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

February 9, 2011

Mr. Ashok S. Bhatnagar
Senior Vice President
Nuclear Generation Development
and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING FINAL SAFETY ANALYSIS REPORT AMENDMENT RELATED TO SECTION 9.5.1 "FIRE PROTECTION SYSTEM" (TAC NO. ME3091)

Dear Mr. Bhatnagar:

By letter dated January 11, 2010, (Agencywide Documents Access and Management System Accession No. ML100191732), the Tennessee Valley Authority (TVA) submitted Final Safety Analysis Report Amendment No. 97 which incorporates, by reference, the Watts Bar Fire Protection Report. TVA responded to earlier information requests relating to the Fire Protection Report through letters dated July 16, August 9, August 20, August 30, November 5, December 1, December 18, and December 20, 2010.

The U.S. Nuclear Regulatory Commission staff has reviewed the information provided by TVA and has determined that additional information is needed to complete its review.

A response is required 30 days from the date of this letter.

If you should have any questions, please contact me at 301-415-2048.

Sincerely,

Justin C. Poole, Project Manager
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFROMATION

WATTS BAR NUCLEAR PLANT, UNIT 2

FIRE PROTECTION REPORT

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

Request for Additional Information (RAI) number format Example: [RAI FPR V-1]
RAI – RAI
FPR [Fire Protection Report] – topic or document from which the comment originates
V – Section of the document
-1 – Sequential comment for that section

RAI FPR General-1

A conflict exists in that Part I, Table 1-1 of the submitted Fire Protection Report does not reflect the change identified for Revision 40 in the "WBN Fire Protection Report Revision Summary 6 Thru 40" table in Tennessee Valley Authority's (TVA's) December 20, 2010, letter. Resolve this conflict.

Confirm that an extent of condition review has been conducted to ensure that: a) all of the identified changes have been incorporated into the submitted Fire Protection Report, and b) all changes have been identified. Any conflicts or discrepancies thus identified must be resolved.

RAI FPR General-2

Provide a copy of the final "as-designed" Fire Protection Report.

Provide an identification and justification of the changes to the Fire Protection Report between Revision 40 and the final "as-designed" version of the report, similar to those provided for Revisions 6 through 40.

Also provide a digital copy of Revision 40 of the Fire Protection Report.

RAI FPR V-1

Fire Protection Report Section 2.1, states that:

> Abnormal Operating Procedure AOI-30.2, "Fire Safe Shutdown" has been developed to specify the manual actions which may be required for fires that damage equipment necessary to achieve and maintain safe shutdown. The fire safe shutdown procedures contained in AOI-30.2 were developed based on calculations EEB-ED-Q000-9992009-0012, "Equipment Required for Safe Shutdown per 10 CFR 50 Appendix R" and WBNEEB-EDQ00099920090016, "Manual Actions Required for Safe Shutdown Following a Fire." The procedure documents the required manual action(s) that must take place given an Appendix R fire in any room of the plant.

Fire Protection Report Part V only discusses "Manual Actions Prior to Main Control Room Abandonment" (Section 2.2) and "Manual Action in Location of the Fire" (Section 2.4). No information is provided regarding the assumptions or criteria for the other manual actions. No information is provided regarding the criteria that were analyzed to demonstrate feasibility and reliability.

TVA's August 9, 2010, letter to the U. S. Nuclear Regulatory Commission (NRC) includes an attachment titled, "Operator Manual Actions Added for Unit 2 Safe Shutdown (baseline)." In this attachment, a number of Unit 2 manual actions have very little margin documented:

- 1053, 1046, 1018, 1021, 1186 – 2 minutes margin, equivalent to 10 percent of required time,
- 1287, 1207, 1047 – 3 minutes margin, equivalent to 17 percent of required time,
- 1184, 1185 – 4 minutes margin, equivalent to 20 percent of required time.

The minimal amount of margin included in these and other manual actions, some have 5, 6, and 10 minutes of margin, provide little confidence that the manual actions can be feasibly and reliably performed. In addition, no information is provided regarding diagnosis time or manual actions performed simultaneously for the same fire since fire area of origin is not provided in the August 9, 2010, letter.

Provide a description of the criteria and assumptions used to ensure that Unit 2 manual actions (including manual actions for alternate or dedicated shutdown) are feasible and reliable. This should include the criteria and assumptions for feasible and reliable diagnosis time, implementation time, and time margin for the other operator manual actions not explicitly described in Part V.

A specific discussion of each of the manual actions is not needed, except for components as part of the safe shutdown success path – see RAI FPR V-2, where manual actions are used to resolve a multiple spurious operation scenario – see RAI FPR V-2, or where Unit 2 manual actions for reentry are needed in less that approximately 1-hour – see RAI FPR V-7. Only the criteria and assumptions that are used in the calculations to assure that the manual actions are both feasible and reliable.

Additionally, a number of entries in the "Operator Manual Actions Added for Unit 2 Safe Shutdown (baseline)" table from TVA's August 9, 2010, letter to the NRC contain "XXX" entries (for example "2-HS-3-XXX-B," "2-JB-292-XXX-B," and "Added by DCN XXX" for Manual Operator Action 1028). Provide the correct information and confirm that an extent of condition review has been conducted to identify and correct other similar instances.

Also provide an explanation of the entries in the "Notes" column of the same table.

<u>RAI FPR V-2</u>

Regulatory Guide 1.189, Revision 2, provides information regarding components required as part of the safe shutdown success path and components important to safe shutdown. The criteria for equipment required for the safe shutdown success path are included in Regulatory Guide 1.189, Revision 2, Section 5.3.1.1, and examples are provided in Section 5.3.1.5 of the guide. These reviews should have been performed for Unit 1 operator manual actions; see Enforcement Guidance Memoranda 07-004, and 09-002.

