

5/20/81

ldz

32/06

Hari Singh

~~Service Water Structure~~

Electrical Penetration Area

50.55(e)

MCAR 24, Interim Rpt # 6, Pg. 4 ^{entire for Unit 1, part Unit 2}

"15' of backfill mat'l under EPA & FIUP has not been sufficiently compacted."

Corrective Action - Prior to Dec 6, 1979 - See MCAR 24, Inter. Rpt. 7 Aug 10, 1979

Remedy 1) Provide caissons @ extremities. Perm & positive support

Remove unsuitable fill below FIUP

Support $\frac{1}{2}$ DL + $\frac{1}{2}$ LL, other support control tower

4000 Kips vertical

CDE Review Comments

CPCo did not support or provide engr. analysis for the 4000 kip vertical loading. No way to evaluate feasibility of proposal in absence of analysis.

Fig. 89 & 90 (Interim Rpt. 6) show 10 caissons @ each end. Arrangement will result in 400 Kips load on each caisson w/d' embedment in glacial till. Closely spaced - not feasible - margin of safety

No analysis - can't evaluate feasibility
concerned bearing capacity - how 4000 Kips established

$\frac{1}{2}$ load from each = 8000 Kips to control tower

CPCo did not investigate add'l load on control tower (settlement concern)
Could place add'l stresses on Auxil Bldg portion founded on till
NRC can't evaluate

Concern w/uneven distribution of loading $\frac{1}{2}$ 2 of 2
Progressive failure of caissons (3 rows) - Heavily stressed inner row
of caissons - outer row not stressed. Cause settlement & plunging.
Must make monolithic to eliminate this concern

Service Water Structure
MKAR 24 Jun 11, 1979 Rpt. 6

Corrective Action

Para 16 (or 18) - 100 ton pile capacity, - north wall
NRC Review of proposal showed it to be inadequate

In Interim Rpt. 7 Fig. 21 on top

DL + LL + Earthquake - 2790 Kips

Used 16 piles $\times 100 \text{ ton/pile} = 3200 \text{ Kips}$ ^{greater, than OK}

Have calculated $\frac{\text{DL Kips}}{\text{length}} \times 86' \text{ length} = 3956 \text{ Kips}$
DL only

$\therefore 110 \text{ ton per pile (DL only)}$

Using $6L = 200 \text{ lb/ft} = \text{adds } 10 \text{ tons per pile}$

CDE Review Comments

- Loading presented ^{not substantiated} appears not to address earthquake loading
- Effect of lateral load ignored in pile design
- Corbel connection w/dowels - stresses not investigated
- More than 18 piles needed - limited space because of conduits

Comments of H. Singh on unresolved safety issues Prior to visit Diesel Generator Building

Diesel Generator Bldg

MCAP Interim Rpt 1, 22 Oct 1978 Exceeded predicted value of settle

Rpt 2, 15 Dec 1979, p. 6 vs soft to to vs stiff clay
Rise of base - dense sand
clay is highly variable w/ some

Rpt 3, 27 Dec 1978, p. 3 CPCs concluded fill is soft

under own weight

Column - Remove or Preload

Preloaded under 100% load

Based on preload program -

responded to Q4 (50.54)

H. Singh's remarks do not bear out w/ preload

Preload results provided questionable data (See Apr 1981 Rpt)

B. because of the variability of DGB footing - soil not

not subjected to even 200 ksf loading

- CPCs - can not conclude the entire area was preloaded

C. Pres. behavior after recharge removal. Behaved to

show excess pore pressure

D. Soil samples for pore installation - not possible to accurately

determine if is sand or clay. Questionable pore reading

since in sand the pore pressure would dissipate

2. CPCs accept criteria for fill (Table A) not given

(e.g. overstressed) what was given was only a settlement

measurement or estimate but not related to stress measured

CPCs response to Q4 did not demonstrate that induced stress

3. Later analysis (response to Q14) by CMA did not evaluate stresses nor give justification for adopted spring constant ^{values} (no considering future settlement)

4. Par. 2, Q14-2 - Self limiting strain - disagreement - settlement does have effect on magnitude of bending moment which when coupled w/ static bending moment could overstress beyond code.

5/27/81
1st

H. Singh's comments on Undergraduate Minutes

10 CFR 50.54(f) Questions

Pertinent Documents 4, 13, 17, 16, 18, 19, 34

1. Q13 Q16 indicates (p. 13-5) lack of backfill causes
reduces magnitude of subgrade reaction - less
curvature & stresses increased

2. Q17 (p. 17-1) Q16 indicates bending stresses are
secondary - not a direct force in failure
- Q16 diagrams - believe bending stresses are not
secondary because of settlement magnitude - believe
greater than pipe internal pressure

also that, p. 17-3 Q16 states settlement stress
will not approach code allowable

Q15, 4, 5, 3, 6 - show soft soils in form
of piping (Q15) to limited code

Questions for Midland Testimony To Support Order

in the various proposed remedial measures

check w/ response to interrogatory 23 5/6, 7, 10, 11, 12, B, M, L, N

What acceptance criteria ~~had been provided to the~~

~~NRC staff~~

do you feel were not provided to the NRC staff by CFCO prior to Dec. 6, 1979 relative to geotechnical engineering.

(Refer to responses to interrogatories, particularly no. 6
check wording in sect. 2 for difference between (when discussing dewatering - answer Warren continuation no. 2A & 2B)

With regard to the adequacy of ^{the} proposed remedial measures and
With the advantage of hindsight, do you ^{now} know of instances which would indicate that ^{the} issuance of the Dec 6, 1979 Order

modifying the construction permit was justified ^{check reasons stated by CFCO} cite Aug 10, 1979 summary

(Cite changes to SW structure, Auxil. Bldg (9 causes to latest) recognition of need to fix BWST, changes in dewatering concept - 200 to 300 wells to ? 40)
cite Staff concern with construction schedule indicated by Interim Rpt 7 & 8
& lack of knowledge on fix that existed @ that time. Indicate many other examples can be given to varying degrees of incomplete information

15/Box 4

x

Records filed in folder
labeled "Midland -
Interrogatories" maintained
by Joseph Kane.

Dep't of Justice - 46 - 39 PDR
7 XA