

Sequoyah Nuclear Plant Unit 1

Inservice Testing Alternative Request for Auxiliary Feedwater Pump | October 19, 2026

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Introduction

- In accordance with 10 CFR 50.55a, “Codes and Standards,” paragraph (z)(2), Tennessee Valley Authority (TVA) requests an alternative to the inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code for the Sequoyah Nuclear Plant (SQN) 1B motor driven auxiliary feedwater (MDAFW) pump.
- ASME OM Code, Section ISTB-3400, “Frequency of Inservice Tests,” requires a biennial Group A comprehensive pump test (CPT) of the 1B MDAFW pump to detect pump degradation. TVA believes that compliance with the specified requirements would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Table ISTB-3400-1: Inservice Test Frequency				
Pump Group	Group A Test	Group B Test	Comprehensive Test	Pump Periodic Verification Test
Group A	Quarterly	N/A	Biennially	Biennially
Group B	N/A	Quarterly	Biennially	Biennially

Introduction (cont.)

- TVA requests an alternative from the IST CPT of the SQN 1B-B MDAFW pump until the SQN Unit 1 Cycle 28 refueling outage (U1R28), currently scheduled to begin mid-February 2027. Deferring the Group A CPT until the next Unit 1 refueling outage will allow SQN to plan repairs of the 1B main feedwater pump (MFP) low pressure (LP) governor valve while offline to avoid risks to plant safety and power generation.
- SQN Unit 1 is currently in the fourth 10-year IST interval, which ends on December 15, 2026. The Code of Record for the fourth IST interval is ASME OM Code 2004 Edition through 2006 Addenda.
- SQN Unit 1 begins the fifth 10-year IST interval on December 16, 2026. The planned Code of Record for the fifth IST interval is the ASME OM Code 2022 Edition (no addenda).
- This request for alternative is for the upcoming fifth IST interval, and will last no longer than February 28, 2027.

Background

- In July 2026, a series of alarms were received in the main control room indicating an issue with the 1B MFP LP governor valve. Indications observed include an LP governor valve demand to actual position mismatch, fluctuating actuator current, and demanded high pressure (HP) governor valve position changes.
- Actuator current and valve position trend reviews indicate that the actuator current maxed out at 3.4 amperes, locking out the actuator. This condition is indicative of the actuator encountering more friction to operate which requires drawing more current. As friction increased over time, the current required to move the actuator to the demanded position increased and reached the maximum limit.
- With the LP governor valve actuator locked out, the valve is bound in location with steam flow forcing it open and a counterweight forcing it closed. The 1B MFP can still adjust to speed demand increases by having the HP governor valve respond, but it will not be able to respond to a lowering pump speed demand with the valve bound in place. The 1A MFP would compensate in speed.

Background (cont.)

- An operational decision-making process was used to arrive at the conclusion that current operation should continue with an adverse condition monitoring plan in place until 1B MFP LP governor valve repair can occur during the next SQN Unit 1 outage (refuel or forced). This ensures reliability of both Unit 1 MFPs, maintains TVA grid conditions, and reduces operational distractions.
- In September 2026, it was identified that the SQN 1B MDAFW pump has a CPT scheduled for November 7, 2026, as required by OM Code. The 1B MDAFW pump CPT has been on increased frequency since 2022 due to vibrations in V3H direction (pump inboard horizontal). The test is performed on an annual frequency with 25 percent (%) grace. The late date for CPT performance is January 2, 2027.

Reason for Request

- To establish the necessary plant conditions to perform the 1B MDAFW pump CPT, a power reduction to 96% power is required. The 1B MFP LP governor valve is stuck in a throttled open position. The 1B MFP will not be able to respond to a lowering pump speed demand, and a down power to 96% power would challenge MFP speed control.
- The LP governor valve would need to be locally isolated with the manual isolation valve during a planned down power. Isolating the LP governor valve will cause the HP governor valve to automatically open for speed control. This adds generation risk because it will introduce a single point vulnerability with the MFPs. If the 1A MFP were to trip, the 1B MFP would be unable to speed up as designed due to the isolated LP governor valve. This would lead to a reactor trip on low steam generator water levels.

Reason for Request (cont.)

