



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

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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  
Amended Request for Relief from ASME Boiler and Pressure Vessel Code Section XI  
Requirements for Containment Tendon Examination and Inspection  
(Relief Request RR-ENG-IWL-01)

Reference: "Request for Relief from ASME Boiler and Pressure Vessel Code Section XI Requirements for Containment Tendon Examination and Inspection (Relief Request RR-ENG-IWL-01)," T. J. Jordan to NRC Document Control Desk, dated July 28, 2000 (NOC-AE-00000868)

In accordance with the provisions of 10CFR50.55a(a)(3)(ii), the South Texas Project requests relief from the requirements of IWL-2500 of ASME Section XI for examination of unbonded post-tensioning systems for Unit 1 and Unit 2. IWL-2521(c) specifies examination of exempted tendons to the extent that the end anchorages of the exempt tendons are accessible either during operation or during an outage. However, the South Texas Project requests Nuclear Regulatory Commission approval to exempt specific tendons from examination because compliance poses hardship and possible personal injury or unusual difficulty without a compensating increase in the level of quality and safety.

The attached amended relief request addresses the basis and justification for the relief request with clarification and enhancement of the original submittal referenced above as requested by the NRC Staff. Changes are indicated with change bars.

The South Texas Project requests Nuclear Regulatory Commission review and approval of this relief request by February 1, 2001.

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

  
T. J. Jordan  
Manager,  
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PLW

Attachment: Amended Request for Relief from ASME Boiler and Pressure Vessel Code Section XI Requirements for Containment Tendon Examination and Inspection (Relief Request RR-ENG-IWL-01)

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**SOUTH TEXAS PROJECT  
UNITS 1 & 2  
AMENDED REQUEST FOR RELIEF FROM ASME BOILER AND  
PRESSURE VESSEL CODE SECTION XI REQUIREMENTS FOR  
CONTAINMENT TENDON EXAMINATION AND INSPECTION  
(RELIEF REQUEST RR-ENG-IWL-01)**

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Reference Code: ASME Boiler and Pressure Vessel Code Section XI, Subsection IWL, 1992 Edition through 1992 Addenda

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

(a) Identification: Containment tendons (unbonded post-tensioning system)

3H062	3H080	3H098	3H116
3H065	3H083	3H101	3H119
3H068	3H086	3H104	3H122
3H071	3H089	3H107	3H125
3H074	3H092	3H110	3H128
3H077	3H095	3H113	3H131

(b) Function: Help maintain containment structural integrity in the event of a LOCA or steam line break accident.

(c) Class: ASME Code Class CC

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

IWL-2521, "Tendon Selection," states the criteria for determining which tendons are to be examined. IWL-2521.1, "Exemptions," allows for use of substitute tendons when tendons are not accessible for examination because of safety or radiological hazards, or because of structural obstructions. IWL-2521.1(c) states:

Each exempted tendon shall be examined in accordance with IWL-2524 and IWL-2525 to the extent that the end anchorages of the exempt tendon are accessible either during operation or at an outage.

IWL-2524 addresses visual examination of tendon anchorage areas. IWL-2525 provides criteria for taking samples for examination of the corrosion protection medium and free water.

The South Texas Project requests relief from applying the requirements of IWL-2521.1(c) to the Class CC unbonded post-tensioning systems listed in section A above for IWL-2524 and IWL-2525 examinations of exempted tendons during operation or outage.

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

The tendons listed in section A are looped horizontally around the containment structure with each end anchored to a buttress above the Isolation Valve Cubicle. The Isolation Valve Cubicle contains the steam generator safety and power-operated relief valves, which are provided to relieve steam pressure from the steam generators and Main Steam System. A steam overpressure transient during plant operation could cause one or more of these valves to open without warning. A large steam release from these valves could result in injury or fatality to personnel inspecting these tendons. Therefore, compliance with the requirements of Section XI for the subject tendons during plant operation poses a hardship and possible personal injury or unusual difficulty without a compensating increase in the level of quality and safety.

Inservice inspection of containment tendons is normally performed when the Unit is operating. Examination of the subject tendons during a refueling outage is not desirable because of other activities that are in progress in the immediate and surrounding area. These activities limit access to the tendons such that tendon examination activities could become a critical path item for concluding a refueling outage. Therefore, compliance with the requirements of Section XI for the subject tendons during an outage poses a hardship and possible personal injury or unusual difficulty without a compensating increase in the level of quality and safety.

