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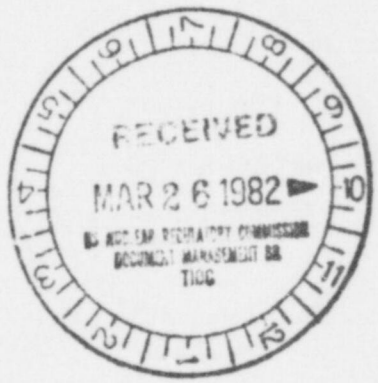

Docket Nos: 50-329
and 50-330 OM, OL

APPLICANT: Consumers Power Company

FACILITY: Midland Plant, Units 1 and 2

SUBJECT: SUMMARY OF MARCH 8, 1982 TELEPHONE CONVERSATION REGARDING SOIL SPRING STIFFNESSES FOR AUXILIARY BUILDING UNDERPINNING AND PHASE II CONSTRUCTION

On March 8, 1982, Mr. Joseph Kane of NRR and NRR consultant Dr. S. Poulos participated in a telephone discussion with members of Consumers Power Company and Bechtel. The call discussed the soil spring stiffness values adopted by Bechtel as soils input in their structural analyses of the design of the Auxiliary Building underpinning at Midland Plant, Units 1 and 2. The call also identified some of the information needed by the NRC's geotechnical staff for its concurrence on the start of "phase II" of the construction activities for the underpinning of the Midland Auxiliary Building. Phase II generally provides for deepening of the vertical access shaft, construction of the first few piers beneath the adjacent Turbine Building and for limited tunneling beneath the Turbine Building and the Feedwater Isolation Valve Pits. Phase II is further defined by a Construction Sequence Diagram included as Enclosure 1 of the summary of a January 18-19, 1982 audit meeting, issued March 10, 1982.

Enclosure 1 is a summary of this telephone conversation.

Darl Hood, Project Manager
Licensing Branch No. 4
Division of Licensing

Enclosure:
As stated

cc: See next page

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NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY

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ENCLOSURE 1

RECORD OF TELEPHONE CONVERSATION

DATE: March 8, 1982, 3:30 pm PROJECT: Midland

RECORDED BY: Joseph D. Kane CLIENT: _____

TALKED WITH:	Bechtel	CPC	GEI	NRC
	J. Anderson M. Das Gupta	T. Thruvengadam K. Razdan	S. Poulos	J. Kane

ROUTE TO: INFORMATION

G. Lear
L. Heller
D. Hood
F. Rinaldi
S. Poulos
H. Singh
R. Landsman
J. Kane

MAIN SUBJECT OF CALL: ADOPTED SOIL SPRING STIFFNESSES USED IN DESIGN OF AUXILIARY BUILDING UNDERPINNING AND START OF PHASE 2 CONSTRUCTION

ITEMS DISCUSSED:

1. Attachments 1 and 2 to this telephone record provide the design cases and soil spring stiffnesses adopted by Bechtel as soils input in their structural analysis of the Auxiliary Building. The values of stiffness also on Attachment 2 under the column labeled NRC are the results of extensive discussions between NRC Consultants, S. Poulos, GEI, H. Singh, COE and J. Kane, NRC and represent the staff and its Consultants determination of the range of reasonable stiffness values which should be considered in design. The NRC values had been provided to Bechtel via telephone on March 5, 1982 as committed to by the Staff in the meeting of February 26, 1982 in Bethesda.

   The NRC recommended value of 70 KCF for the Main Auxiliary Building versus the Applicant's adopted 30 KCF for Case 2 is important because this difference has the potential to affect settlements which are to be tolerated during underpinning. Allowable settlements using the stiffness of 30 KCF had been provided on February 26, 1982 by M. DasGupta of Bechtel Corp.

2. Following considerable discussion on NRC recommended stiffness values (in both March 5 and March 8 telephone calls), Consumers expressed a willingness to use these values in their structural analysis but indicated the time needed to complete the required computer runs would impact their Phase 2 construction plans. As an alternative, J. Kane suggested that Phase 2 work be subdivided into two parts, the initial one beginning with work which would not affect the EPA and Control Tower area and the second part beginning after the analysis using the NRC recommended stiffness values had been completed by CPC and the results evaluated by the NRC staff. An acceptable line of demarcation between these two portions of Phase 2 work was tentatively identified as column lines 2.5 and 10.5 on the Construction Sequence drawing provided for the underpinning work at the February 3-5 design audit. These lines, respectively, are sufficiently west and east of the EPA and Control Tower to conclude that these structures would be unaffected by underpinning operations permitted by this initial portion of Phase 2 work.

