QUESTIONS ON WATERFORD 3 BASEMAT
3/26 MEETING IN BETHESDA

Allegations recently reported in a GAMBIT newspaper article and in staff investigations concerning the GAMBIT article have lead to the assignment of additional reviewers to evaluate the base mat adequacy. This transmittal is a composite set of Questions from the reviewers, and is intended to faciliate LP&L's preparation for the meeting on March 26, 1984 in Bethesda.

1. How many nonconformance reports were issued on the basemat? How many relate to poor concrete placement practices? What were corrective actions taken? Provide justification to substantiate your position that these practives could not have lead to the development of cracks or localized porous zones which may be the cause of water intrusion.

2. Where was water table when 1977 cracks were discovered?

3. Is there any evidence of convex curvature due to ring wall loading?

4. Provide X-Section maps of mat flexure over time period zero to present.

5. Provide complete documentation of groundwater control and foundation heave from the start of dewatering until the present time. Include the history of soil excavation and backfill beneath the mat.

6. Provide the foundation loading history under each block during construction of the mat and walls. This should include the distribution of pressure under each block. Include the location and history of loads due to backfilling adjacent to foundation blocks.

7. Provide complete settlement history for each block from initial pouring until the present time.

8. Analyse and discuss the relationship of the above variables (Qs 5-7 above) on the history of all observed mat cracks and leaks.

9. What basis is there for accepting the adequacy of construction of the first 3 blocks?

10. If engineering judgement was involved in accepting those blocks, what was the basis for that judgement? Where is it documented?

11. What corrective actins were necessary for the first 3 blocks? What corrective actions were taken, and provide specifics for each pour? Where are these actions documented?

12. Were any cracks discovered in 1977 outside of the ringwall? Provide documentation. If none were discovered outside ringwall why not infer that these three blocks were poorly constructed?

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13. Did Kominsky recopy illegible cadweld records? Under whose direction? Why? What happened to the original records?

14. Provide summary of actions taken following Hill's presentation of QA deficiencies. Provide detailed report on document review undertaken and all results.

15. Provide LP&L's evaluation of adequacy of Harstead's third report. Does LP&L assert that it represents their views as well?

16. Provide specific basis for Harstead's conclusion that the documentation problems do not affect their prior conclusion as to basemat's strength. What documents did Hartstead review? What did he look at? Did he see the Phearson-Briggs memo? Hill's NCR's? Other NCR's?

17. Provide differential settlement contours for 6 month periods, starting from early 1977 to present.

18. According to the settlement contours shown in figure 2.5.118, the curvature is concave downward in both directions. This implies cracks on the top surface in both directions which would not penetrate all the way through.

    In view of the above why did the water seep thru? Why dosen't the crack pattern match the given differential settlement?

    It is possible that there are localized convex surfaces on the mat which are not shown in the figure (the grid is quite rough)?

19. Please provide all soil properties (re. results of soil tests, reports confirmed compression test results, boring records, shear modulus etc).

20. Provide all concrete property data, rebar data, placement data (ie also detailed as built drawings of mats).

21. Provide any revised calculations that include settlement effects.

22. Is the Phearson memo accurate? What kind of actions has LP&L taken to respond to and resolve his allegations?

23. Memos of inspectors Hill and Davis, as reported in GAMBIT, stated that they found a broad range of deficiencies in virtually every record package examined and the situation demanded a complete review of all civil/ structural records. What is your response to this allegation?

24. GAMBIT reported that there was falsification on cadweld splices of reinforcing bars. What is LP&L's response to this allegation?

25. What were the problems in the seven NCR's on QA deficiencies in concrete, as mentioned in the last column on page 28 of GAMBIT, and how were they disposed of?

26. What were the problems of soils, waterstops, cadweld splices, and the placement of concrete, as mentioned in the third column on page 22 of Gambit, and how were they resolved?

27. Do the allegations described in Phearson's memo and the Gambit article reflect generally what happened during the construction of the mat? If yes, how would these non-conformance of QA/QC requirements affect the structural integrity of the mat? If not, identify those allegation which are unfounded and the basis thereof.

28. In light of the allegations, documented NCRs, and QA/QC deficiencies, what has LP&L done or what does LP&L intend to do in order to resolve the allegations and deficiencies?

29. Does maintain that the mat possesses adequate capability to resist the design loads and confirm to the criteria commited to in the FSAR despite all the deficiencies and allegations listed? If yes, provide the supporting technical basis. If not, propose specific means to resolve them and thus render the mat acceptable to the staff.

    In any case, the "as-built-mat" should be shown by the applicant, if feasible, to maintain adequate safety margins to perform its safety function and maintain its structural integrity.

    A quantitative demonstration of the "as-built" mat capacity, including adoption of test, monitoring and strengthening programs, if needed, should be provided for staff review.

30. What is LP&L's technical rationale for explaning what has happened (including, water seepage, potential through-thickness cracks, predominently one-way cracks within containment region, uneven settlements, etc) to the mat? What monitoring program(s) has been implemented is underway? What are the results of these programs? Did the monitoring data show that both the cracking and water seepage problems have stabilized and there is no sign of continued degration? What improvements, could be applied to the on-going programs?

31. Are there any known voids of some significant size to affect the mat structural integrity? If yes, what are the sizes (best estimates) and extent of these voids? What is LP&L's suggested diposition to the issue of voids. If no disposition is needed, what is the technical basis?

32. Conservatively assuming the existence of extensive through-cracks of the mat, assess the impact of the presence of water on the long-term stuctural integrity of rebars and mat capacity. Also assess the same impacts due to other potential corrosive elements.

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1. a) How many nonconformance reports were issued on the basemat? b) How many related to poor concrete placement practices? c) What were corrective actions taken? d) Provide justification to substantiate your position that these practives could not have lead to the development of cracks or localized prous zones which may be the cause of water intrusion.

Response: 1a)

NCR's - 106 (See Attachment "A")
DN's - 46 (See Attachment "B")
DR's - 42 (See Attachment "C")

Response: 1b)

NCR's - 7 (Placement Practices)
DN's - 42 (1 on Placing Practice)(4 on Cracks)(37 on Concrete Trucks etc.)
DR's - 22 (Voids)

NCR (See Attachment "A")
DN's (See Attachment "B")
DR's (See Attachment "C")

Response: 1c)

NCR's - See Attachment "A"
DN's - See Attachment "B"
DR's - See Attachment "C"

Response: 1d)

These practices could not have led to the development of cracks or localized porous zones which may be path of water intrusion because the deficiencies discovered were all repaired and the practices which led to the deficiencies were corrected.

