APPENDIX B

URS/John Blume and Associates, Engineers
Docket No. 99900537/85-01

NOTICE OF NONCONFORMANCE

Based on the results of an NRC inspection conducted on January 8-10, 1985,
certain of your activities were not conducted in accordance with NRC require-
ments as indicated below:

Criterion V of Appendix B to 10 CFR Part 50 states: "Activities affecting
quality shall be prescribed by documented instructions, procedures, or
drawings, of a type appropriate to the circumstances and shall be accomplished
in accordance with these instructions, procedures, or drawings. Instructions,
procedures, or drawings shall include appropriate quantitative or qualitative
acceptance criteria for determining that important activities have been satis-
factorily accomplished."

Nonconformances with these requirements are as follows:

A.   Paragraph 5.(c) of the QA manual Section 4.3.3 states, in part, that "The
      verification process shall be performed to the extent required to verify
      the adequacy, accuracy, and reliability of the program results...and the
      validity of the technical models and algorithms."

      Contrary to the above, URS/John Blume did not demonstrate the accuracy of
      the pressure stiffening effect due to internal pressure on pipe elbows in
      PIPESD verification problem GEOM 06. Also, very large displacements
      (up to 9.4×10^8 mm) found in verification problem SPEC II do not verify
      either the accuracy of the results or the validity of the algorithms
      since PIPESD uses linear elastic material behavior and is, therefore,
      limited to small displacements. Further significant differences were
      found in the results of verification problems run on the computer code
      DRAIN2D and the results of the same problems run on ANSYS. Those
      comparisons were used to verify URS/John Blume computer code DRAIN2D.

B.   Criterion XVI of Appendix B to 10 CFR 50, states, in part, that "Measures
      shall be established to assure that conditions adverse to quality such as
      failures, malfunctions, deficiencies, deviations, defective material and
      equipment, and nonconformances are promptly identif'.d and corrected."

      Contrary to the above, URS/John Blume does not have in place measures to
      assure that the effects on designs, past and present, of computer code
      errors are promptly evaluated. One such error, designated PIP 002 by
      Control Data Corporation (CDC), was reported to URS/John Blume on or about

July 11, 1984. The effects of that error on safety-related piping designs had not been evaluated as of January, 1985. The error concerned the use of a stress intensification factor of 1.0 for concentric pipe reducers, whereas the appropriate factor is 2.0.