UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE 1

JUN 15 1982

Docket Nos.: 50-329/330

MEMORANDUM FOR: Elinor Adensam, Chief
Licensing Branch #4
Division of Licensing

FROM: Franz P. Schauer, Chief
Structural Engineering Branch
Division of Engineering

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - MIDLAND PROJECT

Plant Name: Midland Project
Licensing Stage: OL Application Review (Remedial Actions)
Docket Nos.: 50-329/330
Responsible Branch and Project Managers: LB #4, D. Hood/R. Hernan
Review Status: Continuing

REFERENCES:

1. J. W. Cook Letter to H. R. Denton, dated April 22, 1982.
2. J. W. Cook Letter to H. R. Denton, dated April 23, 1982.
3. J. W. Cook Letter to H. R. Denton, dated April 30, 1982.
4. J. W. Cook Letters (2) to H. R. Denton, dated May 7, 1982.
5. J. W. Cook Letters (2) to H. R. Denton, dated May 10, 1982.
6. J. W. Cook Letter to H. R. Denton, dated May 14, 1982.
7. Review Information on Fox Splice System for Underpinning.

The Structural Engineering Branch has reviewed the above referenced letters and their enclosures which have transmitted the Applicant's response to the staff's information requests related to the proposed remedial actions at the Midland site. The enclosure indicates the additional information needed by the staff in order to complete our review. Structural engineering information deliberately omitted from the above references was identified during May 1982.

The enclosure was prepared by Frank Rinaldi of the Structural Engineering Branch. Comments by SEB consultants (Dr. G. Harstead and Mr. J. Matra) have been incorporated in the enclosed questions.

Franz P. Schauer, Chief
Structural Engineering Branch
Division of Engineering

Enclosure: As Stated

cc: R. Vollmer
J. Knight
R. Tedesco
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R. Hernan
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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION

BY STRUCTURAL ENGINEERING BRANCH

MIDLAND PROJECT

REFERENCE 1:

Submittal of April 22, 1982 on Additional Staff Concerns related to the Borated Storage Tank and the Service Water Pump Structure

BWST:

220.5 Provide the results of your analyses for the evaluation of the tank's wall and base which consider the concentrated eccentric loads imposed by the jacking operation.

220.6 Indicate what course of action you propose to take if the strain gauges during the jacking show that the tank's permissible stress/strain limits have been exceeded. Also, identify the allowable limits and acceptance criteria used in this determination.

220.7 You have indicated that the BWST will be elevated 1 1/2 inches therefore requiring coupling nuts and threaded rods to lengthen the existing anchor bolts. Justify the use of the coupling nuts and threaded rods for the loads/load combinations and the applicable acceptance criteria.

220.8 With reference to Confirmatory Issue 2 clarify the gap shown in Figure BWST-8 and justify the acceptance criteria for crack width and strain values.

SWPS:

220.9 In Confirmatory Issue 1, you state that it is not possible to calculate the existing stresses in the overhang portion of the SWPS. However, you also state that an evaluation of the building in its current state has not revealed a structural distress. Explain these contradictory statements.

220.10 Averaging strain over 20'-gage length is not acceptable if it includes high and low stress regions. The length should be

determined by the general dimensions of the region of potential (constant) high stress. The staff requires the use of smaller gauge lengths located in pre-determined high stress areas or vertical settlement measurements at pre-determined locations following the above criteria. The acceptance criteria to be established for either of the above could be determined from the finite element analyses.

220.11 Provide the results of your evaluation showing the effectiveness of the grouted dowels in carrying the calculated load/load combinations (tension and shear) in conjunction with stated code allowable values.

220.12 With regard to Confirmatory Issue 10 identify the values of the actual applied shear loads, compare them to the code allowable shear and determine any additional available safety margins.

220.13 With regard to Confirmatory Issue 11, provide similar information provided for the north and south walls for the east and west walls. The figures should indicate the code allowables as a solid line to be used in our evaluation.

REFERENCE 2:

Submittal dated April 23, 1982, on Borated Water Storage Tank foundation OL design calculations.

No open items.

REFERENCE 3:

Submittal dated April 30, 1982, on Effects of Cracks on Serviceability of Concrete.

220.14 In your evaluation of the proposed crack repair program, you state that the effects of the pH-levels and SO_4-levels are not significant because the results of your evaluation indicated acceptable levels. State if you plan to monitor the pH and SO_4

levels to assure that acceptable levels are maintained during plant operation.

220.15 In your evaluation on the crack repair program you propose to epoxy existing cracks for structural components at elevations effected by the ground water table from the inside face of the pertinent slab/wall. Discuss why you feel that epoxing of the exterior faces are not needed in terms of effects on the reinforcing bars.

220.16 In your proposal for crack repairs, you plan to epox cracks in structural components (walls/slabs) below the permanent water table and splash areas. However, you do not propose repair of all cracks related to the soil-fill problem which exceed a crack width of 12 mils. It is the staff position that all cracks exceeding 12 mils effected by the soil fill should be epoxed after the completion of the underpinning of the effected structures and before operation of the plant.

REFERENCE 4:

Submittal dated May 7, 1982, on Limit Analyses to Evaluate SWPS East/West Wall Capacities.

220.17 With reference to Appendix B, show that the reinforcing in the wall at Section A-A satisfies the reinforcing requirements identified by the applicable code(s). Also, indicate the values assumed for the coefficient of friction.

Submittal dated May 7, 1982, on Soil Impedance Functions of the Auxiliary Building Electrical Penetration Wings.

220.18 The information provided in this report confirms the fact that the techniques used to calculate soil springs are adequate. However, the staff requires that the three peaks in floor response spectra resulting from a variation of $\pm$30% of the soil stiffness should be enveloped. State your intent to comply with the above staff requirement.

REFERENCE 5:

Submittal dated May 10, 1982, on ASLB Soils Order

No Open Items.

Submittal dated May 10, 1982, on Borated Water Storage Tank Foundation OL design calculations.

No Open Items.

REFERENCE 6:

Submittal dated May 14, 1982, on Additional Staff Concerns on Underpinning of the Auxiliary Building.

No Open Items.

REFERENCE 7:

Review of Fox Splices System for Underpinning.

220.19 Provide drawings identifying location of splice system for the proposed underpinning structures for the Auxiliary Building and SWPS. Also identify the stress/strain levels at these locations and provide a comparison to allowable code values. In addition, the information under review provides conclusive results only for standard couplers for #14 and #11 rebars, but does not give test results on standard couplers for #9 rebars. From conversations with Consumer Power Co. (K. Razdan) you indicate the possible use of standard couplers for #9 rebars. Therefore, it is required that these test results be submitted for review.