be involved with matters related to implementation of the Fukushima Orders at operating reactors regardless of the existence of the Steering Committee. As a result, the criterion for closing this Charter and disbanding the Steering Committee is a determination by the Steering Committee that (1) the four remaining lessons-learned activities have been transitioned to line organizations, (2) major implementation issues are resolved or adequately managed within the line organizations, (3) routine executive-level meetings with industry are no longer needed, and (4) the Commission has been notified of these determinations.

**Proposal to Consolidate Post-Fukushima Rulemaking Activities**

On January 28, 2014, the U.S. Nuclear Regulatory Commission's (NRC's) Fukushima Steering Committee endorsed an NRC staff proposal for integrating related post-Fukushima rulemakings into a single rulemaking activity. Specifically, the Steering Committee endorsed consolidating, into a single rulemaking activity, the Station Blackout Mitigation Strategies rulemaking (Near-Term Task Force (NTTF) Recommendations 4 and 7) with the Onsite Emergency Response Capabilities rulemaking (NTTF Recommendation 8), as well as the portions of NTTF Recommendations 9, 10, and 11 that are already being addressed as part of the Mitigating Strategies Order (NRC Order EA-12-049) implementation (NTTF Recommendation 4.2), the Onsite Emergency Response Capabilities rulemaking, and items already being implemented by industry.

During development of the rulemakings, the NRC staff identified that the Onsite Emergency Response Capabilities rulemaking cannot be issued before the Station Blackout Mitigation Strategies rulemaking because it will need to reference the station blackout mitigation strategies requirements. The staff had also previously identified several areas of overlap between the two rules. The direct links between these post-Fukushima rulemakings imply that, from a practical view, they should be combined into a single rulemaking package. The staff believes that it is more efficient to combine the rulemakings during the development of the proposed rules rather than during the final stage of the rulemaking process. Consolidating the rulemaking will produce a more coherent framework and reduce the potential for inconsistencies between the related actions. Additionally, consolidation into a single rulemaking adds clarity for internal stakeholders as they review and concur on a single rulemaking package, and reduces impact on external stakeholders as they will be able to comment on a single rulemaking package. While the Station Blackout Mitigation Strategies requirements and the Onsite Emergency Response Capabilities would be addressed in the same rulemaking, the requirements related to Onsite Emergency Response Capabilities, while retaining the current scope, would expand the capabilities of both the Emergency Operating Procedures and the Severe Accident Management Guidelines, that is, they would continue to address a range of accident sequences, such as, loss-of-coolant accidents in addition to station blackout, but with greater capabilities to maintain or restore key functions.

The schedule for a consolidated rulemaking approach will be made consistent with the current overall schedule for the ongoing industry implementation of NRC Order EA-12-049 (i.e., two refueling outages following August 2012 but no later than December 2016). Currently, the Station Blackout Mitigation Strategies proposed rule is due to the Commission by June 30, 2014, and the Onsite Emergency Response Capabilities proposed rulemaking is due July 25, 2014. The current final rule schedule for Station Blackout Mitigation Strategies is to deliver the final rule to the Commission by December 27, 2016, and the Onsite Emergency Response Capabilities final rule is currently due March 11, 2016. Pending Commission approval of the NRC staff's plans, the staff would deliver the proposed consolidated rule to the Commission by December 31, 2014. A schedule for the final consolidated rulemaking would continue to meet the established milestone for the final Station Blackout Mitigation Strategies rule, and be delivered to the Commission on December 27, 2016.

<u>Background</u>

The NRC staff has recognized that there are areas of overlap between the Station Blackout Mitigation Strategies rulemaking (stemming from NTTF Recommendations 4 and 7) and the Onsite Emergency Response Capabilities rulemakings (stemming from NTTF Recommendation

8) since the inception of these actions. As an example, the staff recognized that there were areas of overlap including drills, exercises, and training requirements for which the staff understood the need for extensive coordination between the two rulemakings. In addition, the staff recognized that the Onsite Emergency Response Capabilities rulemaking effort would, as part of its requirements, integrate into its procedures, guidance and strategies, the mitigation strategies that derive from the requirements of Order EA-12-049 (i.e., it would need to integrate the emergency operating procedures, severe accident management guidelines, extensive damage management guidelines, and the newly imposed station blackout mitigation strategies), and as such there is a direct link between the two rulemaking efforts.

