



# **Briefing on the Status of Lessons Learned from the Fukushima Daiichi Accident**

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Preparedness Programs**

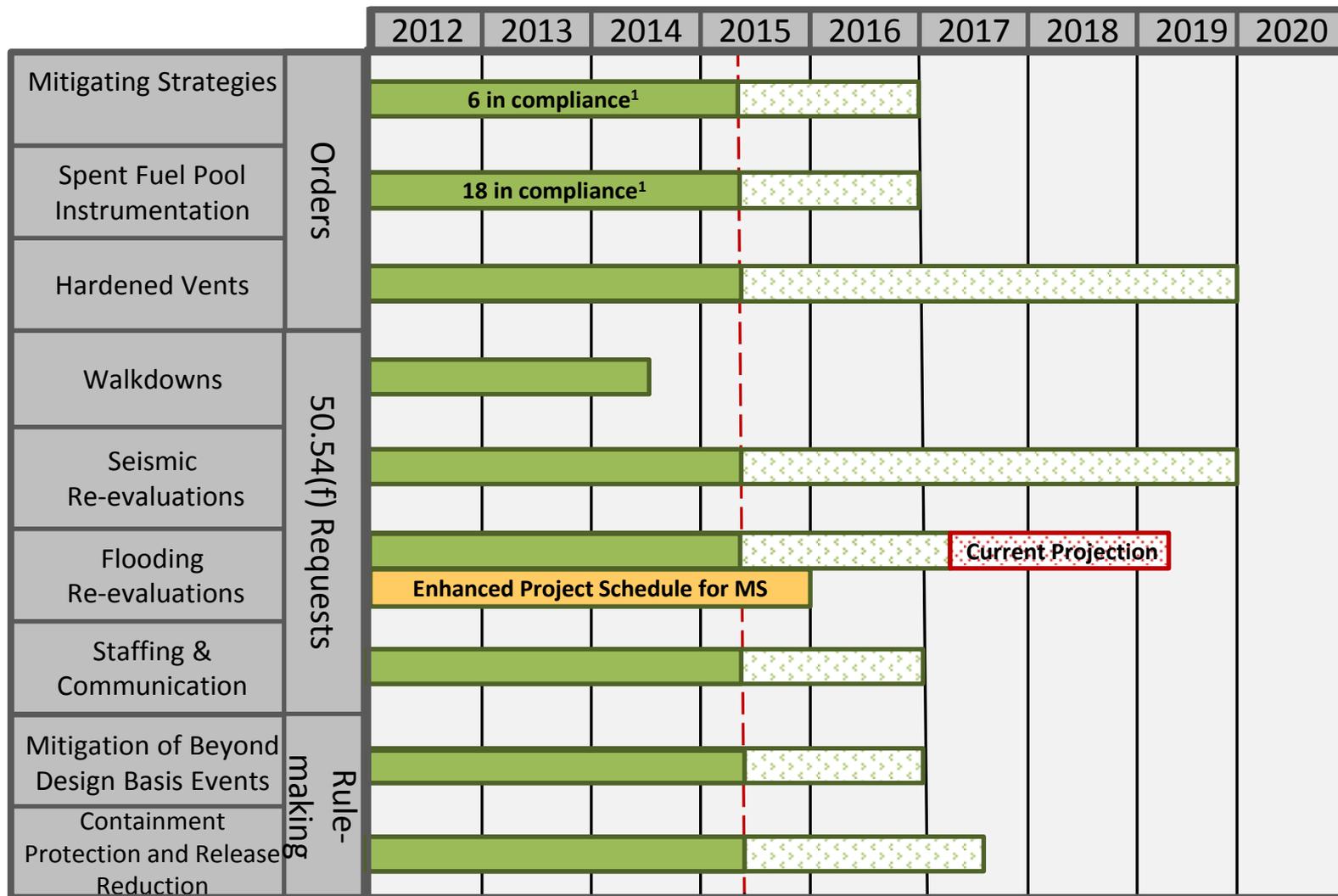
**April 30, 2015**

# Speakers

- **William Dean, Director, Office of Nuclear Reactor Regulation**
  - Overall Progress
- **Jack Davis, Director, Japan Lessons-Learned Division**
  - Orders, Rulemaking, and Tier 2/3 Activities
- **Scott Flanders, Director, Division of Site and Environmental Analysis**
  - Seismic and Flooding Hazard Reevaluations
- **Ray Lorson, Director, Division of Reactor Safety, Region I**
  - Regional Perspective

# Tier 1 Implementation\*

The NRC is on or ahead of schedule in almost every area of Tier 1.



