August 26, 2008

TVA-SQN-TS-08-05

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 Nos. 50-327 50-328

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SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - TECHNICAL SPECIFICATIONS (TS) CHANGE AND EMERGENCY TS CHANGE (TS-08-05) -"AUXILIARY FEEDWATER (AFW) START UPON TRIP OF MAIN FEEDWATER PUMPS"

NRC recently issued Inspection Report 2008-003 dated August 7, 2008, to Watts Bar Nuclear (WBN) Plant. In this report, NRC informed TVA that plant operation is not conforming to TS 3.3.2 Item 6.e when a non-operating main feedwater (MFW) pump is reset. This TS function is equivalent to the SQN TS Functional Unit 6.f of Table 3.3-3. TVA had considered the associated AFW auto-start channel operable; however, NRC informed WBN that a non-operating MFW pump in the reset condition impacts operability of the AFW auto-start due to the false indication of the MFW pump status.

Therefore, pursuant to 10 CFR 50.90, Tennessee Valley Authority (TVA) is submitting a request for a TS change (TS-08-05) to Licenses DPR-77 and DPR-79 for SQN. The proposed TS change will revise the Functional Unit 6.f of Table 3.3-3, "Engineered Safety Feature Actuation System Instrumentation," modifying the mode of applicability. A footnote will indicate that the AFW auto-start function associated with the trip of MFW pumps in Mode 2 is only required when one or more MFW pumps are supplying feedwater to the steam generators (SGs). Functional Unit 6.f of TS Table 3.3-3 is an anticipatory trip function that provides early actuation of the AFW system.

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TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Department of Public Health.

On August 29, 2008, SQN will shutdown Unit 2 to inspect reactor coolant pump motors Nos. 2 and 3 for potential oil leaks. The return to power operation will require implementation of this proposed TS change. No operational options such as starting a MFW pump in Mode 3 or placing both MFW pumps in tripped condition exists for SQN because of plant design or operational constraints. The maintenance activities are scheduled for a short duration that will not allow for the normal amendment timeframes. Therefore, TVA is requesting that TS 08-05 be approved for Unit 2 on an emergency basis in accordance with 10 CFR 50.91(a)(5) to allow unit restart. TVA requests approval of this TS change to support a Unit 1 refueling outage schedule for late March 2009.

The SQN Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed this proposed change and determined that operation of SQN Units 1 and 2 in accordance with the proposed change will not endanger the health and safety of the public.

There are no regulatory commitments associated with this license amendment request. If you have any questions about this change, please contact me at 843-7170.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this <u>26th</u> day of <u>August, 2008</u>.

Sincerely

James D. Smith Manager, Site Licensing and Industry Affairs

Enclosure: Evaluation of the Proposed Change

cc: See page 3

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Enclosure cc (Enclosure): Mr. Brendon T. Moroney, Project Manager U.S. Nuclear Regulatory Commission Mail Stop 08G-9a One White Flint North 11555 Rockville Pike Rockville, Maryland 20852-2739

> Mr. Lawrence E. Nanney, Director Division of Radiological Health Third Floor L&C Annex 401 Church Street Nashville, Tennessee 37243-1532

ENCLOSURE

EVALUATION OF THE PROPOSED CHANGE

Sequoyah Nuclear Plant (SQN) Unit 1 Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.2.1, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," Functional Unit 6.f and SQN Unit 2 TS LCO 3.3.2 Functional Unit 6.f

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Operating Licenses DPR-77 and DPR-79 for SQN Units 1 and 2, respectively. The proposed TS change will modify the mode of applicability for ESFAS Functional Unit 6.f of Table 3.3-3 regarding auxiliary feedwater (AFW) system start upon trip of main feedwater (MFW) pumps. This change will add a footnote that indicates that Mode 2 applicability is limited to operation when one or more MFW pumps are supplying feedwater to the steam generators (SGs). The need for the auto-start of the AFW pumps in Mode 2 without a MFW pump running does not serve any function since the motor-driven AFW pumps are already operating and supplying feedwater to the SGs to provide the heat sink.

