Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

August 18, 2004

TVA-SQN-TS-04-03 10 CFR 50.90

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

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. 04-03, REACTOR COOLANT SYSTEM (RCS) AND EMERGENCY CORE COOLING SYSTEM (ECCS) ENHANCEMENTS

Reference: NRC letter to TVA dated September 6, 2002, "Technical Specification Change No. 00-14, Pressure Temperature Limits Report (PTLR) and Request for Exemption from the Requirements of 10 CFR 50, Appendix G"

In accordance with the provisions of 10 CFR 50.4 and 50.90, TVA is submitting a request for an amendment to SQN's Licenses DPR-77 and 79 to change the TSs for Units 1 and 2.

The proposed amendment incorporates updates to the SQN TS requirements for the RCS and ECCS. These updates provide improvements that are consistent with the improved standard TS (NUREG-1431, Revision 3).

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The original PTLR for SQN was submitted for NRC review and approval in the reference letter. As a follow up to TVA's reference letter, TVA reviewed the balance of SQN TS requirements that could be associated with or provide reference to the PTLR. The enclosed changes reflect this review.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change is 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.

TVA has no specific scheduler needs for the proposed changes. TVA requests that the revised TS be made effective within 45 days of NRC approval.

There are no commitments contained in this submittal. If you have any questions about this change, please contact me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 18th day of August, 2004.

Sincerely,

for

Pedro Salas
Licensing and Industry Affairs Manager

Enclosures:
1. TVA Evaluation of the Proposed Change
2. Proposed Technical Specification Changes (mark-up)
3. Technical Specification Bases Changes

cc: See page 3

Enclosures
cc (Enclosures):

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2
DOCKET NOS. 327 AND 328

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE 04-03
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

1.0 DESCRIPTION

TVA is submitting a proposed revision to SQN TSs to update the reactor coolant system (RCS) and emergency core cooling system (ECCS) specifications. The proposed changes provide improvements consistent with the SQN safety analyses provided in the SQN Updated Final Safety Analyses Report (UFSAR) and the improved standard TSs (NUREG-1431, Revision 3).

In addition, TVA is proposing changes to SQN's RCS section that provide reference to the SQN pressure temperature limits report (PTLR). The proposed PTLR references are based on TVA's proposed TS amendment (TVA letter to NRC dated September 6, 2002, SQN TS Change 00-14) that incorporated the original PTLR and PTLR format into SQN TSs.

TVA's proposed changes affect the following TSs:

3/4.4.2, "Safety Valves - Shutdown"
3/4.4.3, "Safety and Relief Valves - Operating," and
3/4.5.2, "ECCS Subsystems - T_{AVE} Greater Than or Equal to 350°F"

Included with the above changes are the SQN TS index and bases sections that have been modified to reflect the proposed TS changes.

2.0 PROPOSED CHANGE

The first change proposes to delete TS 3/4.4.2, "Safety Valves - Shutdown," in its entirety. The current limiting condition for operation (LCO) is applicable for Modes 4 and 5 and state:

"A minimum of one pressurizer code safety valve shall be OPERABLE with a lift setting of 2485 PSIG ±3%."

The above LCO, along with the associated applicability, action requirements and surveillance requirements, no longer apply in Modes 4 and 5 and are deleted.

The second proposed change is associated with SQN TS 3/4.4.3, "Safety and Relief Valves - Operating." The proposed change revises the current action requirements to incorporate improved standard action requirements. The current ACTION requirement reads as follows:

"With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15 minutes or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours."

The proposed standard ACTION states:

"a) With one pressurizer safety valve inoperable, restore the inoperable valve to OPERABLE status within 15 minutes.

b) With two or more pressurizer safety valves inoperable or with ACTION (a) above not completed within 15 minutes, be in MODE 3 within 6 hours and be in MODE 4 within the following 6 hours."

The third proposed change is a revision to SQN TS 3.4.3.2, "Relief Valves - Operating," to delete surveillance requirement (SR) 4.4.3.2.1.a. Currently, SQN SR 4.4.3.2.1.a states:

"In addition to the requirements of Specification 4.0.5, each PORV shall be demonstrated OPERABLE at least once per 18 months by:

a. Performance of a CHANNEL CALIBRATION, and"

The fourth proposed change is to SQN TS 3/4.5.2, "ECCS Subsystems-T_{ave} Greater than or Equal to 350°F." The LCO for TS 3/4.5.2 requires two independent ECCS subsystems to be OPERABLE and lists the subsystem components required operable. TVA's proposed change adds a standard notation from NUREG-1431, Revision 3 to the LCO that reads as follows:

"In MODE 3, ECCS pumps may be made incapable of injecting to support transition into or from the APPLICABILITY of LCO 3.4.12, 'Low Temperature Overpressure Protection (LTOP) System,' for up to 4 hours or until the temperature of all RCS cold legs exceed LTOP arming temperature specified in the PTLR plus 25°F, whichever comes first."

SQN TS Bases

TVA proposes a revision to the TS Bases title for 3/4.4.2 and 3/4.4.3 to reflect deletion of TS 3/4.4.2. In addition, the Bases for TS 3/4.5.2 is revised to add the standard notation description for the proposed change to 3/4.5.2. These Bases changes align SQN's TS Bases with the proposed changes.

3.0 BACKGROUND

The following provides a general description of the SQN systems and design features associated with the enclosed TS changes.

