August 6, 2004

10 CFR 50.55a(a)(3)(ii)

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

Gentleman:

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

SEQUOYAH NUCLEAR PLANT (SQN) - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI INSERVICE PRESSURE TEST PROGRAM RELIEF REQUEST (ISPT-09)

Pursuant to 10 CFR 50.55a(a)(3)(ii), TVA is submitting a request for relief from ASME Code requirements. The request for relief is associated with the test methods for pressure testing ASME Code Class 1 piping and components that are normally isolated from full reactor coolant system (RCS) pressure during pressure tests. TVA has determined that a hardship exists for testing the isolated components and is proposing alternative methods of pressure testing these Class 1 segments of pipe by pressure testing at a reduced pressure and temperature. The alternative methods are described in the enclosed Relief Request ISPT-09.

The SQN ISPT program is currently in the second 10-year interval. TVA is in the process of planning pressure test activities for the end of the interval. NRC review and approval is requested to support pressure testing activities scheduled for the Unit 2 Cycle 13 (U2C13) refueling outage (Spring 2005) and the U1C14 refueling outage (Spring 2006). The enclosed request is similar to the May 18, 2004 request proposed by Duke Energy Corporation for the Catawba Nuclear Station and the NRC approval letter for H. B. Robinson dated March 16, 2001.

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

Sincerely,

Original signed by

Pedro Salas
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Enclosure
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ENCLOSURE

SEQUOYAH NUCLEAR PLANT (SQN)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

(ASME)

INSERVICE PRESSURE TEST

REQUEST FOR RELIEF

(ISPT-09)

Request for Relief ISPT-09

Summary: During preparation for the ASME Section XI Class 1 pressure tests scheduled for the end of SQN's second 10-year interval, TVA determined that a hardship exists for ASME code pressure testing of certain piping segments within the Class 1 boundary at full reactor coolant system (RCS) pressure and temperature (i.e., 2235 pounds per square inch gauge [psig] and 547 degrees Fahrenheit [°F]). The test pressure is determined by the ASME Section XI Code and the provisions of Case N-498-4 which has been approved for use by the NRC in Regulatory Guide 1.147. TVA has reviewed the SQN plant design and evaluated the hardships associated with testing these piping segments to the extent practical. Based on this review, TVA has determined that test methods required to achieve code compliance (in conjunction with the provisions of ASME Code Case N-498-4) would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. TVA is proposing alternative methods for pressure testing these segments of pipe. The alternative methods provide an acceptable level of quality and safety. Accordingly, TVA requests relief from the ASME code to authorize use of an alternative method in accordance with 10 CFR 50.55a(a)(3)(ii).

Unit(s): 1 and 2

System(s): RCS - System 68 (Final Safety Analysis Report [FSAR] Figure 5.1-1)
Chemical Volume and Control System (CVCS) – System 62 (FSAR Figure 9.3.4-1)
Safety Injection System (SIS) – System 63 (FSAR Figure 6.3.2-1)
Residual Heat Removal System (RHR) – System 74 (FSAR Figure 5.5.7-1)

Component: Reactor Coolant Pressure Boundary Components

Class: 1

Function: The RCS provides for transfer of heat produced from the fission process, decay heat, and the heat input from the reactor coolant pumps to the main steam system during both power operation and when the reactor is subcritical, including the initial phase of plant cooldown to the initiation of RHR.

Code Requirement: The 1989 Edition of the ASME Code, Section XI, Table IWB-2500-1, Examination Category B-P, Note 2 states:

> "(2) The pressure retaining boundary during the system hydrostatic test shall include all Class 1 components within the system boundary."

IWA-5212 requires system leakage tests and system hydrostatic tests to be conducted at the test conditions of pressure and temperature specified in IWB-5000, IWC-5000, and IWD-5000.

IWB-5221(a) states; "The system leakage test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated reactor power."

IWB-5230(a) states; "The minimum test temperature for either the system leakage or system hydrostatic test shall not be lower than the minimum temperature for the associated pressure specified in the plant Technical Specifications."

Code Case N-498-4:

Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems, Section XI, Division 1.

(a) It is the opinion of the committee that as an alternative to the 10-year system hydrostatic test required by Table IWB-2500-1, Categories B-E and B-P, the following rules shall be used.

