



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-15-045

March 11, 2015

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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NFP-90
NRC Docket No. 50-390

Subject: **Revised Response to NRC 10 CFR 50.54(f) Request for Information
Regarding Near-Term Task Force Recommendation 2.3, Flooding -
Review of Available Physical Margin (APM) Assessments**

- References:
1. NRC Letter, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ML12053A340)
 2. NRC Letter to Nuclear Energy Institute, "Endorsement of Nuclear Energy Institute (NEI) 12-07, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features,"" dated May 31, 2012 (ML12144A142)
 3. TVA Letter to NRC, "Tennessee Valley Authority (TVA) - Fleet Response to NRC Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding the Flooding Walkdown Results of Recommendation 2.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated November 27, 2012 (ML12335A340)
 4. NRC Letter, "Request for Additional Information Associated with Near-Term Task Force Recommendation 2.3, Flooding Walkdowns," dated December 23, 2013 (ML13325A891)
 5. TVA Letter to NRC, "Update to Response to NRC 10 CFR 50.54(f) Request for Information Regarding Near-Term Task Force Recommendation 2.3, Flooding - Review of Available Physical Margin (APM) Assessments," dated February 7, 2014 (ML14042A393)

6. NRC Letter to TVA, "Watts Bar Nuclear Plant, Unit 1 - Staff Assessment of the Flooding Walkdown Report Supporting Implementation of Near-Term Task Force Recommendation 2.3 Related to the Fukushima Dai-ichi Nuclear Power Plant Accident (TAC No. MF0297)," dated June 16, 2014 (ML14149A150)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) staff issued Reference 1 requesting information pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f). Enclosure 4 of that letter contains specific requested information associated with Near-Term Task Force Recommendation 2.3 for Flooding. Per Reference 2, the NRC endorsed Nuclear Energy Institute (NEI) 12-07, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features," dated May 31, 2012. By Reference 3, Tennessee Valley Authority (TVA) submitted its final report in response to the request for information for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, Sequoyah Nuclear Plant (SQN), Units 1 and 2, and WBN, Unit 1.

The requirements of NEI 12-07, section 5.8, "Documentation of Available Physical Margins," include: identify the available physical margin (APM) associated with each applicable flood protection feature; determine if the margin provided is small; and, evaluate any small margins that have potentially significant consequences through the corrective action program. The results of this effort were to be maintained on site for future NRC audits.

Following the NRC staff's initial review of the walkdown reports, regulatory site audits were conducted at a sampling of plants. Based on the walkdown report reviews and site audits, the staff identified additional information necessary to allow them to complete its assessments. Accordingly, by Reference 4, the NRC staff issued a request for additional information (RAI). Reference 4 requested a response by January 31, 2014. After requesting an extension, Reference 5 provided TVA's fleet response to the RAI questions for BFN, Units 1, 2, and 3, SQN, Units 1 and 2, and WBN, Unit 1, on February 7, 2014. Using the responses provided in Reference 3 and 5, the NRC issued its Staff Assessment of the flooding walkdown report for WBN, Unit 1 in Reference 6. Reference 6 determined TVA provided sufficient information to be responsive to the 50.54(f) letter for WBN, Unit 1.

The purpose of this letter is to provide an update to the response provided in Reference 5, RAI Question 4, for WBN, Unit 1. TVA provided the following response to RAI Question 4 in Reference 5:

"RAI 4

As a result of the audits and subsequent interactions with industry during public meetings, NRC staff recognized that evaluation of APM for seals (e.g., flood doors, penetrations, flood gates, etc.) was challenging for some licensees. Generally, licensees were expected to use either Approach A or Approach B (described below) to determine the APM for seals:

- a) *If seal pressure ratings were known, the seal ratings were used to determine APM (similar to example 2 in Section 3.13 of NEI 12-07). A numerical value for APM was documented. No further action was performed if the APM value was greater than the pre-established small-margin threshold value. If the APM value was small, an assessment of "significant consequences" was performed and the guidance in NEI 12-07 Section 5.8 was followed.*
- b) *If the seal pressure rating was not known, the APM for seals in a flood barrier is assumed to be greater than the pre-established small-margin threshold value if the following conditions were met: (1) the APM for the barrier in which the seal is located is greater than the small-margin threshold value, and (2) there is evidence that the seals were designed/procured, installed, and controlled as flooding seals in accordance with the flooding licensing basis. Note that in order to determine that the seal has been controlled as a flooding seal, it was only necessary to determine that the seal configuration has been governed by the plant's design control process since installation. In this case, the APM for the seal could have been documented as "not small".*

As part of the RAI response, state if either Approach A or Approach B was used as part of the initial walkdowns or as part of actions taken in response to this RAI. No additional actions are necessary if either Approach A or B was used.