Today

\*For illustrative purposes only  
<sup>1</sup> as of April 23, 2015; current design basis

# **Substantial Safety Enhancements in Place**

- **Plants are coming into compliance with mitigating strategies & spent fuel pool instrumentation orders**
- **Seismic and flooding interim actions further enhance safety, where needed**
- **Other activities are in progress and nearly all are on schedule**

# **Improved Efficiency for Recommendation 2.1 Flooding Activities**

- **Ensure licensees address the reevaluated flood hazard levels within mitigating strategies**
- **Assess the use of targeted strategies, if appropriate**
- **Modify Phase 1 guidance and develop Phase 2 guidance**

# **Action Plan Being Prepared**

- **For Commission approval**
- **Goal is to focus reviews on areas with most potential safety benefit**
- **Plans will ensure mitigating strategies are protected from reevaluated hazards**

# **Mitigating Strategies & Spent Fuel Pool Instrumentation Orders On Schedule**

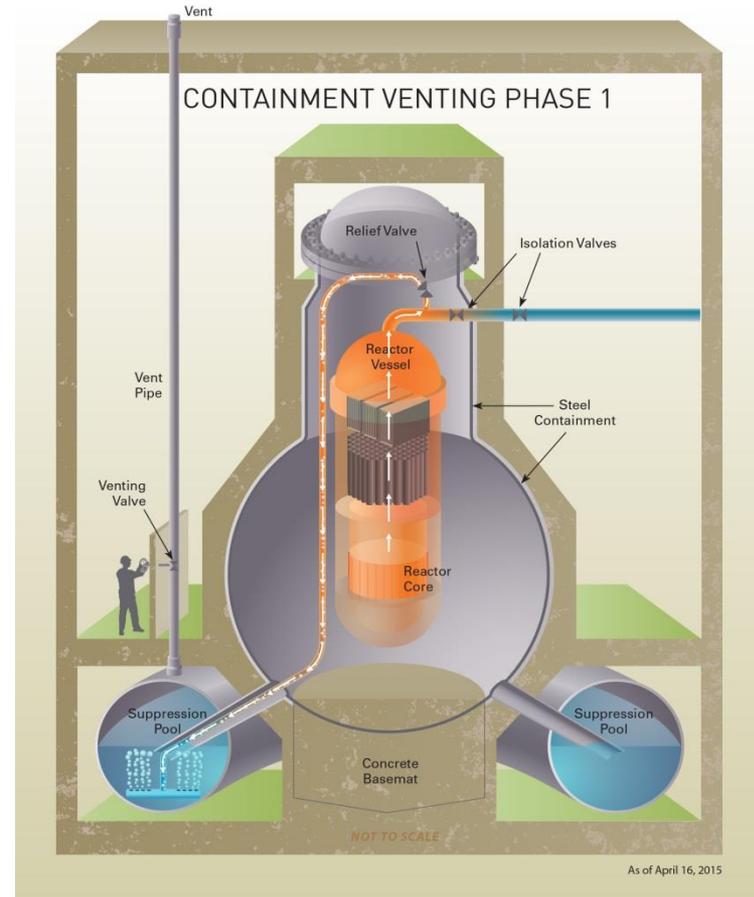
- **Audits are being used to confirm licensee progress**
- **Progress towards compliance:**
  - **End of Spring 2015 outages: ~25%**
  - **End of 2015: >50%**
- **Safety benefit achieved by the end of 2016**
  - **Some modifications extend beyond**

# **Next Steps on Mitigating Strategies & Spent Fuel Pool Instrumentation Orders**

- **Complete safety evaluations for Spring 2015 compliance sites**
- **Perform inspections at sites as compliance is achieved**
- **Further work to ensure that mitigating strategies can be implemented under reevaluated hazard conditions**
- **Development of an oversight program**

# Containment Vent Order On Schedule

- **Phase 1  
(Wetwell Vent)**
  - **Plans received from all licensees**
  - **Interim staff evaluations issued ahead of schedule**



