Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

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10CFR50.55a

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Request for Relief from Reactor Pressure Vessel Weld
Nondestructive Examination Requirements
(Relief Request RR-ENG-36)

References:
1) Request for Relief from ASME Boiler and Pressure Vessel Code Section XI Requirements (Relief Request RR-ENG-21), dated July 16, 1998 (NOC-AE-000197)

2) Request for Alternative to 10CFR50.55a(g)(6)(ii)(A), Augmented Examination of Reactor Pressure Vessel (Relief Request RR-ENG-29), dated November 24, 1998 (NOC-AE-000360)

3) Inservice Inspection Program – Relief Requests RR-ENG-21, 22R1, and 29, South Texas Project, Units 1 and 2 (TAC Nos. MA4245 and MA4246), Safety Evaluation dated March 2, 1999

In accordance with the provisions of 10CFR50.55a(g)(6)(ii)(A)(5) and 10CFR50.55a(g)(5)(iii), the South Texas Project requested relief from the requirements of 10CFR50.55a(g)(6)(ii)(A) and ASME Section XI, Table IWB-2500-1, respectively. These requirements are for inservice inspection nondestructive examination of essentially 100% of the weld length of all reactor pressure vessel welds under Section XI Examination Category B-A, Item B1.10. Obtaining essentially 100% examination coverage of these welds is impractical due to component configuration, part geometry, and examination equipment and techniques used to perform these examinations.

Reference 1 included a request for relief from Section XI requirements for performing an inservice inspection nondestructive examination on essentially 100% of the weld length of one circumferential reactor pressure vessel weld in Unit 1 (RPV1-101-141) and in Unit 2 (RPV2-101-141). Reference 2 requested similar relief from the requirements of 10CFR50.55a(g)(6)(ii)(A). The anticipated examination coverage range was 68% to 76% for RPV1-101-141 and 75% to 83% for RPV2-101-141. The Nuclear Regulatory Commission issued approval of this request in Reference 3. However, the actual coverage of these welds by the examination was subsequently found to be 62% and 69%, respectively. This alternative

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examination coverage, in combination with examination coverage of the other reactor vessel shell welds, provides an acceptable level of quality and safety.

The attached request for a change in required examination coverage includes a discussion of the specific welds for which an alternative is requested, the basis and justification for the proposed alternative, and an implementation schedule.

If there are any questions, please contact either Mr. Michael S. Lashley at (361) 972-7523 or me at (361) 972-7902.

T. J. Jordan
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PLW

Attachment: Request for Relief from Reactor Pressure Vessel Weld Nondestructive Examination Requirements (Relief Request RR-ENG-36)

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SOUTH TEXAS PROJECT
UNITS 1 AND 2
REQUEST FOR RELIEF FROM REACTOR PRESSURE VESSEL WELD NONDESTRUCTIVE EXAMINATION REQUIREMENTS
(RELIEF REQUEST RR-ENG-36)

Referenced Regulation: 10CFR50.55a(g)(6)(ii)(A), "Augmented Examination of Reactor Vessel"

Referenced Code: ASME Boiler and Pressure Vessel Code Section XI, 1983 Edition through Summer 1983 Addenda

A. Components for Which Relief is Requested:

(a) Identification: Reactor Pressure Vessel lower shell-to-bottom head circumferential welds RPV1-101-141 (Unit 1) and RPV2-101-141 (Unit 2)

(b) Function: Reactor pressure vessel welds RPV1-101-141 and RPV2-101-141 are located at the intersection of the lower shell ring plates with the bottom head torus plates, approximately four feet below the core beltline region.

(c) Class: ASME Code Class 1

B. Requirements from Which Relief is Requested:

Code of Federal Regulations

10CFR50.55a(g)(6)(ii)(A)(2) states:

> All licensees shall augment their reactor vessel examination by implementing once, as part of the inservice inspection interval in effect on September 8, 1992, the examination requirements for reactor vessel shell welds specified in Item B1.10 of Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel", in Table IWB-2500-1 of Subsection IWB of the 1989 Edition of Section XI, Division 1, of the ASME Boiler and Pressure Vessel Code.... For the purpose of this augmented examination, 'essentially 100%' as used in Table IWB-2500-1 means more than 90 percent of the examination volume of each weld, where the reduction in coverage is due to interference by another component, or part geometry.

10CFR50.55a(g)(6)(ii)(A)(*4*) states:

> The requirement for augmented examination of the reactor vessel may be satisfied by an examination of essentially 100 percent of the reactor vessel shell welds

specified in Sec. 50.55a(g)(6)(ii)(A)(2) that ... is required by Sec. 50.55a(g)(4)(i), during the inservice inspection interval in effect on September 8, 1992.

ASME Boiler and Pressure Vessel Code Section XI

ASME Section XI Code, Table IWB-2500-1, Examination Category B-A, Note (2) requires nondestructive examination of essentially 100 percent of reactor pressure vessel weld lengths.

