



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

March 1, 2013

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR STATION, UNIT 1 – REQUEST FOR ADDITIONAL
INFORMATION RELATED TO LICENSE AMENDMENT REQUEST TO
UPDATED FINAL SAFETY ANALYSIS REPORT CHANGES ASSOCIATED
WITH HYDROLOGIC ANALYSIS (TAC NO. ME9130)**

Dear Mr. Shea:

By letter dated July 19, 2012, you submitted an application for license amendment to revise the Updated Final Safety Analysis Report (UFSAR) to adopt a revised hydrologic analysis for Watts Bar Nuclear Plant (WBN) Unit 1. These changes to the WBN Unit 1 UFSAR incorporated updates previously submitted in support of the initial licensing of WBN Unit 2 as well as more recently discovered input information.

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your submittal and has determined that additional information is required to complete the review. The specific information requested is addressed in the enclosure to this letter. The proposed questions were discussed by telephone with your staff on February 1, 2013. Your staff confirmed that these questions did not include proprietary or security-related information and agreed to provide a response within 30 days from the date of this request for additional information (RAI).

J. Shea

- 2 -

The NRC staff considers that timely responses to RAIs help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-8480 or via e-mail Andrew.Hon@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Hon", followed by a horizontal line.

Andrew Hon, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure:
Request for Additional Information

cc w/encl: Distribution via ListServ

REQUEST FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST TO
UPDATED FINAL SAFETY ANALYSIS REPORT CHANGES
ASSOCIATED WITH HYDROLOGIC ANALYSIS
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 1
DOCKET NO. 50-390

By letter dated July 19, 2012 (Agencywide Documents Access and Management System Accession No. ML122360173), the Tennessee Valley Authority (the licensee or TVA), submitted a license amendment request (LAR) to revise the Watts Bar Nuclear Plant (WBN), Unit 1 Updated Final Safety Analysis Report to reflect the results from new hydrologic analysis. These proposed changes are consistent with the latest approved hydrology calculations. The proposed changes in the updated hydrologic analysis include updated input information, and updates to methodology that include the use of the U.S. Army Corps of Engineers Hydrologic Modeling System and River Analysis System software. In order to complete its review of the above documents, the U.S. Nuclear Regulatory Commission (NRC) staff requests additional information originating from our Health Physics and Human Performance Branch:

1. What, if any, operator actions are being changed, added or deleted?
2. Have there been any changes to training? Please provide any information regarding changes to training or qualifications as a result of this LAR.
3. It is not clear from the submittal whether a new task analysis was completed to identify any functional requirements. Please describe any new task analysis results that may provide insight into function allocation.
4. Please describe any changes to physical interfaces (control room, etc.).
5. Are there any applied insights from industry operating experience? If so, please provide those insights.
6. How many people will be needed to construct staged sandbags into the berm? How much do the sandbags weigh, how long will this action take.
7. The second paragraph on page 2 of the submittal states, "For the IPS [intake pumping structure], a compensatory measure of staged sandbags to be constructed into a berm at any time prior to or during the event of a Stage I flood warning has been implemented." Please clarify this statement.

Enclosure

8. Are the actions for staging the sandbags controlled and specified in a procedure?
9. On page 8 of Enclosure 1, the first paragraph of the Enclosure states, "However, there are exceptions that require temporary modifications to ensure adequate flood protection in the interim, with permanent plant modifications planned to restore or gain additional margin between the revised DBF [design based flood] elevations and limiting safety-related systems, structures, and components." What temporary modifications and permanent modifications are being done? If they include any human interfaces, what human factor reviews and inputs are/were used?
10. On page 2.4-68 of Attachment 1, the submittal mentions "TVA's climatic monitoring, flood predicting systems and flood control facilities permit early identification of potentially critical flood producing conditions and reliable prediction of floods which may exceed plant grade well in advance of the event." Is prediction done using a controlled procedure consistent with the assumptions of the hydrology analysis? What specific timing is associated with the term "well in advance"?
11. Page 2.4-71 of Attachment 1 in the Basic Analysis section, the submittal declares "the forecast procedure to assure safe shutdown of WBN for flooding is based upon an analysis of 17 hypothetical PMP [probable maximum precipitation] storms, including their antecedent storms. In the proposed change, the procedure is based upon an analysis of nine of the 17 hypothetical storms up to PMP magnitude judged to be controlling." Is this procedure owned and controlled by the plant? If so, what is the procedure number?
12. Also referencing question 11, what is the criterion used to determine which 9 of the 17 hypothetical PMP storms analyses would be used?
13. The Hydrologic Basis for Warning System section on page 22 of the submittal mentions a Stage I, Stage II, and the times associated with each stage. How was the time validated for each stage, 10 hours for Stage I and 17 hours for Stage II? Clarify how this integrates with the Emergency Plan (EP) (e.g., when emergency classifications are made, and whether the EP call-in methods will give them enough people to implement the flood plan(s) in enough time).
14. Ending page 18 and beginning page 17 of Enclosure 1, discusses the communication reliability during emergencies. Will flooding affect any of the communications systems? If so, which one(s). Will any group or individual become unable to communicate because of the failure(s)?
15. Page 37 of Enclosure 1: Are there any other actions (other than those listed) in the corrective action items that address the update of the Hydro analysis? For example, does the corrective action item describe the permanent modifications that are being considered?

16. On page 28 of Enclosure 1, a calculation for shutdown procedures for extreme events has been analyzed for 27 hours. Has there been any physical validation of the TVA calculation that confirms that 27 hours are available? Has NRC seen and approved this calculation?
17. Page 30 of Enclosure 1, the seventh paragraph says "Flood warnings are issued in real-time by TVA RO [River Operations]." What does this statement mean specifically regarding "real-time"? Exactly, how does this go from a warning to implementation of the flood plan? What is the sequence of events/actions?
18. Page 31 of Enclosure 1 states: "...lower forecast threshold warning flood elevations are used in some situations to assure that the 27 hours pre-flood transition interval is always available." Who makes this decision and on what basis?
19. Pages 36 and 37 of Enclosure 1, are there any plant modes, other than 100 percent power, that could complicate planned responses or extend response times? What procedures would be entered if there is a change with the initial assumptions?
20. On page 2.4-61 of Attachment 1, Post-Flood Period section, please explain why detailed procedures are not available for post flood actions?
21. Page 2.4-62 of Attachment 1 Spent Fuel Pool (SFP) Section: This system *cooling* relies on Essential Raw Cooling Water (ERCW), which is one of the two systems requiring additional protection. What procedure would be used if the ERCW fails?
22. The first paragraph on 2.4-62 of Attachment 1 states, "Heat removal from the steam generators is accomplished by adding river water from the High Pressure Fire Protection (HPFP) System and relieving steam to the atmosphere through the power operated relief valves." Will there be sufficient capacity in the HPFP to also maintain the SFP level if necessary? If not, what actions would be taken?

J. Shea

- 2 -

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Sincerely,

/RA/

Andrew Hon, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure:
Request for Additional Information

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