



Japan Lessons Learned Tier 3 Issue: Expedited Transfer of Spent Fuel to Dry Cask Storage and The Spent Fuel Pool Study

Public Meeting

September 18, 2013



Agenda

- Objective & Background
- Spent Fuel Pool Study
- Regulatory Analysis for all Spent Fuel Pools
- Next Steps



Meeting Objectives

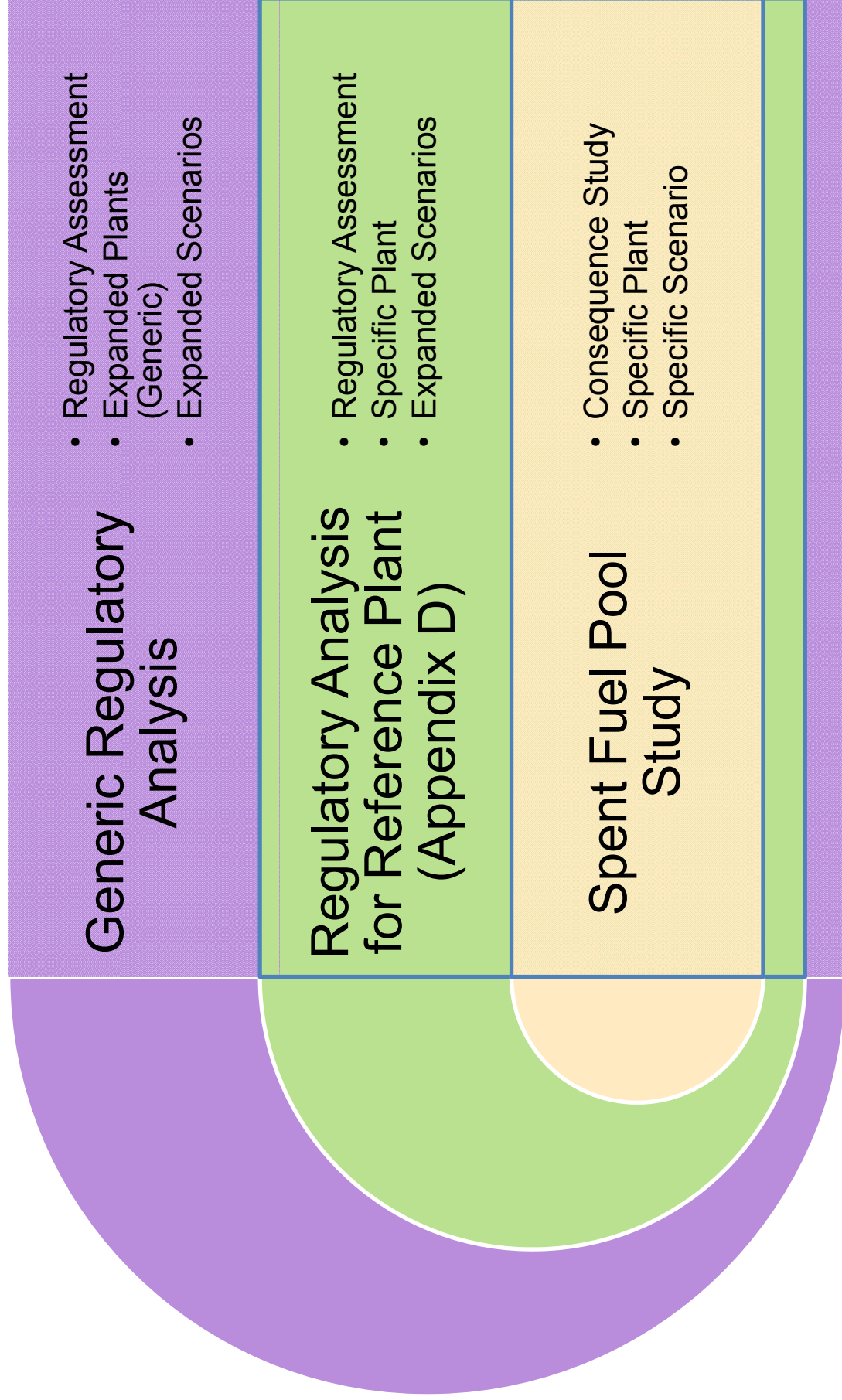
- Discuss the Spent Fuel Pool Study (the Study)
- Outline our activities on the Japan lessons learned Tier 3 activity on expedited spent fuel transfer
- Discuss how we made the Study's analysis and past studies applicable to the regulatory analysis for all spent fuel pools
- Provide extended time for clarifying questions