RCS - System Description:

The SQN RCS is designed to remove heat generated in the fuel and transfer the heat via the steam generators to the secondary plant. The secondary functions of the RCS include the following:

a) Moderating the neutron energy level to the thermal state, to increase the probability of fission;
b) Improving the neutron economy by acting as a reflector;
c) Carrying the soluble neutron poison, boric acid;
d) Providing a second barrier against fission product release to the environment; and
e) Removing the heat generated in the fuel due to fission product decay following a unit shutdown.

Section 3.4 of the SQN TS contains the TS operability requirements for the RCS. The RCS is further described in the SQN Final Safety Analysis Report (FSAR), Section 5.1, and is illustrated on FSAR Figure 5.1-1. The SQN safety analyses (FSAR Chapter 15) contains the design bases accident (DBA) initial conditions that include RCS pressure, RCS temperature, reactor power level, core parameters, and safety system setpoints.

RCS Pressure Boundary

The RCS pressure boundary provides a barrier against the release of radioactivity generated within the reactor and is designed to ensure a high degree of integrity throughout the life of the plant. (See SQN FSAR, Section 5.2)

Pressure Temperature Limits Report

Protection against brittle fracture of SQN's RCS pressure boundary is provided by the limits presented in the SQN PTLR. The PTLR contains the limits associated with plant operation during heatup and cooldown. In addition, the PLTR contains the SQN Low-Temperature Overpressure Protection (LTOP) system setpoints for pressurizer power-operated relief valves (PORVs) that protect against overpressure transients while operating the plant at low temperature modes.

Pressurizer Safety and Relief Valves

Each unit at SQN is equipped with three safety valves and two PORVs that are connected to the pressurizer and provide overpressure protection, in conjunction with the reactor protection system, for the RCS.

The pressurizer safety valves are totally enclosed, pop type, spring-loaded, self-actuated valves with back pressure compensation. The valves operate to prevent the RCS pressure from exceeding the safety limit of 2735 pounds per square inch gauge (psig) (reference SQN TS 2.1.2). The valve operability requirements are governed by SQN TS 3.4.3.1 and have an as-found lift setting of 2485 psig ±3 percent. Each safety valve is designed to relieve 420,000 pounds per hour of saturated steam at the valve setpoint.

The pressurizer PORVs are solenoid type valves that are operated automatically or manually from the MCR. While the SQN safety analyses take no credit for automatic PORV operation while in modes 1, 2 and 3, the PORVs serve to reduce RCS pressure such that actuation of the reactor high-pressure trip for all design transients up to and including the design step-load decrease with steam dump but without reactor trip may not be required. This limits undesirable opening of the spring-loaded safety valves. In the lower plant modes, the pressurizer PORVs function as part of the LTOP system to provide pressure relief for the reactor vessel at low temperatures. The operability requirements for the PORVs are governed by SQN TSs 3.4.3.2 and 3.4.12.

A general description of SQN's pressurizer safety valves and pressurizer PORVs is provided in Section 5.1 of the SQN UFSAR.

Emergency Core Cooling System - System Description

The SQN ECCS is designed to remove stored and fission product decay heat from the reactor core to prevent fuel

rod damage and to provide additional shutdown capability during DBA conditions.

Section 5.0 of the SQN TS contains operability requirements for the ECCS. The ECCS is further described in SQN FSAR Section 5.2, and additional details are provided in FSAR Sections 3.7, 3.9, 7.3, 7.9, 15.3, and 15.4.

4.0 TECHNICAL ANALYSIS

The following provides the detailed basis and justification for each of the proposed TS changes.

Index Pages

The TS index pages are revised to reflect each of the associated changes described below. The changes to the index pages are editorial in nature and do not affect any TS limits or requirements.

Specification 3/4.4.2

The current SQN TS 3/4.4.2, "Safety Valves - Shutdown," is proposed to be deleted in its entirety. The SQN LCO currently states:

"A minimum of one pressurizer code safety valve shall be OPERABLE with a lift setting of 2485 PSIG ± 3%."

The above specification for SQN is currently applicable to Modes 4 and 5. NUREG-1431 requires the pressurizer safety valves to be operable in Modes 1, 2, and 3, and Mode 4 with all RCS cold leg temperatures greater than the LTOP system enable temperature. For SQN the LTOP enable temperature is 350°F, which is the Mode 3/Mode 4 transition temperature. At SQN, the necessary overpressure protection below 350°F is provided by either of two PORVs as part of the LTOP system. The overpressure protection function for the SQN RCS does not rely on the pressurizer code safety valves to function in Modes 4 or 5. The operability requirement for SQN's LTOP system is governed by SQN TS 3.4.12. Accordingly, SQN specification 3/4.4.2 and its requirements are not applicable for unit operation in Mode 4 or 5 and are proposed for deletion. The proposed change will provide an improvement to SQN TSs by aligning the SQN safety analysis with the TS requirements.

