Industry Views on Spent Fuel Pool Storage and Adequacy Of Existing Requirements

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Industry Position

- **The industry agrees with and supports the overarching conclusions of both recent NRC staff evaluations:**

- **"...spent fuel pools protect public health and safety."** **Consequence Study**

- **"...expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit..."**
  Regulatory Analysis

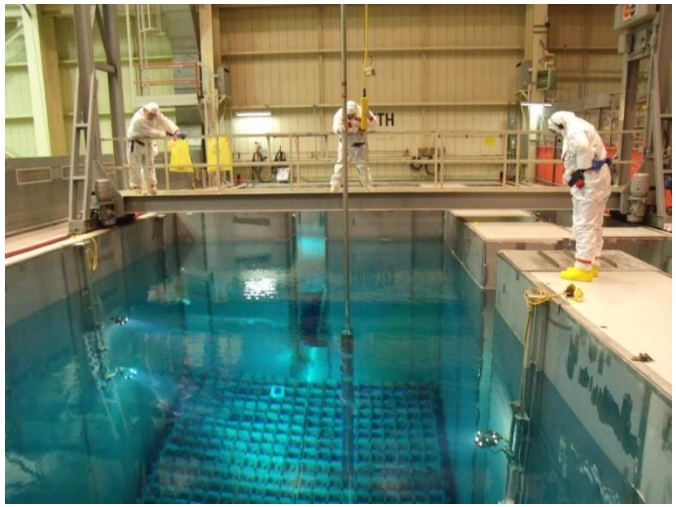
SFP Earthquake Experience Supports Industry Position

- **NRC staff reviewed 20 SFPs in Japan and 1 in the US that experienced major earthquakes**
  - **Kashiwazaki-Kariwa (2007)**
  - **Fukushima Daiichi and Daini (2011)**
  - **North Anna (2011)**
- **In all cases there was no significant damage to the fuel, pool structure, penetrations, and only minor loss of water inventory.**

Dominion Spent Fuel Situation

North Anna

Kewaunee



Fukushima Daiichi Unit 4: Example of SFP Robustness

- Fourth largest earthquake in recorded history (since 1556).
- Entire reactor building damaged by a major hydrogen explosion.
- The pool structure, which is on the operating deck, remained largely intact with only limited damage, retained sufficient water inventory and no damage to the fuel.

Consequences Study Went Far Beyond Experience

- Reference plant similar to Fukushima
- Analyzed earthquake:
  - much larger than plant design (6X SSE)
  - even larger than the one that struck Fukushima Daiichi
- The worst the study could find was an extremely small chance that the spent fuel pool would leak.

Consequences Study Demonstrates Pool Safety

- Experience and many reviews demonstrate the safety of spent fuel pools using current practices.
- Small difference in safety between pool (low density or high) and dry storage
- Public health risk from either pool or dry storage is extremely low
- The difference between the risks of the two options is the small difference between extremely small values.

Mitigation is the Key

- If fuel in pool is damaged, existing emergency procedures would keep the population around the plant safe.
- Off-site effects will be greatly reduced (or prevented altogether) through successful mitigation.
- Industry instituted pool mitigation initiatives following the 2001 terrorist attacks (B.5.b) and the accident at Fukushima Daiichi (FLEX)

Conservative Approach

- **Study used conservatisms to ensure benefits of expedited pool off-load were maximized.**
- **Assumed mitigation only effective in low-density storage cases, not in high-density storage cases.**
- **Assumed mitigation only by B.5.b requirements, not FLEX, which is far more reliable.**
- **Study did not consider risks of moving fuel from pool to dry cask storage.**

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Summary

- **The risks of spent nuclear fuel storage in pools under current practices are very, very small and spent fuel pools are safe and secure.**
- **Based on the very low risk of pool storage and the ability of plants to mitigate beyond-design-basis events, there is no reason to require a reduction of the density of spent fuel storage in pools.**

Acronyms

- SFP = Spent Fuel Pool
- SSE = Safe Shutdown Earthquake
- B.5.b = Section of 2002 Interim Compensatory Measure requiring mitigation capability following 2001 terrorist attacks (codified at 10CFR50.54(h)(h)
- FLEX = Industry's Diverse and Flexible Coping Strategy developed in response to 2011 Fukushima Daiichi accident (NRC Order EA-12-049)