   (1) A system leakage test (IWB-5221) shall be conducted at or near the end of each inspection interval, prior to reactor startup.
   (2) The boundary subject to test pressurization during the system leakage test shall extend to all Class 1 pressure retaining components within the system boundary.
   (3) Prior to performing the VT-2 visual examination, the system, including portions isolated during normal operation, shall be pressurized to not less than the pressure corresponding with 100% rated reactor power. No holding time is required prior to performing the VT-2 visual examination. The system shall be maintained at this pressure during performance of the VT-2 visual examination.

(4) Test temperatures and pressures shall not exceed limiting conditions for the hydrostatic test curve as contained in the plant technical specifications (TS).
(5) The VT-2 visual examination shall include all components within the boundary identified in (a)(2) above.
(6) Test instrumentation requirements of IWA-5260 are not applicable.

The application of the above ASME Code requirements, along with the provisions of Code Case N-498-4, would require system leakage test to be performed that would extend a test pressure equal to the nominal operating pressure associated with 100% rated reactor power (i.e., 2235 psig) to all Class 1 pressure retaining components connected to the RCS.

Code Requirements From Which Relief is Requested: Relief is requested from the following code requirements:

IWB-5221 System Leakage Test

(a) The system leakage test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated reactor power.

IWB-5230 Temperature

(a) The minimum test temperature for either the system leakage or system hydrostatic test shall not be lower than the minimum temperature for the associated pressure specified in the plant TSs.

Full RCS pressure and temperature cannot be extended to all areas of the system boundaries as required by the code and code case N-498-4. The areas in question for the systems are provided in the following table:

TABLE

Safety Injection System

Between valve	And valve	Segment Description
63-560	63-622, -633, -551, FCV-63-117	CLA
63-586	63-581, FCV-63-24	ECCS
63-641	63-640, -543, FCV-63-163	ECCS
63-589	63-581, FCV-63-24	ECCS
63-563	63-625, -635, -557, FCV-63-69	CLA
63-558	63-549, FCV-63-166	ECCS

Between valve	And valve	Segment Description
63-588	63-581, FCV-63-24	ECCS
63-562	63-624, -634, -555, FCV-63-79	CLA
63-644	63-545, -643, FCV-63-164	ECCS
63-587	63--581, FCV-63-24	ECCS
63-561	63-623, -632, 553, FCV-63-97	CLA
63-559	63-547, FCV-63-165	ECCS

Chemical Volume and Control System

Between valve	And valve	Segment Description
62-576	62-560	RCP Seal Injection
62-577	62-561	RCP Seal Injection
62-578	62-563	RCP Seal Injection
62-579	62-562	RCP Seal Injection
62-660	62-717	Normal Charging
62-659	62-716	Alternate Charging
62-661	FCV-62-84	Pressurizer Spray

Residual Heat Removal

Between valve	And valve	Segment Description
FCV-74-1	FCV-74-2	RHR

(Emergency Core Cooling System - ECCS, Cold Leg Accumulator – CLA, Residual Heat Removal – RHR, and Flow Control Valve – FCV)

Basis for Relief:

The following discussion provides the basis for TVA's requested relief and the proposed alternative testing.

The requirement of 10 CFR 50.2 provides a definition of Reactor Coolant Pressure Boundary that reads reactor coolant pressure boundary means all those pressure-containing components of boiling and pressurized water-cooled nuclear power reactors, such as pressure vessels, piping, pumps, and valves, which are:

(1) Part of the reactor coolant system, or
(2) Connected to the reactor coolant system, up to and including any and all of the following:

(i) The outermost containment isolation valve in system piping which penetrates primary reactor containment,

(ii) The second of two valves normally closed during normal reactor operation in system piping which does not penetrate primary reactor containment,

(iii) The reactor coolant system safety and relief valves.

For the valves listed in the table above, the first column represents the primary isolation valve. The second column represents the secondary isolation valve(s), and the third column provides a segment identifier. These valves and the connecting piping segments serve the purpose of complying with the RCS pressure boundary definition.

For the safety injection system, the majority of boundary valves are check valves. The remaining boundary valves are air-operated FCVs.

For the CVCS, all boundary valves are check valves with the exception of one air-operated FCV.

For the two boundary valves listed in the RHR system, both valves are motor-operated FCVs.

