

Six-Month Status Update on Charter Activities—February 2012–July 2012

In the staff requirements memorandum (SRM) dated October 19, 2011, for SECY-11-0117, “Proposed Charter for the Longer-Term Review of Lessons Learned from the March 11, 2011, Japanese Earthquake and Tsunami,” the Commission approved the staff’s proposed “Charter for the Nuclear Regulatory Commission [NRC or the staff] Steering Committee To Conduct a Longer-Term Review of the Events in Japan” (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112920034). The charter requires, among other things, status updates every 6 months on the work conducted under the charter. The staff provided its first 6-month status update in SECY-12-0025, “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tōhoku Earthquake and Tsunami,” dated February 17, 2012 (ADAMS Accession No. ML12039A103). This is the staff’s second 6-month status update.

Update of Near-Term Review Activities

Results of Bulletin 2011-01

On May 11, 2011, following the events at the Fukushima Dai-ichi Nuclear Power Station after the March 11, 2011, earthquake and tsunami, the NRC issued Bulletin 2011-01, “Mitigating Strategies,” to comprehensively verify licensee compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(hh)(2) and to obtain information associated with licensee mitigating strategies (ADAMS Accession No. ML111250360).

The results of analysis of the responses to Bulletin 2011-01 are informing the development of the interim staff guidance (ISG) for the March 12, 2012, Order EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” and will be used as an input to the station blackout (SBO) rulemaking pursuant to Near-Term Task Force (NTTF) Recommendation 4.1.

Design Certifications and Combined Licenses

For design certifications and combined licenses that have been granted (e.g., combined licenses for Vogtle Electric Generating Plant Units 3 and 4, and Virgil C. Summer Nuclear Station Units 2 and 3), the staff will consider what rulemaking, orders, requests for information, or other regulatory action may be necessary as a result of Tier 3 plans described in this paper. For design certification and combined license applications that are under staff review, the staff plans to assure that the Commission-approved Fukushima actions are addressed prior to certification or licensing. The staff will request all combined license applicants to provide the information required by any order and request for information letter resulting from the plans described in this paper, as applicable, through the review process. New reactor and operating reactor staff are coordinating their regulatory positions to assure that the resolutions proposed by new reactor design certification and combined license applicants are not in conflict with those proposed and accepted by the staff for operating reactors.

For reactor design certification or license applications (e.g., construction permit, operating license, combined license) not yet submitted, the staff expects those applicants to address the

Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable.

Fuel Cycle Facilities

On September 30, 2011, the staff issued temporary instruction (TI) 2600/015, "Evaluation of Licensee Strategies for the Prevention and/or Mitigation of Emergencies at Fuel Facilities" (ADAMS Accession No. ML111030453). From December 2011 through May 2012, the staff conducted TI-related inspection activities at seven operating fuel cycle facilities representing facilities licensed under 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," 10 CFR Part 40, "Domestic Licensing of Source Material," and 10 CFR Part 76, "Certification of Gaseous Diffusion Plants." The inspection results have been, or will be, documented in quarterly facility-specific inspection reports. As a result of the TI inspection activities, the staff identified unresolved items, under the current Part 70 requirements and the current licensing basis, and will further evaluate whether licensees are in compliance regarding accident sequences that are a result of certain natural phenomena events. The staff is currently evaluating the TI results to determine appropriate NRC regulatory actions to address any generic issues. Staff plans to present a proposed path forward to the Fukushima Steering Committee in the late summer and will keep the Commission informed as appropriate.

As directed in the March 9, 2012, SRM for SECY-12-0025, the staff will inform the Commission of any proposed changes in licensing basis for any of the fuel cycle facilities, and the staff will continue to evaluate, as noted in SECY-11-0137, "Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011, the applicability of power reactor lessons learned to fuel cycle facilities and to take appropriate actions. Additional information will be provided in the next 6-month status update.

Research and Test Reactors

From March through May 2012, NRC staff participated in four international meetings that were specifically or partially focused on the resulting impacts on research and test reactors from the events at the Fukushima Dai-ichi Power Station. NRC staff attended two International Atomic Energy Agency (IAEA) Fukushima-related meetings, a joint meeting of the European Research Reactor Conference and the International Group on Research Reactors, and Nuclear Energy Agency (NEA), Safety of Research Reactor Task Group (SORRTG) meeting. The purpose of the NRC participation was to gain an understanding of actions being taken by the international operators and regulators of research and test reactors, review and contribute to guidance under development by the IAEA, and assist the NEA in the identification of work needed to enhance research reactor safety as requested by the Committee on Nuclear Regulatory Activities (CNRA).

