



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-18-137

January 18, 2019

10 CFR 50.55a

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

Sequoyah Nuclear Plant, Units 1 and 2
Renewed Facility Operating License Nos. DPR-77 and DPR-79
NRC Docket Nos. 50-327 and 50-328

Watts Bar Nuclear Plant, Units 1 and 2
Facility Operating License Nos. NPF-90 and NPF-96
NRC Docket Nos. 50-390 and 50-391

Subject: **Sequoyah Nuclear Plant (SQN) Units 1 and 2 and Watts Bar Nuclear Plant (WBN) Units 1 and 2, American Society of Mechanical Engineers Operation and Maintenance Code, Request for Alternatives RP 09 (SQN) and IST-RR-6 (WBN)**

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a, "Codes and Standards," paragraphs (z)(2), Tennessee Valley Authority (TVA) requests an alternative to the inservice testing requirements of the American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code, Section ISTB-3310, "Effect of Pump Replacement, Repair, and Maintenance on Reference Values." This alternative request applies to testing of the turbine driven auxiliary feedwater pumps (TDAFWP) for the Sequoyah Nuclear Plant (SQN) Units 1 and 2 (alternative request RP 09) and the Watts Bar Nuclear Plant (WBN) Units 1 and 2 (alternative request IST-RR-6).

If repair, replacement, or routine servicing that could affect reference values of a TDAFWP is performed during an outage, then ASME OM Code ISTB-3310 requires a Group A, comprehensive, or preservice test to be performed to confirm existing reference values or establish new reference values before declaring the pump operable. As discussed in the enclosure to this letter, compliance with ISTB-3310 would cause a hardship or unusual difficulty without a compensating increase in the level of quality or safety. Therefore, TVA is submitting this alternative relief request in accordance with 10 CFR 50.55a(z)(2). The enclosure to this letter describes the proposed alternative and the basis for use.

TVA requests approval of this alternative request by October 1, 2019, in the event this alternative request is needed to support the SQN Unit 1 refueling outage in Fall 2019.

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There are no new regulatory commitments associated with this submittal. Please address any questions regarding this request to Michael A. Brown at 423-751-3275.

Respectfully,

A handwritten signature in blue ink, appearing to read "Erin K. Henderson", with a long horizontal flourish extending to the right.

Erin K. Henderson
Director, Nuclear Regulatory Affairs

Enclosure:

Sequoyah Nuclear Plant (SQN), Units 1 and 2 and Watts Bar Nuclear Plant (WBN), Units 1 and 2, American Society of Mechanical Engineers Operation and Maintenance Code, Request for Alternatives RP 09 (SQN) and IST-RR-6 (WBN), Turbine Driven Auxiliary Feedwater Pump Testing Following Maintenance During an Outage

cc (w/Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Sequoyah Nuclear Plant
NRC Project Manager - Sequoyah Nuclear Plant
NRC Senior Resident Inspector - Watts Bar Nuclear Plant
NRC Project Manager - Watts Bar Nuclear Plant

**Sequoyah Nuclear Plant (SQN), Units 1 and 2
Watts Bar Nuclear Plant (WBN), Units 1 and 2
American Society of Mechanical Engineers Operation and Maintenance Code
Request for Alternatives RP 09 (SQN) and IST-RR-6 (WBN)**

**Turbine Driven Auxiliary Feedwater Pump Testing Following Maintenance
During an Outage**

I. ASME Operation and Maintenance (OM) Code Components Affected

Site/Unit	Pump ID	Pump Description	Pump Type	Code Class	OM Group
SQN Unit 1	SQN-1-PMP-003-0142	Turbine Driven Auxiliary Feedwater (TDAFW) Pump 1A-S	Centrifugal	3	B
SQN Unit 2	SQN-2-PMP-003-0142	TDAFW Pump 2A-S	Centrifugal	3	B
WBN Unit 1	WBN-1-PMP-003-0001A-S	TDAFW Pump 1A-S	Centrifugal	3	B
WBN Unit 2	WBN-2-PMP-003-0002A-S	TDAFW Pump 2A-S	Centrifugal	3	B

II. ASME Code Edition and Addenda

SQN Unit 1 & 2

Fourth ten-year interval - September 1, 2016 to June 30, 2026

ASME OM Code 2004 Edition through 2006 Addenda

WBN Unit 1

Third ten-year interval - October 19, 2016 to October 18, 2026

ASME OM Code 2004 Edition through 2006 Addenda

WBN Unit 2

First ten-year interval - October 19, 2016 to October 18, 2026

ASME OM Code 2004 Edition through 2006 Addenda

III. Applicable Code Requirement

ISTB-3310, "Effect of Pump Replacement, Repair, and Maintenance on Reference Values," states:

"When a reference value or set of values may have been affected by repair, replacement, or routine servicing of a pump, a new reference value or set of values shall be determined in accordance with ISTB-3300, or the previous value reconfirmed by a comprehensive or Group A test run before declaring the pump operable. The Owner shall determine whether the requirements of ISTB-3100, to reestablish reference values, apply. Deviations between the previous and new set of reference values shall be

evaluated, and verification that the new values represent acceptable pump operation shall be placed in the record of tests (see ISTB-9000)."

