Update on Tier 3 Activities

Periodic Confirmation of Seismic and Flooding Hazards

This activity originated from NTTF Recommendation 2.2. It is intended to consider a rulemaking that would require licensees to confirm their seismic and flooding hazards periodically, including consideration of any new and significant information that has become available since the previous hazard evaluation. There are no updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

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

This 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. As described earlier in this paper, the Commission directed that a PRA methodology be initiated to evaluate potential enhancements in this area and that this aspect should be addressed as a Tier 1 activity. The PRA methodology development is currently underway and there are no updates to report with the Tier 3 aspects of this activity, but the overall approach remains consistent with the program plan and schedule described in SECY-12-0095.

Reliable Hardened Vents for Other Containment Designs

This activity originated from NTTF Recommendation 5.2. It exists for the staff to evaluate the need for hardened vents in containment designs other than boiling-water reactor (BWR) Mark I and Mark II containments. There are no updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

Hydrogen Control and Mitigation inside Containment or Other Buildings

This activity originated from NTTF Recommendation 6 to evaluate the current state of knowledge about the generation, transport, distribution, and combustion of hydrogen given the accident at Fukushima, and to determine if any new safety issues have emerged that warrant regulatory action. There are no updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

Items Related to Emergency Preparedness

In SECY–12–0095, the following four Tier 3 items were included within one program plan:

- EP enhancements for prolonged SBO and multiunit events
- ERDS Capability
- Additional EP topics for prolonged SBO and multiunit events
- 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. There are no updates to report with this activity, but the approach (to issue an ANPR to engage stakeholders on these issues) remains consistent with the program plan and schedule described in SECY-12-0095.

Reactor Oversight Process (ROP) Modifications To Reflect Recommended Defense-in-Depth Framework

This activity originated from NTTF Recommendation 12.1 to expand the scope of the annual ROP self-assessment and biennial ROP realignment to include more fully any defense-in-depth considerations that may result from resolution of NTTF Recommendation 1. There are no updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

NRC Staff Training on Severe Accidents and Severe Accident Management Guidelines

This activity originated from NTTF Recommendation 12.2 to enhance the NRC staff training on severe accidents, including resident inspector training on severe accident management guidelines. There are no specific updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

Basis of Emergency Planning Zone (EPZ) Size

This activity originated as an Additional Issue in SECY-11-0137 and involves the staff evaluating the basis of the plume exposure pathway EPZ size. There are no updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

Pre-Staging Potassium Iodide beyond 10 Miles

This activity originated as an Additional Issue in SECY-11-0137 and involves the staff evaluating whether potassium iodide should be pre-staged beyond the current 10-mile zone. There are no updates to report with this activity, but the approach remains consistent with the program plan and schedule described in SECY-12-0095.

Transfer of Spent Fuel to Dry Cask Storage

This activity originated as an Additional Issue in SECY-11-0137 and involves the staff evaluating the need for regulatory action to require expedited transfer of spent fuel from spent fuel pools to dry cask storage. The staff is currently conducting the research activities described in the program plan in SECY-12-0095. The staff is aware of parallel Commission direction on the research activities (as stated in SRM-M120607C, “Staff Requirements—Meeting with the Advisory Committee on Reactor Safeguards,” dated July 16, 2012, ADAMS Accession No. ML121980043), which is closely tied to the overarching Tier 3 program plan. The staff is also aware of the nexus between the research activities, the Tier 3 program plan and the ongoing staff efforts to revise the Commission’s Waste Confidence Decision and rule. The staff is working to effectively coordinate and integrate these efforts and expects to request Commission approval (in a separate paper) to revise the direction given in the SRM to integrate the ongoing research activities more efficiently into the program plan and to align associated milestones of the Tier 3 program plan with the Waste Confidence efforts.

Reactor and Containment Instrumentation Withstanding Beyond-Design-Basis Conditions

This activity originated from a recommendation by the Advisory Committee on Reactor Safeguards (ACRS) and involves identifying and evaluating the need for enhanced reactor and containment instrumentation that can withstand beyond-design-basis accident conditions.

Consistent with the program plan in SECY-12-0095, the staff has conducted the following activities:

- Reviewed the Tier 1 activities that would affect the identification and selection of severe accident instrumentation (ongoing).

- Reviewed U.S. Department of Energy (DOE) activities in the area of severe accident modeling and DOE interfaces with the Japan Severe Accident industry team to identify instrumentation needs for monitoring severe accidents.

- Met with DOE and the Electric Power Research Institute to discuss potential research collaborations in severe accident instrumentation needs and qualification (ongoing).

- The NRC staff is participating in an effort sponsored by the International Atomic Energy Agency (IAEA) to develop an IAEA technical document on severe accident instrumentation that will serve as a technical basis for further standards development (ongoing).

- Met with representatives of the ANS Nuclear Standards Board on November 30, 2012 (ADAMS Accession No. ML12356A086), to encourage interest in developing a standard set of criteria to identify design criteria for severe accident monitoring instrumentation.

- Attended the Embedded Topical Meeting on Severe Accident Modeling at the ANS 2012 Winter Meeting (November 12–15, 2012) to identify the degree of fidelity in severe accident modeling and the comparative results of various thermo-hydraulic models of the Fukushima Dai-ichi event using these models (MELCOR, SAMPSON, MAAP, ATHENA, ASTEC). Such modeling is believed to be sufficiently accurate to predict the design and range for severe accident monitoring instrumentation. The staff plans to continue efforts in this area.

- Interfaced with members of the Institute of Electrical and Electronics Engineers (IEEE) Working Group 6.1 on their efforts to update IEEE 497 on Standard Criteria for Accident Monitoring Instrumentation for Nuclear Power Generating Stations (ongoing).