The staff acquired a general understanding of the actions taken and the results obtained by research reactor operators and regulators. Overall, international approaches and methodologies employed for the post-Fukushima re-assessment of research reactor safety shared some commonalities but varied significantly in their implementation between countries. To address the variation in the post-Fukushima assessment of research reactors, both the NEA and the IAEA have undertaken additional actions. The NEA SORRTG developed a proposal for work that would develop specific criteria, using a graded approach, for the inclusion of a

research reactor facility in the assessment and peer review process, and for the development and implementation of a simplified peer review framework. The IAEA is in the process of developing a document to provide how-to guidance to Member States on the performance of complementary safety assessments.

Other NRC-Regulated Facilities

The staff remains primarily focused on implementation of the NTTF recommendations at power reactor facilities. The staff will begin assessing the applicability of the recommendations to other regulated facilities as resources become available.

Ongoing Tier 1 and 2 Activities

In SECY-11-0137, the staff provided, for each NTTF recommendation prioritized as Tier 1 or Tier 2, the staff's assessment and the basis for its prioritization, the staff's recommendation, unique implementation challenges and the expected schedules and milestones. Additional Tier 1 and Tier 2 activities were identified in SECY-12-0025. A status update on these activities appears below.

Immediately Effective Orders

On March 12, 2012, the staff issued three immediately effective orders to power reactor licensees and holders of construction permits.¹ The staff issued these orders in response to SRM-SECY-12-0025:

- EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events"
- EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents"
- EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation"

All licensees consented to the orders, and none requested a hearing. However, on April 18, 2012, an Atomic Safety and Licensing Board Panel (ASLBP) was established to preside over a proceeding that concerns requests for hearing submitted by Pilgrim Watch (April 2, 2012), and co-petitioner Beyond Nuclear (April 3, 2012) challenging EA-12-050 and EA-12-051. The ASLBP issued order LBP-12-14 on July 10, 2012 denying the petitions for hearing.

¹ On March 30, 2012, Order EA-12-051, and license conditions that addressed the applicable requirements of EA-12-049, were issued with the combined license for Virgil C. Summer Units 2 and 3.

On May 31, 2012, the staff issued draft interim staff guidance for all three orders for a 30-day public comment period:

- JLD-ISG-2012-01, "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. ML12146A014)
- JLD-ISG-2012-02, "Compliance with Order EA-12-050, Reliable Hardened Containment Vents," (ADAMS Accession No. ML12146A371)
- JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," (ADAMS Accession No. ML12144A323)

The public comment period closed on July 7, 2012, and the staff is currently reviewing comments. The staff plans to issue final ISGs for each of these orders by the end of August 2012. These final ISGs will provide details on acceptable approaches for complying with the requirements of the orders.

Request for Information

On March 12, 2012, the staff issued a request for information (RFI) to power reactor licensees and holders of construction permits requiring addressees to provide further information to support the NRC staff's evaluation of regulatory actions to be taken in response to lessons learned from Japan's March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami.² The request addressed the following:

1. Methods and procedures for seismic and flooding hazard walkdowns that will identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program and for verifying the adequacy of the monitoring and maintenance procedures.
2. Reevaluations of seismic and flooding hazards at operating reactor sites that will facilitate NRC's determination of whether design bases for structures, systems and components important to safety should be updated. The information will also be used to address Generic Issue 199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States," dated June 9, 2005, and Generic Issue 204, "Flooding of Nuclear Power Plant Sites Following Upstream Dam Failure," dated February 29, 2012.
3. The adequacy of power supplies for communication systems, and the sufficiency of emergency preparedness staffing to fill all necessary positions during a multi-unit event.

² The applicable parts of this RFI relating to emergency preparedness were issued to Virgil C. Summer Units 2 and 3 on April 13, 2012.

Seismic and Flooding Hazard Walkdowns

By letters dated May 31, 2012, the staff issued its endorsement of industry guidelines for performing seismic and flooding hazard walkdowns:

- Letter from Mr. David L. Skeen (NRC) to Mr. Adrian P. Heymer (NEI), "Endorsement of Nuclear Energy Institute (NEI) 12-07, 'Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features,'" (ADAMS Accession No. ML12144A142).
- Letter from Mr. David L. Skeen (NRC) to Mr. Adrian P. Heymer (NEI), "Endorsement of Electric Power Research Institute (EPRI) Draft Report 1025286, 'Seismic Walkdown Guidance,'" (ADAMS Accession No. ML12145A529).

