Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

August 3, 2000

TVA-SQN-TS-98-10 10 CFR 50.90

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

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - TECHNICAL SPECIFICATION (TS) CHANGE NO. 98-10, REVISION 2 "ENHANCEMENT OF REACTOR COOLANT LEAKAGE DETECTION AND OPERATIONAL LEAKAGE CONSISTENT WITH STANDARD TECHNICAL SPECIFICATIONS" (NUREG-1431)

In accordance with the provisions of 10 CFR 50.4 and 50.90, TVA submitted a request for an amendment to SQN's licenses DPR-77 and 79 to change the TSs for Units 1 and 2. The proposed change updated the current TS requirements for reactor coolant system (RCS) leakage detection and RCS operational leakage specifications consistent with the recommended content of NUREG-1431. Communications with NRC during July 24, 2000, through August 3, 2000, identified a concern with the placement of the acceptance limits curve for the new Specification 3.5.6, "Seal Injection Flow." The proposed revision placed this curve in the Bases section for the new specification and utilized revision control under the requirements of 10 CFR 50.59. This location of the curve was determined by NRC to be inappropriate in that this curve was viewed as required information to properly verify the operability of the seal injection flow limits. This letter serves to provide the necessary revisions

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to the original change request submitted on June 30, 1999, and revised by a revision request on June 16, 2000.

TVA has determined that the original no significant hazards considerations associated with the proposed change remains valid with the proposed revisions and that the change continues to be exempt 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 to the Tennessee State Department of Public Health.

The proposed revision does not alter the intent of the original request associated with the seal injection flow requirements and is changed only by the location of the curve for these limits. The appropriate portions of Specification 3.5.6 and the associated Bases have been revised in this request to reference the new location within Specification 3.5.6. The other portions of the original submittal and Revision 1 remain unchanged and are not affected by this proposal. The enclosure contains copies of the appropriate TS pages for the seal injection flow portion of the proposed revision from Units 1 and 2 with the proposed changes incorporated.

If you have any questions about this change, please telephone me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

Pedro Salas

Subscribed and sworn to before me
on this 3rd day of August
Peggy N. Billingsley
Notary Public

My Commission Expires October 9, 2002

Enclosures
cc: See Page 3

cc (Enclosures):

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Region II
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61 Forsyth St., SW, Suite 23T85
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ENCLOSURE

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

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE 98-10
FOR REVISION 2

I. AFFECTED PAGE LIST

Unit 1	Unit 2
3/4 5-12	3/4 5-12
3/4 5-13	3/4 5-13
B 3/4 5-4	B 3/4 5-4
B 3/4 5-5	B 3/4 5-5
B 3/4 5-6	B 3/4 5-6
B 3/4 5-7	B 3/4 5-7

II. MARKED PAGES

See attached.

3/4.5.6 SEAL INJECTION FLOW

LIMITING CONDITION FOR OPERATION

3.5.6 Reactor coolant pump seal injection flow shall be within the limits of Figure 3.5.6-1.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