For Unit 2, manual actions that restore or that otherwise involve safe shutdown success path equipment or are part of a multiple spurious operation scenario resolution, provide a technical justification of the feasibility and reliability of each of the manual actions.

For manual actions that do not involve safe shutdown success path components, but involve important to safe shutdown components, a description of the criteria and assumptions for feasibility and reliability of the manual actions is sufficient; see RAI FPR V-1.

RAI FPR V-3

Fire Protection Report Section 2.1.1 states:

> Plant walk downs were conducted prior to Unit 1 initial operations and will be prior to Unit 2 operations to sequence operator actions, verify the amount of time required to accomplish the manual action, and identify the minimum number of operators required to support manual actions given a fire in any plant location.

If plant walk downs have not yet been performed for Unit 2 manual actions, provide the bases for the timing provided in the Section 2.4.3, and letter dated August 9, 2010.

A conflict exists between the quoted statement and the statement in Section 2.3 that states, "Plant walk downs were conducted to verify the viability of the operator actions." Resolve these conflicting statements.

If final confirmed walk down information can't be made available in the near term, TVA shall provide a commitment to review the final walk downs and submit to the NRC the results of those walk downs for NRC approval if they differ from the assumptions and details provided in Part V or the other parts of the Fire Protection Report.

RAI FPR V-4

Fire Protection Report Section 2.4.2, Rev. 5 states:

> A few rooms require entry for valve position manipulations approximately 1-hour after reactor trip.

Fire Protection Report Section 2.4.2, of the submittal states:

> A few rooms require entry for valve position manipulations less than 2-hours after reactor trip.

The staff could not identify this change occurring as part of Revisions 6 through 40.

TVA has apparently applied this change and reduced the amount of margin to reenter a fire area from approximately 1-hour to less than 1-hour. This occurred based on Sections 2.4.3.3, and 2.4.3.4, where room reentry is needed at 42 minutes.

Provide the technical basis for changing reentry time from approximately 1-hour to less than 2-hours. This has the potential to reduce the reentry time to less than 1-hour, as evidenced in the above examples. Provide a justification for any Unit 2 manual actions that require reentry in less than approximately 1-hour.

RAI FPR V-5

Insufficient information is provided in Section 2.4.3 to positively identify the manual actions in this section as Unit 1, Unit 2, or both. Some of the actions have room access times reduced to less than approximately 60 minutes.

Identify which manual actions described in Section 2.4.3 are required for Unit 2.

RAI FPR V-6

Fire Protection Report Section 2.4.3.1, Submittal revision, states that if a fire in Room 692.0-A22 occurs, manual actions are needed in Room 713.0-A1B and eventual reentry to this room is needed. This is in conflict with Part I, Table 1-1, which does not indicate for Room 692.0-A22 that, "Man. Ops. Req'd in any room due to fire in room."

Resolve the conflict between Section 2.4.3.1 and Table 1-1. In addition, Fire Protection Report Section 2.4.2.1, related to Room 692.0-A25 and Fire Protection Report Section 2.4.3.2, related to Room 713.0-A20, also include the same conflict.

Confirm that an extent of condition review of Table 1-1 consistency with the remainder of the document has been performed to identify and resolve other conflicts.

RAI FPR V-7

Fire Protection Report Section 2.4.3.3 includes a manual action that requires room access to Room 729-A14 within 42 minutes. This is inconsistent with the approved fire protection program, Revision 5, which states that room access would occur in approximately 1-hour. There is no indication whether these are Unit 2 manual actions.

This would also apply for Section 2.4.3.4 for Room 737.0-A5.

For any Unit 2 manual actions that require reentry, provide a specific discussion of:

- Room construction and dimensions
- A description of the type detection and any fixed suppression system, including if the systems are code compliant and which version of the code
- Number and types of ignition sources in the area
- Horizontal and vertical distance between ignition sources in the area and equipment needed for safe shutdown (targets)
- If there is separation between the ignition sources and the targets, describe any continuous combustibles between them, such as cable trays.
- If flammable or combustible liquids are in the area provide a discussion of how the targets are protected from a flammable or combustible liquid fire
- A discussion of the effectiveness of any available fixed suppression related to the ignition sources
- A discussion of the analysis performed to assure feasibility and reliability of the manual actions.

RAI FPR V-8

Fire Protection Report Section 2.5.1, states:

> The possibility exists, however, that residual smoke from the postulated fire may require the Operator to wear a self contained breathing apparatus (SCBA); therefore, SCBAs are available for use if needed.

Confirm that the calculation of the timing, the plant walk downs for the Unit 2 manual actions that require reentry, and the affected manual action completion times include the time to obtain and don SCBA. Availability of the SCBA on the operator path of travel should be considered. In addition, emergency lighting availability in the SCBA storage area and access thereto should be considered if a fire is in an alternate or dedicated safe shutdown area or if the fire itself has the capability to affect offsite power.

RAI FPR V-9

Section 2.5.2 states that, "Each of the rooms is also provided with an automatic suppression system."

Room 729.0-A14 is included in Section 2.4.3.3, should have suppression based on 2.5.2, but suppression is not listed in Part I, Table 1-1.

Resolve the apparent contradiction for Room 729.0-A14. Perform an extent of condition review to assure that no Unit 2 fire areas have similar conflicts with Part I, Table 1-1.

RAI FPR V-10

Fire Protection Report Section 4.0 states that, "The operators will carry a portable lantern when required to perform a manual action in an area that has experienced a fire." Confirm for Unit 2 manual actions that emergency lanterns are available and access to the lanterns has been considered in the walk down time lines.

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