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

Jack L. Wilson
Vice President, Sequoyah Nuclear Plant

April 17, 1992

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

Gentlemen:

In the Matter of) Docket No. 50-328
Tennessee Valley Authority)

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

References: 1. TVA letter to NRC dated March 25, 1992

2. TVA letter to NRC dated March 17, 1992

3. NRC letter to TVA dated May 31, 1990, "Relief from Code Hydrostatic Pressure Test Requirements for Reactor Coolant System (TAC 75030) - Sequoyah Nuclear Plant, Unit 1"

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 piping for Unit 2. This relief from the code requirements has become necessary as the result of the replacement of Check Valve 2-VLV-63-559. This check valve was found to have a damaged seat during maintenance conducted during the current Unit 2 Cycle 5 refueling outage. This valve cannot be repaired in-place and must be removed from the piping for replacement.

Valve 2-VLV-63-559 is a 6-inch primary check valve in the safety injection line to RCS Loop 2 hot leg.

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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]). 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 exemptions for the replacement of a check valve (VLV-63-551) on Unit 1 and the replacement of Check Valves VLV-63-587, -588, and -589 on Unit 2 (References 1 and 2). NRC approval of TVA's previous request for relief on Unit 1 was provided in the Reference 3 letter.

Replacement of the Unit 2 check valve is required to ensure that the RCS leakage requirements specified in Technical Specification Limiting Condition for Operation 3.4.6.1 and the SQN Section XI testing program are met. 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 of Check Valve 2-VLV-63-559 is tentatively scheduled during mid-loop operation following core reload on April 20, 1992.

TVA requests expeditious NRC review of the relief request such that alternatives may be considered should the relief request be denied.

Please direct questions concerning this issue to Don V. Goodin at (615) 843-7734.

Sincerely,

J. L. Wilson

cc: See page 3

Enclosures
cc (Enclosures):
Mr. D. E. LaBarge, Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

NRC Resident Inspector
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. B. A. Wilson, Project Chief
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

ENCLOSURE 1

I. DESCRIPTION OF THE MAINTENANCE ACTIVITY

Primary Check Valve 2-VLV-63-559 in the 6-inch safety injection line to the reactor coolant system (RCS) Loop 2 hot leg, has been removed and is being replaced with a new valve. The valve location is shown on Final Safety Analysis Report, Figure 6.3.2-1. Because of the piping configuration at the check valve, this replacement requires three new 6-inch butt welds and two new 2-inch socket welds.

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-5500." Code-required hydrostatic test pressures are based on the 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 replacements, as previously described, involve sections 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 repairs 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 hydrostatic test (cold hydrostatic pressure test) would require removal of the RCS pressurizer safety valves and installation of blind flanges. In addition, pressurization of the secondary side of the steam generators (SG) would be required in order to prevent overpressurization of the SG 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 test during start-up (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 leak-tight 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 cannot be performed within the LCO action timeframe required 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 start-up 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 Sequoyah Nuclear Plant (SQN) TS 5.7.1. The transition timeframe will also require two to three additional days of outage time for reperforming start-up tests.

III. ALTERNATIVE TESTING

In lieu of the required hydrostatic pressure test, TVA proposes to perform a reduced pressure test on the new welds and component while in Mode 3. The new welds downstream of 2-VLV-63-559 will be tested at full RCS pressure (2,235 psig). The new welds upstream of 2-VLV-63-559 will be tested at approximately 2,000 psig using a temporary hydrostatic pump. Each new weld will be visually inspected for leakage during these reduced pressure tests. The required nondestructive examination (NDE) will be performed on each new weld to meet construction code requirements.

IV. CONCLUSION

TVA requests relief from the hydrostatic pressure test requirements of the ASME, Section XI, code for replacement of Check Valve 2-VLV-63-559 for SQN Unit 2. 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 that the reduced pressure test while in Mode 3, in conjunction with the NDE of the welds and the weld design, provides 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: 2

System: Emergency Core Cooling System (ECCS)

TVA Drawing: 47W811-1

Component: 2-VLV-63-559

Class: American Society of Mechanical Engineers (ASME), Code Class 1 (TVA Class A)

Function: Provides primary 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 Check Valve 2-VLV-63-559 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 pressurizer safety valves and installation of blind flanges. In addition, pressurization of the secondary side of the steam generators (SG) would be required in order to prevent overpressurization of the SG 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 test during start-up (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 Sequoyah Nuclear Plant (SQN), this is equal to 1.02 times 2,235 pounds per square inch (psig), or 2,280 psig. The setpoint for the RCS pressurizer safety valves is 2,485 psig $\pm$1 percent. The leak-tight 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 cannot be performed within the limited condition of operation action timeframe required 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 Fahrenheit [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 start-up tests to be performed again during the second power ascension. This places the plant in transition from heatup to cooldown and requires approximately two to three additional days of outage time for reperforming start-up tests.

Proposed Alternative: In lieu of a hydrostatic pressure test, TVA proposes to perform the following:

1. The downstream welds will be tested in conjunction with the RCS leak test that is performed during restart in Mode 3 at normal operating pressure.

2. The upstream welds will be tested by use of a hydrostatic pump at a test pressure of approximately 2,000 psig.

In addition, the required nondestructive examinations will be performed to meet construction code requirements.