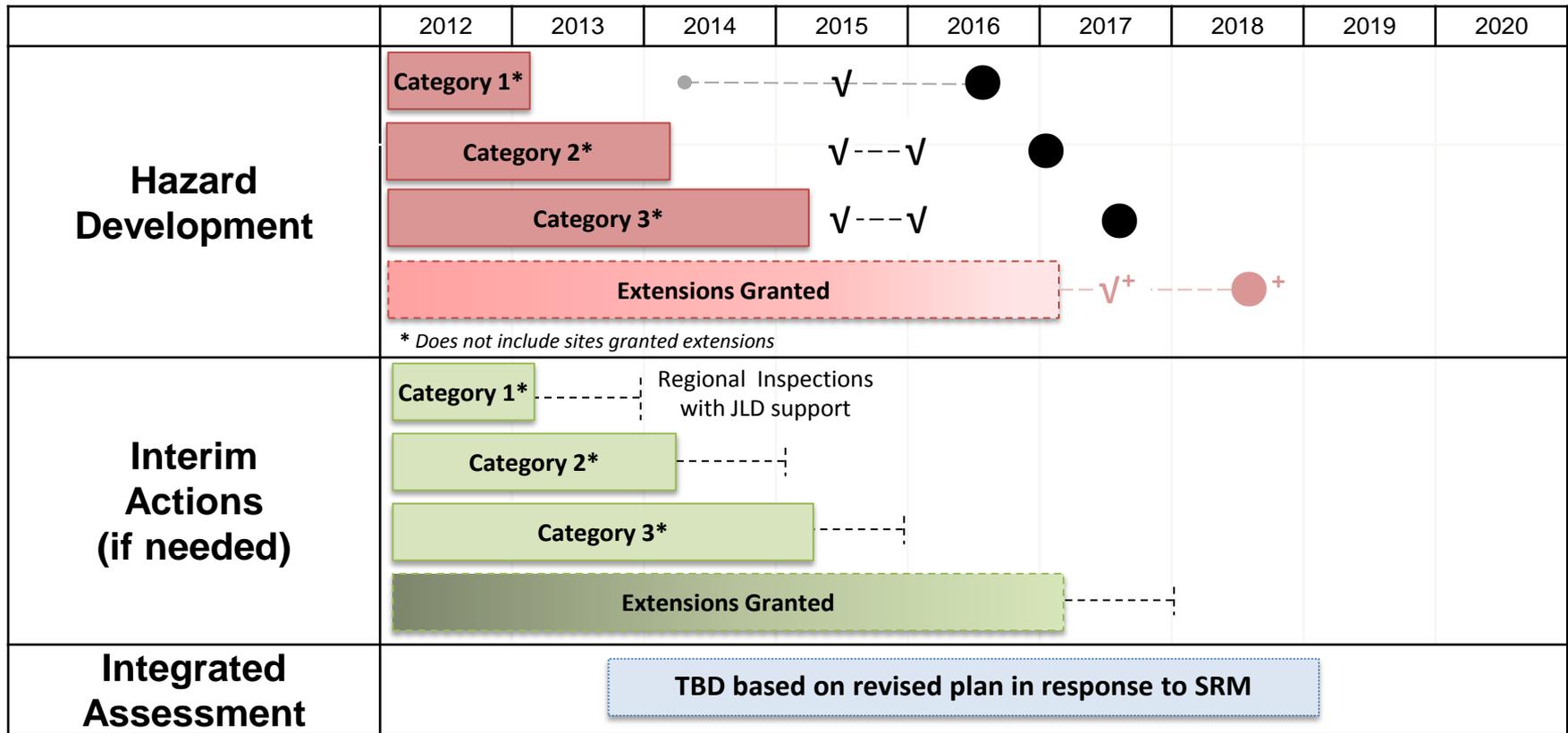
# **Next Steps on Containment Vent Order**

- **Phase 2 (Drywell Vent or Strategy)**
  - **Interim staff guidance to be issued imminently**
- **NRC to issue safety evaluations and perform inspections after Phases 1&2 are complete**

# **Progress Continues on Flooding Hazard Reevaluations**

- **Category 1&2**
  - **Interim action reviews are complete**
  - **Ten staff assessments issued to date**
- **Category 3**
  - **Twenty reevaluated hazards and three extension requests received by March 12, 2015**
  - **Reviewing interim actions**
- **To support the Mitigating Strategies' timelines, staff is identifying alternative approaches to provide earlier feedback on reevaluated hazards**

