Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

MAY 25 2006

10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of) Docket No. 50-390
Tennessee Valley authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - TECHNICAL SPECIFICATION (TS) CHANGE NO. 04-013 - AUXILARY FEEDWATER (AFW) START UPON TRIP OF TURBINE DRIVEN MAIN FEEDWATER (TDMFW) PUMPS - REQUEST FOR ADDITIONAL INFORMATION (RAI) - TAC NO. MC 4586

As a result of a teleconference regarding the subject TS Change on January 27, 2006, NRC issued a RAI on February 27, 2006. The enclosure provides the TVA response to this RAI. The delay in submitting this response was coordinated with the NRC Staff.

There are no regulatory commitments associated with this letter. If you have any questions concerning this matter, please call me at (423) 365-1824.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 25th day of May 2006.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosure
1. Response to Request for Additional Information
cc: See Page 2

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Enclosure
cc (Enclosure):
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ENCLOSURE
WATTS BAR NUCLEAR PLANT, UNIT 1
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

"The operability requirement that is specified by Technical Specification (TS) Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation," Item 6.e, "Trip of All Turbine Driven Main Feedwater Pumps," provides defense-in-depth for the low-low steam generator water level setpoint that is relied upon by the accident analyses for actuating the auxiliary feedwater system. This circuitry is required to be operable in Modes 1 and 2 because, as explained in the Basis for this Technical Specification requirement: "In MODES 3, 4, and 5, the RCPs and MFW pumps may be normally shut down, and thus neither pump trip is indicative of a condition requiring automatic AFW initiation." Note that the TS Basis indicates that a loss of all main feedwater while operating in Modes 1 and 2 will automatically initiate AFW flow to the steam generators for decay heat and sensible heat removal without the need to rely upon operator actions. The practice of using the standby main feedwater pump until the plant is operating at around 18 percent power before starting a turbine driven main feedwater pump renders this AFW initiation circuitry incapable of performing its function in Mode 2 (as well as in Mode 1 below 18 percent power) and does not appear to satisfy the intent of the TS requirement that was established. In order to satisfy the intent of the TS requirement, the AFW automatic initiation circuitry would also have to apply to the standby main feedwater pump when it is being used in Modes 1 and 2 for providing steam generator makeup water. The fact that the turbine driven main feedwater pumps are not normally started until the plant reaches 18 percent power does not justify the proposed change; the intent of the existing TS requirement must be considered and addressed. Therefore, the following additional information is required:

1. Please explain why the existing TS requirement should not be applicable to operation of the standby main feedwater pump when it is being used in lieu of a turbine driven main feedwater pump when the plant is operating in Modes 1 or 2 (up to about 18 percent power) so that a loss of the standby main feedwater pump will automatically actuate the AFW system, consistent with the discussion that is provided in the TS Basis."

Response to Question 1

The WBN TS Bases, in section B3.3.2.6.e, are clear that AFW activation is associated with just the Turbine Driven Main Feed Water (TDMFW) pumps and that absence of a discussion concerning

the Standby Main Feedwater (SBMFW) is consistent with the WBN hardware configuration. WBN's motor driven standby main feedwater pump (SBMFWP) control circuitry does not contain the control logic necessary to provide the auxiliary feedwater auto start function due to the loss of all of main feedwater. The motor driven standby main feedwater pump (SBMFWP) was designed for operation at power and during startup. In particular, it was designed for use during startup and shutdown of the plant and does not have the capacity that the TDMFW pumps have. At WBN, only the TDMFW pumps contain the logic to provide this function.

There is no mention of the SBMFWP contained in the WBN Technical Specification or its bases. A comparison of the WBN TSs at the time of licensing in 1995 with the Westinghouse Owners Group standard technical specification (WOG STS) in existence during the same timeframe, reveals that while the WOG STS Bases include a reference to the standby main feedwater pump control logic and its trip function, the WBN TS Bases do not.

In addition, the WBN Updated Final Safety Analysis Report (UFSAR) is also clear in describing the SBMFWP and its function. The UFSAR in various places (e.g. Section 15.2.8, "Loss of Normal Feedwater") describes the trip function as being limited to the TDMFW pumps.

The interaction between AFW start and SBMFW pump operation was reviewed by NRC staff and documented in Safety Evaluation Report, NUREG 0847, Section 10.4.7 on page 10-12 as follows:

> "The use of the standby feedwater pump is the normal means for starting up and shutting down the plant. This pump is also automatically activated in the event of the loss of one main feedwater pump. This is accompanied by an automatic turbine runback to 85 percent of load if the power level is above 80 percent of full power. Should main feedwater flow continue to decrease, the auxiliary feedwater system will automatically activate when the low-low steam generator level is reached..."

Changing the plant design to add AFW start function circuitry exceeds 10 CFR 50.36 (c)(2)(ii) technical specification criteria. As discussed in question 2, start of AFW upon loss of the MFWPs is not part of the primary success path for postulated accident mitigation. This view is consistent with the one reflected in the initial comments and questions provided via email by NRC upon review of the original amendment request.

"2. Please explain why the defense-in-depth capability that is intended by the existing TS requirement is not considered to be necessary for decay heat and sensible heat removal below a power level of 18 percent, considering the maximum heat load that can exist following full power operation. Note that the NRC typically does not allow automatic safety features to be replaced by manual operator actions and therefore, any credit that is taken for manual operator actions in lieu of automatic protective features must be fully explained and justified."

Response to Question 2

As discussed above in response to Question 1, the motor driven SBMFWP was designed for operation at power and during startup. In particular it was designed for use during startup and shutdown of the plant. On plant startup, the SBMFWP supplies steam generator makeup to approximately 10 to 15 percent when a turbine driven main feedwater pump is placed into service prior to placing the main turbine into service and closing the generator output breaker for connection to the power grid. On plant shutdown, the opposite situation occurs where the SBMFWP is used when the TDMFW pumps are shutdown as the plant power level decreases. The control logic circuit for the SBMFWP does not include an Auxiliary Feedwater auto start function as the TDMFW pumps have. This was the configuration in which WBN was licensed in 1995. Therefore, the existing TS requirement does not apply for the SBMFWP.

It is also important to note that a trip of the SBMFWP when neither TDMFW pump is in service requires the plant operator to start AFW in accordance with AOI-16, "Loss of Normal Feedwater," which provides the same result as the AFW auto start function upon trip of the TDMFW pumps. This manual action predated this amendment application and, besides being procedurally driven, would be the normal response one would expect the operator to perform upon a loss of normal feedwater event. This procedure driven start provides the necessary defense in depth capability.

In addition, automatic action is initiated on low-low level in the steam generator. This remains as the safety grade auxiliary feedwater start. The normal water level in the steam generator varies between approximately 38 percent and 60 percent narrow range. At low power levels, boil off rates are lower than at full power and additional time exists prior to water level depletion in the generator. Therefore, anticipatory start of auxiliary feedwater is not as significant as at higher power levels.

"3. Please revise the proposed TS and/or TS Basis (as appropriate) to establish requirements that are consistent with the responses to Questions 1 and 2, above."

Response to Question 3

As discussed above, TVA has concluded that no further changes are needed beyond what was indicated in the original amendment request.