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

J. L. Wilson
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March 17, 1992

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

Gentlemen:

In the Matter of) Docket Nos. 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

Reference: 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 (ECCS) piping for Unit 2. This relief from the code requirements has become necessary as the result of the anticipated replacement of Check Valves 2-VLV-63-587, -588, and -547. During the Unit 2 forced outage in November 1991, TVA continued its investigation of possible sources of inleakage into the cold-leg accumulators. TVA now considers these three check valves to be suspect in contributing to the accumulator inleakage problem and therefore has decided to remove/repair the valves as a planned outage activity.

Valves 2-VLV-63-587 and -588 are 1-1/2 inch primary check valves in the safety injection lines to RCS Loops 2 and 3 cold legs, respectively. Valve 2-VLV-63-547 is a 2-inch secondary check valve in the safety injection line to RCS Loop 2 hot leg.

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Because the valves being replaced are 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-5500). 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 the replacement of a check valve (VLV-63-551) on Unit 1. NRC approval of TVA's previous request for relief on Unit 1 was provided in the referenced letter.

Replacement of the Unit 2 check valves 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 continue to be 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 Valves 2-VLV-63-587 and 2-VLV-63-588 is presently scheduled during the core empty period between March 27 and April 7, 1992, of the Unit 2 Cycle 5 refueling outage. A leak rate test of 2-VLV-63-547 is scheduled to be complete by March 15, 1992 (Mode 5 entry). Based on the results of the leak rate testing on 2-VLV-63-547, SQN Site Licensing will inform NRC of the status regarding replacement of 2-VLV-63-547.

TVA requests NRC review of the relief requests before the replacement of the check valves 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
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ENCLOSURE 1

I. DESCRIPTION OF THE MAINTENANCE ACTIVITY

Primary Check Valves 2-VLV-63-587 and 2-VLV-63-588 in the 1-1/2 inch safety injection line to the reactor coolant system (RCS) Loop 2 and 3 cold legs, respectively, and secondary Check Valve 2-VLV-63-547 in the 2-inch safety injection line to the RCS Loop 2 hot leg are planned to be removed and replaced. These replacements will be like-for-like changeouts of the socket-welded check valves. The valve locations are shown on 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-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 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 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-63-587 and 2-VLV-63-588 will be tested at full RCS pressure (2,235 psig). The new welds downstream of 2-VLV-63-547 and upstream of 2-VLV-63-587 and 2-VLV-63-588 will be tested at approximately 2,000 psig using a temporary hydrostatic pump. The new weld upstream of 2-VLV-63-547 will be tested at approximately 1,500 psig using the safety injection 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 Valves 2-VLV-63-547, 2-VLV-63-587, and 2-VLV-63-588 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 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-63-547

Class: American Society of Mechanical Engineers (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 2-VLV-63-547 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 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 ±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 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 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 visually inspected for leakage at a test pressure of approximately 2,000 psig. This will be accomplished by using a temporary hydrostatic pump to pressure the section of piping between the primary and secondary check valves (2-VLV-63-559 and 2-VLV-63-547, respectively).

2. The upstream weld will be visually inspected for leakage at a pressure of approximately 1,500 psig.

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

Unit: 2

System: Emergency Core Cooling System (ECCS)

TVA Drawing: 47W811-1

Component: 2-VLV-63-587 and 2-VLV-63-588

Class: American Society of Mechanical Engineers (ASME) 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 2-VLV-63-587 and 2-VLV-63-588 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 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 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 $\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 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 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 examination will be performed to meet construction code requirements.