# Schedule for Flood Hazard Reevaluation and Subsequent Actions



√ Staff acknowledges hazard to use for mitigating strategies (MS)      ● Last Staff Assessment issued      ● Staff Assessments issued

# Schedule for Seismic Hazard and Risk Evaluations



Hazard Analyses



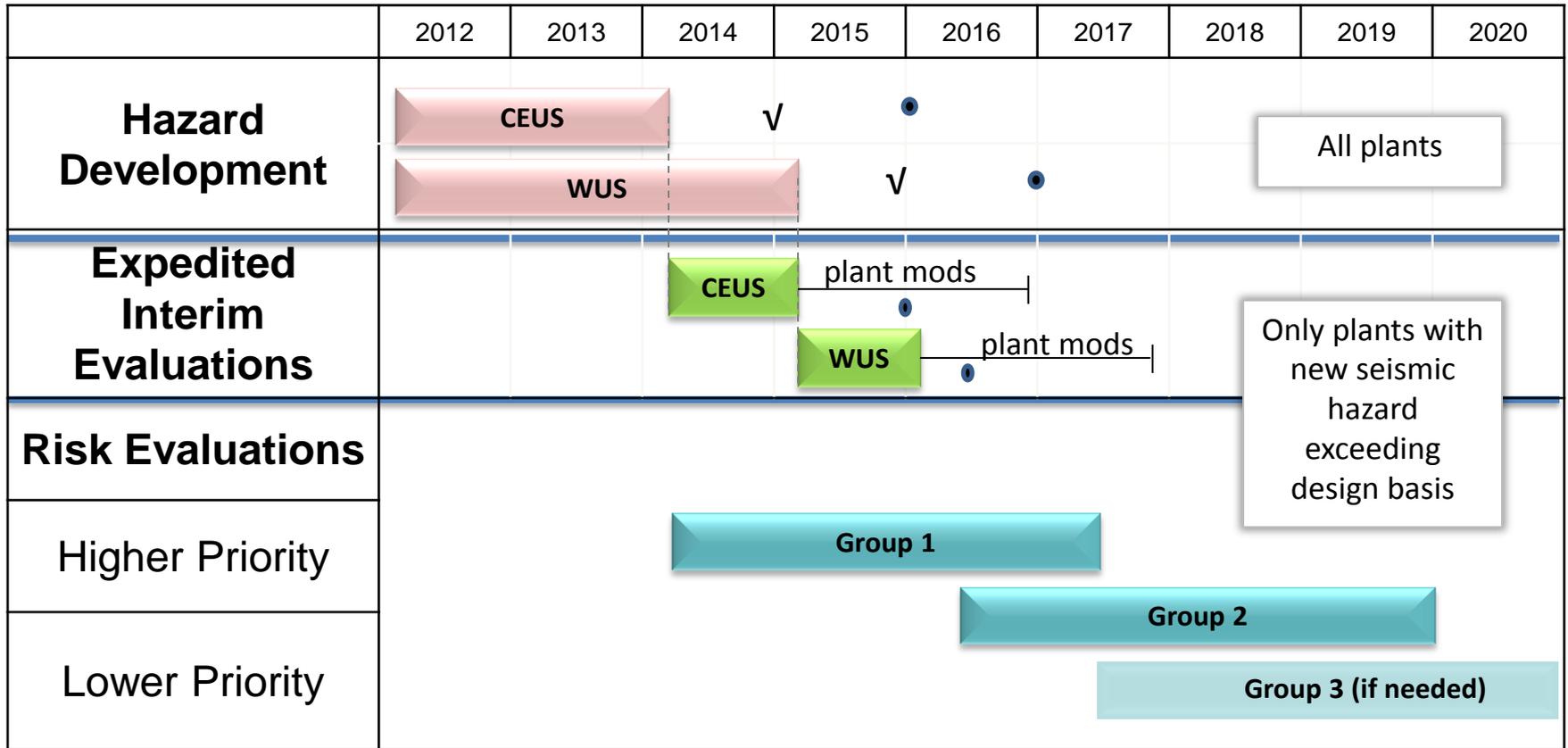
Expedited Interim Evaluations



Risk Evaluations

√ Staff acknowledgement to use GMRS for risk evaluation and MS

● Staff Assessment or response



# **Significant Progress on Seismic Hazard Reevaluations**

## **CEUS**

- **Screening complete**
- **No immediate safety concerns**
- **GMRS review completed**
- **Hazard assessments ahead of schedule**
- **ESEP reports under review**