While the RCS is being brought to normal operating temperature and pressure (approximately 2235 psig and 547°F) in accordance with the plant TS, the piping segments listed in the table become isolated from the RCS either by the check valves going to their closed position or the FCV’s being closed by plant procedure. This causes the piping segments to be at pressures and temperatures less than full RCS pressure and temperature. It may be noted that one exception is the CVCS seal injection piping segments that provide seal injection to the reactor coolant pump seals. The piping is always in service with the check valves normally open. These segments of pipe are at a system pressure equal to or greater than RCS pressure but are not at a corresponding RCS temperature.

The plant design configuration complies with the RCS boundary requirements for double isolation but cannot satisfy the code test requirement for nominal operating pressure associated with 100% rated reactor power (i.e., full RCS pressure and temperature between these segments of piping). The use of temporary hoses to connect the

RCS to these volumes in order to raise them to full test pressure and temperature is not feasible or safe. Temporary hoses are not qualified to meet all aspects of the plant design, (i.e., pressure, temperature, ASME Code, seismic, dead load, etc). Since temporary hoses cannot be fully qualified, it would be unsafe from a personnel and nuclear safety standpoint to try and use them for testing purposes. The failure of unqualified temporary hoses would result in the potential for personnel injury and the loss of reactor coolant. The only alternative to the use of temporary hoses would be to modify the plant configuration by installation of qualified piping to allow the subject piping segments to be connected directly to the RCS. This option is cost prohibitive and imposes an unusual difficulty without a compensating increase in the level of quality and safety.

The piping segments associated with the CLAs will reach approximately 650 psig due to the CLA pressure required by TS LCO 3.5.1.1 when the RCS is at 100% rated reactor power. These segments cannot be raised to full RCS pressure and temperature because this would require isolation of the CLAs during plant operation. The isolation of the CLAs would be required to prevent overpressurization of the accumulator tank above the relief valve setpoint equal to 700 psig.

The piping segments associated with RCP seal injection, the alternate and normal charging paths, and pressurizer spray path will be pressurized to approximately 2400 psig (the charging pump discharge pressure) and 110°F when the RCS is at normal operating pressure and temperature. These segments are at a pressure higher than RCS pressure but below the temperature of the RCS.

The RHR piping segment is in service only when the plant transfers from RHR to main steam for heat removal from the RCS. Plant procedures, when shutting down the plant, allow the RHR system to be placed into service when the RCS temperature is less than 350°F and the RCS pressure is between 325 and 350 psig. When starting up the plant, RHR remains in service until the RCS temperature is greater than 200°F and RCS pressure is between 325 and 350 psig. Pressure interlocks prevent the RHR system valves (FCV-74-1 and -2) from being opened until RCS pressure is less than 380 psig.

The remaining piping segments are associated with ECCS injection and are at static head pressure and temperature when the RCS is at normal operating pressure and temperature and are separated from the RCS conditions by self-operating check valve. The only methods of achieving full RCS conditions in the Class 1 piping between the primary and secondary isolation check valves would be: (1) installing temporary hoses around the primary check valve which would defeat the double isolation requirement for the reactor coolant pressure boundary or (2) to make permanent modifications to the plant to install full qualified piping solely for the purpose of the pressure test.

Alternative Requirement: SQN will perform a pressure test of these piping segments in the following manner.

For the piping segments associated with the CLAs, the test pressure and temperature will be coincident with the CLA tank pressure and temperature.

For the piping segments associated with the RCP seal injection, alternate charging, charging, and pressurizer spray, the test pressure and temperature will be coincident with the respective segment pressure and temperature.

For the RHR piping segment, the test pressure and temperature will be coincident with the plant conditions during the time when RHR is in service for heat.

For the ECCS piping segments, the safety injection test header will be aligned and pressurized using a safety injection pump to pressurize these segments of piping. This will provide a pressure of approximately 1500 psig and an ambient temperature condition since suction to a safety injection pump will be from the refueling water storage tank, which is open to atmospheric conditions.

TVA believes that compliance with the code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, TVA is submitting the request for relief ISPT-09 in accordance with 10CFR50.55a(a)(3)(ii). TVA considers the proposed alternative provides an acceptable method of testing to satisfy the code requirement.