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

September 15, 2000

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

Gentlemen:

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

SEQUOYAH NUCLEAR PLANT (SQN) - REQUEST FOR APPROVAL OF ALTERNATIVE TO AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) CODE REQUIREMENTS - REPAIR SPARE VALVES

Pursuant to 10 CFR.50.55a(a)(3)(i), TVA is requesting the use of alternatives to the ASME code for repair of six valves that TVA plans to utilize as spare valves for SQN's essential raw cooling water system (ERCW).

The subject valves are manufactured by Posi-Seal. TVA plans to refurbish these valves for the purpose of having spare valves for SQN's ERCW system. These valves have degraded seating surfaces and will be repaired by welding such that they can be used as replacement valves in the future. The repairs would be performed in accordance with TVA's ASME Section XI Repair and Replacement Program. TVA is capable of complying with code repair requirements with the exception of the construction code requirement to perform a radiographic examination of the repair weld. Code acceptable examination results can not be achieved due to the physical configuration and thickness of the valve body.

TVA has evaluated the repair options and has determined that the most appropriate repair is a proposed alternative to perform surface examinations of each successive layer of deposited weld metal. The proposed alternative provides meaningful examination results and an acceptable level of quality and safety. Accordingly, TVA requests authorization to use the proposed alternative in accordance with 10CFR50.55a(a)(3)(i).

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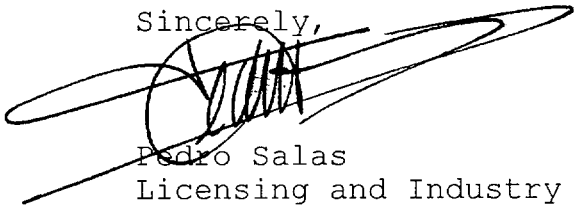
This relief request is similar to a request from Duke Power Corporation for its Oconee Nuclear Station No. 3 that was approved by NRC letter dated August 28, 1997.

As the installed ERCW valves are performing acceptably, TVA has no firm schedule for this relief request. Should this condition change, we will inform NRC project management.

If you have any questions about this change, please telephone me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,



Pedro Salas
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## ENCLOSURE

## SEQUOYAH NUCLEAR PLANT - UNITS 1 AND 2
## REPAIR AND REPLACEMENT REQUEST FOR RELIEF

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Summary: TVA's Sequoyah Nuclear Plant is planning to refurbish six valves that currently have degraded seating surfaces. The refurbished valves would serve as future spare valves for SQN's essential raw cooling water system (ERCW). The repairs are to be performed in accordance with TVA's ASME Section XI Repair and Replacement Program. TVA plans to utilize repair methods that comply with ASME Code requirements with the exception of a requirement contained in the original construction code. The construction code requires performance of a radiographic examination of the repair weld. Due to the physical configuration and the thickness of the valve body, TVA is proposing an alternative examination to perform surface examinations of each successive layer of deposited weld metal. This alternative provides a more meaningful examination and provides an acceptable level of quality and safety. TVA requests authorization to use the alternative in accordance with 10 CFR 50.55a(a)(3)(i).

Unit: 1 and 2

System: ERCW - System 67

Component: Butterfly valves

Class: 3

Function: Valves would serve as spare valves for SQN's ERCW system. When installed, the valves serve to provide system isolation for conducting maintenance.

Code Requirement: ASME Section XI, 1989 Edition paragraph IWA-4120(a) states:,

"Repairs shall be performed in accordance with the Owner's Design Specification and the original Construction Code of the component or system. Later Editions and Addenda of the construction code or of Section III, either in the entirety or portions thereof, may be used. If repair welding cannot be performed in accordance with these requirements, the applicable alternative requirements of IWA-4500 and the following may be used:

(3) IWD-4000 for Class 3 components."

Code Requirements From Which Relief is Requested:

For repair of the valves, relief is requested from the following ASME Section XI, 1989 Edition, IWA-4000, Repair Procedure requirements:

Paragraph IWA-4120(a), "Repairs shall be performed in accordance with the Owner's Design Specification and the original construction code of the component or system. Later editions and addenda of the construction code or of Section III, either in their entirety or portions thereof, and code cases may be used. If repair welding cannot be performed in accordance with these requirements, the applicable alternative requirements of IWA-4500 and the following may be used: (3) IWD-4000 for Class 3 components."

For examination, relief is requested from the following ASME Section III, 1974 Edition, through Summer 1975 Addenda, Paragraph ND-2530, "Examination and Repair of Plate" requirements:

**ND-2530 EXAMINATION AND REPAIR OF PLATE**

**ND-2531 Required Examination**

Plates shall be examined in accordance with requirements of the material specification.

**ND-2537 Time of Examination**

Acceptance examinations shall be performed at the time of manufacture as required in (a), (b), and (c) below.

(a) Examinations required by the material specification shall be performed at the time of manufacture as specified in the material specification.

(b) Radiographic examination of repair welds, when required, may be performed prior to any required postweld heat treatment.

