

**Mail Envelope Properties** (3B38A8B1.43E : 3 : 42046)

**Subject:** Containment Tendons  
**Creation Date:** 6/26/01 11:19AM  
**From:** "Philip Walker" <[plwalker@stpegs.com](mailto:plwalker@stpegs.com)>

**Created By:** [plwalker@stpegs.com](mailto:plwalker@stpegs.com)

**Recipients**

nrc.gov  
owf4\_po.OWFN\_DO  
DHJ (David Jaffe)

**Post Office**  
owf4\_po.OWFN\_DO

**Route**  
nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	92	06/26/01 11:19AM
rreng-37Notes.doc	25600	
Header	623	

**Options**

**Expiration Date:** None  
**Priority:** Standard  
**Reply Requested:** No  
**Return Notification:** None

**Concealed Subject:** No  
**Security:** Standard

**From:** "Philip Walker" <plwalker@stpegs.com>  
**To:** <dhj@nrc.gov>  
**Date:** 6/26/01 11:23AM  
**Subject:** Containment Tendons

We have changed the room for the call. Please contact us at 361-972-7958.

Philip Walker

**REQUEST FOR RELIEF FROM CONTAINMENT  
TENDON INSPECTION REQUIREMENTS  
(RELIEF REQUEST RR-ENG-37)**

**1. Code Requirements from Which Relief is Requested**

- IWL-2421(b) describes the inservice inspection schedule to be followed for containment concrete and unbonded post-tensioning systems for sites with two plants.
  - (1) For the containment with the first Structural Integrity Test, all examinations required by IWL-2500 shall be performed at 1, 3, 10, 20, and 30 years. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 5, 15, 25, and 35 years.
  - (2) For the containment with the second Structural Integrity Test, all examinations required by IWL-2500 shall be performed at 1, 5, 15, 25, and 35 years. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 3, 10, 20, and 30 years.
- IWL-2500 applies to examination of concrete and unbonded post-tensioning systems. IWL-2524 addresses examination of tendon anchorage areas, and IWL-2525 covers examination of corrosion protection medium and free water.

**2. Alternate Examination**

- For the containment with the first Structural Integrity Test, all examinations required by IWL-2500 shall be performed at 1, 3, 10, and 30 years. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 5 and 20 years.
- For the containment with the second Structural Integrity Test, all examinations required by IWL-2500 shall be performed at 1, 5, and 20 years. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 3, 10, and 30 years.

**3. Justification for Granting Relief**

- The design pressure for the building is 56.5 psig, but the calculated maximum pressure that could occur following a LOCA is 41.2 psig. This results in a design margin of 37% [ $56.5/41.2 = 1.37$ ].
- The concrete surface areas of the Unit 1 and Unit 2 reactor containment buildings were visually examined one, three, five, and ten years following completion of the containment structural integrity tests. No damage or degradation of the concrete surfaces was identified during the examinations.

#### **4. Previous Test Results**

- The progression of tendon pre-stress loss is close to the predicted behavior. The IWL-3221.1(b) limit for acceptability is 95% of the predicted value. The trend lines for the four tendon groups show that all four are projected to remain in the acceptable range for the life of the plant.
- The worst-case trend is for Unit 1 horizontal tendons which are trending toward 95.9% of predicted lift-off force at year 60 of plant life (i.e., predicted value minus 4.1%).
- A tendon wire, anchorage hardware, corrosion protection medium, and concrete surrounding the bearing plates of the selected tendons were inspected and tested during the first, fifth, and tenth year surveillances. The tendon wires and anchorage hardware were free of corrosion with no signs of cracking.
- Samples of the corrosion protection medium were tested for water content, reserve alkalinity, concentrations of water soluble chlorides, nitrates, and sulfides. The values were well below the acceptable limits as specified in Table IWL-2525-1.
- The concrete surface surrounding the bearing plates was visually inspected for evidence of cracks greater than 0.01 inch in width. The only cracks identified were minor surface shrinkage cracks, a normal characteristic of concrete.

#### **5. Summary**

- Over the ten-year history of test and examination, the post-tensioning system has behaved as designed, and no damage or degradation of the concrete surfaces was identified during the examinations.
- All tendon groups at the South Texas Project are following a trend that is projected to remain acceptable for the 60-year life of the plant (assuming a 20-year life extension).
- The design has a substantial margin of safety, meaning that pre-stress loss would have to be far greater than predicted to threaten the ability of the containment structure to withstand the calculated accident pressure loads.

