

The Light company

Houston Lighting & Power

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January 26, 1990
ST-HL-AE-3284
File No. G3.03
10CFR50

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

South Texas Project Electric Generating Station
Units 1 & 2
Docket Nos. 50-498 & 50-499
Additional Information Regarding
Surge Line Stratification at STP (IEB 88-11)

Reference: Letter from S. L. Rosen to NRC Document Control Desk dated
March 14, 1989 (ST-HL-AE-3016)

In the referenced letter Houston Lighting & Power (HL&P) committed to monitor STP Unit 1 pressurizer surge line temperatures until the first refueling outage and update the staff regarding the results of the monitoring program. The objective of the program was to confirm that the pressurizer surge line stratification analyses documented in WCAP 12067, Rev. 1 were valid for South Texas Project Electric Generating Station (STP). The staff also requested that HL&P consider other industry surge line data.

Review of the South Texas Unit 1 pressurizer surge line monitoring data through the October 1989 heatup has been performed. Based on the review, it was determined that the pressurizer surge line transients defined in WCAP-12067 are conservative and are considered to bound the monitoring data; therefore, no further investigations of thermal stratification in the South Texas Units' surge lines are required. We also conclude that no additional monitoring data is required.

With the exception of one heatup cycle, the cases of stratification observed in the STP surge line were determined to be within the analytical bounds of WCAP-12067, Rev. 1. The exception was one heatup during which the system delta temperature ($T_{\text{pressurizer}} - T_{\text{RCS}}$) was observed to be outside the bounds of WCAP-12067, Rev. 1 (exceeded 320°F). HL&P has revised the operating procedures to prevent recurrence of this condition and the WCAP consequently bounds the surge line transient conditions expected from STP operating practices.

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The WCAP analyses were performed assuming that one of the surge line supports included in the original design had been removed in order to reduce thermal stresses. This support was removed from Unit 1 in February, 1989, and from Unit 2 prior to issuance of the low power operating license. The excessive delta temperature condition noted above occurred subsequent to the removal of this surge line pipe support. Although the support did not contribute to the stresses in the observed cycle, HL&P reviewed Unit 1 operating records for the time period prior to the support's removal (before February 1989) to determine if the support may have contributed to the stresses in previous cycles. The review concluded that it was likely that the support did contribute to the stresses in the previous cycles.

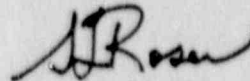
An evaluation of the stress effects of the support has been performed. The evaluation considered the actual system delta temperature and operational cycles experienced prior to the removal of the support. Fatigue usage factors were calculated for the combined effects of operations prior to the removal of the support and future operations (with system delta temperature limits of 320°F maximum) with one support acting. The evaluations were performed at the surge line Reactor Coolant Loop (RCL) hot leg nozzle safe-end (nozzle to pipe weld) and the first long radius elbow from the RCL hot leg nozzle. The total fatigue usage factors calculated at both locations were less than one, and hence meet ASME section III fatigue requirements as stated in Subsection NB-3600. Additionally, pipe stresses were shown to satisfy ASME Section III limits.

The effects of operation with the support in place on the surge line leak before break (LBB) fatigue crack growth analyses will be determined. Preliminary evaluations indicate that the results will not change the conclusions in the surge line LBB analyses. HL&P will provide the staff with the conclusions by February 28, 1990.

Comparison between STP data and data from plants with similar operating practices yields the following:

- a) The maximum number of fatigue significant transients observed per heatup or cooldown for STP is 5. The average number of fatigue significant transients experienced by plants with similar operating practices is 11.3 per heatup or cooldown.
- b) The maximum pipe delta temperature observed in the STP data was 310°F (note: this was associated with the system delta temperature above the 320°F limit of WCAP-12067, Rev. 1 during plant heatup). This represents the highest pipe delta temperature observed in the group of plants with similar operating practices. It should be noted that the STP surge line was qualified for pipe delta temperature of 320°F. It should also be noted that other pipe delta temperatures observed at STP were less than or equal to 250°F, well within the design distribution of cycles vs relative strength of stratification used in the STP fatigue analysis.

If you have any questions, please contact Mr. A. W. Harrison at (512)972-7298, or myself at (512)972-7138.



S. L. Rosen
Vice President
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Construction

SLR/AWH/n1

Houston Lighting & Power Company
South Texas Project Electric Generating Station

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Revised 12/15/89


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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter)
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Houston Lighting & Power) Docket Nos. 50-498
Company, et al.,) 50-499
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South Texas Project)
Units 1 and 2)

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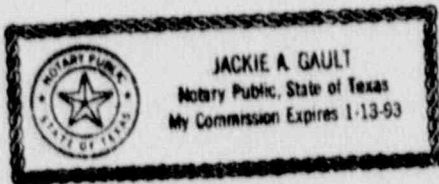
S. L. Rosen being duly sworn, hereby deposes and says that he is Vice President, Nuclear Engineering and Construction of Houston Lighting & Power Company; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached response to NRC Bulletin 88-11; is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge and belief.

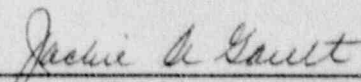


S. L. Rosen
Vice President
Nuclear Engineering and Construction

State of Texas)
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Subscribed and sworn to before me, a Notary Public in and for The State of Texas this *26th* day of *January*, 1990.





Notary Public in and for the
State of Texas