Browns Ferry Nuclear Plant, Unit 3

Pre-Submittal Meeting for Proposed Request for Alternative from American Society of Mechanical Engineers Operation and Maintenance Code Requirements for Standby Liquid Control Pumps

September 4, 2025

TVA TENNESSEE VALLEY AUTHORITY

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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 Browns Ferry Nuclear Plant (BFN), Unit 3 standby liquid control (SLC) pumps.
- ASME OM Code, Section ISTB-3400, “Frequency of Inservice Tests,” requires quarterly Group B functional testing of the SLC pumps to ensure they can meet their design basis safety function. 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.
- TVA requests alternative from the IST quarterly Group B testing of the BFN Unit 3 SLC pumps until the end of the BFN Unit 3 Cycle 22 refueling outage (U3R22), currently scheduled to be completed in March 2026. Deferring the Group B testing until the next Unit 3 refueling outage will allow BFN to plan repairs of the SLC test line throttle valve while offline to avoid risks to plant safety and power generation.

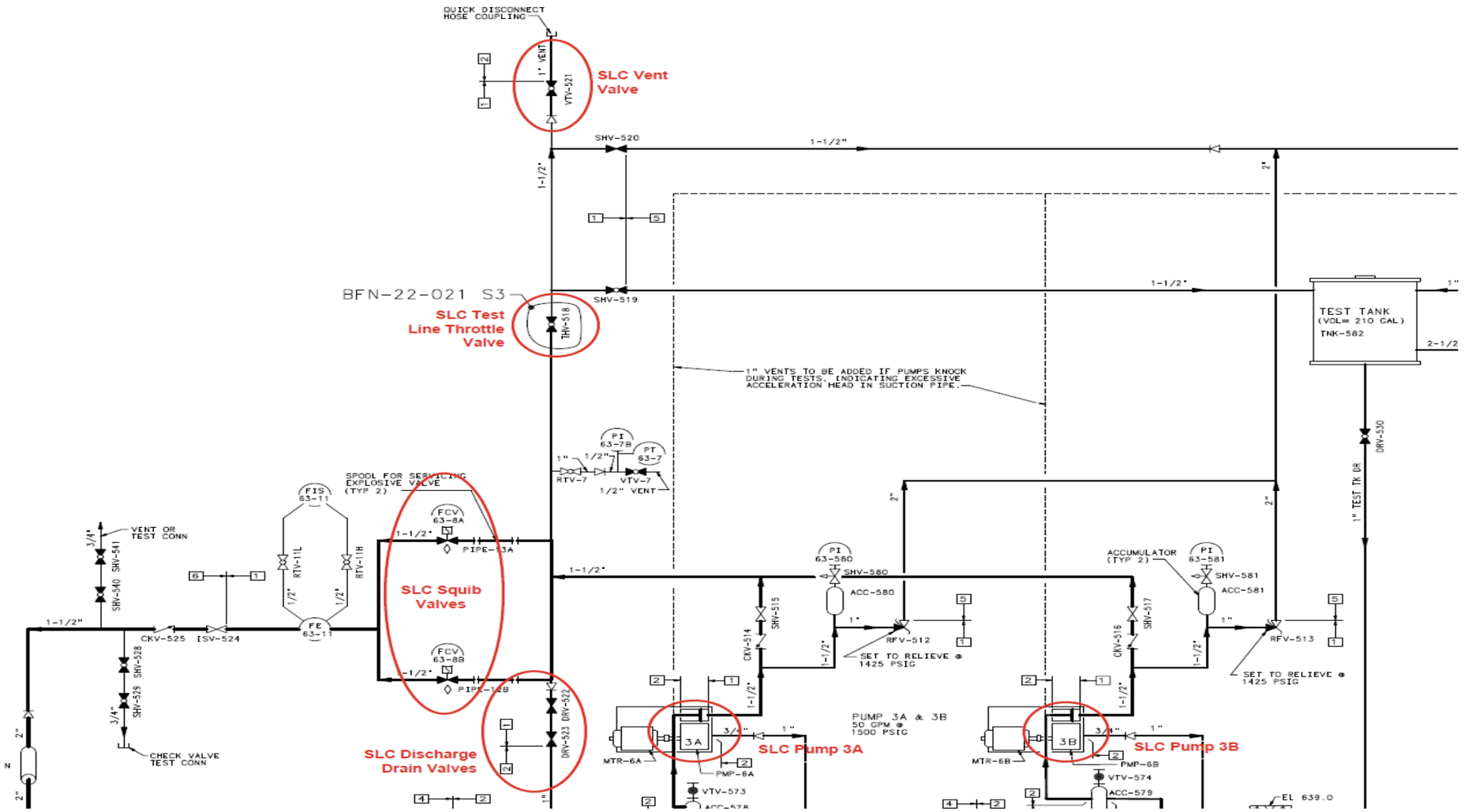
Background

- August 12, 2025 – During performance of SLC pump functional testing on BFN Unit 3, testing was stopped after the 3A SLC pump (3-PMP-63-6A) test due to abnormal indications for SLC pump discharge pressure. SLC discharge pressure sensing lines were flushed, and the pressure indicator was re-calibrated.
- August 13, 2025 – SLC pump testing resumed and was again stopped due to abnormal pressure indication. Pressure continued to rise even as SLC test line throttle valve (3-THV-63-518) was opened. Subsequent troubleshooting (including borescope inspection) identified stem/disc separation of 3-THV-63-518.
- August 16, 2025 – Due to inability to set test conditions for 3B SLC pump (3-PMP-63-6B), functional testing was not completed during its quarterly periodicity (including grace period) by August 15. The 3A SLC pump functional testing was completed satisfactorily on August 12, resulting in a partial periodic performance. The issue was entered into the TVA Corrective Action Program to document the inability to complete the 3B SLC pump in the required ASME OM Code frequency.