- Un-isolating the LP governor valve following return to 100% power adds additional risk as the HP governor valve will automatically throttle closed as the LP governor valve has steam readmitted to it. This steam flow perturbation could challenge MFP speed control and steam generator water level control, reducing overall safety and reliability. This condition also increases the probability of a loss of main feedwater transient, an unplanned reactivity management event that would result in a reactor trip.
- Repairs to address the 1B MFP LP governor valve are scheduled for the upcoming SQN Unit 1 spring 2027 refueling outage (U1R28). As a contingency, the repair scope is included on the forced outage schedule and would be performed if a forced outage were necessary prior to U1R28.
- Repairs online would require a significant down power of Unit 1 to approximately 45% power, placing unnecessary thermal and pressure cycles on plant equipment. Additionally, online repair would require an “exceptional tagout” due to single valve isolation of a high energy line.

Proposed Alternative

- The proposed alternative is to defer the requirement to perform a CPT, as required by ISTB-3400, for the 1B MDAFW pump until the SQN U1R28 outage, not to exceed February 28, 2027. This will allow the CPT to be performed during the planned unit shutdown for the refueling outage.
- The quarterly IST Group A functional pump tests will still be performed as scheduled to provide continued monitoring and assurance of the 1B MDAFW pump operational readiness.
- Past data collected from the quarterly Group A functional pump testing and CPTs show no negative trending for any IST parameter, which indicates there is no current pump degradation. Therefore, it is unlikely that the upcoming pump tests would produce a failing value for any test parameter.

Proposed Alternative (cont.)

Table 1 – SQN 1B MDAFW Pump Quarterly Group A Test

Date	Flow (in. H ₂ O)*	Flow Acceptance Criteria (in. H ₂ O)	Differential Pressure (psid)	dP Acceptance Criteria (psid)
8/4/2026	120	119 to 121	1525.2	1518.1 to 1683.4
5/7/2026	120	119 to 121	1527.3	1518.1 to 1683.4
2/2/2026	120	119 to 121	1529.5	1518.1 to 1683.4
11/9/2025	120	119 to 121	1533.0	1518.1 to 1683.4
8/4/2025	120	119 to 121	1530.0	1518.1 to 1683.4
5/5/2025	120	119 to 121	1533.1	1518.1 to 1683.4
2/4/2025	120	119 to 121	1530.2	1518.1 to 1683.4
10/23/2024	120	119 to 121	1530.6	1518.1 to 1683.4
8/5/2024	120	119 to 121	1529.1	1518.1 to 1683.4
5/8/2024	120	119 to 121	1529.5	1518.1 to 1683.4

Table 2 – SQN 1B MDAFW Pump Biennial Comprehensive Pump Test

Date	Total Flow (gpm)	Flow Acceptance Criteria (gpm)	Differential Pressure (psid)	dP Acceptance Criteria (psid)
10/3/2025	490.5	490 to 500	1243.0	1217.3 to 1267.2
9/3/2024	494.7	490 to 500	1241.7	1217.3 to 1267.2
10/25/2023	496.2	490 to 500	1239.8	1217.3 to 1267.2
11/24/2022	494.5	490 to 500	1243.6	1217.3 to 1267.2
5/31/2021	493.1	490 to 550	1230.3	> 1212.6*
4/7/2021	485.2	480 to 490	1290.0	1195.1 to 1323.5
10/10/2019	487.9	480 to 490	1278.6	1207.9 to 1310.7
4/5/2018	483.1	480 to 490	1288.3	1207.9 to 1310.7
11/24/2016	486.4	480 to 490	1287.7	1207.9 to 1310.7

Proposed Alternative (cont.)

Table 3 – SQN 1B MDAFW Pump Quarterly Group A Test

Date	V3V (ips)	V3H (ips)	V4V (ips)	V4H (ips)	V4A (ips)
Acceptable Range	≤ 0.1450	≤ 0.2020	≤ 0.1592	≤ 0.2260	≤ 0.2762
8/4/2026	0.0672	0.0833	0.0583	0.0929	0.1138
5/7/2026	0.0578	0.0795	0.0539	0.0939	0.1198
2/2/2026	0.0591	0.0776	0.0640	0.1157	0.1158
11/9/2025	0.0651	0.0784	0.0560	0.1018	0.1248
8/4/2025	0.0717	0.1617	0.0530	0.1069	0.1191
5/5/2025	0.0853	0.1627	0.0648	0.1068	0.1157
2/4/2025	0.0829	0.1661	0.0683	0.1224	0.1113
10/23/2024	0.0716	0.1759	0.0735	0.1318	0.1169
8/5/2024	0.0755	0.1344	0.0575	0.1099	0.1111
5/8/2024	0.0681	0.1569	0.0622	0.1057	0.1128