(c) Magnetic particle or liquid penetrant examination of repair welds shall be performed after any required heat treatment except for P-Number 1 materials which may be examined before or after any required postweld heat treatment.

**ND-2538 Elimination of Surface Defects**

(a) Unacceptable surface defects may be removed by grinding or machining provided:

(1) The remaining thickness of the section is not reduced below the minimum required;

(2) The depression, after defect elimination, is blended uniformly into the surrounding surface.

(b) If the elimination of the defect reduces the thickness of the section below the minimum required by the design, the material may be repaired in accordance with ND-2539.

**ND-2539 Repair by Welding**

The material manufacturer may repair materials from which defects have been removed, provided the depth of the repair cavity does not exceed 1/3 of the nominal thickness and the requirements of the following subparagraphs are met. Prior approval of the manufacturer shall be obtained for the repair of plates to be used in the manufacture of vessels.

**ND-2539.1 Defect Removal** - The defect shall be removed or the indication reduced to an acceptable limit by suitable mechanical or thermal cutting or gouging methods and the cavity prepared for repair(ND-4211.1).

**ND-2539.2 Qualification of Welding Procedures and Welders** - The welding procedure and welders or welding operators shall be qualified in accordance with the ND-4000 and Section IX (NA-3766).

**ND-2539.3 Blending or Repaired Areas** - After repair, the surface shall be blended uniformly into the surrounding surface.

**ND-2539.4 Examination of Repair Welds** - Each repair weld shall be examined by the magnetic particle method (ND-2545) or by the liquid penetrant method (ND-2546). In addition, when the depth or repair cavities exceeds the lesser of 3/8 inch or 10 percent of the section thickness, the repair weld shall be radiographed in accordance with and to the applicable acceptance standards of ND-5000. The penetrameter shall be based upon the section thickness of the repaired area.

**ND-2539.5 Heat Treatment After Repair** - The product shall be heat treated after repair in accordance with the heat treatment requirements of ND-4640.

**ND-2539.6 Material Report Describing Defects and Repair** Each defect repair that is required to be radiographed shall be described in the Certified Material Test Report. The Certified Material Test Report for each piece shall include a chart which shows the location and size or the prepared cavity, the welding material identification, the welding procedure, the heat treatment, and a report of the results of the examinations, including radiographic film.

Basis for Relief:

SQN has six butterfly valves that were removed from the plant's ERCW system and replaced with new valves. The valves that were removed have degradation of the seating surfaces. SQN has issued a design change to repair the seating surfaces of the valves by removing base metal in the seating area and replacing the base metal with weld metal. Once sufficient weld metal has been deposited, it will be machined to the original design configuration of the seating surfaces. The Code of Record for these valves is ASME Section III, 1974 Edition, Summer 1975 Addenda, Class 3. The body of the subject valves is made from a machined piece of ASME SA 515 Grade 70 pressure vessel plate. The original component construction code (ASME Section III) requires the repair to be performed in accordance with the rules of ND-2500. ND-2530 requires a radiographic examination to be performed if the depth of repair exceeds the lessor of three eighths of an inch or 10% of the section thickness. The repair thickness, in this case, exceeds both of these values.

Impractical Requirement:

The valve body is 4-3/4 inches deep, front to back. The body has a inside diameter of 23-3/8 inches and an outside diameter of 27-1/4 inches which gives a nominal section valve body wall thickness of 1-15/16 inch, at the thinnest part. There are several protrusions on the outside of the machined valve body. The two major protrusions house the area for the stem for the valve. These protrusions are 5-5/16 inch and 7-7/16 inch thick as measured from the valve ID surface. A TVA Level III Radiography Examiner has determined that due to the thickness of the valve body in the aforementioned areas, a radiographic examination cannot be performed with code acceptable radiographic results. SQN has performed preliminary radiography of these areas and could not obtain the code required radiographic sensitivity for these protruded areas. Additionally, because of the location of the area to be

examined (adjacent to the valve edge), radiographic undercutting occurs and cannot be eliminated.

TVA has evaluated the use of ultrasonic examination and determined that this examination technique is not practicable. Due to the configuration of the final valve seating surface, the TVA Level III Ultrasonic Examiner determined that 100 percent code coverage of the repaired areas could not be achieved.

Alternative Requirement: TVA's Code of Record for Repairs and Replacements is ASME Section XI, 1989 Edition. The new design calls for the existing seating surfaces to be removed and to build up the removed metal by depositing carbon steel weld metal and then by depositing stainless steel weld metal for the final seating surface. TVA proposes to perform a surface examination following each layer of weld deposited and following the final machining of the as left seating surface. Each pass of the carbon steel weld metal will be examined by the magnetic particle process. The stainless steel weld metal will be examined using the liquid penetrant method. The combination of these two surface examination methods will provide acceptable assurance of the integrity of the weld metal deposited.

Conclusion: Based on the above discussion, the proposed alternative surface examinations for the weld overlay repair provide an acceptable level of quality and safety. Authorization to implement the proposed alternatives is requested in accordance with 10CFR50.55a(a)(3)(i).