In fact, this direct link also means that from a practical regulatory and legal standpoint, the Onsite Emergency Response Capabilities rulemaking cannot be issued in final form prior to the Station Blackout Mitigation Strategies rulemaking because the Onsite Emergency Response Capabilities rulemaking needs to reference the station blackout mitigation strategies requirements, which do not yet exist in the Code of Federal Regulations. As such, the related post-Fukushima rulemakings will need to be combined at the final rule stage. The NRC staff recognizes that it is most efficient to combine the rulemakings upfront during the proposed rule stage. Pursuing a single, consolidated rulemaking not only makes more efficient use of staff resources but also enables better external stakeholder understanding of the proposed requirements during the public comment period.

Based on recent public interactions, that are discussed subsequently, it is clear to the NRC staff that industry is implementing the mitigation strategies imposed by Order EA-12-049 into the plant emergency operating procedures and severe accident management guidelines in an integrated manner that effectively merges these regulatory actions. The EA-12-049 requirements are intended to provide additional capability to mitigate beyond-design-basis external events, and are founded on an approach that is functionally-based and intended to maintain or restore core cooling, containment, and spent fuel pool cooling functional capabilities following beyond-design-basis external events. The strategies and guidance are being developed and implemented assuming an onsite surrogate condition of an extended loss of alternating current power and loss of normal access to the ultimate heat sink. The net result is a set of strategies that provide licensees with additional capability, and are flexible and can be adapted to damage states that might occur following a beyond-design-basis external event. The mitigation strategies are deployed out of the emergency operating procedures (i.e., consistent with the objective of maintaining or restoring the key safety functions prior to core damage) when the functional capabilities are lost (i.e., loss of core cooling, loss of spent fuel pool cooling, loss of containment function). However, the industry is also identifying where these same strategies (or similar strategies that might use this equipment) should be reflected in the severe accident management guidelines (i.e., post core damage).

For the reasons described above, the NRC staff considered whether it would be more efficient and effective to manage the associated rulemakings in a more integrated manner (e.g., as a single rulemaking package) with the intent of aligning the regulatory framework with actual order implementation. The staff concluded that a consolidated rulemaking effort:

1. Aligns with industry implementation efforts, and should result in a more coherent and understandable regulatory framework. Given the complexity of these requirements and their associated implementation, the NRC staff concludes this is an important objective for the regulatory framework. The staff notes that consolidating the rules simplifies industry implementation of the final rule; and since the consolidated rulemaking is on the same final rule schedule as station blackout mitigation strategies, the resulting

implementation dates of the requirements is essentially unchanged. (Should the rulemaking activities be kept separate, staff will need to address the disparate final rule due dates for the NTTF Recommendation 8 and Station Blackout Mitigation Strategies rulemakings, with the highly likely outcome of the NTTF Recommendation 8 final rule effective date occurring after the issuance of the Station Blackout Mitigation Strategies final rule).

2. Reduces the potential for inconsistencies and complexities between the related rulemaking actions that can occur when the efforts are pursued in separate rulemakings (e.g., no cross-referencing between rulemaking packages would be necessary if the related efforts are combined).

3. Facilitates better understanding of the proposed requirements for both internal and external stakeholders. Consolidating the rulemaking efforts will reduce NRC staff efforts needed to process the rulemaking packages, and will make the internal review and concurrence efforts more efficient. Similarly, consolidating the rulemaking efforts will lessen the impact on external stakeholders who would otherwise need to review and comment on multiple rulemakings while cross-referencing both proposed rules and sets of guidance documents.

4. Allows for the streamlining of internal review committees that manage and direct the rulemaking efforts, which could also include Advisory Committee on Reactor Safeguards reducing the number of subcommittees needed to review multiple post-Fukushima rulemakings.

