



ENERGY  
SERVICES

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October 2, 1984  
84042.019

Mr. J. B. George  
Project General Manager  
Texas Utilities Generating Company  
Comanche Peak Steam Electric Station  
Highway FM 201  
Glen Rose, Texas 76043

Subject: Phase 3 Open Items - Mass Participation  
Comanche Peak Steam Electric Station  
Independent Assessment Program - Phase 3  
Job No. 84042

References: (a) R. E. Baillard (G&H) letter to J. B. George (TUGCO),  
"Mass Participation," GTN-69454, dated September 14, 1984  
(b) N. H. Williams (Cygna) letter to J. B. George (TUGCO),  
"Phase 3 Open Items - Mass Participation," 84042.017, dated  
September 21, 1984

Dear Mr. George:

A Cygna reviewer was sent to the Gibbs & Hill New York offices on September 28, 1984 to evaluate the work performed on the mass participation reanalysis. Prior to arrival at Gibbs & Hill, it was Cygna's understanding that Gibbs & Hill was proceeding with the plan described in the reference (a) letter. Cygna commented on the approach in reference (b). The major steps associated with this plan are summarized below.

- (1) Rerun a sample of 35 stress problems using the unrefined response spectra and ADLPIPE version D.
- (2) Develop a screening criteria from this sample to determine which of the 272 stress problems require reanalysis on ADLPIPE version D. The criteria will be developed including parameters such as minimum mass necessary to include 90% of response, line sizes/support types versus design margins, and margins available due to the loads/load combinations.
- (3) Those stress problems/supports which do not meet the criteria will be rerun using ADLPIPE, version D. The site would then be provided with the hanger load summaries from the rerun problems so that they

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may evaluate each support with a load increase to determine if the design is capable of resisting the new load.

Cygna reviewed the results for 35 problems rerun in accordance with item (1) above. To develop the screening criteria, Gibbs and Hill had plotted the percent load increases versus mass fraction in each direction for each support in the 35 problems. Then, using the load data available from a previous unrelated study, a sample of 114 supports were used to develop a plot of support margins for various pipe sizes. The proposed screening criteria would be based on the application of these curves as follows:

- (1) Based on the existing mass fractions from each stress problem, determine the expected percent increase in support load from the plot of percent support load increase versus mass fraction developed from the 35 problems.
- (2) Enter the second set of curves and for each support in the problem determine what the average support design margin should be based on the 114 supports.
- (?) If the margin from item 2 is greater than the percent increase from item 1, the support would be considered acceptable. If not, the support would be given to the site for further review.

Based on a comparison of the plan described in reference (a) and Cygna's evaluation of the work actually being performed, we have the following comments:

- (1) The sample size for the support margin plots (114 supports) is insufficient to be considered representative of the plant. In addition, if defensible conclusions are desired, one must develop this plot based on support margins determined from the approximately 740 supports associated with the 35 stress problems.
- (2) It is Cygna's understanding that the site will be evaluating all supports in the 35 problems which showed load increases. Cygna believes it would be beneficial to identify the percentage by which each support passes or fails the increased load when the site personnel evaluate the supports load increases.
- (3) The plot of percent participation versus percent support load increase was developed using a reanalysis that employed refined response spectra. However, the comparison of support load increase was made to loads developed using the unrefined spectra. Since Cygna does not know whether the refined spectra are shaped differ-



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ently from the unrefined spectra, it is impossible to determine what effects are due to spectra changes. The process of developing criteria should be done varying one parameter at a time so as to be able to justify any conclusions based on the criteria. Cygna understood that the reference (a) plan called for running the first 35 problems using unrefined spectra in order to develop criteria, as opposed to a reanalysis to qualify more supports.

- (4) If the plots of average margin versus actual/average load are to have meaning, the percent margin must be used with the percent increase from the same spectra. That is, if unrefined spectra were used in developing the average loads and margins, then the graph of percent increase versus mass fraction must be based on unrefined spectra. This is necessary because the average unrefined load will be higher than the average refined load.
- (5) Page 2, item 5 of the attachment to reference (a) states ". . . criteria will be developed including parameters such as minimum mass necessary to include 90 percent of response . . ." Cygna is not aware of such a criteria having been developed.

If our interpretation of the Gibbs & Hill plan is not accurate, please call to discuss it more fully at your convenience.

Very truly yours,

N. H. Williams  
Project Manager

dmm

cc: Mr. S. Burwell (USNRC)  
Mr. S. Treby (USNRC)  
Mr. D. Wade (TUGCO)  
Ms. J. Van Amerongen (EBASCO/TUGCO)  
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