NRC recently issued, on August 7, 2008, Inspection Report 2008-003 to Watts Bar Nuclear (WBN) Plant. In this report, NRC informed TVA that plant operation is not conforming to TS 3.3.2 Item 6.e when a non-operating MFW pump is reset. TVA had considered the associated AFW auto-start channel operable; however, NRC informed WBN that a non-operating MFW pump in the reset condition impacts operability of the AFW auto-start due to the false (i.e., invalid) indication of the MFW pump status. This change will permanently address this startup and shutdown issue for both SQN units.

For SQN to comply with the current TS applicability and enter into Mode 2, each MFW pump would need to be in a tripped condition. This configuration would result in an AFW start signal, starting the turbine-driven pump in addition to the motor-driven AFW pumps. The turbine-driven AFW level control valves are non-modulating (i.e., either open or closed) valves and closure of these valves to control SG level would impact operability of the pump and preclude Mode 2 entry. SQN's design does not provide any other method for complying with the current TS requirement.

2.0 DETAILED DESCRIPTION

The proposed TS change will modify Mode 2 applicability for Functional Unit 6.f of TS Table 3.3-3. Specifically, the proposed TS change will add the following footnote to Mode 2, clarifying that this function is only required when one or more MFW pumps are operating:

"(a) When one or more main feedwater pump(s) are supplying feedwater to steam generators"

Modification to the mode of applicability will resolve the compliance issue that NRC recently brought to the attention of TVA. Normal SQN plant startup involves operation of the AFW system for feedwater supply to the SGs into Mode 2. A MFW pump is then individually trip tested and placed into service when sufficient steam has been generated to operate the MFW pump. The non-operating MFW pump must be reset during this process to prevent the potential for an engineering safety feature (ESF) actuation and

challenging the operating crew to control excessive AFW supply. The requested change would allow transition into Mode 2 and subsequent operation in Mode 2 with a non-operating MFW pump in the reset condition.

3.0 TECHNICAL EVALUATION

The condensate and feedwater system is designed to supply a sufficient quantity of feedwater to the SG secondary side inlet during normal operating conditions and to guarantee that feedwater will not be delivered to the SGs when feedwater isolation is required. The condensate and feedwater pumps take suction from the main condenser hotwells and delivers water to the SGs at elevated temperature and pressure. Additional information can be found in Updated Final Safety Analysis Report (UFSAR) Section 10.4.7, "Condensate Feedwater System."

The AFW system supplies, in the event of a loss of the MFW supply, sufficient feedwater to the SGs to remove primary system stored and residual core energy. The system is designed to start automatically in the event of a loss of offsite electrical power (LOOP), a safety injection (SI) signal, low-low SG water level, or a trip of one or both MFW pumps. Additional information can be found in UFSAR Section 10.4.7.2, "Auxiliary Feedwater System."

The design basis events, which impose AFW safety function requirements, are loss of normal feedwater, main feed line or main steam line break, LOOP, and small break loss of coolant accident. These design basis events assume auto-start of the AFW system on a blackout signal, low-low SG level, or a SI signal. These ESFAS signals are Class 1E which means all requirements for reliable power supplies, separation, redundancy, testability, and seismic and environmental qualifications as specified in 10 CFR 50.55a(h)(2), "Protection Systems" are met.

The condensate and feedwater system includes two MFW pump turbines per unit. Each MFW pump is equipped with one oil pressure switch located on the pump's control oil system. A low pressure signal from this pressure switch indicates a trip of that pump. As such, this ESFAS instrumentation provides an anticipatory AFW pump start signal upon a loss of both MFW pumps, automatically starting the motor-driven and turbine-driven AFW pumps, and lessoning the effects of a feedwater transient.

During low power operation, the motor-driven auxiliary feedwater (MDAFW) pumps are used to maintain SG level.

Upon startup when sufficient steam pressure is established, one MFW pump is reset and placed into service. The MFW pump is reset when electrical power is applied to the MFW pump trip circuit and the pressure switch located on the oil control system senses that the oil system is pressurized. A MFW pump is in service when the MFW pump's stop valves are open, the governor control valves are either in manual or automatic control and feedwater is being supplied to the SGs.

