

Update on Tier 3 Activities

Periodic Confirmation of Seismic and Flooding Hazards

Status Update

Recommendation 2.2 of the Near-Term Task Force (NTTF) report suggests a periodic update of the reevaluated hazards based on any new and significant information since the most recent reevaluation. In SECY-11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11272A111), the staff prioritized Recommendation 2.2 as Tier 3 because it will be developed from Recommendation 2.1, Seismic and Flooding Reevaluations, a Tier 1 item requiring licensees to reevaluate the flooding and seismic hazards using present-day methodologies and guidance. The Periodic Confirmation of Hazards recommendation depends on the insights gained from the seismic and flooding reevaluations and, because those evaluations are not complete, no updates are currently available to report.

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

Transition to Line Organization Oversight

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

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

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

Reliable Hardened Vents for Other Containment Designs; and

Hydrogen Control and Mitigation Inside Containment or Other Buildings

Status Update

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

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

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

Transition to Line Organization Oversight

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

Activities Related to Emergency Preparedness

Status Update

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

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

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

Transition to Line Organization Oversight

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

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

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

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

Status Update

This lessons-learned activity originated from NNTF 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 NNTF Recommendation 1. Therefore, implementation of this activity largely depends on the outcome of work on Recommendation 1, which is ongoing.

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

Transition to Line Organization Oversight

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

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

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

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

NRC Staff Training on Severe Accidents and Severe Accident Management Guidelines

Status Update

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

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

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

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

Transition to Line Organization Oversight

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

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

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

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

Status Update

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

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

Transition to Line Organization Oversight

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

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

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

Expedited Transfer of Spent Fuel to Dry Cask Storage

Status Update

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

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

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

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

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

Transition to Line Organization Oversight

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

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

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

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

Status Update

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

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

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

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

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

Transition to Line Organization Oversight

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

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

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

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