Sequoyah and Watts Bar Nuclear Plants

Pre-Submittal Teleconference for Proposed License Amendment Request Regarding the Change for the Sequoyah and Watts Bar Nuclear Plants Technical Specification 3.4.12 “Low Temperature Overpressure Protection System” / “Cold Overpressure Mitigation System”

June 9, 2022

TVA TENNESSEE VALLEY AUTHORITY

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Introduction

- Tennessee Valley Authority (TVA) is submitting a request for an amendment to Renewed Facility Operating License Nos. DPR-77 and DPR-79 for Sequoyah Nuclear Plant (SQN), Units 1 and 2, and Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant (WBN), Units 1 and 2.

- This proposed license amendment will add a note to Technical Specification (TS) 3.4.12, entitled “Low Temperature Overpressure Protection (LTOP) System” at SQN and “Cold Overpressure Mitigation System (COMS)” at WBN to allow operation of one safety injection pump (SIP) capable of injecting into the reactor coolant system (RCS) during Mode 5 or Mode 6 with the pressurizer (PZR) manway cover removed.

- There is no significant difference between the LTOP system at SQN and the COMS at WBN.

Background

- When significant maintenance is performed on a SIP during a refueling outage, a comprehensive and/or pre-service flow test can be required to meet post maintenance, in-service, and surveillance testing requirements.

- SIP testing would typically be performed prior to reactor reassembly to meet the applicable MODE and plant conditions of TS 3.4.12, rendering this testing as a critical-path activity on the outage schedule.

- There is also an impact on the specialized contract and vendor service resources supporting the primary/reactor portion of the outage activities, which are often shared between SQN and WBN when outages are scheduled closely together.

- TVA desires to enable this SIP testing to be performed during Mode 5 or Mode 6 for both SQN and WBN, thus providing flexibility in critical path scheduling and enabling specialized outage resources to be released from the outage project more rapidly.

Proposed Change to SQN Technical Specification 3.4.12

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12 An LTOP System shall be OPERABLE with a maximum of one charging pump and no safety injection pump capable of injecting into the RCS and the accumulators isolated and one of the following pressure relief capabilities:

a. Two power operated relief valves (PORVs) with lift settings within the limits specified in the PTLR; or

b. The RCS depressurized and an RCS vent of ≥ 3.0 square inches.

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1. Two charging pumps may be made capable of injecting for ≤ 1 hour for pump swap operations.

2. Accumulator may be unisolated when accumulator pressure is less than the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

3. Two safety injection pumps and two charging pumps may be capable of injecting for ≤ 4 hours after entering MODE 4 from MODE 3 or prior to lowering temperature on any RCS loop below 325°F, whichever occurs first.

4. One safety injection pump and one charging pump may be capable of injecting into the RCS for the purpose of testing in MODE 5 or MODE 6 when the reactor vessel head is on, provided the pressurizer manway cover is removed to provide a vent path for adequate pressure relief.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is ≤ LTOP arming temperature specified in the PTLR,
MODE 5,
MODE 6 when the reactor vessel head is on.

Proposed Change to WBN Technical Specification 3.4.12

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Cold Overpressure Mitigation System (COMS)

LCO 3.4.12 A COMS System shall be OPERABLE with a maximum of one charging pump and no safety injection pump capable of injecting into the RCS and the accumulators isolated and either a or b below.

a. Two RCS relief valves, as follows:

1. Two power operated relief valves (PORVs) with lift settings within the limits specified in the PTLR, or

2. One PORV with a lift setting within the limits specified in the PTLR and the RHR suction relief valve with a setpoint ≥ 436.5 psig and ≤ 463.5 psig.

b. The RCS depressurized and an RCS vent capable of relieving > 475 gpm water flow.

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1. Two charging pumps may be made capable of injecting for less than or equal to one hour for pump swap operations.

2. Accumulator may be unisolated when accumulator pressure is less than the maximum RCS Pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

3. One safety injection pump and one charging pump may be capable of injecting into the RCS for the purpose of testing in MODE 5 or MODE 6 when the reactor vessel head is on, provided the pressurizer manway cover is removed to provide a vent path for adequate pressure relief.

APPLICABILITY: MODES 4 and 5,
MODE 6 when the reactor vessel head is on.

Technical Evaluation

- To minimize the frequency of RCS overpressurization, an automatic LTOP System (SQN) or COMS (WBN), when manually armed from the main control room, uses the pressurizer power-operated relief valves (PORVs) to mitigate pressure excursions within the allowable pressure limits.
- The overpressure protection provided by the LTOP/COMS is designed to accommodate a mass input (MI) transient of only a charging pump.
- To preclude the need for a redesign of the LTOP/COMS, requiring reanalysis and potentially a revision of the setpoints for the PORVs, the RCS can instead be vented to the containment atmosphere via the PZR manway for the duration that a SIP will be capable of injecting into the RCS.
- A TVA analysis demonstrated that the PZR manway opening is capable of relieving the combined MI transient of both the charging pump and SIP, thus prohibiting the pressurization of the RCS when these pumps are operating.
- Thus, the proposal to operate the SIP during LTOPS/COMS modes of applicability is supported with no need for a redesign of the LTOP/COMS or revision of the PORV setpoints.

Regulatory Precedent

- NUREG-1431 Revision 5, Westinghouse Standard Technical Specifications, allows the LTOP system to be operable with a maximum of one high pressure injection pump and one charging pump capable of injecting into the RCS, with suitable venting analysis.

- SIP testing during the APPLICABILITY of LCO 3.4.12 was approved on a one-time exigent basis, with similar technical justification, for SQN Unit 2 on October 27, 2021 (ML21298A031).

Schedule for Submittal

- June 9, 2022 – Pre-submittal teleconference with NRC
- July 21, 2022 – Submit LAR to NRC
- Request NRC approval by July 2023


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