Seismic and Flooding Hazard Reevaluation

The staff is continuing its efforts to develop guidance for the seismic and flooding reevaluations. As of the date of this paper, the staff had held over seven public meetings, and is on track to issue an endorsement of the NEI guidance and its own guidance, as needed, in November 2012.

The March 12, 2012, RFI stated that the due date for submitting reevaluated flooding hazards would be 1, 2, or 3 years from the date of the RFI, based on the staff's prioritization. To achieve this schedule, the RFI stated that the NRC staff would issue its prioritization list within 60 days of the date of the RFI. The staff issued its final prioritization by letter dated May 11, 2012 (ADAMS Accession No. ML12097A509).

EP Communication and Staffing

The staff held three public meetings on February 7, March 5, and April 10, 2012, to discuss development of an ISG for this information request. By letter dated May 15, 2012, the staff concluded that NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," provides an acceptable approach to responding to the staff's March 12, 2012, RFI (ADAMS Accession No. ML12131A043).

Consideration of Other Natural External Hazards

In SECY-12-0025, in response to comments from the Advisory Committee on Reactor Safeguards (ACRS) and as a result of specific language included in the Consolidated Appropriations Act, 2012 (Public Law 112-74), the staff identified a new Tier 2 regulatory action regarding licensee reevaluations for natural external hazards other than seismic and flooding hazards.

The staff expects to begin preparation of an RFI on this topic as resources become available, following implementation of Tier 1 regulatory actions related to seismic and flooding hazard walkdowns and reevaluations.

Probabilistic Risk Assessment Methodology for Seismically-Induced Fires and Floods

In SRM-SECY-11-0137, dated December 15, 2011, the Commission directed the following:

The staff should initiate a PRA methodology to evaluate potential enhancements to the capability to prevent or mitigate seismically induced fires and floods as part of Tier 1 activities. The implementation of NTTF Recommendation 3 would still remain in Tier 3. This methodology is a necessary prerequisite for the implementation of this recommendation. In addition, insights gained from the development of this methodology will be useful to implementation of other NTTF recommendations. The next 6-month status update to the Commission, as required by the staff requirements memorandum on SECY-11-0117, should include a discussion of the resource estimate and schedule to develop the PRA methodology.

Enclosure 8 to SECY-12-0025 provides the staff's resource estimate and schedule to initiate a probabilistic risk assessment (PRA) methodology. The staff's implementation of NTTF Recommendation 3 remains a Tier 3 regulatory action, and Enclosure 3 to this paper presents a Tier 3 program plan. As noted in the program plan, the staff has determined that it needs a more complete understanding of plant-specific hazards, vulnerabilities, mitigation capabilities, and potential post-Fukushima licensing basis changes before substantial resources are dedicated to the evaluation of seismically induced fires and floods.

Advance Notice of Proposed Rulemaking for Station Blackout

In SRM-SECY-11-0137, the Commission approved the staff's proposed prioritization of NTTF Recommendation 4.1 on strengthening SBO mitigation capability and directed the staff to initiate a rulemaking in the form of an advanced notice of proposed rulemaking (ANPR). The SBO ANPR was published in the *Federal Register* (FR) on March 20, 2012 (77 FR 16175), which began the process of considering amendments to the NRC's regulations that address SBO.

The staff held a public meeting on April 25, 2012. The purpose of the meeting was to provide stakeholders with more information on the ANPR, give the public a chance to ask questions, and provide an opportunity to exchange information. The public comment period closed on May 4, 2012. The staff will closely monitor implementation of Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," including feedback from the proposed fall 2012 workshops with industry. The staff is also aware of significant ACRS interest in the rule and will coordinate accordingly.

As noted in the SBO ANPR, the staff does not intend to respond in detail to the information provided. If the NRC ultimately develops a proposed rule on SBO requirements, any notice of proposed rulemaking will provide an opportunity to comment on the proposed rule, and the NRC will document its responses to any comments received in accordance with that notice. If the NRC develops supporting guidance for a proposed rule, stakeholders will have an opportunity to provide feedback on the guidance as well.

ANPR on Integrating On-site Emergency Response Procedures

In SRM-SECY-11-0137, the Commission approved the staff's proposed prioritization and recommendation in NTTF Recommendation 8 on strengthening and integrating onsite emergency response capabilities such as emergency operating procedures, severe accident mitigation guidelines, and extensive damage mitigation guidelines. The Commission approved the staff's plans to initiate a rulemaking in the form of an ANPR. The staff held a public meeting on February 15, 2012, to obtain public feedback on the regulatory process and schedule. On April 18, 2012, the staff published an ANPR (77 FR 23161) to begin the process of considering amendments to the NRC's regulations that address onsite emergency response capabilities.