Response: 1a,b,c

ATTACHMENT "A"

NCR's Written Against Common Foundation Mat

Placement No	NCR#	
2	10	Curing temps low 1 day - Accept as is per cylinder breaks and concrete type only requires 3 days of cure
7A	14	Nelson stud broken off plate - plate rejected and replaced
4	15	Nelson stud broken off plate - plate rejected and replaced
7A	16	#11 bars too long - accept as is
10A	17	Rebar bent - replaced
7A	18	Rebar bent during construction - replaced
4	19	Insufficient concrete cover - area excavated as required
5B	26	Portion of forms removed early - compressive strength and curing acceptable as is
8A	43	Rebar does not have proper projection - replaced
5A, 9A	45	#9 dowels misplaced - replaced or bent to design location
5A	49	8 #11 bars bent - replaced
7A, 13A	51	2 #11 bars bent - replaced
10B, 11B	52	Rebar misplaced - replaced
10B	61	(Minor cut) Waterstop - bulb not affected - accept as is
10B	63	1 #6 bar misplaced - replaced
11B	64	Bolt bent (minor) - accept as is
11B	65	Bolt bent - replaced
14A, 12A	66	Rebar misplaced - accept as is
10B	69	(Minor) Nicks in rebar - accept as is
8B	74	2 bars 'missing', bent - replaced
Ring Wall	76	Resteel clearance to form face - change configuration
11B	78	2 Bars mk #A201 misplaced - moved to correct area
13B	79	1 #8 Rebar 45° out of plumb - replaced
13B	80	1 #9 Rebar 45° out of plumb - replaced
11B	81	1 #9 Dowel missing - replaced
11B	82	1 #8 Rebar misplaced 5" - accept as is
11B	83	1 #9 Rebar misplaced 6" - accept as is
7B	84	Rebar bent - cut off and cadweld back
11A	85	Rebar bent - cut off and cadweld back
11B	87	Rebar - inadvertently cut off - cadweld back

Response: 1a,b,c

ATTACHMENT "A" (cont'd)

12A	89	Rebar - linear indications - effective area insignificant - use as is
19	92	Grout deposited - concrete placed on top and consolidated - use as is - the grout has same 28 day strength
19	93	(SCD #1) (DN-C-62) Poor placement practices - concrete removed - area repaired
1	95	Surface allowed to dry for short period of time - accept as is - visual inspection performed.
3	96	Cure temps low 4th and 5th day - minor use as is
1,2,3,4, 5A&B,6,7A&B	97	Cadweld sampling not followed - engineer eval - test results etc. accept as is
13A	98	11 cadwelds made after reject - engineer eval. and QC visual inspection - use as is
19	102	Wrong bolts installed-bolts are same size, only longer-use as is
15	103	1 #10 dowel missing - replaced
10B	104	2 #11 bars cut - (minor) due to insignificant reduction in cross-sectional area - use as is
9B	106	Low air - engineer evaluated - average 4.5% 28 day 5660 psi and placement method - accept as is
9B	107	1 test interval missed - engr evaluation - 28 day 5660 psi - accept as is
7B	108	Low air - engr evaluated - average 4.6% and 28 day 5601 psi and placing method - use as is
1	109	Low air - engr evaluated - average 4.7% and 28 day 5748 psi - accept as is
1	110	Mixing revs. concrete tests not performed at required intervals - engr eval. 28 day 5748 psi and placing method - use as is
7A	111	DN-C-29 - high slump, DN-C-130 - concrete test not performed at required intervals - engr evaluated - accept as is (28 day 5335 psi slump average 3.6)
5B	113	High air w/average of 4.5% - accept as is
5B	114	(DN-C-134) Test sample frequency, (DN-C-147) Additional mixing revs - 28 day strength of 5601 psi and placement method (accept as is) (DN-C47,48,49 and 52)
5B	115	Truck discharged after 60 min. - FCR-CH-83 - acceptable
5B	116	(DN-C-46) high slump - evaluation performed by engr-accept as is
4	122	1) Concrete placed w/out required mixing revs. 2) Omission of test data - engr evaluated - 28 day 5441 psi, average air 5.3%, and placement method DN-C-65,67,69,70,73,75,76,80,121 and 72

Response: 1a,b,c

ATTACHMENT "A" (cont'd 1)

6	123	1) Conflicting test data 2) Omission of test data - engr evaluated - method of placement and 28 day 6128 psi DN-C74,77, and 79 DN-C-78 - accept as is
6	124	Exceeded mixing count - high slump - accept as is - 28 day 6128 psi and method of placement
6	125	1 hr time limit for concrete discharge - FCR 83 - covers this - compresive strength average 6128 psi
19	145	Nicks in resteel - minor use as is Void in mat - pour back
19	148	3 core holes repaired w/out proper documentation - QA/engr eval. use as is - corrective action retraining and new procedure
12A	151	Resteel missing - replaced
15	166	Resteel #4 dowels missing - replaced
10B	178	Resteel nicked - accept as is
N/A	181	1 #6 dowel misplaced 8 inches - accept as is
15	187	#4 dowels missing - replaced
19	242	Resteel cut - replaced
19	491	Repair not done correctly - removed and replaced
3	112	Unit wt. test data omitted - strength high and replacement method acceptable - use as is
12B	94	1 #6 dowel does not have min cover - OK use as is
1	127	1) Test data omitted or not taken at right intervals 2) Low mixing intervals - engr evaluated - 28 day 5748 psi and placing method
1	128	High and low air content - ave 4.6% - 28 day 5748 psi and placing methods - use as is
	24	High air - engr eval - average air was 5.0% this along with method of placement and consolidation would assure d)durability requirements
	25	High slump - engr eval - accepted as w/c ration, unit weight and strength would meet the specified requirements.
499-4	29	1 truck high air - engr eval - next truck was 6.4% all 21 others taken were acceptable
2	30	Concrete discharge 2 min after specified time - engr eval - placement time did not exceed the 1½ hr overall time limit

Response: 1a,b,c

ATTACHMENT "A" (cont'd 2)

