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December 22, 1983

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MIDLAND ENERGY CENTER
AUXILIARY BUILDING JACKING CRITERIA
FILE 0485.16 SERIAL 22317

REFERENCE: OCTOBER 24, 1983 LETTER FROM J A MOONEY
TO J J HARRISON, SERIAL CSC-6960

On December 15, 1983, there was a conference call between Consumers Power Company and the NRC to discuss NRC concerns relative to the observed upward movements and jacking of Reserve Capacity Loads (RCL) for the Auxiliary Building. Subsequently, on December 16, 1983, R Landsman called J A Mooney and suggested, for CP Co consideration, that the following interim action/guidelines for maintenance of building elevation be employed until the proposed January 4-6, 1984 meeting between the NRC and CP Co to discuss these issues:

1. All instrumentation data to be baselined to August, 1982, when the instrumentation system became operational. (The instrumentation data is presently baselined to December, 1982, which corresponds with the initial excavation under the Turbine Building.)
2. For downward movement, the limits for Δ_1 , the North-South differential settlement after compensating for rigid body motion, would remain as stated in SSER Table 2.7.
3. For upward movement, Δ_1 should not exceed 0.050 inches.
4. Δ_2 , the East-West differential settlement between the Electrical Penetration Area (EPA) and Control Tower after compensating for rigid body motion, should be held between 0.0 to 0.050 inches upward movement.
5. If at any time Δ_1 and Δ_2 exceed the guidelines given in (3) and (4) above, the elevation of the building should be adjusted by jacking.

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6. Grillage jacking loads to maintain the building elevation within the guidelines of (2), (3) and (4) above, may be adjusted as necessary provided the jacking loads applied do not overstress the building.
7. The jacking loads for piers which do not support grillage beams remain as specified in SSER Number 2.

Subsequently, project personnel discussed these suggested action guidelines. The following is a summary of pertinent data and our conclusions regarding implementing these suggestions:

1. The present Δ_1 values, from August 1982 baseline, are as follows:

<u>Location</u>	<u>Values Read From Graph to NRC in 12/16/83 Telecon</u>	<u>Values Later Computed From Raw Data</u>
East EPA Tip	0.048 Inches Upward	0.042 Inches Upward
East Corner of Control Tower	0.021 Inches Downward	0.020 Inches Downward
West EPA Tip	0.026 Inches Upward	0.026 Inches Upward
West Corner of Control Tower	0.035 Inches Downward	0.035 Inches Downward

2. The present Δ_2 values, from August 1982 baseline, are as follows:

<u>Location</u>	<u>Values Read From Graph to NRC in 12/16/83 Telecon</u>	<u>Values Later Computed From Raw Data</u>
East EPA Tip	0.044 Inches Upward	0.041 Inches Upward
West EPA Tip	0.073 Inches Upward	0.075 Inches Upward

3. The upward Δ_1 value at the east EPA tip has almost reached the guideline. The upward Δ_1 values could increase further as the atmospheric temperature decreases.
4. The upward Δ_2 value at the west EPA tip exceeds the guideline. A further increase in Δ_2 values could occur as the atmospheric temperature decreases.
5. The jacking loads would have to be reduced for grillage 8 west to meet the suggested guidelines for Δ_2 . Reducing the jacking load may induce incremental tension at the top of the west EPA structure and is therefore considered undesirable for the structure.
6. The temporary underpinning of the EPA portion of the Auxiliary Building is accomplished by sequentially excavating, installing, and jacking grillages

at piers 8, then 5 and then 2. The following briefly describes the design approach for this operation:

- a. Initially apply predetermined design jacking loads, which are based on final tributary building loads shown as specified loads in the design documents. The building has been analyzed for these jacking loads and found to be structurally adequate.
- b.(1) Subsequent to initial jacking and meeting the acceptance criteria for pier settlement, control differential (not overall) structural movement in the downward direction at the tip of the EPA by increasing and/or adjusting jacking loads.
- (2) After the Grillage 8 cycle is complete and in advance of the excavations for each subsequent cycle, increase jacking loads to maintain active/positive control of the structure by preconditioning the soil support for the pier and distributing a portion of the increased load to the control tower.
- (3) The limits of these increased jacking loads are shown in the design documents as RCL. The building has been analyzed for the above conditions and found to be structurally adequate.
- (4) As the grillage at 2 is jacked, loads on grillages at 8 and 5 are adjusted to their specified loads which are the final tributary building loads.
- c. The application of loads results in upward differential movement of the structure as explained in the referenced letter.

All design and construction documents, which meet the SSER, are based on the above design approach.

7. A rereview of the design approach and subsequent revisions to the existing design and construction documents would be required to implement the suggested guidelines. Timely implementation of the suggested guidelines can only be accomplished by invoking Specification C-200 which is applicable for emergency conditions. We believe that implementation of Specification C-200, to accommodate the suggested guidelines, is not prudent.

These conclusions were communicated to R Landsman and J Harrison by J A Mooney in a subsequent telephone call of December 16, 1983.

In subsequent discussion with the NRC the following interim rejack criteria for the grillages at 8 were developed: The rejack criteria in response to the building movement will be triggered only by Δ_2 values as opposed to the present trigger values of 0.010 inches (absolute) in 48 hours. If Δ_2 decreases and is trending toward 0.010 inches upwards, rejack will be instituted. Jacking loads will be increased such that the Δ_2 value does not exceed 0.050 inches upwards after lockoff.

We are continuing to evaluate the suggested guidelines for upward movement and will be prepared to fully address these issues at the January 4-6, 1984 meeting.

J. Amos