C. Basis for Relief from Requirements:

10CFR50.55a(g)(6)(ii)(A)(5) states:

> Licensees that make a determination that they are unable to completely satisfy the requirements for the augmented reactor vessel shell weld examination specified in Sec. 50.55a(g)(6)(ii)(A) shall submit information to the Commission to support the determination and shall propose an alternative to the examination requirements that would provide an acceptable level of quality and safety....

Pursuant to 10CFR50.55a(g)(6)(ii)(A)(5), the South Texas Project previously requested Nuclear Regulatory Commission authorization to use an alternative to the requirement to examine greater than 90 percent (essentially 100 percent) of reactor vessel shell welds RPV1-101-141 and RPV2-101-141. This was based on the impracticality of achieving essentially 100% coverage. Obtaining essentially 100 percent examination coverage of welds RPV1-101-141 and RPV2-101-141 is not practical due to:

- the configuration of reactor pressure vessel components;
- part geometry; and
- examination equipment and techniques utilized for the automated ultrasonic examinations.

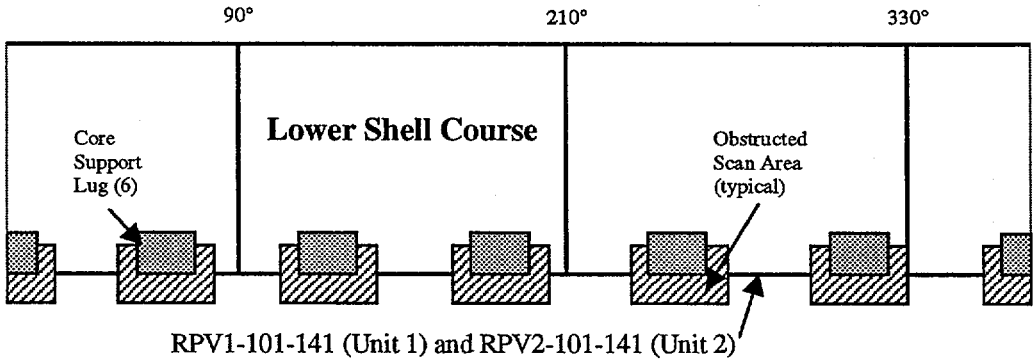
The Nuclear Regulatory Commission approved relief (Reference 3) from these requirements for the South Texas Project for an estimated examination coverage range of 68% to 76% for RPV1-101-141 and 75% to 83% for RPV2-101-141. However, the actual amounts of coverage of these welds by the examination were found to be 62% and 69%, respectively.

D. Alternate Examination:

As an alternative to examining the subject welds as discussed in the safety evaluation report (Reference 3), the South Texas Project proposes the actual coverages achieved, 62% and 69%, be approved for use.

E. Justification for Granting Relief:

Ultrasonic examination coverage for reactor pressure vessel circumferential welds RPV1-101-141 and RPV2-101-141 from the interior is limited by the proximity of the core support lugs. The six core support lugs are the primary interference limiting the ultrasonic examination of circumferential welds RPV1-101-141 and RPV2-101-141. The core support lugs are mounted on the lower shell plate, equally spaced at 60-degree intervals, and are approximately 13 inches high, 24 inches wide, and 8 inches deep. The inside circumference of the lower shell plate is approximately 544 inches. The core support lugs are located within one-half inch of the lower shell ring to bottom head weld and do not allow access from that side of the subject welds. Sketch 1 depicts the limited scan area.



SKETCH 1

Performing nondestructive examinations from the outside of the reactor pressure vessel is not practical based on limited physical access and radiation exposure. Based on previous radiation surveys, general exposure rates at the exterior of the reactor pressure vessel are expected to range from 200 mrem/hr to 700 mrem/hr at the specified circumferential shell welds.

The subject welds were volumetrically examined during fabrication of the vessel in accordance with the applicable construction code and during a limited preservice inspection. The welds were found to be free of unacceptable indications.

There is no change in the justification for reduced weld examination coverage from that presented in references 1, 2, and 3.

The Nuclear Regulatory Commission safety evaluation report (Reference 3) included the following comments:

- There are no mechanisms for damage other than fatigue.
- The subject welds are outside the beltline region and are not subject to irradiation embrittlement due to high neutron fluence.

- The probability of initiation of a flaw and subsequent propagation of the inservice flaw to an extent causing concern during the first ten-year interval is extremely small due to the low number of operating transients. In addition, any degradation mechanism residing in the welds is likely to be detected during the examination.
- The probability of a rejectable indication being present in the unexamined weld volume is extremely low.

Based upon the above, in accordance with the provisions of 10CFR50.55a(g)(6)(ii)(A)(5), the proposed alternative examination coverage, in combination with examination coverage of the other reactor vessel shell welds, will provide an acceptable level of quality and safety.

F. Implementation Schedule:

The South Texas Project requests Nuclear Regulatory Commission approval by December 31, 2000, for use of 62% and 69% coverage in examining welds RPV1-101-141 and RPV2-101-141, respectively.