A detailed technical discussion and justification is provided below:

The primary purpose of the pressurizer safety valves is to protect the RCS from being pressurized above the RCS pressure safety limit (2735 psig). The operability requirements for the pressurizer safety valves are provided in SQN TS 3.4.3.1 that requires safety valves to be operable during Modes 1, 2 and 3 with a lift setting of 2485 psig, ±3 percent. This ensures that RCS overpressure protection is provided during power operation (Modes 1 and 2) and hot standby (Mode 3). Below Mode 3 (i.e., RCS temperature below 350°F), the applicable safety limit is no longer 2735 psig but is governed by the LTOP analysis and associated PORV setpoints. The safety valves are not assumed to function for RCS overpressure protection below Mode 3. As the plant is cooled and RCS temperature is less than 350°F, SQN's LTOP system is armed (enabled) and is designed to protect the RCS from any overpressure condition during low temperature plant conditions. The current SQN TS 3.4.12 governs the operability requirements for the LTOP system during Modes 4, 5, and Mode 6 with the reactor vessel head on. While the RCS temperatures and pressures are low, SQN's pressurizer code safety valves do not perform any overpressure protection function because the setpoint of the valves (2485 psig,± 3.0 percent) is well above that which is necessary to protect the RCS during the low-temperature operation (RCS pressure is controlled and maintained below 685 psig during low-temperature operation). Therefore, consistent with SQN design, there is no need to require one pressurizer code safety to be OPERABLE in Mode 4 or 5.

TVA has also evaluated this TS requirement against the criteria of 10 CFR 50.36, "Technical Specifications." The following discussion addresses the applicability of the 10 CFR 50.36 criteria to SQN's pressurizer code safety valves.

Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

The SQN pressurizer code safety valves provide overpressure protection for the RCS piping during plant operation while in Modes 1, 2, and 3 to prevent the piping and associated components from being pressurized above the RCS pressure safety limit (2735 psig). During plant shutdown (modes below Mode 3), the pressurizer code safety valves have no design basis function associated with this safety limit or protection of the reactor coolant pressure boundary. These valves are passive components and are not installed instrumentation that is used to detect or indicate in the control room a significant abnormal degradation of the reactor coolant pressure boundary.

Accordingly, the SQN pressurizer code safety valves do not satisfy Criterion 1.

Criterion 2: A process variable, design feature or operating restriction that is an initial condition of a Design Basis Accident (DBA) or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The RCS pressure safety limit for SQN is 2735 psig. The lift setting for SQN's pressurizer code safety valves is 2485 psig, ±3 percent which provides overpressure protection for this RCS safety limit. This protection is required during power operation (Modes 1 and 2) and hot standby (Mode 3). While the plant is in the non-power/shutdown modes (modes below Mode 3), overpressure protection is provided by SQN's LTOP system and the pressurizer code safety valves do not provide any RCS overpressure protection function. Since the pressurizer code safety valves do not perform a safety function below Mode 3, they and are not a design feature or operating restriction that is an initial condition of a DBA or transient. The safety valves are not a process variable or design feature that is assumed in any initial condition of a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Accordingly, the functions associated with the pressurizer code safety valves below Mode 3 do not satisfy Criterion 2.

Criterion 3: A structure, system or component that is part of the primary success path and which functions or actuates to mitigate a DBA or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

During plant shutdown conditions (below Mode 3), the RCS is protected by SQN's LTOP system. The LTOP setpoints are well below the pressurizer code safety valve lift setting such that they are not assumed to function. The safety valves are not a structure, system or component that is part of the primary success path for accident mitigation. In addition, the valves do not function or actuate to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. Accordingly, SQN's pressurizer code safety valves do not satisfy Criterion 3.

Criterion 4: A structure, system or component, which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

The SQN pressurizer code safety valves have not been identified as a significant risk contributor. Operational

experience or probabilistic safety assessment has not shown the SQN pressurizer safety valves to be significant to the public health and safety. Therefore, the valves do not satisfy Criterion 4.

In summary, The proposed deletion of SQN TS 3/4.4.2 that governs the requirements for maintaining one operable pressurizer code safety valve while the plant is in either Mode 4 or Mode 5 is considered acceptable based on the above discussions.

Specification 3/4.4.3

The SQN specification 3/4.4.3 provides the requirements for maintaining pressurizer code safety valves operable in Modes 1, 2 and 3. The current applicability for SQN is Modes 1, 2 and 3 to ensure that RCS overpressure protection is available during these modes of plant operation.

TVA is retaining the current applicability for the SQN TSs. This is different from the improved standard TS applicability requirements that states:

"MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures > the Low Temperature Overpressure Protection (LTOP) arming temperature specified in the PTLR."

The above standard applicability includes a portion of Mode 4 above the LTOP arming temperature. The standard applicability is based on a plant's LTOP arming temperature which is typically provided in the plant PTLR. For SQN design, the PTLR provides an LTOP arming temperature of ≤ 350°F. This temperature coincides with the Mode 3/Mode 4 transition temperature. The SQN LTOP system is armed during plant shutdown immediately following entry into Mode 4 (when RCS temperature reaches less than 350°F). Accordingly, SQN's current TS applicability for pressurizer code safety valves is retained and remains consistent with the plant design and the current LTOP arming temperature.

TVA proposes to revise the current action requirements of Specification 3/4.4.3 to include the standard action requirements. The basis for this change is to include the reference to SQN's PTLR in the action requirements. The SQN ACTION requirement currently reads as follows:

"With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15

minutes or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours."

The proposed standard action has two parts that state:

"a) With one pressurizer safety valve inoperable, restore the inoperable valve to OPERABLE status within 15 minutes.

b) With two or more pressurizer safety valves inoperable or with ACTION (a) above not completed within 15 minutes, be in MODE 3 within 6 hours and be in MODE 4 within the following 6 hours."