Background

- Spent Fuel Pool Study initiated in July 2011
- Commission provided additional guidance
- Objective of Tier 3 Plan:
 - Determine whether the NRC should consider expedited transfer of spent fuel to dry casks
 - Provides additional regulatory context of the Study's results
- Schedules have been aligned to facilitate the public's involvement in the Tier 3 issue, the Study, ongoing Waste Confidence activities, and related policy issues

Overview





Study Objectives

- Determine if accelerated spent fuel transfer to dry cask at a reference plant substantially enhances public health and safety
- Update public consequence estimates of a beyond-design-basis earthquake affecting a spent fuel pool under high- and low-density loading conditions
- Provide input to the regulatory analysis for this Tier 3 issue



Study's Key Points

- Reference Plant
 - Boiling Water Reactor (BWR) with Mark I containment and elevated pool
 - Selected based on available extensive plant/site information and models, and similarity to Fukushima
 - Assumed high-density pool racks for both high- and low-density loading -- BWR fuel assemblies' channel boxes would impede crossflow even with open-frame racks.

- Initiating Event is a Severe Earthquake
 - Expected to occur once in 60,000 years; Previous studies consistently show earthquakes present the largest contribution to risk for spent fuel pool accidents
 - 20 Japanese spent fuel pools reported no leakage after both the 2007 Niigataken Chuetsu-Oki and 2011 Tohoku severe earthquakes



Study's Key Points (con't)

- Detailed Structural Analysis for the Earthquake Studied
 - Determine potential leak location/size
 - Potential leaks due to liner tear at pool's bottom edges
 - Analysis shows no liner wall failure, so partial drain down not credible at reference plant
- Use of State-of-the-Art Computational Codes
 - Multiple experiments validate codes' accuracy
- Analyzed Scenarios With and Without Successful Mitigation
 - Reasonably characterizes the range of possibilities
 - 72-hour cutoff for accident progression analysis



