TENNESSEE VALLEY AUTHORITY

5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801
May 29, 1990

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

Gentlemen:

In the Matter of	)	Docket No. 50-327
Tennessee Valley Authority	)	

SEQUOYAH NUCLEAR PLANT (SQN) - REQUEST FOR RELIEF FROM THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), SECTION XI, HYDROSTATIC PRESSURE TEST REQUIREMENTS

Enclosed is a relief request from the ASME Code, Section XI, hydrostatic test requirements involving the reactor coolant system (RCS) and a small section of connected emergency core cooling system (ECCS) piping for Unit 1. This relief from the code requirements has become necessary as the result of the replacement of Check Valve 1-VLV-63-551. This valve is a 2-inch check valve in the Loop 1 cold-leg injection line associated with the safety injection pumps; this valve provides the secondary RCS pressure boundary for the affected line.

Because the valve being replaced is not isolable from the RCS, a hydrostatic pressure test of the entire RCS would be required to comply with the ASME Section XI Code (1980 Edition, Winter 1981 Addenda, IWA-4400[a] and IWA-5000). Pursuant to 10 CFR 50.55a(a)(3) and 10 CFR 50.55a(g)(5)(iii), TVA has determined that conformance to the code would be impractical and would present an undue hardship. This request is similar to TVA's previous hydrostatic exemption for removal of SQN's upper head injection system and resistance temperature device manifolds dated September 29, 1989.

Replacement of Valve 1-VLV-63-551 is required to ensure that the RCS leakage requirement specified in Technical Specification Limiting Condition for Operation 3.4.6.1 and the SQN Section XI testing program is met. The need to replace 1-VLV-63-551 was only recently identified during testing performed to support restart of Unit 1 from its Cycle 4 refueling outage. Enclosure 1 contains a description of the maintenance activity and the basis for TVA's exemption request. Enclosure 2 contains the request for relief.

Replacement and testing of this check valve is presently scheduled to be complete in the early morning on May 30, 1990. At this time, the unit will be ready to begin heatup for return to power. TVA therefore requests NRC review of the relief request on an expedited basis.

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U.S. Nuclear Regulatory Commission May 29, 1990

Please direct questions concerning this issue to Bruce S. Schofield at (615) 843-6172.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

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ENCLOSURE 1

I. DESCRIPTION OF THE MAINTENANCE ACTIVITY

The secondary check valve (1-VLV-63-551) in the 2-inch safety injection line to the reactor coolant system Loop 1 cold leg will be removed and replaced. This replacement will be a like-for-like changeout of a 2-inch socket welded check valve; replacement will include four socket welds associated with the valve and pipe and coupling installation. A small section of piping will be removed for reinstallation with a coupling due to support interference. The valve location is shown at coordinate H-1 of FSAR, Figure 6.3.2-1.

II. BASIS FOR RELIEF

IWA-4400(a) of the American Society of Mechanical Engineers (ASME), Section XI Code (1980 Edition, Winter 1981 Addenda) states that "after repairs by welding on the pressure retaining boundary, a system hydrostatic test shall be performed in accordance with IWA-5000." Code-required hydrostatic test pressures are based on the reactor coolant system (RCS) temperature. Test pressures range from 2,280 pounds per square inch gauge (psig) at a temperature of 500 degrees Fahrenheit (F) or higher, to a maximum of 2,460 psig at 100 degrees F or less. The valve replacement, as previously described, involves a section of piping and welds that cannot be isolated from the rest of the RCS; therefore, a hydrostatic test of the entire RCS would be required following the repair and prior to the unit returning to power operation. This requirement presents an undue hardship for the following reasons.

1. The performance of a low-temperature/high-pressure test (cold hydrostatic pressure test) would require removal of the RCS safety relief valves and installation of blind flanges. In addition, pressurization of the secondary side of the steam generators would be required in order to prevent overpressurization of the steam generator tubes. These measures result in unusual plant configuration and require additional downtime to perform. The additional downtime represents a substantial cost in replacement power to TVA's system.

2. The performance of a high-temperature/low-pressure hydrostatic pressure test during startup (i.e., Mode 3) presents a problem with lifting of the RCS pressurizer safety valves. The lowest hydrostatic test pressure allowed by the Code is 1.02 times the RCS operating pressure, or 2,280 psig. The setpoint for the RCS pressurizer safety valves is 2,485 psig $\pm$1 percent. Even though the hydrostatic test pressure is well below the lift setpoint, the potential for small steam leaks occurring through the valve increases as RCS pressure approaches the setpoint. The leaktight pressure for these valves has been certified by the vendor at approximately 10 percent below the setpoint pressure. Above this pressure, the valves begin to discharge small amounts of steam prior to full lift. According to the valve manufacturer, this discharge

could become excessive, and the proper reseating of the relief valves would not be possible. In such a case, it would be necessary to cool the unit back down and depressurize the RCS to repair the valves. Gagging or removal of the valves for installation of a blind flange is precluded by Technical Specification (TS) 3/4.4.3. This TS requires these valves to be operable in Modes 1, 2, and 3.

3. For personnel safety reasons, it is impractical to perform the visual examination of the RCS piping following a 4-hour hold period at the high-temperature/low-pressure (500 degrees F) condition. Paragraph IWA-5245 of the ASME Section XI Code recognizes the high temperature levels that would be encountered by examination personnel and thereby allows the RCS temperature to be lowered (following the 4-hour hold time) to 200 degrees F for performance of the visual examination (VT-2). The provision for lowering the RCS temperature will require several startup tests to be performed again during the second heatup. This places the plant in transition from heatup to cooldown and imposes additional thermal cycles on the RCS that are limited by SQN TS 5.7.1. The transition timeframe will also require two to three additional days of outage time for reperforming startup tests.