D. **Alternate Examination:**

IWL-2521 specifies the requirements for selecting the tendons to be examined. The tendons listed in section A will remain in the sample population. However, should one of the listed tendons be selected for examination under this code, a substitute tendon shall be selected that is located as close as possible to the exempt tendon. This is consistent with the criteria of IWL-2521.1(b) for exempting tendons from examination. However, IWL-2524 and IWL-2525 will not be applied to the exempt tendon. Instead, these requirements will be applied to both ends of an additional tendon that is as close as possible to the exempt tendon. If the substitute tendon is located above the exempt tendon, then the additional tendon will be located below the exempt tendon and vice versa. Therefore, an exempt tendon will be replaced by surveillance of two nearby tendons, both of which are anchored in an accessible buttress.

If abnormal degradation is detected, an engineering evaluation will be performed in accordance with the requirements of IWL-3310. The specifics of the evaluation cannot be determined in advance because they depend upon the condition being evaluated. When necessary to ensure that the structural integrity of the containment is maintained, the exempt tendons will be included within the scope of the evaluation.

**E. Justification for Granting Relief:**

**Containment Design:**

The Reactor Containment Building is constructed with three vertical buttresses located 120° apart. The horizontal tendons extend 360° around the containment building, with both ends of a given tendon anchored at the same buttress. Each successive horizontal tendon is progressively offset 120° from the one beneath it. Every third horizontal tendon is located within the same buttress so two tendons are located between the exempt tendons and are accessible from the other two buttresses. Each horizontal tendon is basically the same length, has virtually identical end anchorage hardware, and is exposed to the same environmental conditions as its neighbor.

In addition to the horizontal tendons, tendons are also mounted vertically. The vertical U-shaped tendons are continuous over the dome, forming a two-way post-tensioning system for the dome. These tendons are anchored in a continuous gallery beneath the base slab which is provided for the installation and inspection of the vertical tendons.

**Effect on Tendon Population:**

Surveillance of every tendon is not necessary. The selected tendons are a small percentage of the entire tendon population, and they will represent the entire population (accessible and inaccessible). All tendons were designed, fabricated, installed, and inspected using identical methods. There are no significant differences between the accessible tendons and the inaccessible ones. Therefore, the selected tendons will be just as representative of the inaccessible population as they are of the non-selected portion of the accessible population.

The 24 tendons listed in Section A constitute 18% of the 133 horizontal tendons and 10% of the 229 total tendons. Therefore, 82% of the horizontal tendons and 100% of the vertical tendons remain within the scope of the proposed surveillance program. The South Texas Project believes this constitutes a sufficiently large and representative population for selection of tendons for surveillance.

**Previous Test Results:**

Surveillance testing of containment building tendons is performed one, three, and five years following the initial Structural Integrity Test and every five years thereafter. The initial structural integrity tests for Units 1 and 2 were completed March 26, 1987, and September 29, 1988, respectively. The following inspections have been performed:

<u>Unit 1</u>	<u>Unit 2</u>
1 <sup>st</sup> Year completed 6/88	1 <sup>st</sup> Year completed 12/89
3 <sup>rd</sup> Year completed 3/90	3 <sup>rd</sup> Year completed 3/92
5 <sup>th</sup> Year completed 5/92	5 <sup>th</sup> Year completed 10/93
10 <sup>th</sup> Year completed 7/98	10 <sup>th</sup> Year completed 9/98

The tendons listed in section A were not included in these surveillances except for the first inspection of Unit 1. The grease caps, including those of the excluded tendons, have

been examined to identify grease leakage or deformation. No relevant indications were found during the inspections.

### **Additional Examination Requirements**

Containment tendons are inspected under 10CFR50.55a(b)(2)(viii)(A) as follows:

Grease caps that are accessible must be visually examined to detect grease leakage or grease cap deformations. Grease caps must be removed for this examination when there is evidence of grease cap deformation that indicates deterioration of anchorage hardware.

As stated in 10CFR50.55a(b)(2)(viii)(E):

For Class CC applications, the licensee shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. For each inaccessible area identified, the licensee shall provide the following in the ISI Summary Report required by IWA-6000:

- (1) A description of the type and estimated extent of degradation, and the conditions that led to the degradation;
- (2) An evaluation of each area, and the result of the evaluation; and
- (3) A description of necessary corrective actions.

### **Conclusion**

The alternate examination will ensure the containment structural integrity is not jeopardized. Using two tendons for examination in place of one inaccessible tendon will provide representative results. Therefore, because compliance with the requirements of Section XI for the subject tendons poses a hardship and possible personal injury or unusual difficulty without a compensating increase in the level of quality and safety, the South Texas Project requests relief from IWL-2521.1(c).

#### **F. Implementation Schedule:**

The South Texas Project requests Nuclear Regulatory Commission approval of this relief request by February 1, 2001, to apply this alternate examination beginning in the first IWL inspection interval and in subsequent intervals.