The standard Action (a) above restores one pressurizer safety valve within 15 minutes. The action time of 15 minutes for restoring an inoperable pressurizer safety valve reflects the importance of maintaining the RCS overpressure protection system. If one valve is not restored within 15 minutes, Action (b) becomes effective and a unit shutdown is begun to reach hot standby (Mode 3) within 6 hours and hot shutdown (Mode 4) within the following 6 hours. The 12-hour shutdown time for achieving a mode where the TS is no longer applicable is consistent with SQN's current action shutdown time and thereby remains unchanged.

The standard action is an improvement to the current action requirement because it establishes separate actions for the case when one valve is inoperable and the second case when two or more valves are inoperable. The additional action (b) that addresses two or more valves inoperable is a conservative change with respect to SQN's current design that includes three pressurizer safety valves.

It may be noted that TVA's proposed Action (b) does not contain the improved standard TS language italicized below:

"With two or more pressurizer safety valves inoperable or with ACTION (a) above not completed within 15 minutes, be in MODE 3 within 6 hours and be in MODE 4 *with any RCS cold leg temperature ≤ the LTOP arming temperature specified in the PTLR* within the following 6 hours."

The italicized language references the LTOP arming temperature specified in the PTLR. This language is not proposed for incorporation into the SQN TSs based on SQN's current LTOP arming temperature. The LTOP arming temperature for SQN design is ≤ 350°F. This temperature is equivalent to the Mode 3/Mode 4 transition temperature.

Thus, for SQN, the LTOP system is armed immediately following entry into Mode 4 which ensures overpressure protection is available during plant shutdown conditions. Accordingly, the standard language does not apply for SQN's design and LTOP arming temperature. This is previously discussed in the above paragraph associated with applicability.

SQN Specification 3.4.3.2

TVA proposes a revision to TS 3.4.3.2, "Relief Valves - Operating," to delete surveillance requirement (SR) 4.4.3.2.1.a. Currently, SQN SR 4.4.3.2.1.a performs a channel calibration of the PORV actuation circuitry for PORV operability in Modes 1, 2, and 3. TVA's proposed deletion of SR 4.4.3.2.1.a eliminates duplicate requirements for PORV testing (reference PORV testing required by SQN SR 4.4.12.1.b).

In addition, based on a review of operability requirements for PORVs (see SQN TS Bases Section 3/4.4.3), PORV automatic actuation circuitry is not required to mitigate a DBA or plant transient (i.e., specifically an RCS overpressure event) while the unit is operating in Modes 1, 2 and 3. Accordingly, automatic PORV operation is not an assumed safety function while in these modes. SQN plant design relies upon pressurizer safety valves for RCS overpressure protection in Modes 1, 2 and 3 and does not rely on automatic PORV actuation circuitry. This clarification of PORV function is also discussed in TSTF-151, Revision 1, "PORV Operability Clarification."

SQN plant design does rely on PORV actuation circuitry in Modes 4, 5, and 6 (LTOP modes). RCS overpressure protection in the LTOP mode is provided by SQN's LTOP system and the TS requirements for this system is governed by TS 3.4.12. The specification provides for LTOP operability requirements by performance of a channel calibration of SQN's PORV actuation circuitry every 18 months (reference SQN SR 4.4.12.1.b). Accordingly, TVA's proposed deletion of SR 4.4.3.2.1.a aligns SQN's PORV surveillance testing with the standard TS requirements and provides consistency with SQN plant design basis.

SQN Specification 3/4.5.2

The current SQN TS 3/4.5.2 is entitled "ECCS Subsystems-T_{ave} Greater Than or Equal to 350°F." TVA proposes to revise this specification to incorporate notation from NUREG-1431, Revision 3 that states:

"In MODE 3, ECCS pumps may be made incapable of injecting to support transition into or from the Applicability of LCO 3.4.12, 'Low Temperature Overpressure Protection (LTOP) System,' for up to four hours or until the temperature of all RCS cold legs exceeds 375°F, whichever comes first."

The above standard notation is applicable to SQN in order to provide a time allowance (up to four hours) for rendering certain ECCS pumps incapable of injection. This provision facilitates entry into or exit from the applicability of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," and is necessary for plants such as SQN that have an LTOP arming temperature near the mode 3 boundary temperature of 350°F. SQN LCO 3.4.12 requires that certain pumps be rendered incapable of injecting at and below the LTOP arming temperature. When RCS temperature is at or near the mode 3 boundary temperature, time is needed to make pumps incapable of injecting prior to entering the LTOP applicability, and provide time to restore the inoperable pumps to operable status on exiting the LTOP applicability. The four-hour allowance is based on a reasonable time for the operator to perform this task under controlled plant conditions. The 375°F temperature is based on a 25°F margin above the 350°F LTOP arming temperature.

TVA's proposed addition of the standard notation provides a clarification to the ECCS requirements and associate the ECCS pump operability requirements with the associated LTOP and PTLR limits.

SQN TS Bases

TVA's proposed changes require associated changes to the TS Bases. The Bases title for 3/4.4.2 and 3/4.4.3 is changed to reflect the proposed deletion of TS 3/4.4.2. Also, the addition of standard notation for TS Bases 3/4.5.2 properly aligns the Bases with the proposed change to TS 3/4.5.2.

Based on the above discussion, TVA's proposed changes do not affect safety limits or margins of safety assumed in the safety analysis for SQN's RCS and ECCS. In addition, the proposed changes do not affect any plant operation or limits. Accordingly, the proposed changes are risk neutral and provide equivalent or improved operating practices for SQN's RCS and ECCS.