Background (cont.)

- The SLC test line throttle valve (3-THV-63-518) disc remains fully seated, confirmed by Engineering personnel during handwheel actuation by Operations personnel. The valve is locked closed in the safety position.
- 3-THV-63-518 is capable of performing its safety function, and the SLC system remains operable if injection to the reactor vessel is needed. However, valve alignment for SLC pump testing is not possible under the current conditions. The throttle valve would function as a stop-check if testing were performed.
- The previous throttle valve (gate valve) was replaced with a globe valve in March 2024. The SLC pump functional test has been performed five times since 3-THV-63-518 was replaced without any deficiencies noted.
- The performance of the Group B test for the 3B SLC pump was originally scheduled for July 23 and went late (including grace period) on August 15. The next due date is October 21, 2025.

BFN Unit 3 SLC Flow Diagram



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Basis for Request

- The SLC test line throttle valve (3-THV-63-518) is common to both the 3A and 3B SLC pumps. To repair the valve, both SLC pumps must be declared inoperable, requiring entry to BFN Technical Specification (TS) Limiting Condition for Operation (LCO) 3.1.7, Condition B, which requires restoration of at least one SLC pump within 8 hours. If an SLC pump is not restored to operable status within 8 hours, BFN Unit 3 would be required to enter Condition C, which requires Mode 3 entry within 12 hours and Mode 4 entry within 36 hours.
- Repairs to 3-THV-63-518 are expected to take up to 6 hours. Pulling clearances post-repair and performing SLC pump functional tests to restore operability could take another 4 hours. This could cause BFN Unit 3 to begin plant shutdown midcycle because of an inability to test the SLC pumps.
- The SLC vent valve 3-VTV-63-521 is an alternate valve that can be used for throttling. It is a gate valve design (which is not ideal for throttling and pressure control) with downstream piping not rated for the 1150 psig normal test pressure. Additional testing risks further damage to 3-THV-63-518 with potential to render the valve in a position that is not capable of performing its safety function.

Basis for Request (cont.)

- An alternative flow path through SLC pump discharge drain valves 3-DRV-63-522 and 3-DRV-63-523 is available but has not historically been utilized for testing. The drain valves are gate valve designs, and the piping downstream of 3-DRV-63-523 is not rated for the 1150 psig normal test pressure.
- Vessel injection through the squib valves (3-FCV-63-8A and 3-FCV-63-8B) is not an acceptable solution for online testing due to the complexity associated with the testing and the potential for injecting sodium pentaborate.
- Therefore, use of the SLC vent valve for throttling, discharge drain valves for test tank injection, or squib valves for reactor vessel injection are not considered to be desirable alternatives for quarterly testing.

Basis for Request (cont.)

- Previous IST trends for the 3A and 3B SLC pumps show the operational readiness of the pumps to perform their safety function. The last 4 years of data from the quarterly Group B tests and the last 10 years of data from the comprehensive pump tests indicate there is no current pump degradation. The recorded values for pump vibration, flow, and discharge pressure during the review period were within ASME OM Code and design limits.
- Periodic maintenance of each pump is performed to disassemble, inspect pump internals, and refurbish as necessary in accordance with the BFN Preventive Maintenance Program. During the last two inspections, the as-found pump internals were in good condition.
- Because of the risks of online repair to 3-THV-63-518 and the available data supporting the conclusion that the SLC pumps can perform their design function, compliance with ISTB-3400 requirements to complete the IST quarterly SLC pump tests as scheduled represent a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Duration of Alternative

- Upon approval, this proposed alternative will be applied to BFN Unit 3 until the end of the U3R22 outage in March 2026.
- This timeframe provides an adequate window of opportunity to perform repairs to the SLC test line throttle valve (3-THV-63-518) while the plant is not operating. Following valve repair, Group B functional pump testing will resume at the normal quarterly frequency, and TVA will conduct the normal (biennially) scheduled comprehensive pump tests and periodic pump verification tests for the 3A and 3B SLC pumps.

Precedents

- Vogtle Electric Generating Plant, Unit 2 (ML25010A381)
  On January 16, 2025, the NRC approved a similar alternative request for Vogtle Unit 2 charging pumps 2A and 3B.

- Joseph M. Farley Nuclear Plant, Unit 2 (ML24351A040)
  On December 19, 2024, the NRC approved a similar alternative request for Farley Unit 2 charging pumps 2A, 2B, and 2C and mini-flow isolation valves.

- Monticello Nuclear Generating Plant (ML23107A285)
  On April 25, 2023, the NRC approved a similar alternative request for components in the HPCI system at Monticello.

- Millstone Power Station, Unit 3 (ML18275A012)
  On October 4, 2018, the NRC approved a similar alternative request for Millstone Unit 3 charging pump 3C.

Proposed Schedule

- TVA submits BFN Unit 3 request for alternative – **September 12, 2025**
- NRC completes review of TVA request – **October 17, 2025**
- BFN Unit 3 begins Cycle 22 refueling outage (valve repair window begins) – **February 2026**
- BFN Unit 3 reactor startup for Cycle 23 (alternative duration ends) – **March 2026**


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