William G. Counsil
Executive Vice President

January 18, 1988

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
           DOCKET NOS. 50-445 AND 50-446
           PIPE WHIP RESTRAINT DESIGN METHODOLOGY
           SDAR: CP-87-53 (FINAL REPORT)

Gentlemen:

On July 29, 1987, we verbally notified your Mr. H. S. Phillips of deficiencies in the methodology used for designing pipe whip restraints. Specifically, three potential deficiencies have been identified in the calculations used to qualify pipe whip restraint designs. Our last interim report on this issue was logged TXX-6907, dated October 30, 1987. Due to the substantial evaluation required to determine whether or not this issue is reportable, and since we have already decided to reperform the pipe rupture design calculations utilizing a different methodology which will preclude a recurrence of these potential deficiencies, we have elected to deem this issue reportable under the provisions of 10CFR50.55(e). The required information follows.

DESCRIPTION

PIPERUP Version 1.3 is a computer program which was originally used on the CPSES project to obtain data used in the design of Pipe Whip Restraints (PWR) on high energy lines. The program models piping systems subject to High Energy Line Breaks (HELB), and calculates support reactions, internal forces, moments and system deflections as a function of time. This information is included in the Pipe Rupture Books.

On June 29, 1987, we were notified of deficiencies identified in the application of the PIPERUP Program by Gibbs & Hill, the original responsible design organization. We were advised that these deficiencies had been found not reportable under 10CFR21, but that it may be appropriate to review the concerns for reportability under 10CFR50.55(e). These concerns were:

1)   There are no calculations to justify the time steps (integration intervals) used in the PIPERUP runs to calculate the area (energy) under the restraints force-deflection curve.

400 North Olive Street   LB 81   Dallas, Texas 75201

2)   There are no calculations to justify the selection of arbitrary points where fictitious anchors were used in some PIPERUP runs.

3)   There are no calculations to justify the elimination of pre-steady state wave forces traveling through the piping system from the PIPERUP runs.

The cause of these potential deficiencies was failure to document the basis for assumptions made in application of the program.

The potential deficiencies discussed in this issue are specific to the calculations that utilize the PIPERUP computer program and do not suggest any other concerns.

SAFETY IMPLICATIONS

Improper application of the three subject concerns in modeling systems for PIPERUP runs could result in inadequate pipe whip restraint designs. Potentially non-conservative PWR designs could result in the inability of the PWRs to perform as intended during a postulated HELB. This could lead to an inability to attain and maintain safe shutdown.

CORRECTIVE ACTION

The Ebasco Systems Interaction Program (SIP) will reperform all previous pipe rupture design calculations as part of the overall HELB program. The methodology being used by Ebasco to perform the calculations will preclude a recurrence of the subject deficiencies.

Modifications (if any) required as a result of our evaluation will be identified and scheduled for implementation in the general construction schedule no later than August 11, 1988.

This is our final report on this issue. Corrective action will be tracked and statused via SDAR CP-87-133, entitled "High Energy Line Break Analysis." Our final report for SDAR CP-87-133, logged TXX-88118, was submitted on January 18, 1988.

Very truly yours,

W. G. Counsil

BSD/grr

c-Mr. R. D. Martin, Region IV
   Resident Inspectors CPSES (3)