In short, a consolidated rule should enable NRC staff and management to better use limited resources in a more efficient manner to produce a more coherent and understandable regulatory framework. The staff understands that different portions of the consolidated rulemaking will have different backfitting justifications under 10 CFR 50.109, and accordingly portions of the consolidated rulemaking may not be supportable in accordance with the provisions of 10 CFR 50.109. The staff will also need to determine whether the consolidated rulemaking will be inconsistent with any applicable issue finality provisions in 10 CFR Part 52. As such, the staff intends to construct the consolidated rulemaking with this in mind, and enable any requirements that do not meet the backfitting or issue finality requirements to be bifurcated from the consolidated rulemaking at the final rule stage. The staff will seek input from external stakeholders during the proposed rule comment period regarding backfitting considerations as part of implementing the cumulative effects of regulations process enhancements.

Accordingly we recommend that the Commission agree to consolidate the two rulemaking activities.

Scope of the Consolidated Rulemaking

The NRC staff recommends that the scope for this consolidated rulemaking address Commission direction and align with order implementation activities underway by industry. The staff notes that as industry implements the mitigating strategies order (EA-12-049), some of the NTTF recommendations pertaining to emergency preparedness are already being addressed. Accordingly, staff recommends that the scope of the consolidated rulemaking effort include:

1. All the requirements currently envisioned to be part of the station blackout mitigation strategies rulemaking, directed by COMSECY-13-0002, “Consolidation of Japan

Lessons Learned Near-Term Task Force Recommendations 4 and 7 Regulatory Activities." This rulemaking stems from NTTF Recommendations 4 and 7, and is intended, in part, to make the requirements of EA-12-049 (and equivalent license conditions) generically-applicable (WITS 201100263, WITS 201100264).

2. All the requirements currently envisioned to be part of the Onsite Emergency Response Capabilities rulemaking. This rulemaking, which stems from NTTF Recommendation 8 of the NTTF report, was directed by SRM-SECY-11-0137 "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned" and its scope is being determined by the rulemaking process, which to date includes the issuance of a final regulatory basis. Note that this portion of the consolidated rulemaking, which has as part of its scope the consideration of command and control issues, would also address the NTTF Recommendation 10.2 concerning command and control and the qualifications of decision-makers (WITS 201100267, WITS 201100268). Command and control is being addressed in industry guidance through the Nuclear Energy Institute (NEI) 14-01, "Emergency Response Procedures and Guidelines for Extreme Events and Severe Accidents," Rev. 0, which is currently under development.

3. Numerous emergency preparedness actions are being addressed as part of this rulemaking. They are being implemented in conjunction with the implementation of EA-12-049, and through the development of guidance supporting the Recommendation 8 portion of the consolidated rulemaking. Specifically those regulatory actions, the associated NTTF Recommendations from which they stem, and the current vehicle being used to address those issues are:

    a. Staffing and communications issues stemming from NTTF Recommendation 9.3, and also discussed in NTTF Recommendations 9.1 and 9.2: Currently being addressed through EA-12-049 implementation guidance; specifically NEI 12-01 which is referenced in NEI 12-06 which is endorsed by the NRC in JLD-ISG-12-01.

    b. Facilities and equipment issues stemming from NTTF Recommendation 9.3, and also discussed in NTTF Recommendations 9.1 and 9.2: Currently being addressed through EA-12-049 implementation guidance and also NEI 13-06,"Enhancements to Emergency Response Capabilities for Beyond Design Basis Accidents and Events," Rev.0, guidance currently under development.

    c. Multi-Unit Dose Assessment issues stemming from NTTF Recommendation 9.3, and also discussed in NTTF Recommendation 9.1: Being addressed through NEI 13-06 guidance currently under development. Industry has committed to implementation of this capability by December 31, 2014.

    d. Training and exercise issues stemming from NTTF Recommendation 9.3, and also discussed in NTTF Recommendations 9.1 and 9.2: Currently being addressed through EA-12-049 implementation guidance and also NEI 13-06 guidance currently under development.

    e. Onsite emergency resources to support multiunit with station blackout including the need to deliver equipment to the site with offsite infrastructure

degraded stemming from NTTF Recommendation 11.1; addressed by EA-12-049 and supporting guidance.