The NRC held a public meeting on May 23, 2012. The purpose of the meeting was to provide stakeholders with more information on the ANPR, give the public an opportunity to ask questions, and provide an opportunity to exchange information. The public comment period closed on June 18, 2012. A draft regulatory basis will be prepared by December 2012, with a final regulatory basis scheduled to be completed by May 2013. The proposed rule is due July 2014, and the final rule in February 2016.

As noted in the ANPR, the staff does not intend to provide detailed comments on the information provided in response to the ANPR. Consistent with the development of a proposed rule, any notice of proposed rulemaking will provide an opportunity to comment on the proposed rule, and the NRC will document its responses to any comments received in accordance with that notice. If supporting guidance is needed the staff would also provide stakeholders an opportunity to provide feedback on the guidance.

Spent Fuel Pool Instrumentation and Makeup Capability

In SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated July 12, 2011, the NTTF recommended the following with respect to spent fuel pool instrumentation and makeup capability:

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

As noted in SECY-11-0137, and approved by the Commission in the associated SRM, the staff prioritized these recommendations as a Tier 2 activity and proposed to initiate rulemaking. This rulemaking is a follow-on activity to the completion of implementation of the March 12, 2012, order on spent fuel pool level instrumentation (NTTF Recommendation 7.1). As also noted in SECY-11-0137, this rulemaking will be initiated after consideration of insights from (1) the RFIs and any subsequent regulatory action (e.g., orders) related to seismic and flooding hazard reevaluations (NTTF Recommendation 2.1), (2) ongoing rulemaking activities for prolonged SBO (NTTF Recommendation 4.1), and (3) industry implementation of the requirements of the March 12, 2012, order EA-12-049, requiring mitigation strategies for beyond-design-basis external events (NTTF Recommendation 4.2). Given that it will take several years to gain insights from all of these ongoing Tier 1 regulatory actions, the staff has deferred initiation of this rulemaking until it has gained sufficient insights from implementing the related Tier 1 requirements.

Additional Performance Requirements for Hardened Containment Vent Systems

A separate Commission paper is being developed to address the staff's recommendations on additional performance requirements for hardened containment vent systems, including the need for operability during severe accidents, and the need for filters on hardened containment vents.

Consideration of Loss of Ultimate Heat Sink

In SECY-12-0025, the staff prioritized the additional issue of loss of ultimate heat sink as a Tier 1 regulatory action, which has been subsumed as part of other ongoing Tier 1 actions. These include (1) the RFI on seismic and flooding reevaluations and walkdowns, (2) a new Tier 2 item concerning other natural external hazards, (3) the SBO ANPR, and (4) the March 12, 2012, order requiring mitigation strategies for beyond-design-basis external events (EA-12-049).

The staff's status update on these other Tier 1 and Tier 2 actions is provided above.

NTTF 9.3 Emergency Preparedness Order on Multiunit Events and Prolonged Station Blackout

The staff's proposed project plan for publication of an ANPR on emergency preparedness activities addresses the Tier 2 and Tier 3 components of NTTF Recommendation 9.3. Enclosure 3 presents the project plan for the emergency preparedness ANPR.

Accident Timeline

The staff continues to review reports published by both domestic and international bodies (including several accident anniversary reports by the American Nuclear Society, Sandia National Laboratories, and Carnegie Endowment) that address the accident sequence and the status of equipment throughout the accident at Fukushima Dai-ichi. These reports validate the staff's basic understanding of events as presented in the NTTF report, dated July 12, 2011, and continue to support the staff's plan for regulatory action. The staff will continue to follow the development of a more detailed timeline of events to support these and longer term actions.

As noted in SECY-11-0137, in July 2011, the NRC and the U.S. Department of Energy signed a one-year "Fukushima Daiichi Accident Study" addendum to its memorandum of understanding on cooperative nuclear safety research (ADAMS Accession No. ML111930010). The staff plans to extend the period of performance. This cooperative research program will, among other things, develop a detailed understanding of the accident progression of each reactor and spent fuel pool. The staff also continues to work with Federal counterparts, industry, and the international community, including the Government of Japan, to establish cooperative efforts to share and integrate specific information into a common understanding of the sequence of events at the Fukushima Dai-ichi facility.

Recommendation 1

In SRM-SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated August 19, 2011, the Commission directed that NTTF Recommendation 1 should be pursued independently of any activities associated with the review of the other Task Force recommendations. To implement this direction, the staff established a working group (WG) to develop a comprehensive set of options for the Commission, including resource estimates, schedules, and the staff's recommended approach.