3	32	Mixing rev count not recorded - engr eval - visual observations and remarks on test record
SO2-2	33	2 tickets low air - engr eval - average for placement 4.9% and method of placements and consolidation would assure acceptance
2	34	Discharge time not recorded - engr eval - 72 min. batching circle would result in meeting 60 min. delivery time requirements
SO2-3	35	Low air (2 tickets) engr eval - average 4.7 this with (etc same as below)
SO2-2	36	(2 tickets) low air - engr eval - air average 4.9%. This with the method of placement and consolidation assures durability reqmts
2	37	(1 ticket) high slump - engr eval - use as is based on unit weight and strength data
10B	39	Rain in placement concrete placed improperly - engr evaluation - repair, core sample and compressive strengths
10A	40	1 ticket high air - use as is - engr eval - air 5.5% average in placement - method of placement and consolidation.
10A	41	Test freq - use as is - engr eval 7 day 4010 and 3530 psi and slump and air consistant
	131	Test freq - see #137
	132	Batch info see #137
	130	High slump see #137
	138	Air and slump high - use as is see #137
	139	Test freq - see #137
	137	Testing frequ - eng and QA use as is - corrective action see memo from W. C. Griggs.
11B	141	High air and no tests or cylinder taken at the right intervals - use as is - corrective action u/a memo from W. C. Griggs
N/A	146	Specific gravity - fine aggregate engr eval - minor deviation and cylinder breaks use as is 11B
	174	DN-C-113 High slump - engr evaluation - 28 day 4870 psi isolated incident - accept as is
ALL	7154	Curing - engr eval - use as is
ALL	7150	QV inspectors certs - QA eval - use as is
ALL	7151	QV inspectors eye exams - QA eval - use as is
ALL	7152	QV inspectors eye exams - QA eval - use as is
ALL	7153	Curing - engr eval - use as is
ALL	7149	QV inspector certs - QA evaluation of exp/training use as is

Response: 1a,b,c

ATTACHMENT "A" (cont'd 3)

ALL	7353	Mix designs - engr evaluated (use as is have FCR's)
ALL	7353	Concrete mix design - eng eval - use as is have FCR's)
ALL	7154	Mixing cure dates - eng eval - use as is
ALL	7153	Missing cure dates - eng eval - use as is based of weather temp.
ALL	7152	No eye exam - eng eval - as is based on previous certs
ALL	7151	No eye exam - eng eval - use asis/all have eye exam in cert. package now
ALL	7150	No inspection certion file - eng eval - use as is based on exp end
ALL	7149	Inspected prior to certs - eng eval - use as is based on prior exp/training and successfule completion of training
7B	31	Air content of concrete - eng eval - use as is based on overall air content 4.7%
S02-4	12	One truck low mix rev connt - eng eval - use as is - letter on concrete drum revoluation
S04-16	414	Concrete void - engr eval - chip out and replace
S03-19	341	Concrete coating prior to placement of repair - engr eval - remove and replace
CFS	273	Resteel misplaced - engr eval - add resteel
BASE MAT RAB	6212	Concrete cracks - engr eval - use as is - based on findings there is no stability or corrosion problems
ALL	6245	Cadwelds (authenticity of signatures or initials - N/A for cracking in CFM
ALL	6234	Cadwelding - N/A for cracking in CFM
ALL	7481	Cadwelding - N/A for cracking in CFM
S02-4	11	High slump - engr eval - use-as-is - new test taken on truck, found acceptable - people re-instructed

Response: 1a,b,c

ATTACHMENT "B"

Ebasco Base Mat DN's Where an NCR was not Initiated

Date	DN#	Placement#	Description	C.A.
11-19-75	C-5	499-S02-3	Rebar offset	Moved to correct location
12-10-75	C-7	499-S02-6	Cracks & rockpockets inface	Chipped out & repaired
12-18-75	C-12	499-S02-1	Cracks in face	Chipped out & repair
12-16-75	C-13	499-S02-2	Cracks in face	Chipped out & repair
01-08-76	C-27	499-S02-6	Cracks & rockpockets inface	Chipped out & repair
02-03-76	C-55	499-S02-7B	Water stop left	Repaired
02-10-76	C-61	499-S02-10B	Misplaced batch tickets and no records on concrete discharge	Accept-as-is
02-10-76	C-62	499-S02-10B	Excessive time on truck	Accept-as-is
02-10-76	C-63	499-S02-10B	Excessive time on truck	Accept-as-is
02-10-76	C-65	499-S02-10B	Excessive time on truck	Accept-as-is
02-10-76	C-72	499-S02-6	Low air	Accept-as-is
02-10-76	C-78	499-S02-6	Excessive mixing	Accept-as-is
03-09-76	C-92	499-S03-11B 499-S03-13B	Oilone rebar	Rebar cleaned
03-22-76	C-105	499-S03-13B	Testing time	Use-as-is
03-22-76	C-106	499-S03-13B	Low air	Accept-as-is
03-22-76	C-107	499-S03-13B	Testing Frequency	Accept-as-is
03-22-76	C-108	499-S03-11B	Testing Frequency	Accept-as-is
03-22-76	C-109	499-S03-11B	Low air	Use-as-is
03-22-76	C-114	499-S02-5A	High air	Use-as-is
03-22-76	C-115	499-S02-5A	Added water twice	Use-as-is
03-22-76	C-116	499-S02-5A	Added water	Use-as-is
03-22-76	C-117	499-S02-5A	Recording error	Use-as-is
03-22-76	C-118	499-S02-5A	Recording error	Use-as-is

Response: 1a,b,c

ATTACHMENT "B" (cont'd)

Date	DN#	Placement#	Description	C.A.
03-22-76	C-119	499-S02-5A	Recording error	Use-as-is
03-22-76	C-120	499-S02-5A	Test-frequency	Use-as-is
03-25-76	C-130	499-S02-7A	Test-frequency	Use-as-is
03-25-76	C-133	499-S02-7B	Excessive time on truck	Use-as-is
03-25-76	C-145	499-S02-8A	Excessive time on truck	Use-as-is
03-29-76	C-147	499-S02-5B	Add water w/no revs on truck	Use-as-is
04-20-76	C-152	499-S02-2	Test not taken	Use-as-is
04-28-76	C-153	499-S03-16	Layers excessive in height. Layers sloped, excessive flow	Inspectors Retrained
04-28-76	C-154	499-S01-14A	Spill over on steps & excessive height	Inspectors Retrained
05-03-76	C-155	499-S01-13A	Mix revs exceeded	FCR-CH-117
03-26-76	C-158	499-S02-8B	Excessive time	FCR-CH-83
05-01-76	C-166	499-S02-19	1st truck not tested pumping problems	Accept-as-is
05-12-76	C-170	499-S02-5A	Insufficient drum revs	Use-as-is
05-31-76	C-176	499-S03-18	Excessive Slump	Use-as-is
06-03-76	C-181	499-S03-12A	Correlation test not taken	Use-as-is
06-04-76	C-182	499-S03-12A	Excessive slump	Use-as-is
06-15-76	C-183	499-S03-12A	Test frequency exceeded	Use-as-is
06-15-76	C-184	499-S03-12A	No discharge time on ticket	Use-as-is
06-15-76	C-185	499-S03-12B	No pump discharge sample	Use-as-is
06-17-76	C-187	499-S02-4	Test frequency exceeded	Use-as-is
06-17-76	C-188	499-S01-15	Excessive slump	Accept-as-is
06-18-76	C-189	499-S03-13B	Excessive slump	Accept-as-is
06-24-76	C-190	499-S01-14A	Cure box too hot	Accept-as-is

