

Meeting of Sept. 17, 1981 on Service Water Structure

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from D. Hood

MEETING BETWEEN NRC STAFF AND CONSUMERS POWER COMPANY

10/35

SEPTEMBER 17, 1981

"Preliminary Design of Modifications to Midland Service Water Pump Structure to Resolve Concerns Resulting from Inadequate Compaction of Site Fill."

During construction of the Midland plants, unexpected settlement of some structures was observed. This observation resulted in a need for remedial actions to improve the support of certain structures which are founded on fill material which was apparently compacted inadequately. This meeting was held at the request of Consumers Power Company to discuss the preliminary design of remedial modifications to the Service Water Pump Structure.

The Service Water Pump Structure is founded partially on original soil and partially on fill material. The remedial modifications involve provision of additional support to that portion founded on fill to prevent excessive settlement which might damage the structure.

The schedule for design and installation of these modifications was discussed by Dennis Budzik (CPCo) and is summarized in a slide (attached). Preliminary Analysis and Design have been completed and an installation specification has been issued for bid. The final analysis is yet to be completed; following this analysis, a revision to the FSAR will be made incorporating the design of these modifications. The FSAR revision is presently scheduled for February or March, 1982. It was noted that this schedule is not consistent with completion of NRC review to support issuance of a Safety Evaluation Report in May 1982. CPCo acknowledge this schedular problem and it was agreed that final acceptance of these modifications would have to be addressed in a Supplemental SER.

Bimal Dhar (Bechtel) and Edmund Burke (Muesa, Rutledge, Johnson & Densmore) described the design and installation scheme for the modifications to the Service Water pump Structure. The slides used in this presentation are attached. The portion of the structure founded on fill material is to be supported by an underpinning wall to be constructed beneath the present structure. The underpinning wall will be founded on undisturbed material and will consist of a continuous perimeter reinforced concrete wall to be constructed in sections or "piers". The wall will be attached to the existing structure by bolts anchored to the wall of that portion of the structure founded on original material and by through-bolting to the floor of the portion now founded on fill.

Preliminary design analyses have been completed in the following areas:

1. Margin to sliding and overturning.
2. Bearing Pressure.
3. Evaluation of the Adequacy of reinforcing steel and its connections.
4. Evaluation of the base slab (592' elevation) for bending moment and shear.
5. Evaluation of the base slab currently founded on fill (620' elevation) under the new conditions imposed by the modified support.
6. Evaluation of shear and moment imposed on the east and west walls.

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Final analyses are in progress and will be reflected in a future revision to the FSAR.

Construction of the underpinning wall in piers is necessitated by the need to maintain support of the existing structure during construction. This installation scheme will therefore require the horizontal reinforcing steel bar to be spliced. The confined working space and problems with toxic fumes which may be created by welding operations dictate a mechanical splice. CPCo has elected to use a mechanical splice manufactured by Fox-Howlett. This design is the subject of a topical report previously submitted for NRC review by the manufacturer; correspondence between Fox-Howlett and NRC Staff (copies provided at the meeting by CPCo) indicate that some review was performed but final approval of the topical report was not granted principally because no applicant had yet proposed use of this connection. Use of this connection will thus require NRC approval either by approval of the pending topical report or approval of this specific application.

During the discussion period, several items of additional information were requested by the NRC Staff. As a result of these requests, CPCo agreed to provide the following:

1. A description of the crack monitoring to be performed and the criteria to be used for acting on the results of this monitoring.
2. Plans for monitoring of the groundwater table during this work (peizometer).
3. Values and methodology basis for soil spring constants used in the design. (CPCo agreed to develop a schedule for providing this information and to inform the Project Manager of this schedule.)
4. A discussion of the criteria to be used during construction for evaluating pier settlement (to include criteria for determining that a bearing capacity problem may exist).
5. Settlement predictions for the final structure.
6. An estimate of the changes to the bearing pressure on the existing structure due to the modification and its post-tensioning process.
7. Formal documentation of the information on settlement monitoring discussed during this meeting which has not previously been submitted to NRC.