UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE FIRST 10-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF 1-ISI-4

WATTS BAR NUCLEAR PLANT, UNIT 1

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

1.0 INTRODUCTION

In a letter dated February 16, 1999, Tennessee Valley Authority (TVA or the licensee) submitted a request for relief from the requirements of the ASME Code, Section XI, 1989 Edition during the first ISI interval of Watts Bar Nuclear Plant, Unit 1 (WBNP-1). TVA proposed an alternative to the 100 percent volumetric examination of 1B seal water injection filter head-to-shell circumferential weld required by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) due to physical constraints. The design configuration limits examination to approximately 80 percent of the weld volume. The proposed alternative is to supplement the volumetric examination with a liquid penetrant surface examination of the entire weld.

2.0 BACKGROUND

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g)(4), ASME Code Class 1, 2 and 3 components (including supports) must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions of the Code and Addenda that become effective subsequent to the editions specified in paragraphs (g)(2) and (g)(3) of this section and that are incorporated by reference in paragraph (b) of this section, to the extent practical within the limitations of design, geometry and materials of construction of the components.

2.1 Code Requirements

The ASME Code, Section XI, 1989 Edition, Subsection IWC-2500, Table IWC-2500-1, Examination Category C-A, Item No. C1.20 requires volumetric examination of essentially 100 percent of the full volume of the chemical and volume control system's seal water injection filter head-to-shell circumferential weld.

2.2 Request for Approval of an Alternative

10 CFR 50.55a(a)(3) states that proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the

ENCLOSURE

Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements of this section would result in hardship of unusual difficulty without a compensating increase in the level of quality and safety.

TVA has requested approval for an alternative to the Code-required 100 percent full volume ultrasonic examination. Specifically, TVA proposes to perform an ultrasonic examination of approximately 80 percent of the weld volume that is accessible and to then supplement this with a surface examination of the weld using liquid penetrant.

2.3 Basis for Relief

The geometric configuration of the seal water injection filter head-to-shell circumferential weld CVCS-SWIFLTR-62-96 precludes 100 percent volumetric examination and, therefore, conformance with the examination requirement of the applicable ASME Code, Section XI, is impractical.

3.0 EVALUATION

The staff finds that the configuration of the head-to-shell circumferential weld in the seal water injection filter precludes ultrasonic scanning of the weld from the head side of the weld and, therefore, limits volumetric coverage of the weld. The licensee's best-effort examination has resulted in approximately 80 percent volumetric coverage. The Code-required examination coverage is "essentially 100 percent" which means coverage greater than 90 percent. The staff believes that it is impractical to obtain the required volumetric coverage unless the component is redesigned and replaced, which would impose a significant burden on the licensee. The staff has determined that the licensee's examination of the accessible weld volume and a supplemental surface examination provide reasonable assurance of structural integrity since any pattern of degradation existing in the weld would most likely be detected with the licensee's proposed extent volumetric and surface of examination coverage.

4.0 CONCLUSION

Based on the above evaluation, the staff concludes that the proposed alternative to supplement the volumetric inspections with a surface examination, provides an acceptable level of quality and safety. Therefore, the staff authorizes the proposed alternative pursuant to 10 CFR 50.55a(a)(3)(i).

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Date: July 28, 1999