Study Summary

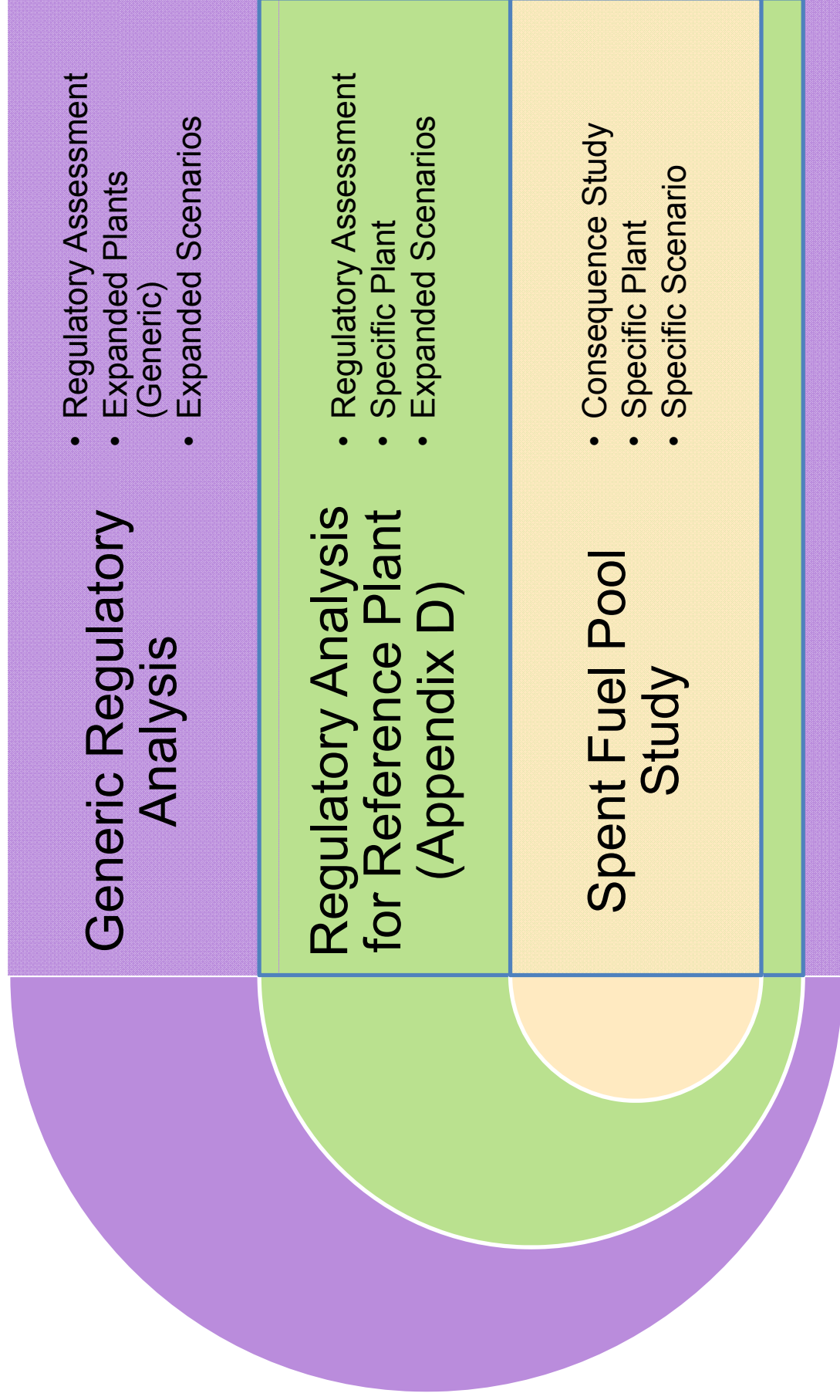
- The pool in this study survives the severe earthquake with no liner leakage 90 percent of the time
- Even if a leak occurs, spent fuel is only hot enough to cause a radiological release within a few months after the fuel is moved into the pool; otherwise the spent fuel is air-coolable for at least 72 hours
- Both high- and low-density pool loads generate a release with similar (but very low) frequency; high-density loading can lead to a larger release



Study Summary (con't)

- Public health and environmental effect estimates are generally the same or smaller than earlier studies
- The Study, together with previous research, confirms spent fuel pools adequately protect public health and safety
- The regulatory analysis for the reference plant indicates that faster spent fuel transfer does not substantially enhance safety

Overview





Tier 3 Generic Regulatory Analysis

- **The Study's Regulatory Analysis (Appendix D) considers other initiating events such as:**
 - Cask drop
 - Loss of power
 - Partial draindown
- **Expand Appendix D to all Spent Fuel Pools**
 - Conduct regulatory analysis for all spent fuel pools, including PWRs and new reactors
- **Security events previously assessed outside of this analysis**



Preliminary Findings

- Expedited transfer of spent fuel to dry cask storage does not appear to provide either a substantial increase in the overall protection of public health and safety or a safety benefit that outweighs the associated costs
- The staff's current position is to not pursue expedited transfer of spent fuel to dry cask storage and close this Tier 3 Japan lessons learned activity



Next Steps

- Draft Tier 3 Analysis Publicly Available
 - Late September
- Present Tier 3 Analysis to full Advisory Committee on Reactor Safeguards
 - October 2, 2013
- Issue Final Commission Papers
 - October 11, 2013
- Conduct Commission Meeting on Spent Fuel Safety
 - By end of 2013



Q&A