

February 11, 2009

WBN-TS-08-07

10 CFR 50.90

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

Gentlemen:

In the Matter of)
Tennessee Valley Authority (TVA))

Docket No. 50-390

**WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION RE: AUXILIARY FEEDWATER AUTO-START UPON
TRIP OF THE TURBINE DRIVEN MAIN FEEDWATER PUMPS (TAC NO. MD9713)**

The purpose of this letter is to respond to NRC's request for additional information (RAI) dated January 16, 2009 (ADAMS No. ML090130651).

By letter dated September 18, 2008, TVA issued a license amendment request to change Watts Bar Nuclear Plant (WBN), Unit 1, Technical Specifications (TS). The proposed request was to revise the mode applicability for Function 6.e as defined in Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation," and the limiting condition for operation (LCO) 3.3.2, Condition J, to be consistent with WBN Unit 1 design bases.

There are no regulatory commitments associated with this submittal. If you have any questions concerning this matter, please call me at (423) 365-1824 or Robert Clark, Senior Licensing Engineer at (423) 365-1818.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 11th day of February, 2009.

Sincerely,

M. K. Brandon
Manager, Site Licensing and
Industry Affairs

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Enclosure
cc:

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION (RAI) WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 TECHNICAL SPECIFICATIONS (TS) CHANGE REQUEST TS-08-07

By letter dated September 18, 2008, TVA issued a license amendment request (LAR) to change Watts Bar Nuclear Plant (WBN), Unit 1, Technical Specifications (TS). The proposed request was to revise the mode applicability for Function 6.e as defined in Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation," and the limiting condition for operation (LCO) 3.3.2, Condition J, to be consistent with WBN Unit 1 design bases. The NRC issued a request for additional information (RAI) dated January 16, 2009 (ADAMS No. ML090130651). TVA's response to this RAI is given below.

Question:

The following question is in reference to the proposed Mode 1 Applicability Note (i) for Function 6.e of Table 3.3.2-1.

Please explain the justification for why the 4-hour allowance to suspend entry into Condition J should be granted, as permitted under 10 CFR 50.36(c)(2)(i), given the 48-hour completion time.

Response:

When entering Mode 1 (> 5% Rated Thermal Power (RTP)), one turbine driven main feedwater (TDMFW) pump is in service, i.e., its associated hydraulic control circuit is pressurized (≥ 50 psig), its anticipatory trip circuit is "reset," and the pump is providing feed flow to the steam generators (SGs). The second non-operating TDMFW pump is in the "trip" condition, i.e., its hydraulic control circuit is de-pressurized (< 50 psig) and its associated stop and control valves are closed. With one anticipatory trip channel "reset" and the other in "trip," the auxiliary feedwater (AFW) auto-start logic is in a one-out-of-two trip condition between 5% and approximately 50% RTP. Trip of the operating TDMFW pump during this time would result in automatic startup of all AFW pumps.

The second non-operating TDMFW pump is placed in service at approximately 50% RTP. During the process of placing the second TDMFW pump in service, its associated anticipatory trip circuit is "reset," i.e., its hydraulic control circuit is pressurized and the trip circuit energized. Although the anticipatory trip circuit for the second TDMFW pump is "reset," the pump is not providing feed flow to the SGs at this time because all pump startup activities as described below have not been completed. However, with both anticipatory trip channels "reset," the AFW auto-start circuit is also "reset," i.e., both inputs to the "AND" gate making up the AFW auto-start circuit are not present (see Figure 1 of LAR). In summary, "reset" of the AFW auto-start circuit does not mean both pumps are operating or providing feed flow; it only indicates that the hydraulic control circuits for both pumps are pressurized. However, no hydraulic pressure is a positive indication that the TDMFW pump is tripped and not pumping because hydraulic pressure is needed to open the turbine stop valves and to throttle the governor valves controlled by the electronic governor.

In this configuration with the second TDMFW pump coming on-line in the "reset" condition, the AFW auto-start circuit is prevented from performing its intended safety function. For example, if the running TDMFW pump were to trip during this time, no AFW auto-start signal would be generated because the anticipatory trip circuit for the second non-operating TDMFW pump is "reset." Therefore, during this short period the AFW auto-start logic (Function 6.e) is inoperable which forces the plant to enter LCO 3.3.2, Condition J. Until the second TDMFW is pumping forward, LCO 3.2.2 is not met.

To resolve this issue, TVA elected to modify Mode 1 applicability for Function 6.e to include operational allowances which are similar to those approved by the NRC for Sequoyah, Vogtle, Callaway, Indian Point 2, and Prairie Island.

The proposed TS allowance is justified because, as described in Section 3.0 of the LAR, the process for placing the second TDMFW pump in service requires approximately 4 hours to complete. During this time, the second TDMFW pump is placed on turning gear and the auxiliary support systems such as injection water, gland steam sealing, steam drains, raw cooling water, and lube oil are aligned and placed into operation. Afterwards, the main feed pump (MFP) turbine vacuum is established, the turbine rolled, and the MFP temperature increased to normal operating levels. With both anticipatory trip circuits "reset" and both TDMFW pumps in service (i.e., both providing feed flow), the AFW auto-start Function 6.e is fully operational. During plant shutdown, the sequence of events is reversed. At a prescribed power level above 50% RTP, one TDMFW pump is removed from service and is placed in the tripped condition. These sequences of events would also place the AFW auto-start logic in a half trip condition.

Loss of the anticipatory trip circuits during plant startup or shutdown is of very low safety significance because the AFW system will automatically start on low-low SG level, loss of offsite power, and safety injection, which are all Class 1E circuits. The TDMFW pump anticipatory trip circuits are not single failure proof, nor do they meet the requirements for Class 1E safety circuits as defined by 10 CFR 50.55a(h)(2).

Summary:

The TS provision to allow suspension of up to 4 hours to routinely place the second TDMFW pump in service or routinely remove one of the two TDMFW pumps from service during Mode 1 operations without the requirement to enter LCO 3.3.2, Condition J, for an inoperable trip channel will resolve NRC Inspection Report 2008-003 concerns and reduce administrative burden on plant operations. As stated above, plant safety is not compromised during this transition period because the safety-grade trip circuits, i.e., low-low SG level, loss of offsite power, and safety injection, are operable in Modes 1 through 3.

In addition, entering into an LCO Action to routinely place a system into service or routinely remove a system from service is atypical without express allowance in the TS. LCO 3.5.2 is one example where TS allowance is required for the emergency core cooling system and the low temperature overpressure protection system. Other examples can be found in TS Section 3.3, "Instrumentation."