3. Consumers agreed to provide a letter to NRC giving details which would permit the Staff to fully understand what work would be performed under this initial portion of Phase 2 work.

4. The following comments were given to Consumers concerning the monitoring plans during underpinning of the Auxiliary Building.

   a. Drawing C-1493(Q), "Monitoring Matrix," should be updated and values provided in the tolerance criteria column for staff concurrence before any portion of Phase 2 work is started.

   b. Sheet 8 of M. DasGupta's presentation on February 26, 1982 does not agree with previous drawings provided (Drwgs. C-1490 (Q) and C-1491 (Q)). Corrections in proper labeling of the deep seated bench mark locations on Sheet 8 and on Sheet 10 are needed and should be provided to the NRC.

   c. NRC expressed a concern for measurement of horizontal movement between the EPA and the Turbine Building and between the Control Tower and the Turbine Building during underpinning operations and suggested three monitoring devices be installed. One device at the top of each wing of the EPA's and one at the top of the Control Tower was recommended. Consumers responded that they were now planning to place instruments at those locations in response to questions raised by ASLB but had not yet updated the monitoring locations on Drawings C-1490(Q), C-1491(Q) and C-1493(Q). The Staff indicated that criteria on tolerable relative horizontal movement for these instruments should be established and furnished on the Monitoring Matrix drawing along with the basis for these limits.

   d. As previously discussed at the February 26, 1982 meeting in Bethesda, the Staff anticipates a submittal by Consumers identifying the acceptance criteria for the strain gages to be placed at El.659 on the Auxiliary Building.

5. Consumers indicated that the six deep seated bench mark instruments located on Sheet 8 of M. DasGupta's presentation will be in operation before beginning Phase 2 work. Installation of the additional instruments at top of the EPA's and Control Tower and the strain gages at El 659 and the results of the structural analysis using NRC recommended stiffness valves are to be completed before the second portion of Phase 2 work is started.

6. J. Kane indicated that subdivision of Phase 2 underpinning work into two portions is subject to the approval of NRC Project Management and Structural Engineering Branch. It was also indicated that other conditions which could affect the start of Phase 2 work may be identified by the Staff. The original intent of this telephone conference call was to discuss soil spring stiffnesses but was not intended to address the start of Phase 2 work.

SOIL SPRING STIFFNESSES

Cases Considered

1. Normal Soil Springs - Springs used to represent subgrade for analysis of structure for FSAR loading conditions. (A subcase of this is the seismic condition).

2. Existing Condition - Springs used to represent subgrade for analysis of existing state of stress in the structure.

3. Long Term Settlement Condition - Springs which represent the behavior of the structure due to secondary consolidation of the structure after lock-off.

The springs for Case 1 are based on settlement data obtained since 1977 and the load increment added during that time. For the seismic subcase the springs are based on the stiffness used in the seismic model.

For the second case (existing condition) the springs are computed at the center of each area using elastic half space theory and assuming a flexible footing.

For the long term settlement case the springs are computed from the estimated settlement after lock-off and the estimated loads. There are two subcases which were considered: 3a) Where the [illegible] areas settle more than the main auxiliary building

Design Conditions	UNIT SPRING STIFFNESSES (KCF)					
	BECHTEL			NRC		
	E.P.A	C.T.	M.A	E.P.A.	C.T.	M.A.
Case 1						
Normal Soil Springs	180	180	80	Acceptable to NRC		
Case 2						
Existing Condition	17	18	30	Acceptable to NRC		70
Case 3(a)						
Long Term Settlement	410	350	1,160	180	240	580
Case 3(b)						
Long Term Settlement	160	350	230	Acceptable to NRC		

E.P.A. - Electrical Penetration Area
C.T. - Control Tower
M.A. - Main Auxiliary Building

Attachment 2