5.0 REGULATORY SAFETY ANALYSIS

TVA's proposed technical specifications (TS) amendment provides clarification to the SQN reactor coolant system (RCS) and emergency core cooling system (ECCS) requirements. The proposed changes are consistent with the SQN safety analyses and the improved standard TS requirements (NUREG-1431, Revision 3). The proposed changes continue to satisfy the Policy Criterion of 10 CFR 50.36. In addition, the proposed amendment completes the balance of changes needed to supplement TVA's TS amendment (TS change 00-14) that incorporates SQN's original pressure temperature limits report (PTLR) into the SQN TSs.

TVA's proposed change is also supported by an NRC-approved TSTF (TSTF-151, Revision 1, "PORV Operability Clarification"), that clarifies TS applicability relative to PORV operability.

In addition, the proposed changes remain consistent with the SQN accident analyses as presented in SQN UFSAR and follow the guidance contained in other regulatory requirements that include NRC Generic Letter (GL) 96-03, "Relocation of the Pressure Temperature Limit Curves, and Low Temperature Overpressure Protection (LTOP) limits," and GL 90-06, "Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Reliability' and Generic Issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors.'"

5.1. No Significant Hazards Consideration Determination

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   TVA's proposed TS revisions do not involve a significant increase in the probability of any accident previously evaluated. TVA's proposed TS revisions provide improvements to the RCS and ECCS requirements to include appropriate reference to SQN's PTLR requirements. The

proposed revision is a TS improvement that remains consistent with the improved standard TS requirements for Pressurized Water Reactors (PWRs) (NUREG-1431, Revision 3).

TVA's proposed revision to delete SQN TS 3/4.4.2.1, "Reactor Coolant Safety Valves - Shutdown," does not involve a significant increase in the probability of any accident previously evaluated. Pressurizer code safety valve requirements are not applicable for plant shutdown conditions (i.e., modes 4 and 5) because the valves do not perform a safety function in these modes. The pressurizer code safety valves are not used as inputs to initiating events or accidents previously evaluated. Protection of the RCS against an overpressure condition in modes 4 and 5 is provided by the LTOP system which is governed by SQN TS 3.4.12. The setpoint for the pressurizer code safety valves is sufficiently high such that the safety valves do not afford protection to the RCS during low temperature operation. Accordingly, there is no impact on the consequences previously evaluated for the proposed change.

The proposed revisions are not the result of changes to plant equipment, test methods or operating practices. The proposed changes do not contribute to the generation or assumptions for postulated accidents. The proposed changes do not affect the design basis accidents or their assumptions. The revisions to SQN TSs continue to support SQN's required safety functions.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed revisions are not the result of changes to plant equipment or plant design.

The proposed revisions adopt standard TS requirements that are consistent with SQN's safety analysis and design and provide improvements over the existing requirements. The safety functions of the RCS and ECCS remain unchanged and do not affect any assumptions in SQN's accident analyses.

TVA's proposed change to delete the mode 4 and mode 5 TS requirements for pressurizer safety valves is consistent with the Policy Criterion of 10 CFR 50.36. The pressurizer code safety valves are not assumed to function for any safety analysis in modes 4 and 5 and consequently, the proposed changes do not create the possibility of a new or different kind of accident.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed TS change does not involve a significant reduction in a margin of safety. TVA's proposed revisions will not result in changes to system design features or plant features that could be precursors to accidents or potential degradation of accident mitigation systems. The proposed changes to the RCS and ECCS requirements remain consistent with the current TS requirements for equipment operability. Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

TVA's proposed change that removes the requirement for a pressurizer safety valve in modes 4 and 5 does not affect any margin of safety because the lift setting of the pressurizer code safety valves (2485 pounds per square inch gauge [psig] ±3 percent) is well above the limit needed to protect the RCS during low temperature operation and would not provide any safety function for overpressure protection in the lower modes. The TS requirements associated with low temperature operation are governed by SQN TS 3/4.4.12, LTOP system. The LTOP system provides the necessary overpressure protection for SQN's RCS in modes 4 and 5.

Accordingly, TVA's proposed deletion of operability requirements for SQN's pressurizer code safety valves for modes 4 and 5 will not affect the margin of safety.

Based on the above, TVA concludes that the proposed amendment present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c); and accordingly, a finding of "no significant hazards consideration" is justified.

5.2. Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The Commission's regulatory requirements related to the content of the TS are contained in Title 10, Code of Federal Regulations (10 CFR), Section 50.36. The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and limiting control settings, (2) LCO, (3) surveillance requirements, (4) design features, and (5) administrative controls. The safety features and equipment requirements for the RCS and ECCS are included in the TS in accordance with 10 CFR 50.36(c)(2), "Limiting Conditions for Operation." As stated in 10 CFR 50.59(c)(1)(i), a licensee is required to submit a license amendment pursuant to 10 CFR 50.90 if a change to the TS is required. Furthermore, the requirements of 10 CFR 50.59 necessitate that U.S. Nuclear Regulatory Commission (NRC) approve the TS changes before the TS changes are implemented. TVA's submittal meets the requirements of 10 CFR 50.59(c)(1)(i) and 10 CFR 50.90.

The General Design Criterion (GDC) 15, "Reactor Coolant System Design," of Appendix A, "General Design Criteria," to 10 CFR Part 50, provides design considerations for the RCS. Section 5.1 of the SQN UFSAR provides a summary description of the SQN RCS design that satisfies the requirements of the GDC criteria.

