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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
REQUEST FOR ADDITIONAL INFORMATION REGARDING
STEAM GENERATOR TUBE REPAIR USING LASER WELDED
SLEEVES

REF: 1) TXU Electric Letter, logged TXX-01071, from Mr. C. Lance Terry to the NRC dated April 11, 2001

Gentlemen:

In the referenced letter TXU Electric stated that it would provide the NRC staff an opportunity to review calculation TH-97-08 "Sleeve Code Multiplier for Excess Conservatism". On August 16, 2001 TXU Electric met with the NRC staff. The purpose of the meeting was to discuss the NRC staff's review of the Westinghouse calculation that had been submitted in support of the laser welded sleeving of the CPSES, Unit 1 Steam Generators.

During this aforementioned meeting, additional information was requested by the NRC staff. The information requested, as we understand it, and TXU Electric's responses are as follows:

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Question 1

On page 19 of the calculation TH-97-08, the reason for the SLEEVE code, the test data multipliers being different is stated to be unknown. Since the difference is somewhat surprising, could this be an indication of a code error or unrecognized test anomaly? What is the implication?

TXU Electric Response:

The main purpose of the test program is to show that the SLEEVE code can conservatively predict the increase in tube hydraulic resistance from installation of a sleeve. The test data show that the SLEEVE code overestimates the sleeve hydraulic resistance (expressed as hydraulic equivalency number) for every test case. In particular, the code substantially overpredicts the effects of installing a hot leg sleeve. Since most sleeves are installed on the hot leg side, the SLEEVE code prediction is very conservative.

The test data show a consistent trend with relatively small scatter. Loss coefficients for the test articles without a sleeve obtained from 4 test series (2 each – hot leg and cold leg locations – for 30" and 36" sleeves) fall in a tight band, thus indicating there were no anomalies in the test procedure or measurement techniques. The SLEEVE code utilizes simple correlations used often to calculate frictional and form losses in a fully developed pipe flow. Hot leg sleeves are located at the inlet end of the tube where the fully developed flow assumption may not apply, which may partly explain why SLEEVE code over predicts the hydraulic resistance for hot leg sleeves. One of the reasons for carrying out a test program was to ensure that equations for a fully developed flow would yield conservative results for hydraulic equivalency.

Essentially all sleeves are installed on the hot leg side for which the SLEEVE code is demonstrated to yield conservative results. Furthermore, the effect of installing sleeves on the total flow through the tube bundle is small in comparison to that from tube plugging. The SLEEVE code can be used conservatively to predict hydraulic sleeve equivalency.

Question 2

Similarly, calculation TH-97-08 on page 18 shows a reversal of the multipliers between the hot leg side and the cold leg side. The 30" sleeve multipliers are larger for the former. The reversal occurs for the latter. Why?

TXU Electric Response

The hydraulic equivalency multiplier for the cold leg sleeves fall in a narrow band (1.25 to 1.55) for both 30" and 36" sleeves and the data scatter for each sleeve is comparable to the band width. So, no meaningful conclusions can be drawn from the apparent differences noted in the two data series.

Question 3

Page 34 of the subject calculation illustrates a coupling in the unsleeved test section. This appears to introduce non-conservatism in the test results. (See page 13. The effect is the opposite of the conservatism introduced there.) On page 36, new tests are identified without the coupling (last sentence). How was the coupling addressed and what is its effect?

TXU Electric Response

Since a Swagelok union is used in both test articles with and without a sleeve, it should have no effect on hydraulic equivalency calculation for the test specimens. Also, increase in hydraulic resistance due to the presence of a Swagelok union is expected to be small in comparison to the total resistance. The test program has clearly shown that the hydraulic equivalency value calculated using the SLEEVE code is very conservative, especially for hot leg sleeves. A small perturbation introduced by a Swagelok union in the middle of the test sections should no effect on the overall conclusion that the SLEEVE code prediction is very conservative.

This communication contains no new licensing basis commitments regarding CPSES Units 1 and 2.

If you have any questions please contact Obaid Bhatty at (254) 897-5893 or Douglas W. Snow at (254) 897-8448.

I state under penalty of perjury that the foregoing is true and correct.

Executed on September 12, 2001.

Sincerely,

C. L. Terry

By: Roger D. Walker
Roger D. Walker
Regulatory Affairs Manager

OAB/dws

c - E. W. Merschoff, Region IV
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