U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

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Commissioner Briefing on Oconee External Flooding Issue

May 25, 2010

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U.S.NRC

Background

- In 2006, while performing a Reactor Oversight Process (ROP) evaluation, the staff questioned Duke's maintenance of the flood protection barrier for the standby shutdown facility (SSF).
- Based on staff's concerns with external flooding at the Oconee site, pursuant to 10 CFR 50.54(f), the NRC issued a request for information on August 15, 2008.
- The licensee responded September 26, 2008.
  - In response to this letter, Duke stated that this inundation will lead to core damage, containment failure, and loss of spent fuel pool cooling at all three units, if no mitigating actions are taken.
- Duke's response did not provide sufficient information to demonstrate that the Oconee site had adequate protection from an external flooding event.
- NRC staff conducted numerous closed meetings and telecons with Duke to achieve a common understanding of the technical issues.

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Background, Cont.

- NRC then issued a letter on April 30, 2009, requesting additional information on Oconee external flooding issue.
- Duke provided a response on November 30, 2009.
- NRC staff determined that although Duke provided a more accurate estimate of flooding caused by failure of Jocassee Dam, additional information was still needed.
- The NRC issued another round of questions on January 29, 2010.
- Duke provided a partial response on March 5, 2010 and is on track to submit a final response by the end of June 2010.

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Interim Compensatory Measures Being Taken

- Duke submitted letter to staff on January 15, 2010, committing to implement interim compensatory measures to ensure that Oconee site will be adequately protected from external flooding events prior to final resolution.
- Region II, with NRR support, will conduct an inspection of the interim compensatory measures during the week of June 7, 2010.
- Quarterly NRC/Duke senior management meetings are held to continue effective communications.

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Potential Failure of Jocassee Dam

- The most likely failure scenario for the Jocassee Dam is a piping failure near the west abutment.
- If dam failure occurs, the Oconee site could be inundated within 3 hours.
- Duke did not address a Jocassee Dam random failure and the resulting inundation of the Oconee site when it was licensed in 1973.
  - Probable maximum precipitation/probable maximum flood (i.e., overtopping of the dam) and seismic considerations were reviewed by the staff and found acceptable during original licensing.

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Flood Effects on Oconee Site

- 18.5 ft of water (based on latest model) will result in unavailability of equipment for accident mitigation.
  - Loss of Keowee hydro-generators, which are emergency AC onsite power supplies
  - Switchyard would be unavailable, which is offsite AC power source.
    - Renders all pumps and valves with AC motors unavailable.
  - Loss of emergency core cooling system and emergency feedwater pumps in turbine building basement for all three units.
  - Normal and alternate methods for providing reactor coolant makeup, decay heat removal, and associated power to shutdown all three Oconee units will be unavailable.
    - Leaves only the SSF to mitigate the flooding event and to provide cooling to the reactor coolant pump seals.
  - The SSF would also be lost due to flooding waters of approximately 18.5 ft., since presently only protected by 7.5 ft. wall.
  - With loss of all equipment, flooding inundation would lead to core damage, containment failure and loss of spent fuel pool cooling at all three units within approximately 60 hours.

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Generic Failure Rate Evaluation of Large Rock-filled Dams

- Staff approach in deriving generic failure rate of large rock-filled dams:
  - Assessment of overall US dam population for those with similar features to Jocassee Dam.
  - Study of US dam performance information for failure events that may be applicable to this subset of overall population.
- Staff used two databases to obtain information about the population of dams in the US.
  - National Inventory of Dams (NIDs)
  - National Performance of Dams Program (NPDP)
- Staff estimated generic dam failure rate for large rock-filled dams to be 2.8E-4/dam-year.
- Literature review corroborated this conclusion.
- Duke intends to complete a more detailed failure rate evaluation specifically for the Jocassee Dam next year, which is being conducted by Utah State.

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Next Steps

- Region II, with NRR support, will conduct an inspection of the interim compensatory measures (week of June 7, 2010).
- Duke to submit final responses to staff's questions regarding potential flooding by end of June.
- Staff is completing Adequate Protection Backfit Analysis.
- Staff plans to issue an Order in the near term to confirm the compensatory measures, and Duke's schedule for the final resolution.
- Staff has entered this issue into RES Generic Issues Program.
- NRC/Duke Sr. management and staff meetings and telecons will continue to ensure effective communications.

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