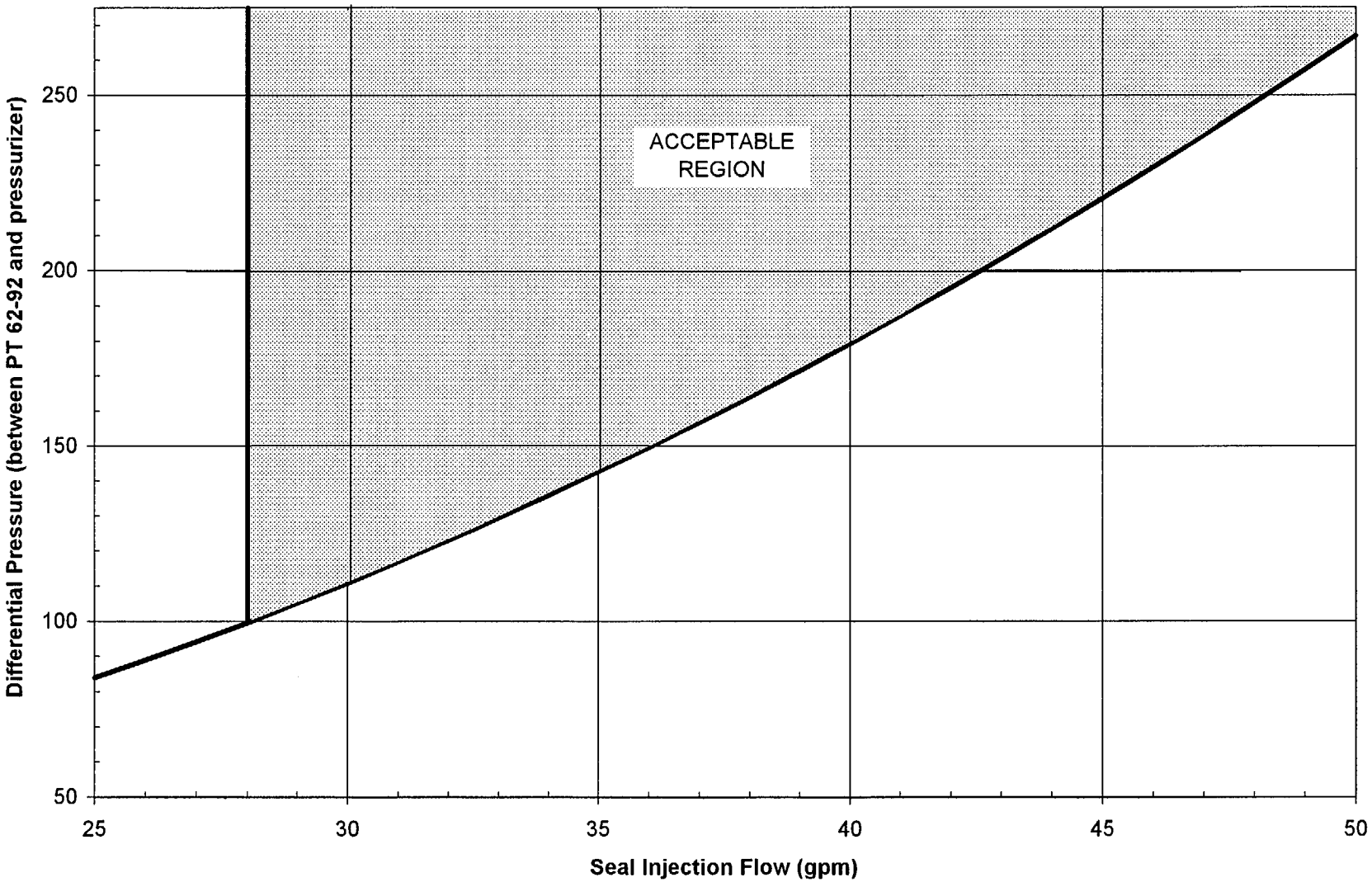
With reactor coolant pump seal injection flow not within limit, adjust manual seal injection throttle valves to give a flow within limit in accordance with Surveillance Requirement 4.5.6 within 4 hours. Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.6 At least once per 31 days* verify manual seal injection throttle valves are adjusted to give a flow within the emergency core cooling system safety analysis limits in Figure 3.5.6-1 .

*This surveillance is not required to be performed until 4 hours after the reactor coolant system pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig.

FIGURE 3.5.6-1
Seal Injection Flow Limits



3/4.5.6 SEAL INJECTION FLOW

BACKGROUND

The function of the seal injection throttle valves during an accident is similar to the function of the ECCS throttle valves in that each restricts flow from the centrifugal charging pump header to the Reactor Coolant System (RCS).

The restriction on reactor coolant pump (RCP) seal injection flow limits the amount of ECCS flow that would be diverted from the injection path following an accident. This limit is based on safety analysis assumptions that are required because RCP seal injection flow is not isolated during safety injection.

APPLICABLE SAFETY ANALYSES

All ECCS subsystems are taken credit for in the large break loss of coolant accident (LOCA) at full power (Ref. 1). The LOCA analysis establishes the minimum flow for the ECCS pumps. The centrifugal charging pumps are also credited in the small break LOCA analysis. This analysis establishes the flow and discharge head at the design point for the centrifugal charging pumps. The steam generator tube rupture and main steam line break event analyses also credit the centrifugal charging pumps, but are not limiting in their design. Reference to these analyses is made in assessing changes to the Seal Injection System for evaluation of their effects in relation to the acceptance limits in these analyses.