Table 4 – SQN 1B MDAFW Pump Biennial Comprehensive Pump Test

Date	V3V (ips)	V3H (ips)	V4V (ips)	V4H (ips)	V4A (ips)
Acceptable Range	≤ 0.1340	≤ 0.1475	≤ 0.1447	≤ 0.1657	≤ 0.1960
10/3/2025	0.0886	0.1907	0.0693	0.1051	0.0816
9/3/2024	0.0803	0.2044	0.0774	0.1262	0.0652
10/25/2023	0.0880	0.1437	0.0622	0.0936	0.0974
11/24/2022	0.0739	0.1557	0.0718	0.1112	0.1028
5/31/2021	0.0536	0.0590	0.0579	0.0663	0.0784
4/7/2021	0.0485	0.0507	0.0432	0.0521	0.0787
10/10/2019	0.0530	0.0627	0.0460	0.0645	0.0634
4/5/2018	0.0464	0.0506	0.0332	0.0588	0.0854
11/24/2016	0.1902	0.1193	0.0682	0.0404	0.0880

Duration of Alternative

- The next performance of the Group A comprehensive pump test for the 1B MDAFW pump is due by January 2, 2027. Therefore, TVA is requesting NRC authorization of this proposed alternative by December 14, 2026.
- Upon approval, this proposed alternative will be applied to SQN Unit 1 during the fifth 10-year IST interval (beginning December 16, 2026) until the SQN U1R28 outage.
- This timeframe provides an adequate window of opportunity to perform to perform the CPT during power descension for U1R28. The performance of the CPT for the 1B MDAFW pump will resume at the normal biennial frequency following the SQN U1R28 outage.

Precedents

Ginna Nuclear Power Plant (ML24170A385)

- On July 16, 2024, the NRC approved a similar alternative request for the Ginna 'B' auxiliary feedwater (AFW) pump. Ginna requested an alternative to ISTB-3400 requirements for comprehensive pump testing and periodic verification testing of the 'B' AFW pump due to flow blockage of the condensate heater 4B outlet check valve. The proposed alternative deferred the testing until the next refueling outage to avoid a potential 50% down power.
- The Ginna request for alternative is similar to the proposed alternative for SQN Unit 1 in that both defer comprehensive pump testing for an AFW pump until an upcoming refueling outage to avoid conditions that challenge plant safety and reliability.