Initially, work on Recommendation 1 was limited to allow key staff and managers to focus on the Tier 1 orders and RFI. Active efforts resumed in February 2012, and in March 2012, the WG briefed the Steering Committee on its proposed approach to evaluating regulatory framework alternatives. In early May 2012, the WG briefed the Steering Committee to ensure alignment on plans to limit the scope of the initial Recommendation 1 effort to power reactor safety (operating plants and new designs recently or currently being certified, such as the AP1000 and ESBWR). Nonreactor safety program office representatives (Office of Nuclear Material Safety and Safeguards, Office of Federal and State Materials and Environmental Management Programs, and the Office of Nuclear Security and Incident Response) will participate in WG activities to keep informed as the power reactor safety regulatory framework alternatives are being developed. In this manner, other offices will be aware of all framework alternatives and, if appropriate, later adopt or modify certain framework aspects to apply to certain program areas. However, because the main focus of NTTF Recommendation 1 is to establish a logical, systematic and coherent regulatory framework for power reactors, the WG believes that the regulatory framework alternatives being evaluated will have only limited, if any, applicability to other offices' programs.

On June 20, 2012, the staff held a public meeting to discuss with stakeholders the regulatory framework alternatives being evaluated. Another public meeting is planned for the fall of 2012.

Plans To Sunset the Longer Term Review Organization

In SRM-SECY-11-0117, the Commission specified that the longer term review will conclude when all longer term evaluations have been completed and regulatory actions identified and those regulatory actions have been referred to the NRC line organization for action using existing processes (e.g., the rulemaking process). As of July 2012, the staff has completed evaluations of schedule and milestones, resources and critical skill sets, and implementation challenges for all Tier 1, 2, and 3 regulatory actions. However, not all lessons-learned regulatory actions stemming from the events in Japan have been referred to the NRC line organization for action using existing processes.

For example, the Japan Lessons-Learned Project Directorate (JLD) and the Steering Committee continue to provide project management, policy, and other support to line organizations that are preparing guidance for implementation of multiple Tier 1 regulatory actions. It will be necessary for JLD to maintain a coordinating role as the guidance is issued and the requirements are implemented. The staff anticipates that JLD will play a central role in coordinating NRC responses to the March 12, 2012, RFI, issuing any additional RFIs (e.g., Tier 2 regulatory action on other external hazards), and in addressing inspections of facility and program modifications required in response to the Tier 1 orders. JLD will also serve a coordinating role should additional orders (or revised orders) be required following the staff's evaluation of responses to the March 12, 2012, RFI.

As a result, the Office of Nuclear Reactor Regulation plans to continue JLD functions through fiscal year 2014. The staff will continue to report on its plans to sunset the longer term review organization in future 6-month status updates.

National Academy of Sciences Study

The Conference Report on the Consolidated Appropriations Act, 2012 (Public Law 112-74) directed the NRC to transfer \$2 million to the National Academy of Sciences (NAS) to fund an NAS study of the lessons learned from the events at the Fukushima nuclear plant. The project plan and budget for this study have been finalized and the funds have been transferred to NAS. NAS has announced the study and established a study committee. The current plan is for completion of the study by February 2014.

Improving Communication with Stakeholders

Since early October 2011, the staff has held over 50 public meetings related to Japan lessons learned. Most of these meetings included use of Webinar, Webcasting, and teleconferencing to allow greater participation by individuals from remote locations.

In SRM-SECY-12-0010, "Engagement of Stakeholders Regarding the Events in Japan," dated March 21, 2012, the Commission approved the staff's plans for ongoing engagement with the public and stakeholders concerning Japan lessons learned (ADAMS Accession No. ML120820056). The Commission also directed the staff to assess the effectiveness of these initiatives, establish processes and procedures for institutionalizing the initiatives proposed in SECY-12-0010, dated January 23, 2012 (ADAMS Accession No. ML12006A006), and inform the Commission of the results of the assessment. The staff was also directed to provide clear access to chronologies of the events in Japan by providing links to the various recognized reports, and other additional information, on the NRC Web site.

The effectiveness of the staff's communication activities and the establishment of processes and procedures to institutionalize the initiatives outlined in SECY-12-0010, will be considered in the staff's ongoing actions in response to the President's Open Government Initiative (<http://www.nrc.gov/public-involve/open.html>). By June 21, 2012, the staff had added chronologies of the events in Japan by providing links to various recognized reports, and other additional information, on the NRC Web site.