

February 7, 2000

Mr. William T. Cottle
President and Chief Executive Officer
STP Nuclear Operating Company
South Texas Project Electric
Generating Station
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNITS 1 AND 2 - SECOND 10-YEAR INTERVAL
INSERVICE INSPECTION PROGRAM PLAN - RELIEF REQUEST RR-ENG-2-6
(TAC NOS. MA5874 AND MA5875)

Dear Mr. Cottle:

By letter dated June 9, 1999, STP Nuclear Operating Company (STPNOC) submitted a request for relief from the ASME Section XI Code Table IWC-2500-1. This table includes a requirement that a surface examination be performed on essentially 100 percent of the length of each weld of one pump casing among each group of multiple Class 2 pumps.

The Nuclear Regulatory Commission staff has evaluated the information provided and concludes that the Section XI examination requirements for the subject welds would result in a hardship and an unusual difficulty on STPNOC without a compensating increase in the level of quality and safety. Furthermore, the staff concludes that STPNOC's proposed alternative and previous inspection results provide reasonable assurance of structural integrity of the subject welds. Therefore, STPNOC's proposed alternative contained in relief request RR-ENG-2-6 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii). Our related safety evaluation is enclosed.

Sincerely,

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

RELIEF REQUEST RR-ENG-2-6

STP NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT, UNITS 1 AND 2

DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

The inservice inspection (ISI) of the American Society of Mechanical Engineers (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(g)(6)(i). The regulation at 10 CFR 50.55a(a)(3) states in part 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 pre-service 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 South Texas Project, 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. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life

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or property or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

By letter dated June 9, 1999, STP Nuclear Operating Company (STPNOC) submitted a request for relief from the ASME Section XI Code Table IWC-2500-1. This table includes a requirement that a surface examination be performed on essentially 100 percent of the length of each weld of one pump casing among each group of multiple Class 2 pumps. The staff has evaluated the information provided in licensee's submittal which indicates that the Section XI examination requirements for the subject welds would cause hardship and unusual difficulty to STPNOC without a compensating increase in the level of quality and safety.

2.0 DISCUSSION

STPNOC submitted relief request RR-ENG-2-6, seeking relief from the requirements of the ASME Code, Section XI, for the South Texas Project Units 1 and 2 during the second 10-year ISI interval. The information provided by the licensee in support of the request for relief from code requirements has been evaluated and the basis for disposition is documented below.

2.1 Request for Relief RR-ENG-2-6

ASME Code, Section XI, Table IWC-2500-1, Examination Category C-G, Item No. C6.10 requires surface examination of 100 percent of the welds of one pump among each group of multiple pumps of similar design, size, function, and service in a system. Pursuant to 10 CFR 50.55a(a)(3) the licensee has proposed an alternative to the requirements of ASME Code, Section XI, Table IWC-2500-1, Examination Category C-G, Item No. C6.10.

2.2 Components for which alternative is requested

- Containment spray (CS) pumps 1A (Unit 1) and 2A (Unit 2): longitudinal seam weld PCW5 and circumferential weld PCW3
- Low head safety injection (LHSI) pumps 1A (Unit 1) and 2A (Unit 2): longitudinal seam weld PCW5 and circumferential weld PCW3
- High head safety injection pumps (HHSI) 1A (Unit 1) and 2A (Unit 2): longitudinal seam weld PCW5 and circumferential weld PCW3

2.3 Licensee's Basis for Requesting Relief (as stated)

The subject outer barrel (pump casing) welds of the affected pumps are located in pump pits. In order to perform a surface examination on the subject casing welds, either the pump would have to be pulled from the associated pit, or the pump motor and pump internals would have to be removed to allow access to the interior of the pump casing.

The Containment Spray, Low Head Safety Injection, and High Head Safety Injection pumps are of a similar centrifugal multiple stage vertical design, and are manufactured by Pacific Pumps. There are five pressure-retaining casing welds

associated with each of the subject pump casings: three circumferential casing welds; one suction nozzle weld; and one longitudinal casing weld. Of these welds, only the lower circumferential weld and the lower portion of the longitudinal casing weld are inaccessible for surface examination while a pump is in its pit. The remaining welds are accessible for the required Section XI surface examination.