Response: 1a,b,c

ATTACHMENT "C"

J. A. Jones Base Mat DR's Where an NCR was Not Initiated

Date	DR#	Placement#	Description	C.A.
04-08-76	5	499-S03-12B	(Gouge) Waterstop	Repair EIR-200-7
04-12-76	6	499-S01-12A	(Gouge) Waterstop	Repair EIR-200-7
04-14-76	7	499-S01-13A	(Gouge) Waterstop	Repair EIR-200-7
04-20-76	8	499-S03-16	(Gouge) Pipe Trench Frame	Repair
04-22-76	10	499-S01-12A	Defective concrete	FCR-50
04-23-76	11	499-S01-14A	Defective concrete	FCR-50
04-26-76	12	499-S03-19	(Gouge) 9" P.V.C. waterstop	Repair EIR-200-7
04-27-76	13	499-S01-15	"Void" under waterstop	Repair FCR-50
04-27-76	14	499-S01-15	"Void" under waterstop	Repair FCR-50
04-27-76	15	499-S01-15	"Void" under waterstop	Repair FCR-50
04-27-76	16	499-S01-15	(Gouge) waterstop	Repair EIR-200-7 FCR-50
04-29-76	17	499-S01-15	(Gouge) waterstop	Repair EIR-200-7
04-30-76	19	499-S01-15	(Gouge) waterstop	Repair FCR-50
04-30-76	20	499-S01-15	Void in concrete	Repair FCR Dry pack 50
05-03-76	21	499-S01-15	Void in concrete	Repair FCR Dry pack 50
05-03-76	22	499-S03-17	Bent studs on frame Frame	Bend back
05-04-76	25	499-S03-17	Voids under waterstop	Dry pack/ FCR-50
05-04-76	26	499-S03-17	Voids under/over waterstop	Dry pack/ Repair FCR-50
05/06/76	29	499-S03-19	Void concrete	Backfill with 499-S03-17
05/06/76	30	499-S03-19	Void concrete	Backfill with 499-S03-17

Response: 1a,b,c

ATTACHMENT "C" (cont'd)

Date	DR#	Placement #	Description	C.A.
05-17-76	33	499-S03-17	Void under waterstop	Pour with 499-S03-17
05-12-76	36	499-S03-19	Concrete Void	Pour with 568-8
05-12-76	38	499-S03-18	Void under waterstop	Dry pack FCR-CH-50
05-17-76	40	499-S03-18	Void above/below waterstop	Dry pack FCR-CH-50
05-17-76	42	499-S03-18	Void above/below waterstop	Dry pack FCR-CH-50
05-17-76	43	499-S03-18	Void above/below waterstop	Dry pack FCR-CH-50
05-17-76	44	499-S03-18	Serial No's	Logged on embed sht.
05-18-76	45	499-S03-16, 18,11B,13B	Hydraulic oil spill	Remove
05-19-76	46	499-S03-18	Voids in concrete	Dry pack
05-19-76	47	499-S03-18	Voids in concrete	Dry pack
05-20-76	48	499-S01 3FH & W	Damaged waterstop	Repair EIR-200-7
05-20-76	49	499-S03-16	Concrete Voids	Dry pack
05-20-76	50	499-S03-18	Clam shell not covered by mud mat	Cover with visqueen prior to placement
05-24-76	50	499-S03-18	Gouges in waterstop	Repair EIR-200-7
05-27-76	54	499-S03-19	Voids in concrete	Dry pack FCR-152
05-28-76	56	499-S03-11B & 499-S02-10B	Hydraulic oil spill	Remove
06-02-76	58	499-S01-12A	Gouges in water stop	Repair EIR-200-7
06-04-76	59	499-S03-18	Voids under elevator pit	Repair FCR-152
06-09-76	63	499-S01-7FH & W	Damaged waterstop	Repair FCR-CH-110 EIR-300-120
06-09-76	64	499-S02-10B	Cadweld at wrong elevation	Use-as-is
06-09-76	65	499-S02-9A	Cadweld at wrong elevation	Use-as-is
06-28-77	77	499-S03-18	Gouge in waterstop	Repair EIR-200-7

2. Where was water table when 1977 cracks were discovered?

Response:

At the time of discovery the ground water in the shell fill beneath the mat was at about elevation -20 ft. or about 15 feet above the top of the mat. (FSAR Figure 2.5-113: "Piezometer, Heave Point and Extensometer Responses Sh. 3 of 5).

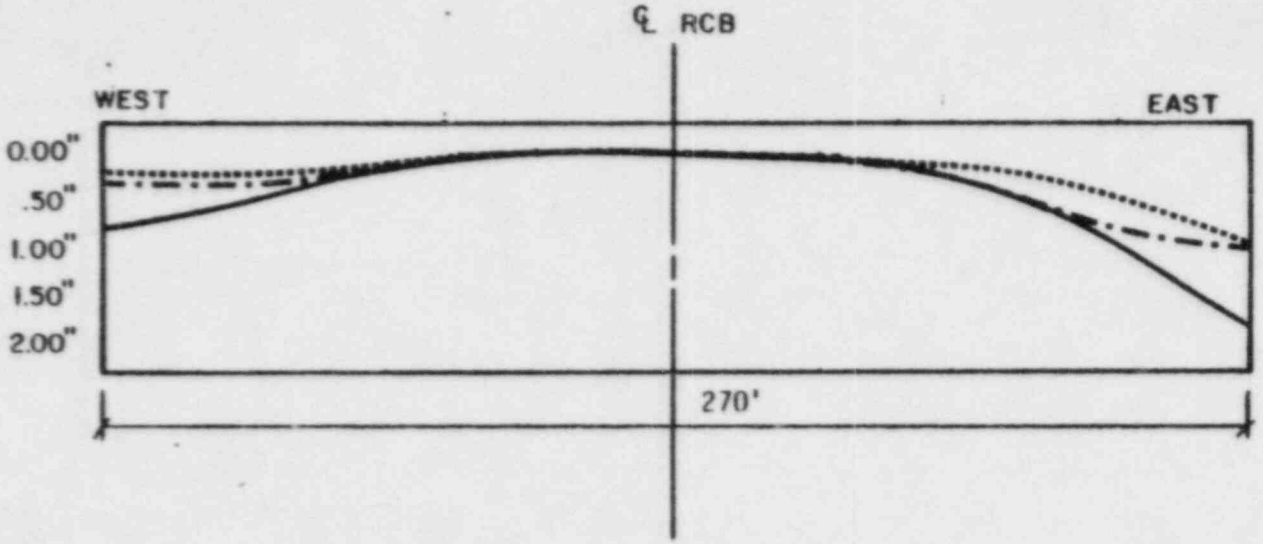
3. Is there any evidence of convex curvature due to ring wall loading?

