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Fukushima Lessons Learned Overview

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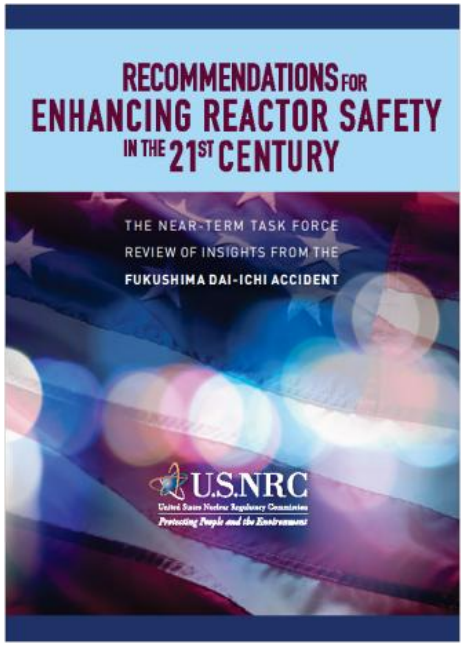
Lessons Learned: The Near-Term Task Force

- Within weeks of the accident, NRC created the task force (NTTF) to provide recommendations to enhance safety at U.S. plants
- The Task Force report was issued July 2011
- Task force determined U.S. plants were safe, but made several recommendations to further enhance safety



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Prioritization of Task Force Recommendations

- Subsequent to the task force Report, NRC staff prioritized the 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 determine if regulatory action is necessary

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Summary of Tier 1 Regulatory Actions

- **Orders (issued March 2012)**
  - Mitigation strategies for extreme external events
  - Containment venting system for Mark I and II containments
  - Spent fuel pool water level instrumentation
- **Request for Information (issued March 2012)**
  - Seismic and flooding walkdowns (completed Nov. 2012)
  - Seismic and flooding hazard reevaluations
  - Emergency Preparedness staffing and communications
- **Rulemakings (ongoing)**
  - Station Blackout Mitigation Strategies (SBOMS)
  - Onsite Emergency Response Capabilities
  - Filtering and Confinement Strategies

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Mitigation Strategies
For External Events

The order requires a three-phase approach for maintaining or restoring core cooling, containment, and spent fuel cooling at all nuclear power plants

Phase	Licensee may use
Initial	Installed equipment
Transition	Portable, onsite equipment
Final	Resources obtained from offsite

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Containment Venting System

- Applies only to boiling water reactors (BWRs) with Mark-I and Mark II containment designs
  - (not applicable to any California plants)
- Vents help control containment pressure by removing heat
- May help prevent core damage
- Required to work, even if power is lost

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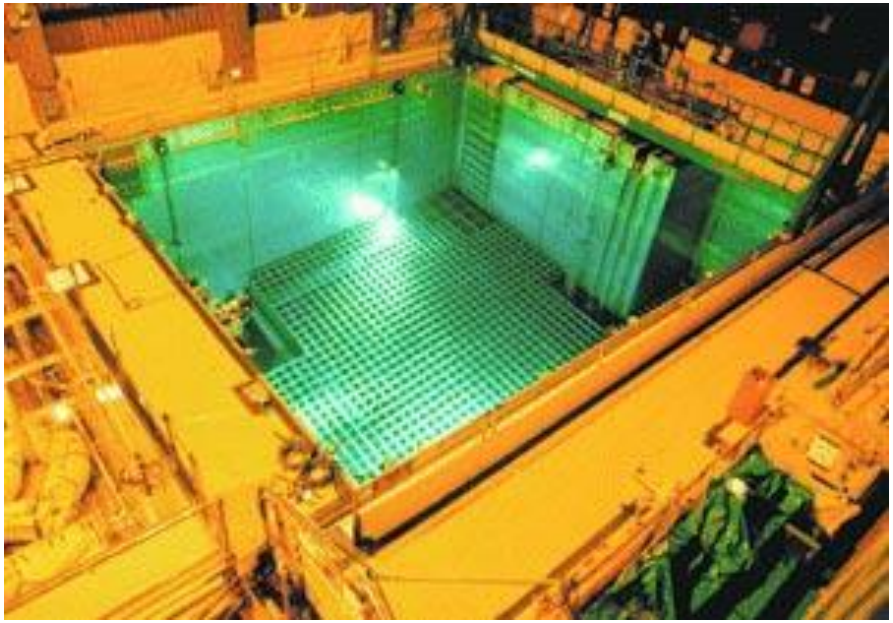
Spent Fuel Pool Instrumentation

Requires installation of additional water level instrumentation at all nuclear power plants to indicate:

1 – Normal fuel pool level

2 – Below-normal pool level that still provides radiation shielding

3 – Very low level, near top of fuel racks, where immediate action to add make-up water should be taken



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Requests for Information

- NRC asked licensees to:
  - Inspect or “walk down” currently installed earthquake and flooding protection features, and correct degraded conditions
  - Use present-day information to reevaluate the potential effects of an earthquake or flooding event
  - Enhance emergency plans to ensure sufficient staffing and communication capabilities if multiple reactors at a single site are affected by the same event

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Rulemaking Activities

Station Blackout/Mitigation Strategies (2016)

- Will make Mitigation Strategies Order a regulation

Onsite Emergency Response (2016)

- Will integrate plant emergency procedures

Filtering and Confinement Strategies (2017)

- Will consider additional protections to limit potential release of radioactive material from containment following an accident

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Process Overview

Accident at Fukushima

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Near-Term Task Force Recommendations

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Orders, Requests for Information & Rulemaking

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Implementation by licensees

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NRC Inspection and Verification

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California Plants

- Diablo Canyon
  - Seismic and Flooding reevaluations – due March 2015
  - NRC Orders to be fully implemented:
    - Unit 1 – Fall 2015
    - Unit 2 – Spring 2016
- San Onofre
  - In light of the recent decision to permanently cease operation of Units 2 and 3, NRC will discuss with the licensee the need for completing actions related to lessons learned from the Fukushima accident

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More Information

- Public website

  From www.nrc.gov, find link under “Spotlight” section called “Japan Lessons Learned”

THANK YOU

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BACKUP SLIDES

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Tier 2

- Spent Fuel Pool Makeup Capability*
- Emergency Preparedness*
- Reevaluation of “Other” External Hazards

*Items addressed by the Mitigation Strategies order

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Tier 3 Recommendations

2.2	Periodic 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 Emergency Response Data System capability
10	Additional EP topics for prolonged Station Blackout 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
—	Pre-stage potassium iodide beyond 10 miles
—	Expedited transfer of spent fuel to dry cask storage
—	Reactor and Containment Instrumentation