The GDC 35, "Emergency Core Cooling" of Appendix A, "General Design Criteria," to 10 CFR Part 50, provides design considerations for the ECCS. Section 6.3 of the SQN UFSAR provides a summary description of the SQN ECCS design and the features that satisfy the requirements of the GDC criteria.

TVA's proposed change is consistent with the improved standard TS (NUREG-1431, Revision 3) and an NRC approved TSTF (TSTF-151, Revision 1, "PORV Operability Clarification)" that clarifies TS applicability relative to PORV operability.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

TVA's proposed changes comply with the requirements of 10 CFR 50.90 and 10 CFR 50.36. The proposed TS change for SQN remains consistent with the SQN accident analyses as presented in SQN UFSAR and follows the guidance contained in other regulatory requirements that include NRC Generic Letter GL 90-06, "Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Reliability,' and Generic Issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors.'" Accordingly, TVA's proposed change adheres to the above regulatory requirements/criteria.

6.0 ENVIRONMENTAL IMPACT CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 50.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. 10 CFR 50.90 and 10 CFR 50.36
2. TVA letter to NRC dated September 6, 2002 (TS Change 00-14)
3. NUREG 1431, Revision 3
4. TSTF-151, Revision 1, "PORV Operability Clarification"
5. NRC Generic Letter 90-06

ENCLOSURE 2

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

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE
MARKED PAGES

I. AFFECTED PAGE LIST

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

BASES

(DELETED)

REACTOR COOLANT SYSTEM

3/4.4.2 SAFETY VALVES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.2 A minimum of one pressurizer code safety valve shall be OPERABLE# with a lift setting of 2485 PSIG ± 3%.*

APPLICABILITY: MODES 4 and 5

ACTION:

MODE 4

With no pressurizer code safety valve OPERABLE, immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1 and place an OPERABLE RHR loop into operation in the shutdown cooling mode.

MODE 5

With no pressurizer code safety valve OPERABLE, immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.2 and place an OPERABLE RHR loop into operation in the shutdown cooling mode.

SURVEILLANCE REQUIREMENTS

4.4.2 No additional Surveillance Requirements other than those required by Specification 4.0.5. Following testing, lift settings shall be within ± 1%.

* The lift setting pressure shall correspond to ambient conditions of the valve of nominal operating temperature and pressure.

A safety valve is not required OPERABLE provided at least one safety valve is removed from the pressurizer and the associated RCS breech is not covered by a pressure retaining membrane.

REACTOR COOLANT SYSTEM

3/4.4.3 SAFETY AND RELIEF VALVES - OPERATING

SAFETY VALVES - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.3.1 All pressurizer code safety valves shall be OPERABLE with a lift setting of 2485 PSIG ± 3%.*

APPLICABILITY: MODES 1, 2 and 3.
ACTION:

With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15 minutes or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

INSERT A

SURVEILLANCE REQUIREMENTS

4.4.3.1 No additional Surveillance Requirements other than those required by Specification 4.0.5. Following testing, lift settings shall be within ± 1%.

* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

INSERT A

a. With one pressurizer safety valve inoperable, restore the inoperable valve to OPERABLE status within 15 minutes.

b. With two or more pressurizer safety valves inoperable or with ACTION (a) above not completed within 15 minutes, be in HOT STANDBY within 6 hours and be in HOT SHUTDOWN within the following 6 hours.

RELIEF VALVES - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.3.2 Two power relief valves (PORVs) and their associated block valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

a. With one or more PORV(s) inoperable, but capable of RCS pressure control, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s); otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one PORV inoperable and incapable of RCS pressure control, within 1 hour either restore the PORV to OPERABLE status or close the associated block valve and remove power from the block valve; restore the PORV to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With both PORVs inoperable and incapable of RCS pressure control, within 1 hour either restore each of the PORVs to OPERABLE status or close their associated block valves and remove power from the block valves and be in HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

d. With one or more block valve(s) inoperable, within 1 hour: (1) restore the block valve(s) to OPERABLE status, or close the block valve(s) and remove power from the block valve(s), or close the PORV(s) and remove power from its associated solenoid valve(s); and (2) apply the ACTION b. or c. above, as appropriate, for the isolated PORV(s).

e. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.3.2.1 In addition to the requirements of Specification 4.0.5, each PORV shall be demonstrated OPERABLE at least once per 18 months by:

Deleted

a. ~~Performance of a CHANNEL CALIBRATION, and~~

b. Operating the valve through one complete cycle of full travel during Mode 3, 4, or 5 with a steam bubble in the pressurizer.

4.4.3.2.2 Each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel.

3/4.5.2 ECCS SUBSYSTEMS - T_{avg} Greater Than or Equal to 350°F

LIMITING CONDITION FOR OPERATION

3.5.2 Two independent ECCS subsystems shall be OPERABLE* with each subsystem comprised of:

a. One OPERABLE centrifugal charging pump,

b. One OPERABLE safety injection pump,

c. One OPERABLE residual heat removal heat exchanger,

d. One OPERABLE residual heat removal pump, and

e. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a safety injection signal and automatically transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

INSERT

* In MODE 3, ECCS pumps may be made incapable of injecting to support transition into or from the APPLICABILITY of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," for up to four hours or until the temperature of all RCS cold legs exceeds LTOP arming temperature specified in the PTLR plus 25 °F, whichever comes first.