## **WUS**

- **Screening letter by mid-May 2015**
- **No immediate safety concerns**

# **Next Steps on Seismic Risk Evaluations**

- **Alternative approaches for high frequency and spent fuel pool evaluations**
- **Use of risk insights for relief from risk evaluations (SPRA) for certain sites**
- **SPRA template for Group 1 submittals Phase 2 decision criteria**

# **Proposed Rule on Mitigation of Beyond-Design-Basis Events is Nearing Completion**

- **Codifies Order EA-12-049**
- **Reflects extensive interaction with stakeholders**
- **Incorporates lessons learned and addresses additional regulatory initiatives**

# MITIGATION OF BEYOND DESIGN BASIS EVENTS RULEMAKING

## NTTF Orders

- 4.2: Mitigation Strategies, EA-12-049
- 7.1: Spent Fuel Pool Instrumentation, EA-12-051
- 7: Spent Fuel Pool Requirements (partial)\*
- 8 Onsite Emergency Response Capabilities (partial)\*

\*Part of EA-12-049

## Petitions for Rulemaking

- 50-97: EP Enhancements for Prolonged Station Blackout
- 50-98: EP Enhancements for Multiunit Events
- 50-100: Improve Spent Fuel Safety
- 50-101: Revise 10 CFR 50.63
- 50-102: Require More Realistic Training on SAMGs

## NTTF Misc.

- 4.1: Station Blackout Rulemaking
- 7: Spent Fuel Pool Requirements (partial)
- 8: Onsite Emergency Response Capabilities (partial)
- 9.1: EP for Multiunit Events Rulemaking
- 9.2: EP for Prolonged Station Blackout
- 9.3: EP Orders (except long term ERDS)
- 9.4: ERDS Modernization
- 10.2: Command and Control Structure and Qualifications
- 11.1 Enhanced Onsite Emergency Response Resources

## Supporting Guidance

- DG-1301: NEI 12-06 Mitigation Strategies Guidance
- DG: 1317: NEI 12-02 SFP Level Guidance
- DG-1319: NEI 12-01 Staffing and Communications Assessment; NEI 13-06 Emergency Response Capabilities; NEI 14-01 Emergency Response Procedures and Guidelines

## Existing Requirements

- 10 CFR 50.63
- 10 CFR Part 50,
- Appendix E
- 10 CFR 50.54(hh)(2)

## NTTF 50.54(f) Requests

- 2.1: Seismic and Flooding Reevaluation (for reasonable protection)
- 9.3: EP Staffing and Communication\*

# **Progress on Containment Protection and Release Reduction Strategies**

- **Completed analyses and developing draft regulatory basis**
- **Analysis indicates that installation of filters is not justified**
- **Will issue draft regulatory basis for public comment**
- **Will schedule public meetings**

# Progress Made on Tiers 2&3

- Expedited transfer of spent fuel to dry cask storage (complete)
- 7.2 – 7.5 Spent Fuel Pool Makeup Capability (subsumed in Tier 1)
- 9.1/9.2 Emergency preparedness (EP) enhancements for prolonged SBO and multiunit events (subsumed in Tier 1)
- 9.3 Emergency Preparedness (subsumed in Tier 1)
- 9.4 Improve ERDS capability (subsumed in Tier 1)
- 3 Enhanced capability to prevent /mitigate seismically induced fires & floods (in progress)
- 5.2 Reliable hardened vents for other containment designs (in progress)
- 6 Hydrogen control and mitigation inside containment or in other buildings (in progress)
- 10 Additional EP topics for prolonged SBO and multiunit events (in progress)
- 11 EP topics for decision-making, radiation monitoring, and public education (In progress)
- 12.1 Reactor Oversight Process modifications to reflect DID framework (in progress)
- 12.2 Staff training on severe accidents and resident inspector training on SAMGs (in progress)
- Reactor and Containment Instrumentation (in progress)
- Reevaluation of “Other” External Hazards (planned)
- 2.2 Periodic confirmation of seismic and flooding hazards (planned)
- Revisit Emergency Planning Zone Size (planned)
- Prestage potassium iodide beyond 10 miles (planned)

