

**Use of Commercial Quality Requirements to Demonstrate  
Seismic Reliability of Spent Fuel Pool Level Instrumentation  
(NRC Order EA-12-051)**

The use of commercial quality requirements to demonstrate the seismic reliability of spent fuel pool (SFP) level instrumentation channel components, such that they retain their function when subjected to design-basis event conditions is consistent with NRC Order EA-12-051 and the approach being taken to implement the lessons learned from the Fukushima Daiichi.

**Discussion**

NRC's Near-Term Task Force review of insights from the Fukushima Daiichi accident, *Recommendations for Enhancing Reactor Safety in the 21<sup>st</sup> Century*, July 12, 2011, recommended that the NRC (Recommendation 7.1):

*Order licensees to provide sufficient safety-related instrumentation, able to withstand design-basis natural phenomena, to monitor key spent fuel pool parameters (i.e., water level, temperature, and area radiation levels) from the control room.*

However, based on a complete consideration, including extensive public interactions, the NRC issued Order EA-12-051, *Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation*, March 12, 2012. The order *does not* adopt each and every provision of Recommendation 7.1. For example, the order *does not* require that the SFP instrument channel components be safety-related. The only requirement in the order that mentions seismic ground motion is "Mounting," in that:

*Installed instrument channel equipment within the spent fuel pool shall be mounted to retain its design configuration during and following the maximum seismic ground motion considered in the design of the spent fuel pool structure.*

Order EA-12-051 requires "reliable" SFP level instrumentation. "Reliable" is not only in the title of the order, it is mentioned in a number of provisions of the order, which provides additional guidance as to how "reliable" SFP instrumentation is achieved. In no instance is "reliable" related to seismic ground motion or seismic qualifications. Attachment 2 of EA-12-051 provides many and varied requirements for reliability of the SFP instrumentation channels. It is important to note that section 2 of Attachment 2 also states that SFP instrumentation reliability is maintained through development and implementation of three programmatic requirements: training, procedures, and testing and calibration. Therefore, "reliable" is an overarching attribute of the SFP instrumentation channels required by order.

Provision IV.C.1. of EA-12-051 requires utilities submit to the NRC an "overall integrated plan" describing how compliance with the requirements of Attachment 2 will be achieved. It is evident that reliability is achieved by overall integrated compliance with all the requirements of the order, not by a single seismic qualification for instrument channel components that isn't in the order.

In Staff Requirements Memorandum (SRM) approving the issuance of EA-12-051, SRM-SECY-12-0025, Proposed Orders and Requests for Information in Response to Lessons Learned From Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami, the Commission specifically addressed reliability in stating

*Reliable, commercial grade equipment could be an appropriate solution, so long as the expectations for 'reliable' are clearly outlined in the guidance documents.*

Thus "reliable" is tied directly to commercial-grade equipment.

Lastly, in approving the issuance of EA-12-051, the Commission also rejected the staff's proposal that SFP instrumentation was an adequate protection issue, and instead invoked the "administrative" exemption to backfitting. For the staff to now attempt to impose additional requirements through guidance that aren't plainly in the order text seems entirely inconsistent with the Commission's clear direction.

## **Conclusion**

Spent Fuel Pool instrumentation channel components qualified using commercial quality requirements and installed on seismic mountings in the pool fully meet the requirements of the NRC Order EA-12-051. If utilities must qualify instrument channel components using other than commercial quality requirements, there may be implications for meeting the schedules required by EA-12-051. We expect utilities will bring any schedule effects to the NRC's attention in either their reports due 60 days following issuance of the final guidance or their Overall Integrated Plans due February 28, 2013.