If neither Approach A or B was used to determine the APM values for seals (either as part of the walkdowns or as part of actions taken in response to this RAI), then perform the following two actions:

- *Enter the condition into the CAP (note: it is acceptable to utilize a single CAP entry to capture this issue for multiple seals). CAP disposition of "undetermined" APM values for seals should consider the guidance provided in NEI 12-07, Section 5.8. The CAP disposition should confirm all seals can perform their intended safety function against floods up to the current licensing basis flood height. Disposition may occur as part of the Integrated Assessment. If an Integrated Assessment is not performed, determine whether there are significant consequences associated with exceeding the capacity of the seals and take interim action(s), if necessary, via the CAP processes. These actions do not need to be complete prior to the RAI response.*
- *Report the APM as "undetermined" and provide the CAP reference in the RAI response.*

TVA Response:

As part of the initial walkdowns, TVA performed visual inspections of seals (e.g. flood doors, penetrations, flood gates, etc.) at BFN, Units 1, 2, and 3, SQN, Units 1 and 2, and WBN, Unit 1. All seals were inspected for signs of degradation, and corrective actions were taken, if required. TVA used a combination of Approach A and Approach B as part of the initial walkdowns. If seal pressure rating data was known, the seal ratings were used to determine APM (similar to example 2 of Section 3.13 of

NEI 12-07), then a numerical value for APM was documented. If no seal rating information was available, then the APM was assumed to be greater than the established small-margin threshold value if the flood licensing basis documentation provided evidence that the seals were designed/procured, installed, and controlled as flooding seals.

For WBN, Unit 1:

As part of the actions taken to address this RAI, APM values were determined for flood seals in accordance with a combination of Approach A and Approach B."

After submittal of Reference 5, a historical documentation issue was identified for the Containment Purge Exhaust System during flood mode. The isolation valves 1-FCV-30-061, -062, -213, and -216 (Containment Purge Exhaust) in the WBN Auxiliary Building Penetration Room on elevation 713 are designed to close and keep floodwaters from traveling through the ductwork into the annulus during an external flood that exceeds plant grade. However, there are expansion joint assemblies in the duct work into the annulus between these isolation valves and the WBN Unit 1 Shield Building wall. The original bill of materials and purchase specification for these expansion joint assemblies only specified an internal pressure rating of 3 psi. No external pressure rating appears to have been specified during the original design. No documentation can be located to show that these expansion joints are rated for the external hydrostatic pressure that could be induced during a flood scenario. The current design basis credits the Shield Building and all penetrations below design basis flood level as being watertight and therefore maintaining the annulus dry during flood conditions. This issue was documented in TVA's Corrective Action Program (CAP).

Based on this information, the following revised response to RAI 4 is provided for WBN, Unit 1:

TVA Revised Response:

As part of the initial walkdowns, TVA performed visual inspections of seals (e.g. flood doors, penetrations, flood gates, etc.) at BFN, Units 1, 2, and 3, SQN, Units 1 and 2, and WBN, Unit 1. All seals were inspected for signs of degradation, and corrective actions were taken, if required. TVA used a combination of Approach A and Approach B as part of the initial walkdowns. If seal pressure rating data was known, the seal ratings were used to determine APM (similar to example 2 of Section 3.13 of NEI 12-07), then a numerical value for APM was documented. If no seal rating information was available, then the APM was assumed to be greater than the established small-margin threshold value if the flood licensing basis documentation provided evidence that the seals were designed/procured, installed, and controlled as flooding seals.

For WBN, Unit 1:

As part of the actions taken to address this RAI, APM values were determined for flood seals in accordance with a combination of Approach A and Approach B, except for the expansion joint assemblies for Containment Purge Exhaust isolation valves 1-FCV-30-061, -062, -213, and -216. The APM values for these expansion joints could not be determined and the flood licensing basis documentation does not provide evidence that the seals were designed, procured, installed, and controlled as flooding seals. Therefore, the APM is reported as undetermined, and this condition has been entered in TVA's CAP under Problem Evaluation Report (PER) 943620.

This letter contains no new regulatory commitments. If you have any questions regarding this submittal, please contact Gordon Arent at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 11th day of March 2015.

Respectfully,

A handwritten signature in black ink, appearing to read "J. W. Shea".

J. W. Shea
Vice President, Nuclear Licensing

cc: NRC Regional Administrator - Region II
NRR Director - NRC Headquarters
NRC JLD Director - NRC Headquarters
NRC Senior Resident Inspector - Watts Bar Nuclear Plant, Unit 1
NRR Project Manager - Watts Bar Nuclear Plant