THIS PAGE AFFECTED BY TECHNICAL SPECIFICATION 00-14 CURRENTLY UNDER REVIEW

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

BASES

(DELETED)

REACTOR COOLANT SYSTEM

3/4.4.2 SAFETY VALVES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.2 A minimum of one pressurizer code safety valve shall be OPERABLE# with a lift setting of 2485 PSIG ± 3%.*

APPLICABILITY: MODES 4 and 5.

ACTION:

MODE 4

With no pressurizer code safety valve OPERABLE, immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1 and place an OPERABLE RHR loop into operation in the shutdown cooling mode.

MODE 5

With no pressurizer code safety valve OPERABLE, immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.2 and place an OPERABLE RHR loop into operation in the shutdown cooling mode.

SURVEILLANCE REQUIREMENTS

4.4.2 No additional Surveillance Requirements other than those required by Specification 4.0.5. Following testing, lift settings shall be within ± 1%.

* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

\# A safety valve is not required OPERABLE provided at least one safety valve is removed from the pressurizer and the associated RCS breech is not covered by a pressure retaining membrane.

3/4.4.3 SAFETY AND RELIEF VALVES - OPERATING

SAFETY VALVES - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.3.1 All pressurizer code safety valves shall be OPERABLE with a lift setting of 2485 PSIG ± 3%.*

APPLICABILITY: MODES 1, 2 and 3

ACTION:

~~With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15 minutes or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.~~

INSERT A

SURVEILLANCE REQUIREMENTS

4.4.3.1 No additional Surveillance Requirements other than those required by Specification 4.0.5. Following testing, lift settings shall be within ± 1%.

* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

INSERT A

a. With one pressurizer safety valve inoperable, restore the inoperable valve to OPERABLE status within 15 minutes.

b. With two or more pressurizer safety valves inoperable or with ACTION (a) above not completed within 15 minutes, be in HOT STANDBY within 6 hours and be in HOT SHUTDOWN within the following 6 hours.

RELIEF VALVES - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.3.2 All power operated relief valves (PORVs) and their associated block valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

a. With one or more PORV(s) inoperable, but capable of RCS pressure control, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s); otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one PORV inoperable and incapable of RCS pressure control, within 1 hour either restore the PORV to OPERABLE status or close the associated block valve and remove power from the block valve; restore the PORV to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With both PORVs inoperable and incapable of RCS pressure control, within 1 hour either restore each of the PORVs to OPERABLE status or close their associated block valves and remove power from the block valves and be in HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

d. With one or more block valve(s) inoperable, within 1 hour: (1) restore the block valve(s) to OPERABLE status, or close the block valve(s) and remove power from the block valve(s), or close the PORV(s) and remove power from its associated solenoid valve(s); and (2) apply the ACTION b. or c. above, as appropriate, for the isolated PORV(s).

e. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.3.2.1 In addition to the requirements of Specification 4.0.5, each PORV shall be demonstrated OPERABLE at least once per 18 months by:

DELETED

a. ~~Performance of a CHANNEL CALIBRATION, and~~

b. Operating the valve through one complete cycle of full travel during Modes 3, 4, or 5 with a steam bubble in the pressurizer.

4.4.3.2.2 Each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel.

3/4.5.2 ECCS SUBSYSTEMS - T_{avg} Greater Than or Equal to 350°F

LIMITING CONDITION FOR OPERATION

3.5.2 Two independent emergency core cooling system (ECCS) subsystems shall be OPERABLE with each subsystem comprised of:

a. One OPERABLE centrifugal charging pump,

b. One OPERABLE safety injection pump,

c. One OPERABLE residual heat removal heat exchanger,

d. One OPERABLE residual heat removal pump, and

e. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a safety injection signal and automatically transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

INSERT

* In MODE 3, ECCS pumps may be made incapable of injecting to support transition into or from the APPLICABILITY of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," for up to four hours or until the temperature of all RCS cold legs exceeds LTOP arming temperature specified in the PTLR plus 25 °F, whichever comes first.

ENCLOSURE 3

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

PROPOSED TECHNICAL SPECIFICATION (TS) BASES CHANGES
MARKED PAGES

I. AFFECTED PAGE LIST

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B3/4 5-1

Unit 2

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3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with all reactor coolant loops in operation, and maintain DNBR above the safety analysis DNBR limit during all normal operations and anticipated transients. In MODES 1 and 2 with one reactor coolant loop not in operation this specification requires that the plant be in at least HOT STANDBY within 1 hour.

In MODE 3, two reactor coolant loops provide sufficient heat removal capability for removing core decay heat even in the event of a bank withdrawal accident; however, a single reactor coolant loop provides sufficient heat removal capacity if a bank withdrawal accident can be prevented, i.e., by opening the Reactor Trip System breakers. Single failure considerations require that two loops be OPERABLE at all times.

In MODE 4, a single reactor coolant loop or residual heat removal (RHR) loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

In MODE 5, single failure considerations require that two RHR loops be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions in starting an RCP only when a steam bubble exists in the pressurizer will minimize the pressure transient when the pump is started. The steam bubble will accomodate the resultant expansion as any cold water injected by the charging pump is rapidly warmed. This cushion will dampen the plant response to potential transients and provide easier pressure control with the slower transient response.