IV. Reason for Request

If repair, replacement, or routine servicing that could affect reference values of a TDAFWP is performed during an outage, then ISTB-3310 requires a Group A, comprehensive, or preservice test to be performed to confirm existing reference values or establish new reference values before declaring the pump operable. SQN and WBN Technical Specifications (TS) Limiting Condition of Operation (LCO) 3.7.5, "Auxiliary Feedwater (AFW) System," requires the TDAFWP to be operable in Modes 1, 2, and 3. Previous efforts to perform the periodic TDAFW comprehensive test in Mode 3 during start-up from a refueling outage have experienced difficulty in maintaining consistent and stable test conditions (e.g., speed, flow) long enough to complete the test due to decreasing steam pressure as result of the high flow rate of relatively cold AFW injection into the steam generators. Performance of a Group A test with a flow rate high enough to fully assess the mechanical and hydraulic performance or a preservice test both require flow to the steam generators and are expected to have the same issues in Mode 3 as the comprehensive test.

Compliance with ISTB-3310 under the circumstances described above represents a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, this request for alternative is being submitted in accordance with 10 CFR 50.55a(z)(2).

V. Proposed Alternative and Basis for Use

Proposed Alternative

If repair, replacement, or routine servicing that could affect reference values of a TDAFWP is performed during an outage, then initial pump operability for compliance with TS LCO 3.7.5 will be established by performance of the required TS Surveillance Requirement (SR) 3.7.5.2 pump test in Mode 3 with the required steam pressure test conditions. The SR 3.7.5.2 required test will be performed using the fixed resistance pump minimum flow recirculation path in which pump speed is set, then flow and differential pressure are measured and compared to acceptance criteria established in accordance with ISTB-3300, ISTB 5122, and Table ISTB-5121-1. This acceptance criteria is truncated if necessary to ensure the pump minimum design limits are met.

If repair, replacement, or routine servicing that could affect reference values of a TDAFWP is performed during an outage, the ISTB-3310 required comprehensive or preservice test will be performed in Mode 1 during power ascension at approximately 30 to 50% power level, or within ten days of entering Mode 3. If the required comprehensive or preservice test is not performed within these timeframes, the unit will enter the required Action Statement of TS 3.7.5. If for some unforeseen reason, the unit needs to shutdown and cooldown below Mode 3 before completing the Group A, comprehensive, or preservice test, the ten-day period will restart upon re-entering Mode 3 ascension.

Basis for Use

SQN Unit 1 and Unit 2 TS Bases for SR 3.7.5.2 state:

“Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by the ASME Code (Ref 2). Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code (Ref. 2) (only required at 3 month intervals) satisfies this requirement.

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.”

WBN Unit 1 and Unit 2 TS Bases for SR 3.7.5.2 states:

“Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by the American Society of Mechanical Engineers (ASME) OM Code (Ref. 2). Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME OM Code (Ref. 2) (only required at 3 month intervals) satisfies this requirement. The 31 day Frequency on a STAGGERED TEST BASIS results in testing each pump once every 3 months, as required by Reference 2.

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there may be insufficient steam pressure to perform the test.”

The TS Bases provided above demonstrate the inservice test performed at the recirculation flow point on the pump design curve is adequate to confirm component operability. The TS SR and Bases do not place additional requirements on AFW pumps that have undergone repair, replacement, or routine servicing.

The performance of SR 3.7.5.2 is adequate to identify any significant issues resulting from a repair, replacement, or routine servicing and provide reasonable assurance the TDAFWP is capable of performing its safety-related function until plant conditions are stable enough to complete the ISTB-3310 required comprehensive or preservice test.

VI. Duration of Proposed Alternative

This alternative request is for the duration of SQN Units 1 and 2 fourth IST ten-year interval and the WBN Unit 1 third IST ten-year interval and the WBN Unit 2 first IST ten-year interval.

VII. Precedents

A similar alternative (RR-4-12) was approved by the NRC for Virgil C. Summer Nuclear Station, Unit 1 on April 28, 2017 (ML17088A256 and ML17103A533).