



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

November 29, 1999  
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File No.: G09.16  
10CFR50.55a

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

South Texas Project  
Unit 1  
Docket No. STN 50-498  
Request for Relief from ASME Boiler and Pressure Vessel Code  
Section XI Requirements (Relief Request RR-ENG-33)

In accordance with the provisions of 10CFR50.55a(a)(3)(i), the South Texas Project requests relief from IWA-5250(a) of ASME Section XI, 1983 Edition, for disposition of a through-wall leak in the Class 2 Refueling Water Storage Tank of South Texas Project Unit 1. The South Texas Project requests NRC approval to disposition the leak based on an analytical evaluation in accordance with IWB-3142.4 of the 1989 Edition of the ASME Section XI code. The South Texas Project believes this alternative will provide an acceptable level of quality and safety.

The attached relief request includes a discussion of the basis and justification for the relief request and an implementation schedule.

The South Texas Project requests NRC review and approval of this relief request by February 1, 2000, to enable resolution of issues of code compliance in a timely manner.

If there are any questions, please contact Mr. C. A. Murry at (361) 972-8285 or me at (361) 972-7902.

  
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PLW/

Attachment: Request for Relief from ASME Boiler and Pressure Vessel Code Section XI Requirements (Relief Request RR-ENG-33)

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**SOUTH TEXAS PROJECT  
UNIT 1  
REQUEST FOR RELIEF FROM ASME BOILER AND  
PRESSURE VESSEL CODE SECTION XI REQUIREMENTS  
(RELIEF REQUEST RR-ENG-33)**

Reference Code: ASME Boiler and Pressure Vessel Code, Section XI  
1983 Edition with the Summer 1983 Addenda

**A. Components for Which Exemption is Requested:**

- (a) Name and Identification Number: Unit 1 Refueling Water Storage Tank  
(TPNS No. 2N121NTF101A)
- (b) Function: The Refueling Water Storage Tank provides borated water to the Low Head Safety Injection, High Head Safety Injection, and Containment Spray pumps for the injection mode of Emergency Core Cooling operation. Additionally, the Refueling Water Storage Tank provides borated water for filling the refueling cavity during refueling operations and for charging pump suction during normal operation if a low-level exists in the volume control tank.
- (c) Class: ASME Section III, Class 2

**B. Code Requirement from Which Relief is Requested:**

A collection of boric acid crystals was discovered in the fall of 1997 on a very small area at the toe of the weld joining the Unit 1 Refueling Water Storage Tank shell to the base plate. The area was cleaned and observed for potential leakage. It was initially suspected the boric acid residue may have come from a tank connection above this location. No leakage was detected after seven days, and an engineering evaluation was issued to accept the indication as is. Periodic monitoring of the potential leakage area was initiated. This condition was later detected during a Section XI, Class 2 system pressure test and VT-2 visual examination of the Refueling Water Storage Tank performed February 23, 1999. Boric acid crystals were again found to have accumulated at this area of the weld. Chemical analysis of water collected at the leakage site indicated radioactive isotopes were present. As a result, the South Texas Project has concluded that the Refueling Water Storage Tank has a very small active leak.

Section XI Table IWC-2500-1, 1983 Edition, lists IWA-5250 as the specified acceptance standard for Category C-H, "All Pressure Retaining Components." IWA-5250(a) states that the source of leakage detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective action as follows:

- (1) Buried components with leakage losses in excess of limits acceptable for continued service shall be repaired or replaced;
- (2) Repairs or replacements of components shall be performed in accordance with IWA-4000 or IWA-7000, respectively.

IWA-5250(b) provides acceptance criteria for boric acid corrosion on ferritic steel components.

The leakage does not exceed acceptable limits. However, the Refueling Water Storage Tank is not a buried component, so criterion (a)(1) does not apply. The Refueling Water Storage Tank and the subject weld are fabricated from stainless steel materials; therefore, criterion (b) does not apply. IWA-5250(a)(2) implies that repair or replacement of components having through-wall leakage is required regardless of the leakage rate.