This consolidated rulemaking would address, either in requirements or through supporting implementation guidance, all of the recommendations in NTTF Recommendations 4, 7, 8, 9.1, 9.2, 9.3 with one exception (maintenance of Emergency Response Data System (ERDS) capability throughout the accident), 10.2, and 11.1. The NTTF Recommendations in 9.1, 9.2, 10.2, and 11.1 were prioritized as Tier 3 regulatory actions in SECY-11-0137 because they involved rulemaking or other regulatory considerations that could be delayed while higher priority Tier 1 and Tier 2 actions were pursued.

In addition, the NRC staff is proposing to include the recommendation in NTTF Recommendation 9.4 to modernize ERDS as part of this consolidated rulemaking. This action differs from the above list of regulatory actions because ERDS is not an essential component of a licensee's capability to mitigate a beyond-design-basis external event. However, ERDS is important for communication purposes between the licensee and the NRC, and in some situations, other external stakeholders. Additionally, the modernization has been voluntarily completed by industry, and it can readily be incorporated into this rulemaking. The current intent would be to remove technology-specific references in 10 CFR Part 50, Appendix E, Section VI, "Emergency Response Data System."

Schedule for the Consolidated Rulemaking

The NRC staff recommends that the schedule for consolidated rulemaking remain consistent with the current schedule for providing the final station blackout mitigation strategies rulemaking to the Commission. Specifically, the staff proposes to provide the final consolidated rulemaking package to the Commission on December 27, 2016.

In order to align the proposed rule with current progress in industry with implementation of EA-12-049, including the integration of the mitigation strategies into the plant procedures, guidance, and strategies, the staff proposes that the proposed consolidated rulemaking be provided to the Commission by December 19, 2014. This will enable insights from the ongoing EA-12-049 implementation (now occurring later in 2014 than previously envisioned) to be better considered within the consolidated proposed rule. This schedule also accounts for past and potential future delays in the development of key industry guidance that supports the Onsite Emergency Response Capabilities portion of the single rulemaking. Most importantly, the December 31, 2014, date for providing the proposed rule to the Commission provides sufficient time for Commission deliberation on the proposed rule package and subsequent public comment period, such that the final rule date of December 2016 can continue to be met.

Note, the above proposed schedule would revise the current schedules for the station Blackout Mitigation Strategies rulemaking and the Onsite Emergency Response Capabilities rulemaking as follows:

1. Current proposed Station Blackout Mitigation Strategies rulemaking: Due to Commission on June 30, 2014;
2. Current proposed Onsite Emergency Response Capabilities rulemaking: Due to Commission on July 25, 2014.

Proposed consolidated rule schedule: Due to Commission on December 19, 2014:

1. Current final Station Blackout Mitigation Strategies rulemaking: Due to Commission on December 16, 2016;
2. Current final Onsite Emergency Response Capabilities rulemaking: Due to Commission on March 11, 2016.

Proposed final consolidated rule schedule: Due to Commission on December 16, 2016.

Public Interactions

Consolidation of the Station Blackout Mitigation Strategies rulemaking and the Onsite Emergency Response Capabilities rulemaking was recently discussed in multiple public interactions. Notably, at a public meeting held on November 19, 2013, it became clear that the implementation of the EA-12-049 mitigation strategies was occurring in both the onsite emergency procedures and in the severe accident management guidelines. It was also clear that the industry's objective was for a full, integrated implementation. In effect, this integrated implementation by industry merges the station blackout mitigation strategies and the onsite emergency response capabilities requirements, and it reflects the industry's desire to do the implementation "one time." During the meeting, industry representatives suggested that a rulemaking framework aligning with the actual ongoing implementation by industry might result in a more coherent and understandable set of requirements. There was general agreement by meeting attendees with the concept of consolidation, and as a result the NRC staff indicated it would explore the idea further.