III. ALTERNATIVE TESTING

In lieu of a hydrostatic pressure test, TVA proposes to perform a leakage test of four socket welds while in Mode 3. The three socket welds down stream of 1-VLV-63-551 will be visually inspected for leakage at a test pressure of approximately 2,000 pounds per square inch (psi). This will be accomplished by using a temporary hydrostatic pump to pressurize the section of piping between the primary and secondary check valves (1-VLV-63-560 and 1-VLV-63-551 respectively). The socket weld on the upstream side of 1-VLV-63-551 will be visually inspected for leakage at a pressure of approximately 1,500 psi. In addition, the required nondestructive examination (NDE) will be performed to meet construction code requirements.

In accordance with Table IWB-2500-1 of the ASME Section XI Code, an RCS hydrostatic pressure test will be performed near the end of the first 10-year inspection interval. The subject welds will, at that time, be subjected to hydrostatic pressure and temperature. The hydrostatic pressure test for the SQN RCS has been designed to be performed during unit cooldown prior to entering a refueling outage. By performing the hydrostatic test during a plant cooldown, the additional unit downtime discussed above can be avoided, and the repair of any leaking relief valves can be performed during the refueling outage. Performance of the hydrostatic test in this manner allows the Code-required 10-year hydrostatic test to be conducted with a minimum of unit downtime.

IV. CONCLUSION

TVA requests relief from the hydrostatic pressure test requirements of the ASME Section XI Code for the replacement of Check Valve 1-VLV-63-551 for SQN Unit 1. Conformance to the Code requirements for hydrostatically pressure testing the entire RCS following the subject maintenance has been determined by TVA to result in undue hardship. TVA finds the leakage test while in Mode 3 in conjunction with the NDE of the welds and the weld design provide an acceptable alternative for ensuring the structural integrity of the RCS pressure boundary. This relief request is submitted in accordance with 10 CFR 50.55a(a)(3) and 10 CFR 50.55a(g)(5)(iii).

ENCLOSURE 2

Unit:	1
System:	Emergency Core Cooling System (ECCS)
TVA Drawing:	47W811-1
Component:	1-VLV-63-551
Class:	ASME Class 1 (TVA Class A)
Function:	Provides secondary pressure isolation boundary for the reactor coolant system (RCS) ECCS interface.
Code Requirement:	IWA-4400(a), 1980 Edition, Winter 1981 Addenda of the ASME Boiler and Pressure Vessel Code, Section XI, states that: "After repairs by welding on the pressure retaining boundary, a system hydrostatic test shall be performed in accordance with IWA-5000."
Basis for Relief:	The replacement of 1-VLV-63-551 involves a section of piping and welds that cannot be isolated from the rest of the RCS; therefore, a hydrostatic test of the entire RCS would be required to comply with the Code requirement. This presents an undue hardship for the following reasons.

1. The performance of a low-temperature/high-pressure test (cold hydrostatic pressure test) would require removal of the RCS safety relief valves and installation of blind flanges. In addition, pressurization of the secondary side of the steam generators would be required in order to prevent overpressurization of the steam generator tubes. These measures result in unusual plant configuration and require additional downtime to perform. The additional downtime represents a substantial cost in replacement power to TVA's system.

2. The performance of a high-temperature/low-pressure hydrostatic pressure test during startup (i.e., Mode 3) presents a problem with lifting of the RCS pressurizer safety valves. The lowest pressure

allowed by the Code is 1.02 times the RCS operating pressure. For SQN, this is equal to 1.02 times 2,235 psig, or 2,280 psig. The setpoint for the RCS pressurizer safety valves is 2,485 psig ±1 percent. The leaktight pressure for these valves has been certified by the vendor at approximately 10 percent below the setpoint pressure, or 2,236 psig. Above this pressure, the valves begin to discharge small amounts of steam prior to full lift. According to the valve manufacturer, this discharge could become excessive, and the proper reseating of the relief valves would not be possible. In such a case, it would be necessary to cool the unit back down and depressurize the RCS to repair the valves. Gagging or removal of the valves for installation of a blind flange is precluded by Technical Specification (TS) 3/4.4.3. This TS requires these valves to be operable in Modes 1, 2, and 3.

3. For personnel safety reasons, it is impractical to perform the visual examination of the RCS piping following a 4-hour hold period at the high-temperature/low-pressure (500 degrees F) condition. Paragraph IWA-5245 of the ASME Section XI Code recognizes the high temperature levels that would be encountered by examination personnel and thereby allows the RCS temperature to be lowered (following the 4-hour hold time) to 200 degrees F for performance of the visual examination (VT-2). The provision for lowering the RCS temperature will require several startup tests to be performed again during the second power ascension. This places the plant in transition from heatup to cooldown and requires two to three additional days of outage time for reperforming startup tests.

Proposed Alternative: In lieu of a hydrostatic pressure test, TVA proposes to perform a leakage test of four socket welds while in Mode 3. The three socket welds down stream of 1-VLV-63-551 will be visually inspected for leakage at a test pressure of approximately 2,000 pounds per square inch (psi). This will be accomplished by using a temporary hydrostatic pump to pressurize the section of piping between the primary and secondary check valves (1-VLV-63-560 and 1-VLV-63-551, respectively). The socket weld on the upstream side of 1-VLV-63-551 will be visually inspected for leakage at a pressure of approximately 1,500 psi. In addition, the required nondestructive examination (NDE) will be performed to meet construction code requirements.