This LCO ensures that seal injection flow will be sufficient for RCP seal integrity but limited so that the ECCS trains will be capable of delivering sufficient water to match boiloff rates soon enough to minimize uncovering of the core following a large LOCA. It also ensures that the centrifugal charging pumps will deliver sufficient water for a small LOCA and sufficient boron to maintain the core subcritical. For smaller LOCAs, the charging pumps alone deliver sufficient fluid to overcome the loss and maintain RCS inventory. Seal injection flow satisfies Criterion 2 of the NRC Policy Statement.

LCO

The intent of the LCO limit on seal injection flow is to make sure that flow through the RCP seal water injection line is low enough to ensure that sufficient centrifugal charging pump injection flow is directed to the RCS via the injection points (Ref. 2).

The LCO is not strictly a flow limit, but rather a flow limit based on a flow line resistance. In order to establish the proper flow line resistance, a pressure and flow must be known. The flow line resistance is established by adjusting the RCP seal injection needle valves to provide a total seal injection flow in the acceptable region of Technical Specification Figure 3.5.6-1. The centrifugal charging pump discharge header pressure remains essentially constant through all the applicable MODES of this LCO. A reduction in RCS pressure would result in more flow being diverted to the RCP seal injection line than at normal operating pressure. The valve settings established at the prescribed centrifugal charging pump discharge header pressure result in a conservative valve position should RCS pressure decrease. The flow limits established by Technical Specification Figure 3.5.6-1 are consistent with the accident analysis.

The limits on seal injection flow must be met to render the ECCS OPERABLE. If these conditions are not met, the ECCS flow will not be as assumed in the accident analyses.

APPLICABILITY

In MODES 1, 2, and 3, the seal injection flow limit is dictated by ECCS flow requirements, which are specified for MODES 1, 2, 3, and 4. The seal injection flow limit is not applicable for MODE 4 and lower, however, because high seal injection flow is less critical as a result of the lower initial RCS pressure and decay heat removal requirements in these MODES. Therefore, RCP seal injection flow must be limited in MODES 1, 2, and 3 to ensure adequate ECCS performance.

ACTION

With the seal injection flow exceeding its limit, the amount of charging flow available to the RCS may be reduced. Under this condition, action must be taken to restore the flow to below its limit. The operator has 4 hours from the time the flow is known to be above the limit to correctly position the manual valves and thus be in compliance with the accident analysis. The completion time minimizes the potential exposure of the plant to a LOCA with insufficient injection flow and provides a reasonable time to restore seal injection flow within limits. This time is conservative with respect to the completion times of other ECCS LCOs; it is based on operating experience and is sufficient for taking corrective actions by operations personnel.

When the actions cannot be completed within the required completion time, a controlled shutdown must be initiated. The completion time of 6 hours for reaching MODE 3 from MODE 1 is a reasonable time for a controlled shutdown, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators. Continuing the plant shutdown from MODE 3, an additional 6 hours is a reasonable time, based on operating experience and normal cooldown rates, to reach MODE 4, where this LCO is no longer applicable.

SURVEILLANCE REQUIREMENTS

Surveillance 4.5.6

Verification every 31 days that the manual seal injection throttle valves are adjusted to give a flow within the limit ensures that proper manual seal injection throttle valve position, and hence, proper seal injection flow, is maintained. The differential pressure that is above the reference minimum value is established between the charging header (PT 62-92) and the RCS, and total seal injection flow is verified to be within the limits determined in accordance with the ECCS safety analysis (Ref. 3). The seal water injection flow limits are shown in Technical Specification Figure 3.5.6-1. The frequency of 31 days is based on engineering judgment and is consistent with other ECCS valve surveillance frequencies. The frequency has proven to be acceptable through operating experience.

The requirements for charging flow vary widely according to plant status and configuration. When charging flow is adjusted, the positions of the air-operated valves, which control charging flow, are

adjusted to balance the flows through the charging header and through the seal injection header to ensure that the seal injection flow to the RCPs is maintained between 8 and 13 gpm per pump. The reference minimum differential pressure across the seal injection needle valves ensures that regardless of the varied settings of the charging flow control valves that are required to support optimum charging flow, a reference test condition can be established to ensure that flows across the needle valves are within the safety analysis. The values in the safety analysis for this reference set of conditions are calculated based on conditions during power operation and they are correlated to the minimum ECCS flow to be maintained under the most limiting accident conditions.