Next Steps

October 29, 2026

TVA submits SQN Unit 1 request for alternative

December 14, 2026

NRC authorizes proposed alternative for SQN Unit 1 fifth IST Interval

December 16, 2026

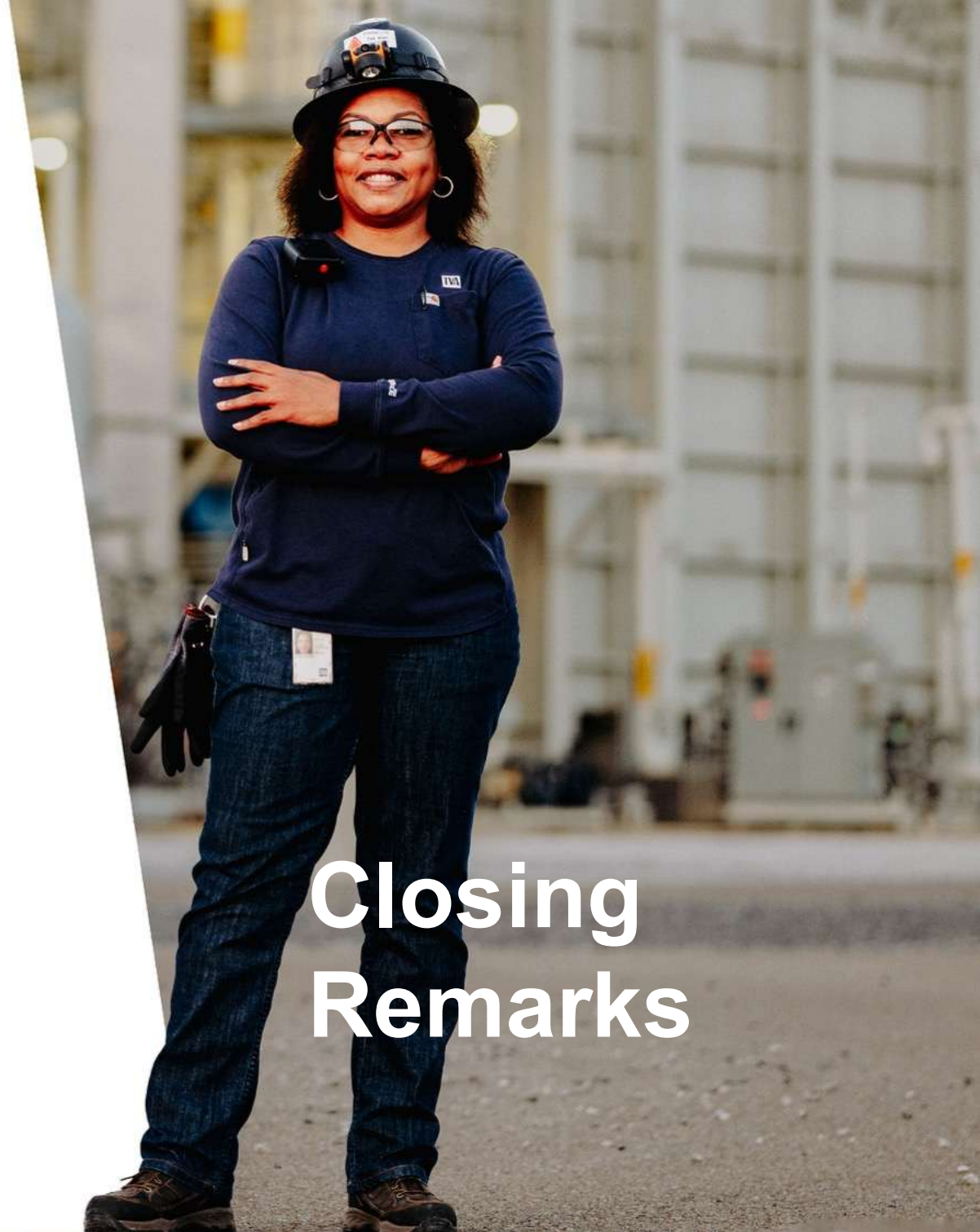
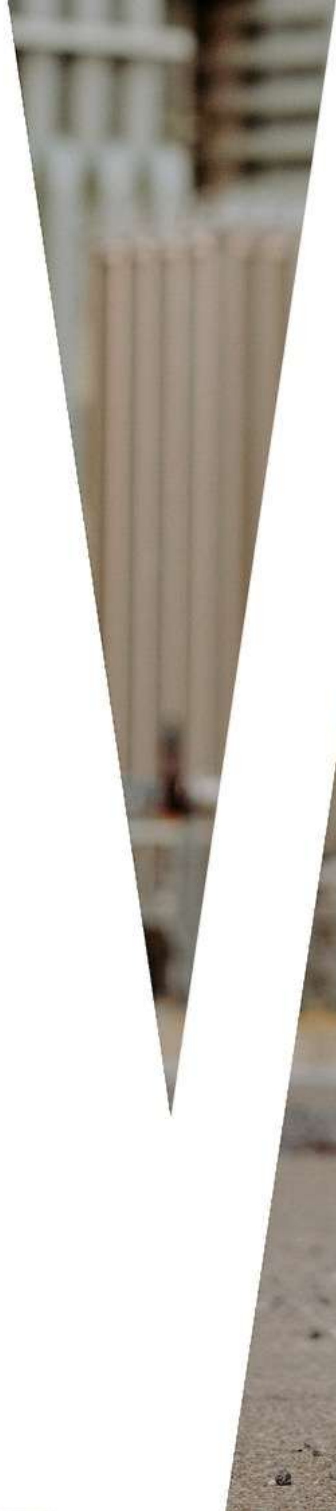
SQN Unit 1 fifth 10-Year IST interval (and relief period) begins

February 2027

SQN Unit 1 begins Cycle 28 refueling outage (and performs 1B MDAFW pump CPT)



Building Tomorrow Together



Closing
Remarks