



# Recent NRC Actions Involving Spent Nuclear Fuel Storage

Lawrence Kokajko

Acting Deputy Director

Office of Nuclear Material Safety and Safeguards

U.S. Nuclear Regulatory Commission

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## Background

- March 11, 2011 earthquake
  - Reactor Units 1, 2, 3 safely shut down
  - Loss of offsite power
- Tsunami
  - Loss of emergency AC power
  - Extended Station Blackout
  - Loss of coolant flow
- Incomplete information on event sequences affecting spent fuel pool performance and radionuclide releases



## NRC Actions To Date

- Monitoring and advice
- Information Notice 2011-05
  - Effects on Japanese nuclear power plants
- Temporary Instruction 2515/183
  - Extensive damage mitigation guidelines
  - Station blackout
  - Seismic and flooding
- Temporary Instruction 2515/184
  - Severe accident management guidelines



## NRC Actions (cont.)

- Bulletin 2011-01 (5/11/11) to licensees
  - Comprehensive verification of requirements for mitigating large explosions or fires
- Within 30 days, verify
  - Equipment is available and can function as intended
  - Staff are appropriately trained and available
- Within 60 days, answer questions on
  - Maintenance, testing, and availability of equipment relied on for mitigation
  - Updates of guidance for mitigation strategies
  - Availability of offsite support

## **NRC Task Force**

- The Commission established a Task Force on March 23 to:
  - Review available information on the events in Japan
  - Evaluate NRC regulatory requirements, programs, and processes, and their implementation
  - Recommend near-term actions
  - Identify a framework and topics for longer-term review



# Task Force Charter

- NRC Task Force will independently
  - Study the events at Fukushima
  - Identify relevant and important topics for application to U.S. reactors
  - Consult with agency experts
  - Interact with domestic and international stakeholders
  - Identify a framework and topics for review and assessment of a longer-term effort
  - Formulate recommendations and provide to the Commission via a July 2011 report

# Review Approach

- Systematic and methodical
  - Including insights from past lessons-learned efforts, such as Three Mile Island
- Defense-in-depth approach
- Task Force will review:
  - Protection from natural phenomena
  - Mitigation for long-term station blackout; including single or multiple unit events
  - Emergency preparedness
  - Implications for NRC programs



## Protection from Natural Phenomena

- Evaluation of the design basis and safety margins for seismic and flooding events
- Evaluation of external challenges that could lead to station blackout
  - Seismic
  - Tsunami
  - Other flooding events (i.e., hurricanes [storm surge], dam failures, precipitation, internal flooding)
- Survivability of emergency AC power during beyond design basis external events





## Mitigation for Long-Term Station Blackout

- Strategies for mitigating consequences of long-term station blackout; including single or multiple-unit events, to:
  - Prevent core damage
  - Prevent fuel damage in the spent fuel pool
  - Prevent containment failure and releases
  - Prevent or mitigate releases from the spent fuel pool
- Personnel availability, effectiveness, and protection – procedures and training



## Considerations for Strategies to Prevent Fuel Damage in the Spent Fuel Pool

- Heat removal capability (water and air cooling)
- Enhancing air coolability by relocating spent fuel
- Instrumentation availability
- Emergency Operating Procedures, Severe Accident Mitigation Guidelines, Extensive Damage Mitigation Guidelines



## Considerations for Strategies to Prevent or Mitigate Releases from the Spent Fuel Pool

- Filtration, monitoring, scrubbing releases
- Hydrogen control measures
- Pressure control in secondary containments and spent fuel pool buildings
- Instrumentation availability
- Emergency Operating Procedures, Severe Accident Mitigation Guidelines, Extensive Damage Mitigation Guidelines



## Current Assessment

- To date the Task Force has not identified any issues that undermine our confidence in the continued safety and emergency planning of U.S. plants
- Task Force review is likely to recommend actions to enhance safety and preparedness

## Next Steps

- Evaluate results from Temporary Instructions 2515/183 and /184
- Commission Meetings
  - June 16, 2011 status briefing
  - July 19, 2011 final briefing
- Near-term Task Force report to be made public in July 2011
- Additional actions to be identified for a longer-term effort