



NRC Actions Related to Fukushima Lessons Learned

**Japan Lessons Learned Project Directorate
Office of Nuclear Reactor Regulation**

November 2012

Brief History

- **July 2011**
 - Issued Near-Term Task Force (NTTF) report
- **September/October 2011**
 - NTTF recommendations prioritized into three tiers
- **March 2012**
 - Issued regulatory orders and requests for information
- **July 2012**
 - Issued Tier 3 program plans (SECY-12-0095)
- **August 2012**
 - Issued implementation guidance for orders
- **November 2012**
 - Walkdown reports
 - Issue additional seismic/flooding guidance

NTTF Recommendations

Licensee Safety Enhancements

- Seismic/flooding protection
- Prolonged loss of AC power
- Containment venting
- Spent fuel pool cooling
- Severe accident procedures
- Emergency preparedness (EP)

NRC Program Enhancements

- Regulatory framework for low-probability, high consequence events
- Greater attention to defense-in-depth to cope with low probability events

Longer-Term Study

- Seismically induced fires and floods
- Hydrogen control mitigation inside buildings
- EP topics for multiunit events and prolonged SBO
- EP topics on decision making, radiation monitoring, and public education

Categorization of NTTF Recommendations

- The Commission directed the staff to prioritize the NTTF recommendations:
 - Tier 1 - To be implemented without unnecessary delay
 - Tier 2 - Could not be initiated in the near term due to resource or critical skill set limitations
 - Tier 3 - Require further staff study to support a regulatory action

Tier 1 Activities

- **Orders**
 - EA-12-049 – Mitigating strategies for beyond design basis events
 - EA-12-050 – Hardened vents for Mark I and II containments
 - EA-12-051 – Spent fuel pool level instrumentation
- **Request for Information**
 - Seismic and flooding walkdowns
 - Seismic and flooding reevaluations
 - Enhanced Emergency Preparedness staffing and communications
- **Rulemaking Initiation**
 - Station blackout (SBO)
 - Integration of emergency procedures

Tier 2 Recommendations

- **Spent fuel pool makeup capability – Require licensees to:**
 - Provide safety-related AC electrical power for SFP makeup
 - Revise TS to require one train of onsite emergency electrical power be operable for SFP makeup and SFP instrumentation whenever irradiated fuel is in the SFP
 - Have an installed means to spray water into the SFP, including an easily accessible connection to supply the water.
- **Emergency preparedness – Require licensees to:**
 - Have guidance for multiunit dose assessment capability
 - Hold training and exercises for multi unit and prolonged SBO scenarios
 - Practice the identification and acquisition of offsite resources
 - Ensure that sufficient EP equipment and facilities exist to deal with multiunit and prolonged SBO scenarios
- **Reevaluation of other external hazards**
 - Request licensees reevaluate external hazards (other than seismic and flooding)

Tier 3 Recommendations

- 2.2 Ten-year confirmation of seismic and flooding hazards
- 3 Enhanced capability to prevent /mitigate seismically induced fires and floods
- 5.2 Reliable hardened vents for other containment designs
- 6 Hydrogen control and mitigation inside containment or in other buildings
- 9.1/9.2 Emergency preparedness (EP) enhancements for prolonged SBO and multiunit events
- 9.3 Improve ERDS capability
- 10 Additional EP topics for prolonged SBO and multiunit events
- 11 EP topics for decision-making, radiation monitoring, and public education
- 12.1 Reactor Oversight Process modifications to reflect the recommended defense-in-depth framework
- 12.2 Staff training on severe accidents and resident inspector training on SAMGs
- Revisit Emergency Planning Zone Size
- Prestage potassium iodide beyond 10 miles
- Transfer of spent fuel to dry cask storage
- Reactor and Containment Instrumentation

NTTF Recommendation 1

- The Task Force recommended establishing a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.
 - *Risk-informed defense-in-depth framework that includes extended design-basis requirements*
 - *Modify the Regulatory Analysis Guidelines to more effectively implement the risk-informed defense-in-depth philosophy*
 - *Evaluate risk insights to identify potential generic regulations or plant-specific regulatory requirements.*
- Chairman tasking to NRC staff to also consider Risk Management Task Force recommendations for power reactors (NUREG-2150)
- Paper due to Commission in February 2013

New Reactor Considerations

- **Applicability of Orders and RFI**
 - Orders apply to existing holders of a combined operating license (COL) or construction permit (CP)
 - RFI related to EP applies to existing COL and CP
 - RFI related to reevaluations applies to CP holders
- **Future New Licenses**
 - NRC will continue to use the existing COL licensing approach, which includes requests for additional information to address the Orders and RFI
- **Advanced Reactors**

Next Steps

- Issue final guidance for seismic and flooding reevaluations by November 2012
- Complete seismic and flooding walkdowns at each nuclear power plant (including NRC inspections)
- Present to the Commission a notation vote paper on filtered containment vents in November 2012
- Continue rulemaking efforts on SBO and Emergency Procedures coordination (EOPs, SAMGs, EDMGs)
- Begin implementation of Tier 3 recommendations
- Continue information exchange with international community to share lessons learned