**C. Basis for Relief from Code Requirements**

A component with a small, stable leak that has been evaluated and found to be acceptable for continued service should not have to be repaired or replaced. The implied requirement of IWA-5250 for repair or replacement for any through-wall leakage is not appropriate for very small and stable leakage rates that have no impact on the safety function of the affected component.

A comprehensive repair program for this leak would require draining the tank and performing nondestructive testing and repair welding (if required) on the floor plate inside the tank. Because there are only narrow windows in the schedule in which the Refueling Water Storage Tank water is normally pumped to the refueling cavity, this operation could easily extend the duration of a refueling outage.

**D. Alternative Requirements:**

The South Texas Project requests Nuclear Regulatory Commission approval to apply IWB-3142.4 of the 1989 Edition of the Section XI code as an alternative to IWA-5250 of the 1983 Edition as the Category C-H Examination acceptance standard for addressing this leak in the Unit 1 Refueling Water Storage Tank. IWB-3142.4, "Acceptance by Analytical Evaluation," for Inservice Visual Examinations states that:

Components containing relevant conditions shall be acceptable for continued service if an analytical evaluation demonstrates the component's acceptability. The evaluation analysis and evaluation acceptance criteria shall be specified by the Owner. Components accepted for continued service based on analytical evaluation shall be subsequently examined in accordance with IWB-2420(b) and (c).

Therefore, under this code requirement, analytical evaluation of Refueling Water Storage Tank leakage by the South Texas Project determines the acceptability of the leakage and the need for corrective measures or repairs. (The results of the evaluation performed for this leak are summarized in Section E.) Also, the evaluation analysis of examination results would be submitted to the Nuclear Regulatory Commission in accordance with IWB-3144(b) of the 1989 Edition.

Because the Category C-H examination is performed each examination period, the requirements of IWB-2420(b) and (c) for successive examinations are satisfied.

If further leakage from this location is detected by any remaining Category C-H visual examinations in the current inspection interval, or in the second inspection interval, those findings would be resolved consistent with this relief request.

**E. Justification for Granting Relief:**

The South Texas Project requests Nuclear Regulatory Commission approval of the proposed alternative in accordance with 10CFR50.55a(a)(3)(i). The South Texas Project believes the proposed alternative, performing an analytical evaluation of the Refueling Water Storage Tank leakage in accordance with IWB-3142.4 of the 1989 Edition of Section XI to determine the acceptability of the leakage and the need for corrective measures or repairs, provides an acceptable level of quality and safety.

The 1989 Edition of Section XI has been approved by NRC and the South Texas Project is currently updating its Inservice Inspection Program for the second inspection interval based on the 1989 Edition of Section XI. IWB-3142.4, "Acceptance by Analytical Evaluation," of the 1989 Edition of Section XI includes provisions regarding evaluation and disposition of relevant conditions, including component through-wall leakage, that are detected by Category C-H examinations.

At the time of discovery, an engineering evaluation pursuant to IWB-3142.4 concluded that this leak has no impact on the safety and operability of the Refueling Water Storage Tank. Small, intermittent linear indications in the base plate outboard of the shell-to-base plate weld aligned with the leak location have been detected by liquid penetrant examination; however, these linear indications are not necessarily associated with the leakage emanating from the toe of the weld. In addition, the operating conditions of the Refueling Water Storage Tank are atmospheric pressure and ambient temperature. Changes in temperature or pressure are not expected to be significant. Because the resultant operating stresses on the weld and base material are low, leakage is anticipated to remain very small and stable.

Based on the above considerations, the South Texas Project believes the most prudent course of action is to defer repair of this Refueling Water Storage Tank leak and continue to monitor the leak for stability. If the leakage rate increases, the analytical evaluation

would be updated based on the new data. If the leakage rate increases to the extent that repair is necessary, the tank will be repaired during an appropriate refueling outage.

**F. Implementation Schedule:**

The South Texas Project requests NRC review and approval of this relief request by February 1, 2000, to enable resolution of issues of code compliance in a timely manner. This relief request is applicable to South Texas Project Unit 1 for the remainder of the first inspection interval and the second inspection interval.