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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE SECOND 10-YEAR INSERVICE INSPECTION PROGRAM

RELIEF REQUEST RR-ENG-2-7

STP NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT, UNITS 1 AND 2

DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

By letter dated July 6, 1999, STP Nuclear Operating Company (the licensee) submitted a request for relief from the American Society of Mechanical Engineers (ASME) Code Section XI nondestructive examination requirements of Appendix III, III-3410 for the second inservice inspection (ISI) interval of South Texas Project (STP) Units 1 and 2. The proposed relief request contains a proposed alternative to III-3410 for ultrasonic examination of piping system welds (Relief Request No. RR-ENG-2-7).

2.0 BACKGROUND

ISI of the ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(i). The regulation at 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. For STP Units 1 and 2 the applicable edition of Section XI of the ASME Code for the second 10-year ISI interval is the 1989 Edition.

3.0 LICENSEE'S REQUEST

The components for which relief is requested:

Piping system welds in the auxiliary feedwater, containment spray, chemical and volume control, feedwater, main steam, reactor coolant, residual heat removal, and safety injection systems ultrasonically examined in accordance with Appendix III of the ASME Code Section XI.

Applicable Code requirement from which relief is requested:

ASME Code, Section XI, Appendix III, III-3410, requires that the calibration block be fabricated from material of the same nominal wall thickness or pipe schedule as the pipe to be examined.

Licensee's Basis for Requesting Relief (as stated)

> The ASME Section XI code, Appendix III, III-3410 code requirement that ultrasonic calibration blocks be of the same nominal wall thickness or pipe schedule as the pipe to be examined is unnecessarily restrictive. The requirement results in a significant cost that is not technically justified. Piping calibration blocks can cost several thousand dollars, depending on availability of the piping material.

Licensee's Proposed Alternative Examination (as stated)

> As an alternative to the Section XI, III-3410 ultrasonic calibration block material requirements, the South Texas Project proposes to use ultrasonic calibration blocks with thickness within 25% of the pipe wall thickness to be examined. Whenever inservice inspection ultrasonic piping weld examinations are performed using calibration blocks permitted by this relief request, the examiner will determine the thickness of the piping and the weld joint contour and use this information in his examination. This information will be used to prepare cross-sectional sketches of the weld and adjacent base material for plotting and evaluation of indications.

Licensee's Justification for Granting Relief (as stated)

> In accordance with the provisions of 10 CFR 50.55a(a)(3)(i), the proposed alternative will provide an acceptable level of quality and safety. Use of an ultrasonic calibration block having thickness within 25% of that of the pipe wall to be examined will not impact the examiner's ability to detect and size flaws. Because detection scanning is typically performed at an increased gain level above reference level sensitivity, and flaw characterization and sizing techniques typically do not rely on signal amplitude, the referenced level sensitivity is not significant for ultrasonic flaw detection and sizing. Therefore, allowing the proposed tolerance on calibration block thickness will still provide an acceptable level of quality and safety.
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> This relief request is based on the provisions of Section XI Code Case N-461-1, which has not yet been approved by the Nuclear Regulatory Commission in Regulatory Guide 1.147. However, Code Case N-461-1 is very similar to Code

Case N-461, which was conditionally approved by the Nuclear Regulatory Commission in Regulatory Guide 1.147, Rev. 11. The difference between N-461 and N-461-1 is editorial. Code Case N-461-1 requires the calibration block thickness to be "within 25% of the pipe wall thickness to be examined," while Code Case N-461 requires the block thickness to be "within ±25% of the pipe wall thickness to be examined."

The Nuclear Regulatory Commission has found Code Case N-461 to be acceptable, subject to the following additional condition which is included as part of the proposed alternative examination:

> Thickness measurements and weld joint contour of the pipe/component must be known and used by the inspector who conducts the ultrasonic examination.

4.0 EVALUATION

The applicable code requirements for the licensee's second 10-year ISI interval would require the basic calibration blocks be made from material of the same nominal diameter and nominal wall thickness or pipe schedule as the pipe to be examined. The licensee proposes to follow the provisions of Code Case N-461-1. Code Case N-461-1 is technically the same as Code Case N-461. The staff has found Code Case N-461 to be acceptable in Regulatory Guide 1.147, Rev.11, subject to the following condition which the licensee included as part of its proposed alternative examination:

> Thickness measurements and weld joint contour of the pipe/component must be known and used by the inspector who conducts the ultrasonic examination.

The staff finds the use of an ultrasonic calibration block having thickness within 25 percent of that of the pipe wall to be examined will not impact the examiner's ability to detect and size flaws. Therefore, the staff finds the licensee's use of Code Case N-461-1 with the inclusion of the conditions in Regulatory Guide 1.147, Rev. 11 for Code Case N-461 to be acceptable since Code Case N-461-1 is technically the same as Code Case N-461.

5.0 CONCLUSION

The staff concludes that the licensee's proposed alternative to use Section XI Code Case N-461-1, with the condition documented in Regulatory Guide 1.147, Rev. 11, for Code Case N-461, provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the alternative proposed in relief request RR-ENG-2-7 is authorized for the second 10-year ISI interval at STP, Units 1 and 2.

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Date: November 9, 1999