~~3/4.4.2 and~~ 3/4.4.3 SAFETY AND RELIEF VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 420,000 lbs per hour of saturated steam at the valve set point. The relief capacity of a single safety valve is adequate to relieve any over-pressure condition which could occur during shutdown. In the event that no

3/4.4.2 DELETED

3/4.5.1 ACCUMULATORS

The OPERABILITY of each cold leg injection accumulator ensures that a sufficient volume of borated water will be immediately forced into the reactor core in the event that the RCS pressure falls below the specified pressure of the accumulators. For the cold leg injection accumulators, this condition occurs in the event of a large or small rupture.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the safety analysis are met. The limits in the specification for accumulator nitrogen cover pressure and volume are operating limits and include instrument uncertainty. The analysis limits bound the operational limits with instrument uncertainty applied. The minimum boron concentration ensures that the reactor core will remain subcritical during the post-LOCA (loss of coolant accident) recirculation phase based upon the cold leg accumulators' contribution to the post-LOCA sump mixture concentration.

The accumulator power operated isolation valves are considered to be "operating bypasses" in the context of IEEE Std. 279-1971, which requires that bypasses of a protective function be removed automatically whenever permissive conditions are not met. In addition, as these accumulator isolation valves fail to meet single failure criteria, removal of power to the valves is required.

The limits for operation with an accumulator inoperable for any reason except boron concentration not within limits minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures. Under these conditions, the full capability of one accumulator is not available and prompt action is required to place the reactor in a mode where this capability is not required. The 24 hours allowed to restore an inoperable accumulator to OPERABLE status is justified in Westinghouse Commercial Atomic Power (WCAP)-15049-A, Revision 1, dated April 1999. For an accumulator inoperable due to boron concentration not within limits, the limits for operation allow 72 hours to return boron concentration to within limits. This is based on the availability of ECCS water not being affected and an insignificant effect on core subcriticality during reflood because boiling of ECCS water in the core concentrates boron in the saturated liquid.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long term core cooling capability in the recirculation mode during the accident recovery period.

INSERT B

~~3/4.4.2 and~~ 3/4.4.3 SAFETY AND RELIEF VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 420,000 lbs per hour of saturated steam at the valve set point. The relief capacity of a single safety valve is adequate to relieve any over-pressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating RHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Code.

The power operated relief valves (PORVs) and steam bubble function to relieve RCS pressure during all design transients up to and including the design step load decrease with steam dump. Operation of the PORVs minimizes the undesirable opening of the spring-loaded pressurizer code safety valves. Each PORV has a remotely operated block valve to provide positive shutoff capability should a relief valve become inoperable. The PORVs also function to remove non-condensibles or steam from the pressurizer.

The OPERABILITY of the power-operated relief valves (PORVs) and block valves is determined on the basis of their being capable of performing the following functions:

a. Manual control of PORVs to control reactor coolant system pressure. This is a function that is used for a steam generator tube rupture accident.

b. Maintaining the integrity of the reactor coolant pressure boundary. This is a function that is related to controlling identified leakage and ensuring the ability to detect unidentified reactor coolant pressure boundary leakage.

c. Manual control of the block valve to: (1) unblock an isolated PORV to allow it to be used for manual control of reactor coolant system pressure (Item A), and (2) isolate a PORV with excessive seat leakage (Item B).

3/4.5.1 ACCUMULATORS

The OPERABILITY of each cold leg injection accumulator ensures that a sufficient volume of borated water will be immediately forced into the reactor core in the event the RCS pressure falls below the pressure of the accumulators. For the cold leg injection accumulators this condition occurs in the event of a large or small rupture.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the safety analysis are met. The limits in the specification for accumulator nitrogen cover pressure and volume are operating limits and include instrument uncertainty. The analysis limits bound the operational limits with instrument uncertainty applied. The minimum boron concentration ensures that the reactor core will remain subcritical during the post-LOCA (loss of coolant accident) recirculation phase based upon the cold accumulators' contribution to the post-LOCA sump mixture concentration.

The accumulator power operated isolation valves are considered to be "operating bypasses" in the context of IEEE Std. 279-1971, which requires that bypasses of a protective function be removed automatically whenever permissive conditions are not met. In addition, as these accumulator isolation valves fail to meet single failure criteria, removal of power to the valves is required.

The limits for operation with an accumulator inoperable for any reason except boron concentration not within limits minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures. Under these conditions, the full capability of one accumulator is not available and prompt action is required to place the reactor in a mode where this capability is not required. The 24 hours allowed to restore an inoperable accumulator to OPERABLE status is justified in Westinghouse Commercial Atomic Power (WCAP)-15049-A, Revision 1, dated April 1999. For an accumulator inoperable due to boron concentration not within limits, the limits for operation allow 72 hours to return boron concentration to within limits. This is based on the availability of ECCS water not being affected and an insignificant effect on core subcriticality during reflood because boiling of ECCS water in the core concentrates boron in the saturated liquid.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long term core cooling capability in the recirculation mode during the accident recovery period.

With the RCS temperature below 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

INSERT B

INSERT B

As indicated in the footnote for 3/4.5.2, operation in MODE 3 with ECCS trains made incapable of injecting in order to facilitate entry into or exit from the Applicability of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System, " is necessary for plants with an LTOP arming temperature at or near the MODE 3 boundary temperature of 350°F. LCO 3.4.12 requires that certain pumps be rendered incapable of injecting at and below the LTOP arming temperature. When this temperature is at or near the MODE 3 boundary temperature, time is needed to make pumps incapable of injecting prior to entering the LTOP Applicablity, and provide time to restore the inoperable pumps to OPERABLE status on exiting the LTOP Applicability.