



Japan Lessons Learned Near Term Task Force Recommendation 7.1

December 15, 2011

Lisa M. Regner

Senior Project Manager
Japan Lessons Learned
Project Directorate

Steven R. Jones

Senior Reactor Systems Engineer
Division of Safety Systems

Agenda

- Background
- Current Status
- Looking Forward
- Questions

Background

- Japanese Earthquake on March 11, 2011
 - Prolonged Station Blackout
 - Fuel Damage and Offsite Release
- Near Term Task Force
 - Chartered: March 30, 2011
 - Issued Report: July 12, 2011
 - Assessment of Report: September 9, 2011

Potential Assumptions

- Beyond design basis natural event(s) resulting in the following:
 - Affects all nuclear reactors at a site
 - Initiates a prolonged SBO (e.g., 72 hrs)
 - Impedes external support for an extended period (e.g., 72 hrs)
 - Interrupts access to normal ultimate heat sink
- Each licensee develops and implements guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities.
- These are preliminary assumptions and are based on NRC Steering Committee initial concepts and stakeholder input.

NTTF Recommendation 7.1:

...provide sufficient safety-related instrumentation, able to withstand design-basis natural phenomena, to monitor key spent fuel pool parameters (i.e., water level, temperature, and area radiation levels) from the control room.

Basis: Lack of SFP information at Fukushima contributed to a poor understanding of possible radiation releases and confusion about the needs and priorities for support equipment.

Objectives (from SECY-0137)

Provide reliable indication of spent fuel pool attributes under accident conditions:

1. Expanded instrument range (loss of coolant inventory and extended loss of forced cooling scenarios)
2. Functional with pool at saturation conditions (i.e., boiling)
3. Reliable power supply (e.g., safety related)
4. Accessible indication (e.g., control room)

Physical Considerations

- Refueling increases spent fuel risk
 - decay heat much higher
 - more potential drain paths connected to pool, some non-seismic
 - unusual equipment configurations increase potential for SBO (Vogtle)
- Field actions often necessary for aligning makeup and restoring forced cooling

Regulatory Considerations

- GDC 63, “Monitoring fuel and waste storage,” specifies, in part, that appropriate instrumentation be provided to (1) detect conditions that may result in a loss of residual heat removal capability and (2) initiate appropriate safety actions
- Spent fuel pool boiling within the design basis of many facilities

Challenges

- **Interface issues**
 - Recommendation 4.1: uninterrupted spent fuel cooling for a 72 hour extended station blackout coping period
 - Recommendation 4.2: reasonable protection for equipment necessary for implementation of spent fuel cooling strategies during multi-unit event
- **Schedule**

Instrumentation Criteria

Criteria	NRC Proposal
Parameters	Level
Monitoring Availability	<ul style="list-style-type: none">• Continuous• Operability Demonstrated by Test Just Prior to Refueling• Available during Extended SBO
Display Locations	Control room and/or Alternate Shutdown Panel
Supports Prompt Identification of these Pool Conditions	<ul style="list-style-type: none">• Level adequate for operation/restoration of forced cooling• Level inadequate for shielding - access threatened by high radiation• Extremis – coolant just covers stored fuel

Reliability Options

Criteria	Options
Arrangement	<ul style="list-style-type: none">• One Missile-Protected and Hardened Train• Two Spatially Diverse Trains• One Train with Portable Backup
Qualification	<ul style="list-style-type: none">• Safety-Related, Seismic Class I, and 50.49 EQ• Commercial-Grade Level Detector with Demonstrated Reliability in Harsh (High Temp and Vibration) Environments; Seismic Mounting
Power Supplies	<ul style="list-style-type: none">• Safety-Related• Non-safety Related with Portable Backup

Next Steps

- Interact with Stakeholders
- Define Success for Each Recommendation
- Regulatory Vehicles for Recommendations
 - 50.54(f) Letters
 - Orders (2.202)
 - Rules

Long-term Schedule

- Phase 1: Develop and Issue Order
- Phase 2: Licensing Activities
- Phase 3: Inspection Activities

Web Resources

- NRC Public Website:
 - www.nrc.gov
 - www.nrc.gov/japan/japan-info.html
- Future Public Meetings:
 - www.nrc.gov
 - www.nrc.gov/japan/japan-meeting-briefing.html
 - www.nrc.gov/public-involve/public-meetings/index.cfm



Questions?