The Containment Spray and Low Head Safety Injection pump casings are 24 inches in diameter with approximately a three-inch annular clearance between the casing and the pit wall. The High Head Safety Injection pump casing is 18 inches in diameter with approximately a 6-inch annular clearance. A debris seal covers the annular opening between each pump casing and the edge of the pit. The lower circumferential weld in each pump casing, located approximately 10 feet down in the pump pit, is inaccessible for surface examination. The 10 feet of each longitudinal casing weld located inside the pump pit are also inaccessible for surface examination. The upper portion of each longitudinal casing weld is accessible for Section XI surface examination for approximately 50 to 55 inches of its overall length.

The subject pumps are approximately 30 feet tall with the driver mounted. Alignment of the shaft along the multiple vertical stages to the driver coupling is critical to proper operation. Improper rigging or alignment can result in a bent pump shaft or vibration and subsequent impaired operation and pump damage. Therefore, removal of the pump casing from the pit or removal of the pump internals to gain access to the specified welds to perform a surface examination would present an undue hardship without a compensating increase in quality and safety. Removal could also have a negative impact on quality and safety if the precise alignment required for these vertical pumps is not achieved when they are returned to their positions.

2.4 Licensee's Proposed Alternative Examination (as stated)

Due to the small annular space between the pump casing and the pit wall and the distance of the welds from the access opening at the top of the pit (i.e., up to ten feet), performing a complete surface examination of these welds in the installed condition is not practical. However, this configuration is compatible with a boroscopic visual examination of these welds. Boroscopic VT-1 visual examinations were performed during the first inspection interval on the entire length of the circumferential and longitudinal pump casing welds within the pit of each pump subject to inservice inspection.

If a Containment Spray, Low Head Safety Injection, or High Head Safety Injection pump is disassembled for maintenance within the inspection interval, allowing access to the subject welds, a surface examination will be performed. If these pumps are not disassembled during the second inspection interval, the alternative boroscopic visual examination will be performed during the second interval. The accessible welds (or accessible portions of welds) in these pump casings will be examined with a surface examination technique as required by Section XI code requirements.

The accessible welds (or accessible portions of welds) in these pump casings will be examined as required by Section XI code requirements. If a Containment Spray, Low Head Safety Injection, or High Head Safety Injection pump is disassembled for maintenance within the inspection interval such that access is provided to the subject welds, a surface examination will be performed on these welds. Otherwise, the alternative boroscopic visual examination will be performed by the end of the inspection interval.

3.0 EVALUATION

The licensee has proposed as an alternative to surface examination to perform a boroscopic VT-1 visual examination of the pump casing welds within the pump pits for the welds covered by relief request RR-ENG-2-6. The weld and the adjacent base material surfaces will be examined. The VT-1 boroscopic examination should be able to detect degradation or defects prior to them becoming structurally significant. This is because the VT-1 examination is conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, or erosion. The accessible welds or accessible portions have been examined with a surface examination technique as required by Section XI code requirements during the first 10-year inspection interval. No flaws were detected by the licensee's examinations. Additionally, the licensee has proposed that it would perform a surface examination of the specified welds if any of the applicable pumps were to be disassembled for maintenance within the current inspection interval, allowing access to the subject welds.

The alignment of the shaft along the multiple vertical stages to the driver coupling is critical to proper operation. Improper rigging or alignment can result in a bent pump shaft or vibration and subsequent impaired operation and pump damage. Removal of the pump casing from the pit or removal of the pump internals to gain access to the specified welds to perform a surface examination could have a negative impact if the precise alignment required for these vertical pumps is not achieved when they are returned to service. Therefore, the code requirements are a hardship and unusual difficulty for the licensee without a compensating increase in quality and safety.

The staff determined that the licensee's proposed alternative provides reasonable assurance of structural integrity of the subject welds and that the code compliance would result in hardship and unusual difficulty for the licensee without a compensating increase in quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year inspection interval.

4.0 CONCLUSION

The staff concludes that the Section XI examination requirements for the subject welds would result in hardship and unusual difficulty for the licensee without a compensating increase in the level of quality and safety. Furthermore, the staff concludes that the licensee's proposed alternative and previous inspection results provide reasonable assurance of structural integrity of the subject welds. Therefore, the licensee's proposed alternative contained in relief request RR-ENG-2-6 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year inspection interval of South Texas Project Units 1 and 2.

Principal Contributor: P. Patnaik

Date: February 7, 2000