On February 10, 2014, the NRC staff held a public Joint Steering Committee meeting between NRC senior managers and NEI and industry representatives to discuss the status of Fukushima lessons-learned, including rulemakings. The NRC representatives explained that the staff plans to propose to the Commission to consolidate, into a single rulemaking activity, the Station Blackout Mitigation Strategies rulemaking with the Onsite Emergency Response Capabilities rulemaking, as well as the portions of NTTF Recommendations 9, 10, and 11 that are already being addressed as part of the mitigating strategies order (NRC Order EA-12-049) implementation (NTTF Recommendation 4.2), the Onsite Emergency Response Capabilities rulemaking, and items already being implemented by industry. In response to questions from the industry, NRC representatives clarified that this would not result in one rule; rather, that processing these rulemakings together in the same package would ensure an integrated rulemaking. Industry representatives noted that there was no formal industry position at that time on the prospect of combining these rulemakings, but that they would be discussing the topic internally further. Industry representatives further expressed their view that it is important for the NRC staff to recognize that different portions of the consolidated rulemaking would have different bases with respect to the backfitting justification that would support any new requirements. The NRC committed to holding further discussions with the industry and other external stakeholders prior to making a formal proposal to the Commission.

Consistent with this commitment, the NRC staff discussed the issue of rulemaking consolidation on March 4, 2014, at a public meeting, and additionally used a conceptual version of the draft rule language as a vehicle to support better understanding for how these rulemaking efforts might be merged. The advantages of consolidation were discussed and it was clearly denoted to stakeholders that different portions of the rulemaking would have different backfitting bases (e.g., portions that are making mitigation strategies generically-applicable would be considered

necessary for adequate protection consistent with EA-12-049, whereas aspects that relate to onsite emergency response capabilities may require a different backfitting justification).

Finally, the NRC staff held a public teleconference on the consolidated rulemaking approach on March 6, 2014. The staff held this teleconference at industry's request to allow industry to provide their perspective following their March 5, 2014, Executive Steering Committee Meeting.

During the teleconference, the NRC staff suggested that industry consider providing a letter expressing their views on rulemaking consolidation. NEI representatives agreed, and by letter dated March 7, 2014 (ADAMS Accession No. ML14069A472), provided their views regarding rulemaking consolidation. To summarize the March 7, 2014 letter, NEI and industry support the NRC staff's proposal to consolidate rulemaking activities. Industry agreed with the NRC staff that, given the nature of the proposed rulemaking approach, it will be very important to maintain discipline in the scope and applicability of new requirements, and encouraged the staff to identify specific methods for accomplishing these goals while the proposal is still in the "concept" stage. Industry believes that a consolidated approach to rulemaking would facilitate a more efficient use of staff and industry resources and promote better alignment between final rule elements and related guidance. Industry offered the following additional detailed comments:

1. The rulemaking should codify all Fukushima-related NRC Orders, including EA-13-109 (the Order related to reliable hardened containment vents capable of operation under severe accident conditions), which are already in the implementation phase to avoid unnecessary rework. The rulemaking should be performance-based, and implementation in accordance with NRC-endorsed industry guidance should result in full compliance;

2. All rule requirements should be assessed in accordance with 10 CFR 50.109, the Backfit Rule;

3. Beyond-design-basis-related requirements should be separate and distinct from regulations that address design basis and safety-related matters to the degree practicable (e.g., design-basis structure, system, and component requirements, operator training, emergency preparedness, etc.);

4. The rulemaking should enable subsequent development of a clear, understandable inspection regime;

5. Change control for beyond-design-basis activities should be under the licensee's purview and subject to NRC inspection;

6. Training needs should be determined through the Systematic Approach to Training process;

7. Implementation dates for requirements should consider the cumulative effects of regulation.

In summary, through multiple public interactions, the NRC staff has received strong external stakeholder support for the concept of combining these related lessons-learned activities.