At approximately two percent RTP and upon securing AFW, the non-operating MFW pump is placed in the trip condition or the AFW auto-start channel is inoperable until the MFW pump is tripped. Placing the MFW pump in the trip condition means electrical power is applied to the MFW pump trip bus and the pressure switch senses no control oil pressure, and that the MFW turbine stop valves and governor control valves are closed. Under these conditions, half the AFW auto-start logic will exist. If the operating MFW pump was to trip, an AFW auto-start signal will cause all three AFW pumps to start. The

second MFW pump is reset and placed into service, when required for continued plant power ascension.

During a plant shutdown in which the MFW system supplies feedwater to the SGs, the sequence of events can be reversed. At a prescribed RTP power above 5 percent, one MFW pump is removed from service and is placed in a tripped condition.

The need for the auto-start of the AFW pumps in Mode 2 without a MFW pump running does not serve any function since the motor-driven AFW pumps are already operating and supplying feedwater to the SGs to provide the heat sink.

In summary, the proposed change will modify the applicability requirement of TS Table 3.3-3 Functional Unit 6.f during Mode 2 when the MFW pumps are supplying feedwater to the SGs. Modifying the requirement for auto-start of the AFW pumps to be only required when the MFW pumps are in service limits the potential for inadvertent AFW actuations during normal plant startups and shutdowns. This change also limits the potential for inadvertent AFW actuations during normal plant startup and shutdown that could lead to reactivity control issues due to over cooling transients. Lastly, additional protection for loss of normal feedwater for all modes of operation is provided by the safety-related signals discussed in this section of this license amendment request.

4.0 **REGULATORY EVALUATION**

4.1 Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include technical specifications (TSs) as part of the license. The Commission's regulatory requirements related to the content of the TS are contained in Title 10, Code of Federal Regulations (10 CFR), Section 50.36, "Technical Specifications," of 10 CFR Part 50 "Domestic Licensing of Production and Utilization Facilities." The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and control settings, (2) limiting conditions for operation, (3) surveillance requirements (SRs), (4) design features, and (5) administrative controls. The requirements for the initiation of a auxiliary feedwater (AFW) start resulting from a main feedwater (MFW) pump trip are included in the TS in accordance with 10 CFR 50.36(c)(2), "Limiting Conditions for Operation."

As stated in 10 CFR 50.59(c)(1)(i), a licensee is required to submit a license amendment pursuant to 10 CFR 50.90 if a change to the TS is required. Furthermore, the requirements of 10 CFR 50.59 necessitate that U.S. Nuclear Regulatory Commission (NRC) approve the TS changes before the changes are implemented. TVA's submittal meets the requirements of 10 CFR 50.59(c)(1)(i) and 10 CFR 50.90.

General Design Criterion (GDC) 13 "Instrumentation and Control," of Appendix A "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 requires, among other things, that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges. The proposed operational change continues to provide system monitoring and proper actuation to satisfy the anticipatory trip function. No changes are proposed to the safety-related instrumentation. General Design Criterions (GDC) 20 through 29, "Protection and Reactivity Control Systems," of Appendix A, "General Design Criteria," to 10 CFR Part 50, provides the expectations for protection systems associated with reactor operation. The proposed change does not alter the ability for the reactor trip functions to actuate. The proposed operational allowance is consistent with the SQN design and analysis and ensures proper actuation to satisfy the anticipatory trip function. Therefore, the recommendations of these GDCs continue to be met with the proposed change.

4.2 Precedent

Several operating facilities have been identified with similar operational TS allowances as proposed herein. These facilities include Vogtle, Callaway, Indian Point 2, and Prairie Island. In particular, on November 19, 1993, Vogtle requested a license amendment change in a similar manner as proposed herein. NRC subsequently approved the request. During conversion to Improved Standard TS, Vogtle clarified the language to be more consistent with similar notes in NUREG-1431. The SQN proposed change is consistent with this language.

4.3 <u>Significant Hazards Consideration</u>

The proposed TS change will modify SQN Units 1 and 2, Mode 2 applicability for Functional Unit 6.f of TS Table 3.3-3. Specifically, a footnote will be added to Mode 2 to clarify that the AFW auto-start function associated with "Trip of all Main Feedwater Pumps" is only required when one or more MFW pumps are supplying feedwater to the steam generators (SGs).