As noted, the surveillance is not required to be performed until 4 hours after the RCS pressure has stabilized within a ± 20 psig range of normal operating pressure. The RCS pressure requirement is specified since this configuration will produce the required pressure conditions necessary to assure that the manual valves are set correctly. The exception is limited to 4 hours to ensure that the surveillance is timely. Performance of this surveillance within the 4-hour allowance is required to maintain compliance with the provisions of Specification 4.0.3.

REFERENCES

1. FSAR, Chapter 6.3 "Emergency Core Cooling System" and Chapter 15.0 "Accident Analysis".

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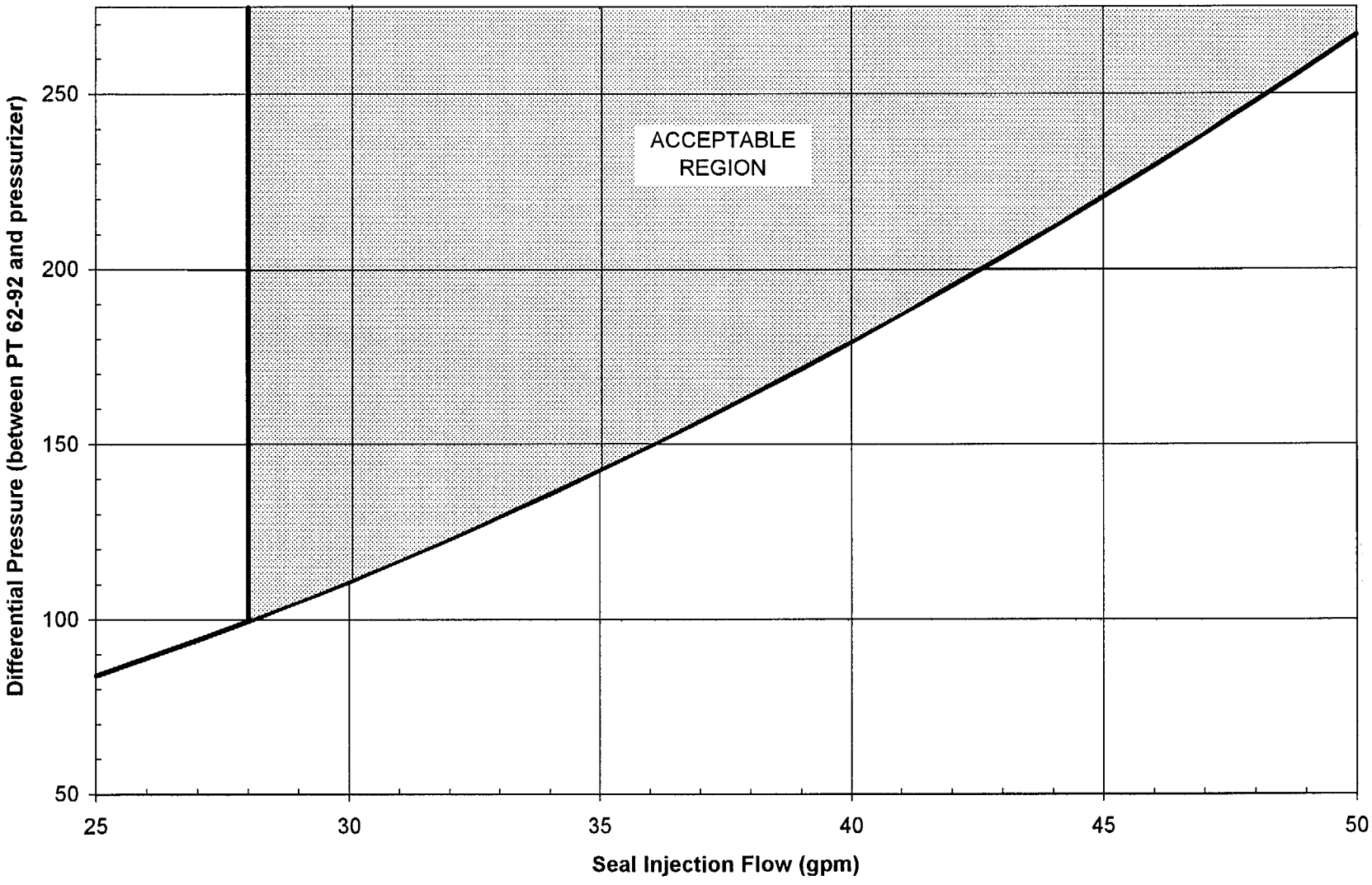

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