Response:

Attached is a graph (Figure ES-3) reflecting the contours obtained from the maps generated on April 22, 1977, November 10, 1977, and October 9, 1979. These curves reflect a before mat (ring wall) loading, after ring wall placement and a majority of concrete construction complete. These contours do reflect a convex mat with maximum differential of two inches (2").

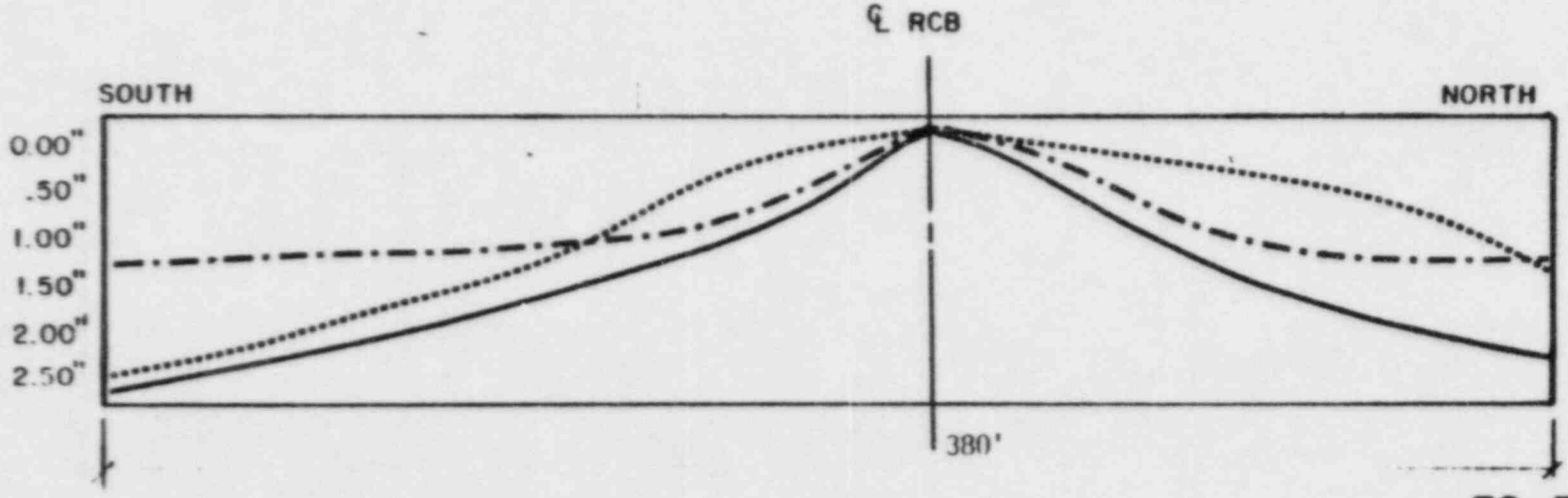
curvatures of mat itself.

↑ this should help flexure argument.



LEGEND

10-9-79 .....
4-22-77 - - -
11-10-77 ——
VERT. EXAG. = 300



ES-3

4. Provide X-Section maps of mat flexure over time period zero to present.

Response:

The following sketches reflect the mat by block and point settlement as monitored. Two full size copies have been provided for staff use.

SK-1564-15.10-G-25.1
SK-1564-15.10-G-26.1
SK-1564-15.10-G-27.1
SK-1564-15.10-G-28.1
SK-1564-15.10-G-29.1
SK-1564-15.10-G-30.1
SK-1564-15.10-G-35.0
SK-1564-15.10-G-35.1

} as built documents

provided 2 copies
1. Joe Japia
2. John Ma

5. a) Provide complete documentation of groundwater control and foundation heave from the start of dewatering until the present time. b) Include the history of soil excavation and backfill beneath the mat.

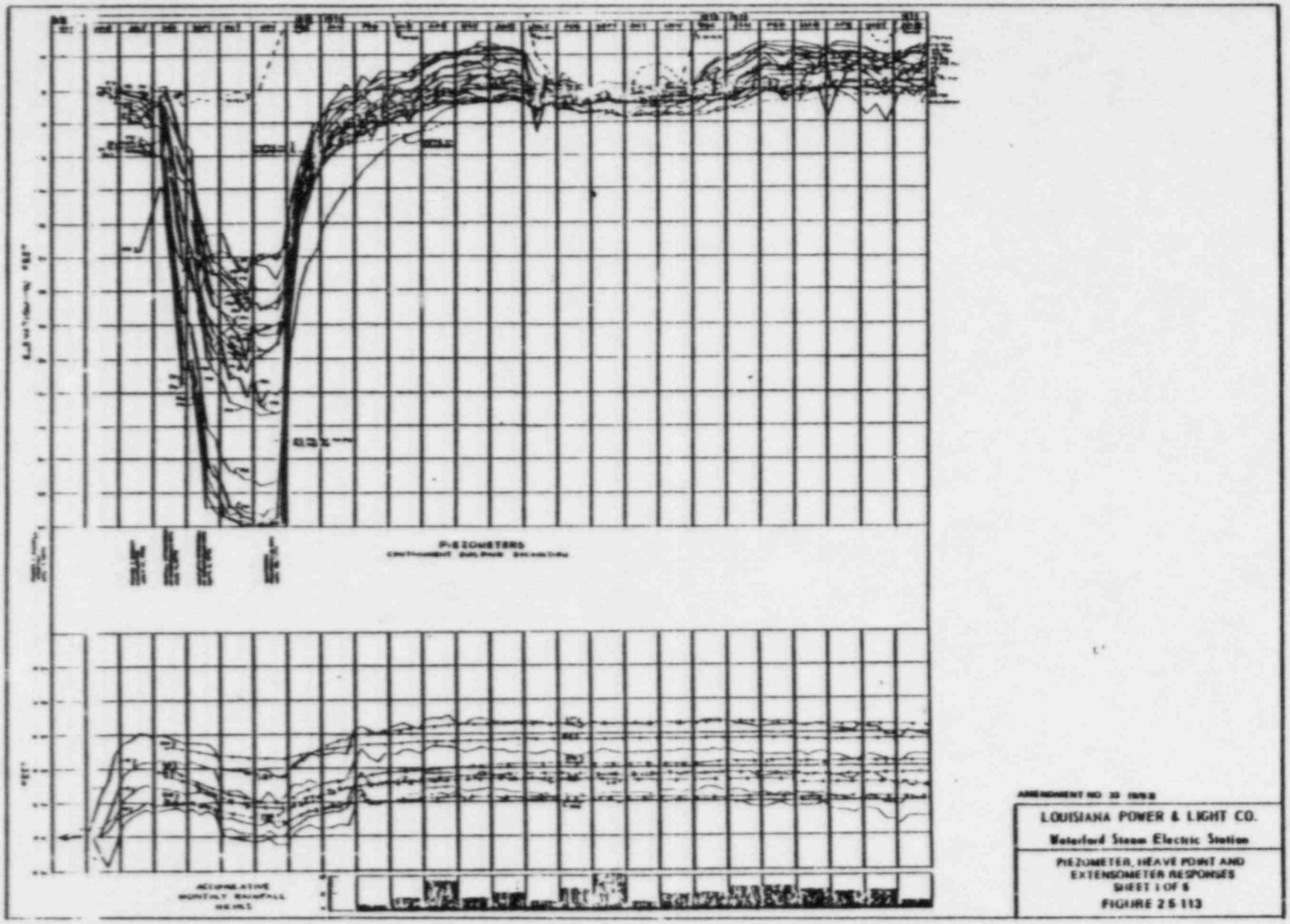
<u>Response</u>: 5a)