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The design basis events which impose AFW safety function requirements are loss of normal MFW, main feedline or main steam line break, loss of offsite power, and small break loss of coolant accident. These design basis event evaluations assume actuation of the AFW due to a blackout signal, low-low SG level, or a safety injection (SI) signal. The automatic start of the AFW pumps, because of a trip of both MFW pumps, is an anticipatory trip function. Requiring this function in Mode 2 only when the MFW pumps are running will not impact any previously evaluated design basis events. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change allows for an operational allowance during Mode 2 for placing MFW pumps in service or securing MFW pumps. Since this change only affects the conditions at which this trip function needs to be operable and does not affect the function that actuates AFW due to a blackout signal, low-low SG level or a SI signal, it will not be an initiator to a new or different kind of accident from any accident previously evaluated.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

This TS change involves the automatic start of the AFW pumps when both MFW pumps trip, which is not an assumed start signal for design basis events. This change does not change any values or limits involved in a safety-related function or accident analysis. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendments do not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 **REFERENCES**

NRC letter to Mr. C. K. McCoy dated June 1, 1994, "Issuance of Amendments - Vogtle Nuclear Generating Plant, Units 1 and 2 (TAC Nos. M88268 and M88269)"

ATTACHMENTS

1. Technical Specifications (and/or Operating License) Page Markups

ATTACHMENT 1

TENNESSEE VALLEY AUTHORITY SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

I. AFFECTED PAGE LIST

Unit 1

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Unit 2

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II. MARKED PAGES

See attached.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

e.	FUNCT	<u>FIONAL UNIT</u> of Power Start	TOTAL NO. OF <u>CHANNELS</u>	CHANNELS <u>TO TRIP</u>	MINIMUM CHANNELS <u>OPERABLE</u>	APPLICABLE	ACTION
	1.	Voltage Sensors	3/shutdown board ^{**}	2/shutdown board ^{**}	3/shutdown board**	1, 2, 3	35
	2.	Load Shed Timer	2/shutdown board ^{**}	1/shutdown board ^{**}	1/shutdown board**	1, 2, 3	35
f.	Trip o Pump Driver Turbir	f Main Feedwater s Start Motor- n Pumps and ne Driven Pump	1/pump	1/pump	1/pump	1, 2 ^(a)	20
g.	Auxilia Suctio	ary Feedwater on Pressure- Low	3/pump	2/pump	3/pump	1, 2, 3	21
h.	Auxilia Suctic Delay 1.	ary Feedwater on Transfer Time s Motor-Driven Pump	1/pump	1/pump	1/pump	1, 2, 3	21
	2.	Turbine-Driven Pump	2/pump	1/pump	2/pump	1, 2, 3	21

	**Unit 1	1 shutdown boards only	
r - · 	(a)	When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators	

SEQUOYAH -	UNIT	1
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September 13, 2006 Amendment No. 41, 129, 182, 188, 207, 301, 310 I

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u> </u>	FUNCTIONAL UNIT	TOTAL NO. OF <u>CHANNELS</u>	CHANNELS <u>TO TRIP</u>	MINIMUM CHANNELS <u>OPERABLE</u>	APPLICABLE MODES	<u>ACTION</u>
e.	Loss of Power Start					
	1. Voltage Sensors	3/shutdown board ^{**}	2/shutdown board**	3/shutdown board**	1, 2, 3	35
	2. Load Shed Timer	2/shutdown board ^{**}	1/shutdown board ^{**}	1/shutdown board**	1, 2, 3	35
f.	Trip of Main Feedwater Pumps Start Motor- Driven Pumps and Turbine Driven Pump	1/pump	1/pump	1/pump	1, 2 ^(a)	20
g.	Auxiliary Feedwater Suction Pressure-Low	3/pump	2/pump	3/pump	1, 2, 3	21
h.	Auxiliary Feedwater Suction Transfer Time Delays					
	1. Motor-Driven Pump	1/pump	1/pump	1/pump	1, 2, 3	21
	2. Turbine-Driven Pump	2/pump	1/pump	2/pump	1, 2, 3	21

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**	Unit 2 Shutdown Boards Only			
(a) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators				
s	EQUOYAH - UNIT 2	3/4 3-20	September 13, 2006 Amendment No. 29, 116, 174, 180, 197, 290, 299	