**Mail Envelope Properties** (3B30E95D.527 : 21 : 21114)

**Subject:** RAI  
**Creation Date:** 6/20/01 2:20PM  
**From:** David Jaffe

**Created By:** DHJ@nrc.gov

<b>Recipients</b>	<b>Action</b>	<b>Date &amp; Time</b>
txu.com	Transferred	06/20/01 02:20PM
jseawright ( <u>jseawright@txu.com</u> )		

<b>Post Office</b>	<b>Delivered</b>	<b>Route</b>
		txu.com

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
Mail MESSAGE	652	06/20/01 02:20PM

**Options**

**Auto Delete:** No  
**Expiration Date:** None  
**Notify Recipients:** Yes  
**Priority:** Standard  
**Reply Requested:** No  
**Return Notification:** None

**Concealed Subject:** No  
**Security:** Standard

**To Be Delivered:** Immediate  
**Status Tracking:** Delivered & Opened

**From:** David Jaffe  
**To:** jseawright@txu.com  
**Date:** 6/20/01 2:20PM  
**Subject:** RAI

I just got these late questions on the power uprate. Please call me.

**From:** Cheng-Ih Wu  
**To:** David Jaffe  
**Date:** 6/20/01 2:12PM  
**Subject:** rai - CPSES power uprate

David,

Please talked to TXU for the attached RAI. Please let me know, should you have a question.

Thanks.  
John

1. On page 26 of Attachment 2 to the reference submittal, with regard to U-bend fatigue evaluation, you indicated that fluid elastic vibration and fatigue of unsupported, small radius U-bends can occur and lead to significant fatigue usage when "denting" is present at the top tube support plate. The model DS steam generators installed in CPSES Unit 2 are not susceptible to "denting" and therefore this issue is not applicable to Unit 2. An evaluation was performed and determined that the revised design conditions will increase the susceptibility of several tubes in the Unit 1 steam generators. Provide a summary of evaluation for the fluid induced vibration and fatigue of the U-bend for Sgs in Unit 1. Confirm whether corrective actions are required on the SG tubes for the proposed power uprate. Also, provide the following information for Unit 1 similar to that you provided for Unit 2 in the previous power uprate submittal: the maximum calculated stress and CUF for the critical locations (such as the vessel shell, secondary manway bolts, and nozzles), the allowable code limits, and the Code and Code edition used in the evaluation for the power uprate. If different from the Code of record, provide a justification. Also, provide an evaluation of the flow-induced vibration of the steam generator U-bends tubes due to power uprate regarding the analysis methodology, vibration level, computer codes used in the analysis and the calculated cross flow velocity.
2. On page 28, Section C of Attachment 2 to the reference submittal, you stated that a detailed evaluation of Unit 2 non-NSSS systems, structures, components, and related programs was completed which demonstrated continued compliance with all CPSES applicable industry and regulatory requirements at a core thermal power of 3458 MWt. This Unit 2 evaluation also specifically addressed Unit 1 applicability throughout, identifying those unit-specific areas of design documentation that remain to be reviewed to substantiate similar conclusions to support a Unit 1 uprate. Based on the Unit 2 evaluation conclusions, the similarity of the two CPSES units, and awareness of the unit differences that might be sensitive to the revised operating conditions, Unit 1 is expected to also remain in compliance with all CPSES applicable industry and regulatory requirements at a core thermal power of 3458 MWt. The detailed evaluation of Unit 1 non-NSSS systems, structures, and components and related programs will be completed prior to implementation of the requested Unit 1 uprate. Please provided this information regarding the evaluation of the BOP piping and supports, the analysis of high energy line break and jet impingement due to the effects of the proposed power uprate condition. Confirm whether the safety-related valves will be in compliance with the design basis and operational requirements at the power level of 3458 Mwt. Also, confirm whether and how the proposed power uprate will not have impact on the CPSES Unit 1 and 2 commitments and responses to Generic Letter (GL) 89-10 regarding Motor Operated Valves, GL 95-07 regarding pressure locking and thermal binding of gate valves, and GL 96-06 associated with the possible overpressurization of pipe segment during a LOCA.

#### REFERENCES

TU Electric Letter (Log # TXX-01042) to the NRC, "Comanche Peak Steam Electric Station Units 1 and 2, Docket Nos. 50-445 and 50-446, Submittal of License Amendment Request Increase in Units 1 And 2 Reactor Power to 3458 MWt," dated April 5, 2001 with Attachments.