Completed

Subsumed in Tier 1

In Progress

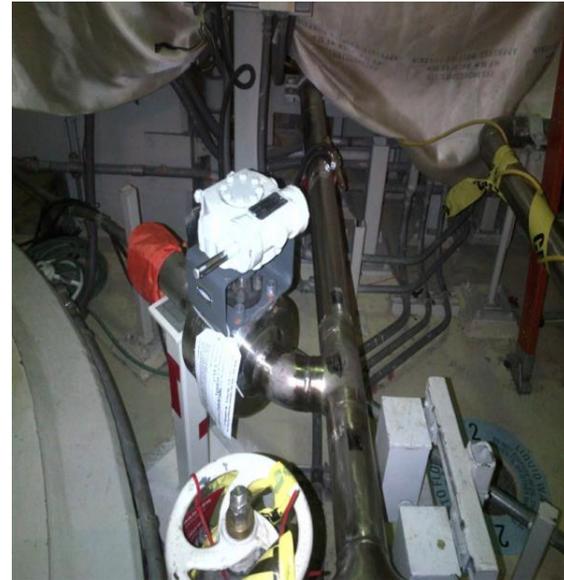
Planned

# **Staff is Reassessing Initial Project Plans**

- **Staff expects to identify recommendations to move forward ahead of schedule**
- **Staff will engage the Commission when appropriate**
- **Opportunity for stakeholder input moving forward**

# **Strong Regional Support for Fukushima Lessons-Learned Activities**

- **Essential part of agency response**
  - **Independently verify licensee actions to ensure safety**
  - **Communications with stakeholders**
- **Assist with audits and development of program guidance**
- **Continue to ensure operational safety as licensees implement NRC Orders related to Fukushima**



# **Ready to Inspect Implementation of NRC Orders**

- **Temporary Instruction (TI) 191 issued to provide inspection guidance for confirmation of NRC Orders**
  - **Mitigation strategies for beyond design basis events**
  - **Spent fuel pool instrumentation**
  - **Communications/staffing for large-scale events**
- **Inspector training on TI**
- **Pilot inspection conducted at Watts Bar in March 2015**
  - **Observed by all regions and NRR**
- **Assessment panel formed to ensure consistent treatment of inspection findings**

# Successful TI-191 Pilot Inspection

- **Licensee was effective at implementing NRC Orders**
- **Some preliminary observations related to labelling and procedure adequacy**
- **Developed insights to improve the TI**



# **Continued Collaboration with International Partners**

- **General consistency in lessons learned activities**
- **The NRC plays a leadership role in worldwide nuclear safety**
- **NRC benefits and learns from other countries**

# Conclusions

- **Continuous focus on the safety and security of operating plants**
- **Steady progress towards on schedule completion**
- **Demonstrable improvement in safety as the lessons are implemented**

# Acronyms

<b>CEUS</b>	<b>Central and Eastern United States</b>	<b>MS</b>	<b>Mitigating Strategies</b>
<b>CFR</b>	<b>Code of Federal Regulations</b>	<b>NEI</b>	<b>Nuclear Energy Institute</b>
<b>CPRR</b>	<b>Containment Protection and Release Reduction</b>	<b>SA</b>	<b>Staff Assessments</b>
<b>EA</b>	<b>Enforcement Action</b>	<b>SAMGs</b>	<b>Severe Accident Management Guidelines</b>
<b>EP</b>	<b>Emergency Preparedness</b>	<b>SBO</b>	<b>Station Blackout</b>
<b>ERDS</b>	<b>Emergency Response Data System</b>	<b>SFP</b>	<b>Spent Fuel Pool</b>
<b>ESEP</b>	<b>Expedited Seismic Evaluation Process</b>	<b>SFPI</b>	<b>Spent Fuel Pool Instrumentation</b>
<b>GMRS</b>	<b>Ground Motion Response Spectra</b>	<b>SPRA</b>	<b>Seismic Probabilistic Risk Assessment</b>
<b>HF</b>	<b>High Frequency</b>	<b>WUS</b>	<b>Western United States</b>
<b>MBDBE</b>	<b>Mitigation of Beyond Design Basis Events</b>		