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80ETEC-DRF-3747

Mr. R. J. Bosnak, Chief
Mechanical Engineering Branch
Division of Engineering
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Summary of Documents Submitted to NPC by ETEC Concerning
The Midland Plant Units 1 and 2

- References:
- 1) Ltr 80-ETEC-DRF-0123, "Review of Response to 10 CFR 50.54 Request on Plant Fill for Midland Plant, Units 1 and 2", J. O. Bates to A. J. Cappucci, January 17, 1980
 - 2) Ltr 80-ETEC-DRF-0650, "ETEC Review of Draft MEB SER for Midland Plant Units 1 and 2", J. O. Bates to R. J. Bosnak, February 27, 1980
 - 3) Ltr 80-ETEC-DRF-3195, "Review of Underground Utilities Section of Interagency Agreement No. NRC-03-79-167, Task No. 1 - Midland Plant Units 1 and 2, Subtask No. 1 - Letter Report", J. O. Bates to A. J. Cappucci, July 30, 1980

Dear Mr. Bosnak:

Per the request of Mr. A. J. Cappucci, Jr. summaries of the documents submitted by ETEC to NRC - MEB concerning the Midland Plant Units 1 and 2 are enclosed. The documents submitted are References 1 through 3 listed above.

Sincerely yours,

J. O. Bates, Program Manager
Energy Programs Office
Energy Technology Engineering Center

Enclosure
As Noted

cc w/encl.: 4. L. Branner - NRC
A. J. Cappucci - NRC

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SUMMARY OF DOCUMENTS SUBMITTED TO NRC BY ETEC
CONCERNING THE MIDLAND PLANT UNITS 1 AND 2

- Reference 1 This is a review of Consumer Power Company responses to Questions 16-20 of the NRC 10 CFR 50.54(f) Revision 2 dated July 9, 1979. These questions concerned the effect of the plant fill settlement on the underground piping. In the review, concern was expressed over the following items:
- a) Buckling or crippling were not considered as failure modes.
 - b) The stresses were based on the current pipe profiles and not the expected differential settlement over the life of the plant.
 - c) The method outlined for calculating the stresses in the deformed piping was not particularly applicable for the profiled piping.
 - d) What is to be done if stresses approach or exceed code allowables.
 - e) The differential settlement between piping and building at areas of penetration.
 - f) The additional loading that may be imposed on active components due to differential settlement.

Some of these same concerns were again expressed in Reference 3 based on latter revisions to Consumers Power Company responses.

- Reference 2 The draft Safety Evaluation Report prepared by the NRC - MEB Staff based on the Midland 1 and 2 FSAR through Revision 21 was reviewed. It was found to be current with respect to the FSAR with no changes being required at the time.

The major remaining unresolved issues were:

- 1) Asymmetric cavity pressurization.
- 2) The effect of building settlement upon mechanical components.
- 3) Seismic qualification of mechanical and electrical equipment.
- 4) The completion of the confirmatory analysis.

Reference 3 Section g of the referenced report was reviewed and in general ETEC concurred with the concerns expressed therein. A summary of our comments follow:

- a) Methods of measuring in-situ stresses in the pipes should be investigated.
- b) Based on an elastic analysis, our calculations show maximum stresses as high as 212,000 psi in the buried pipe whereas the maximum stress calculated by CPC is 27,000 psi. These stresses are bending stresses based on the pipe profiles.
- c) Stresses other than bending stresses are also of concern. The external crushing loads required to cause the pipe to deform with a relatively sharp radius of curvature, as shown in some areas of the profiled pipes, will be high. This could induce high stresses and local crippling.
- d) Local crippling can also occur due to the high bending stresses, sudden changes in slope such as at building penetrations, attachments to heavy equipment and sharp dips in the pipe profile.