Groundwater control and foundation heave from the start of dewatering until recent time are exhibited in FSAR Fig. 2.5-113 (sheets 1/5 to 5/5).

<u>Response</u>: 5b)

The history of excavation and backfill is provided in FSAR Figures 2.5-102 and 2.5-103.

Lyman Heller
Section leader
- additional Q's given
to W&L



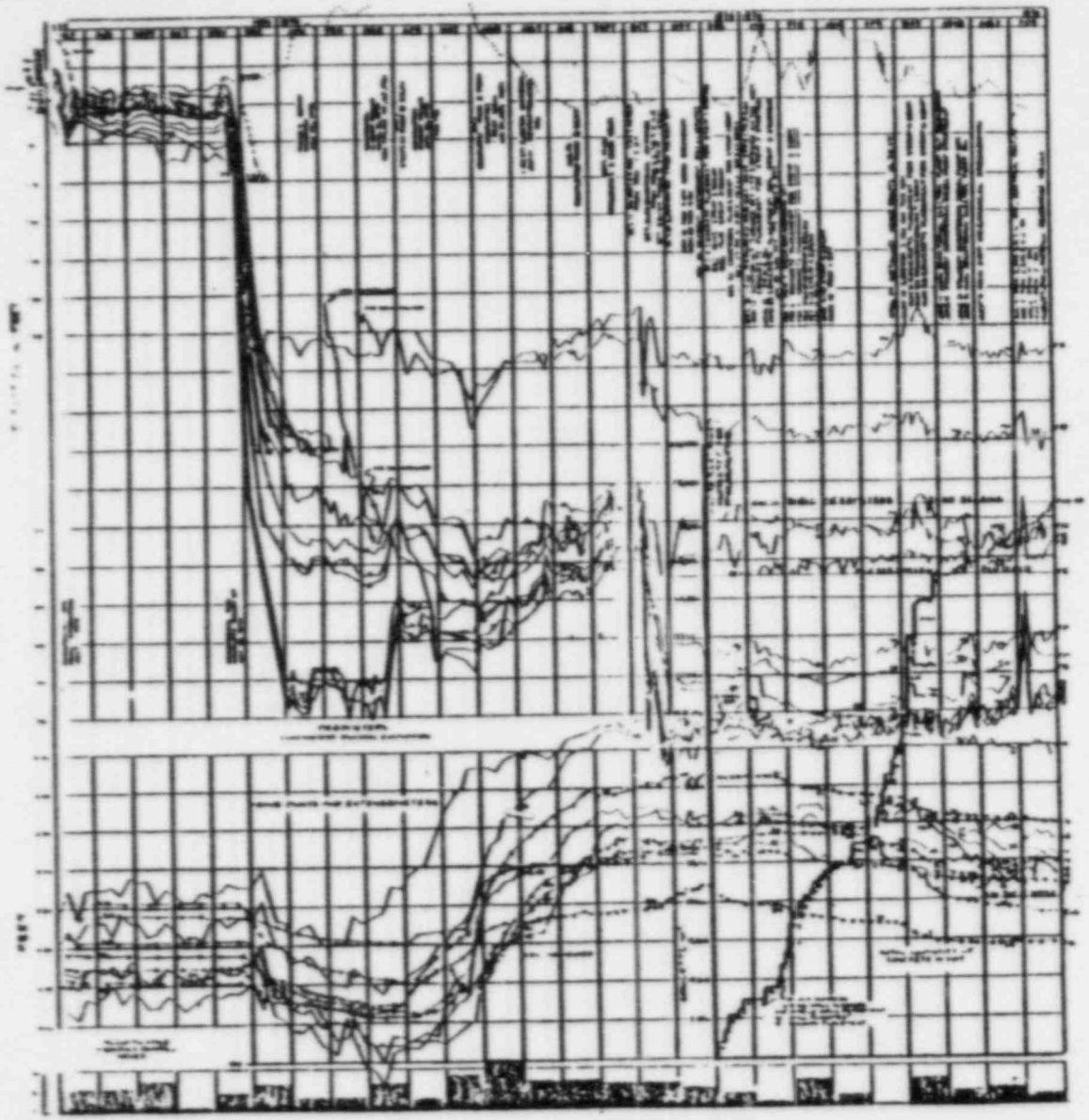
AMENDMENT NO. 33 (10/83)

LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

PIEZOMETER, HEAVE POINT AND EXTENSOMETER RESPONSES
SHEET 1 OF 5

FIGURE 2.5-113



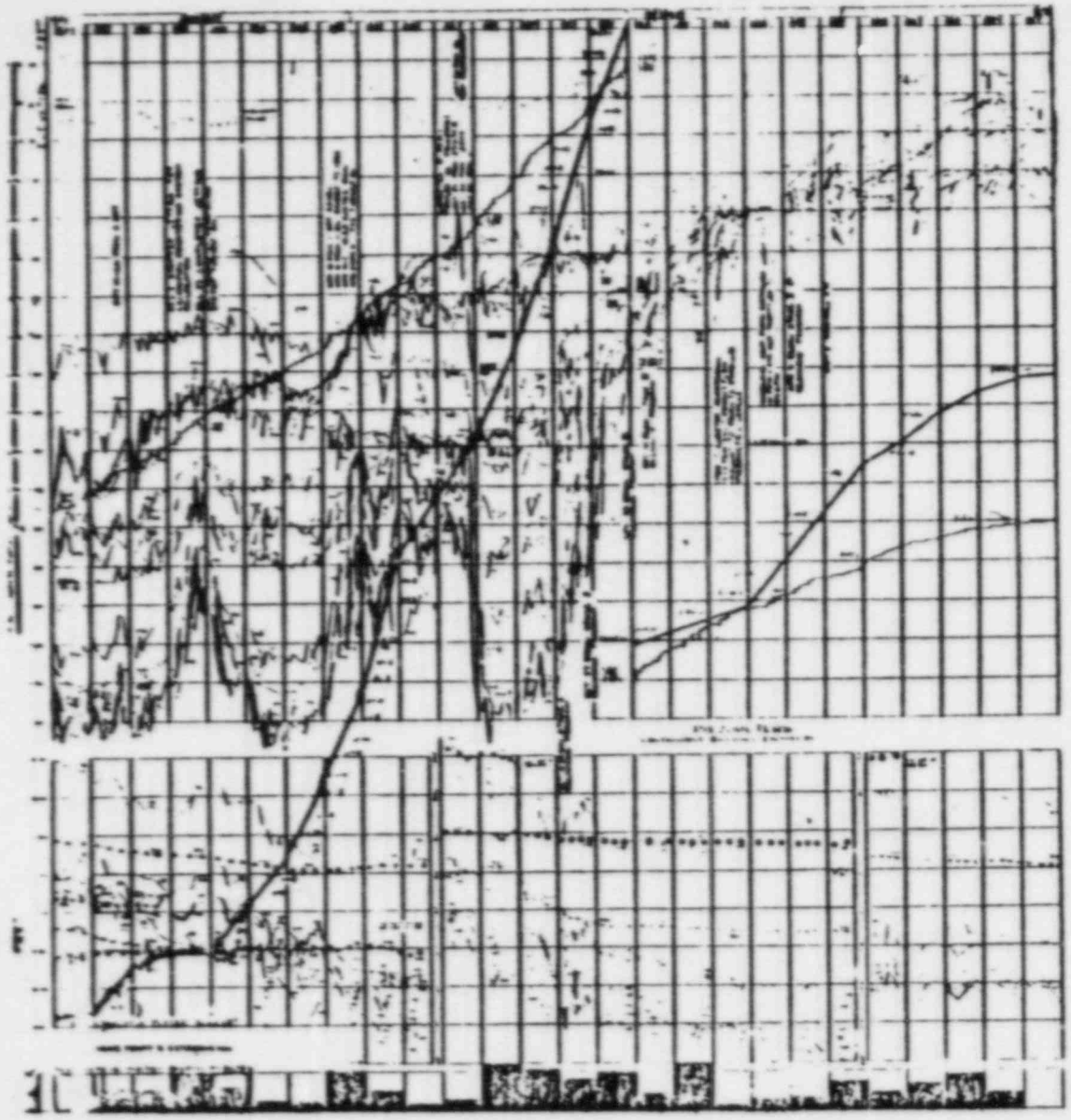
AMENDMENT NO. 33 (WSES)

LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

PIEZOMETER, HEAVE POINT AND EXTENSOMETER RESPONSES
SHEET 2 OF 6

FIGURE 2.5-113



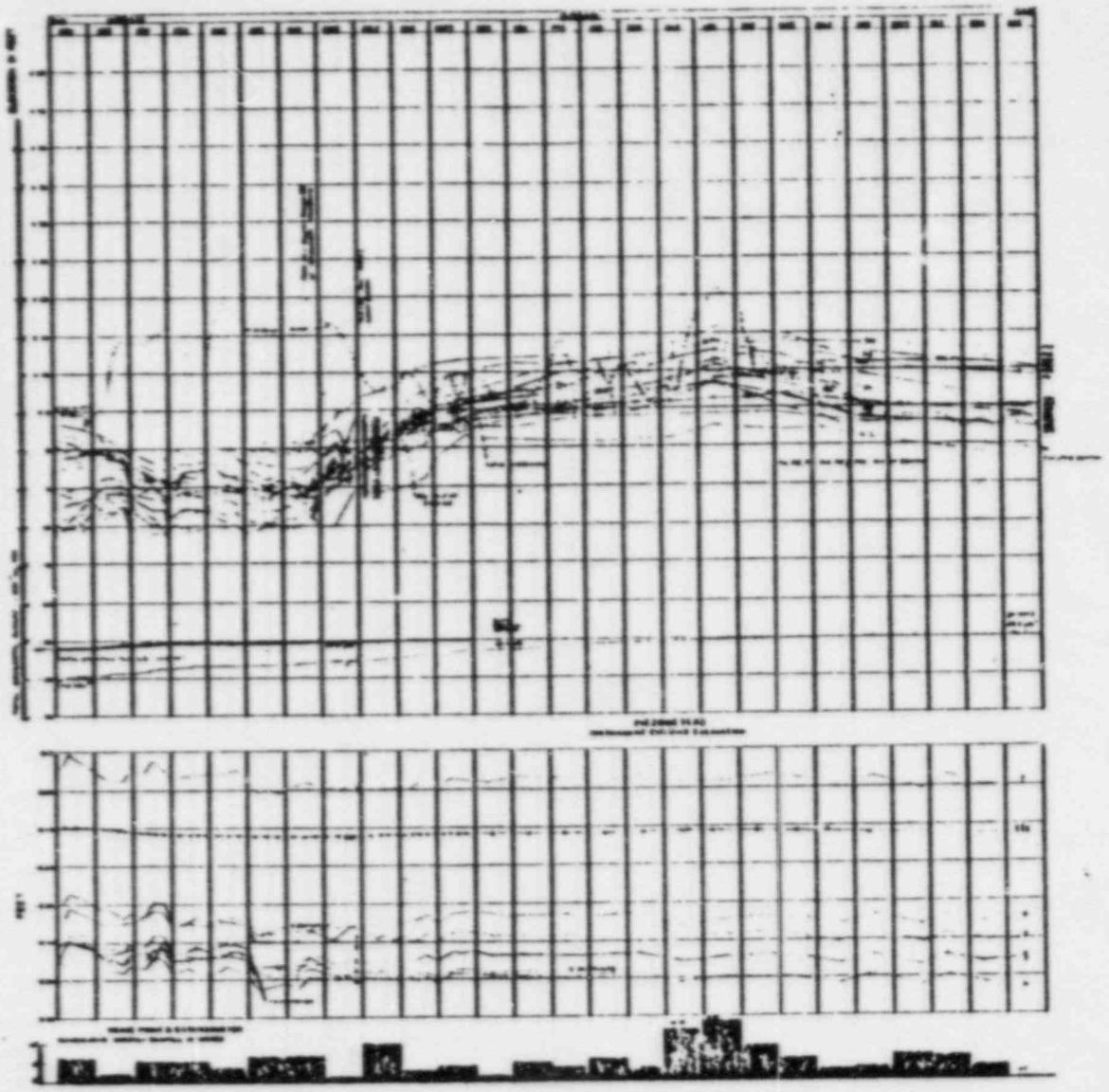
AMENDMENT NO. 33 (MAY)

LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

PIEZOMETER, HEAVE POINT AND EXTENSOMETER RESPONSES
SHEET 3 OF 8

FIGURE 2.5-113



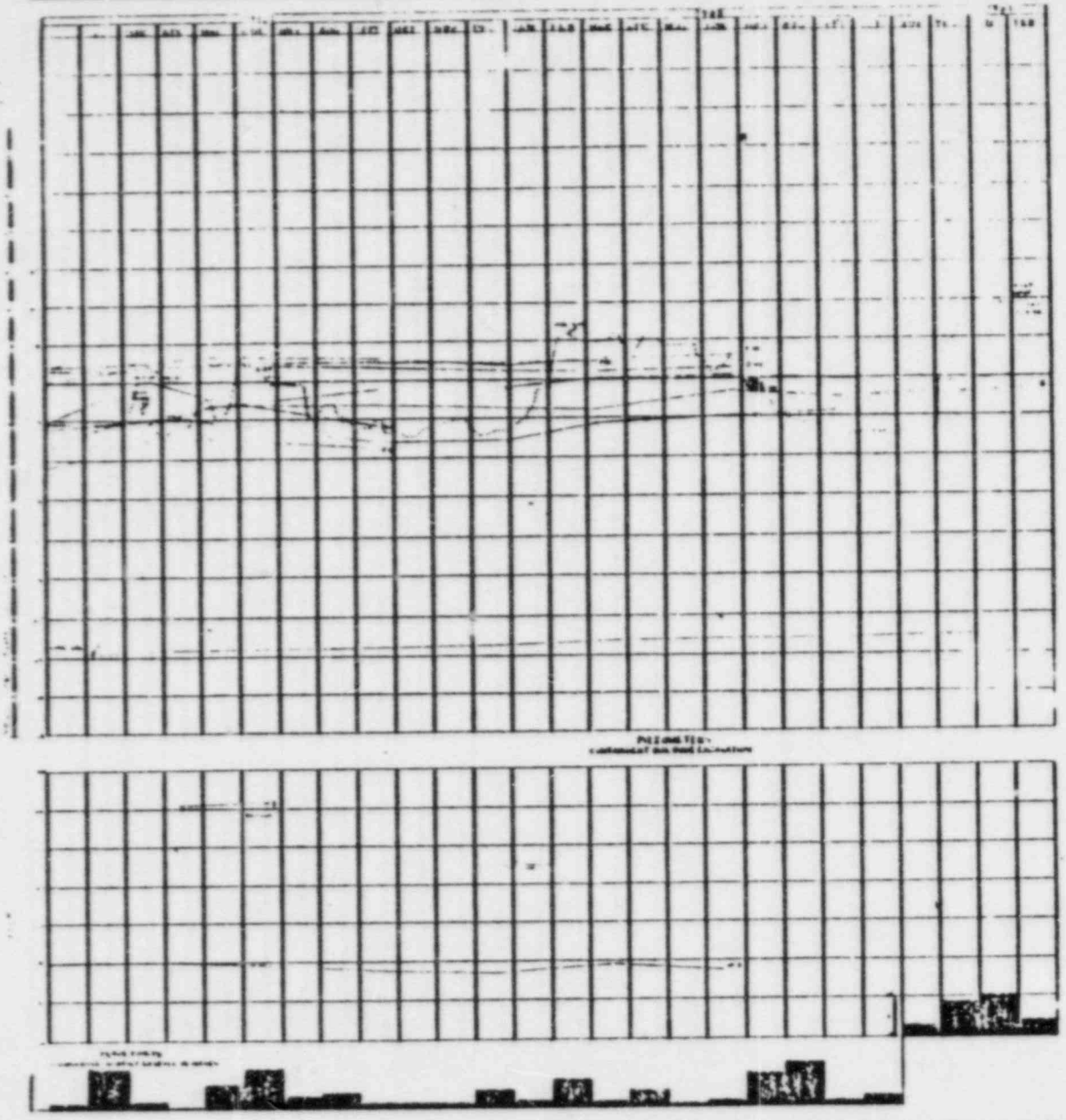
AMENDMENT NO. 33 (WSES)

LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

PIEZOMETER, HEAVE POINT AND EXTENSOMETER RESPONSES
SHEET 4 OF 6

FIGURE 2.5-113



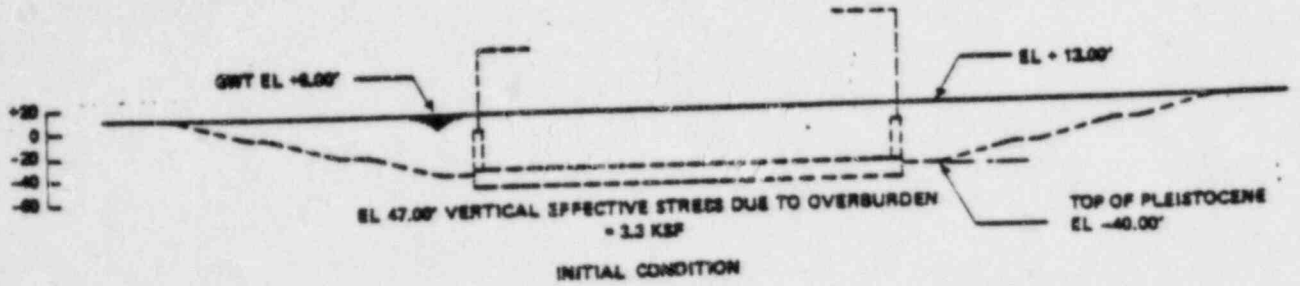
AMENDMENT NO. 22 (WSES)

LOUISIANA POWER & LIGHT CO.

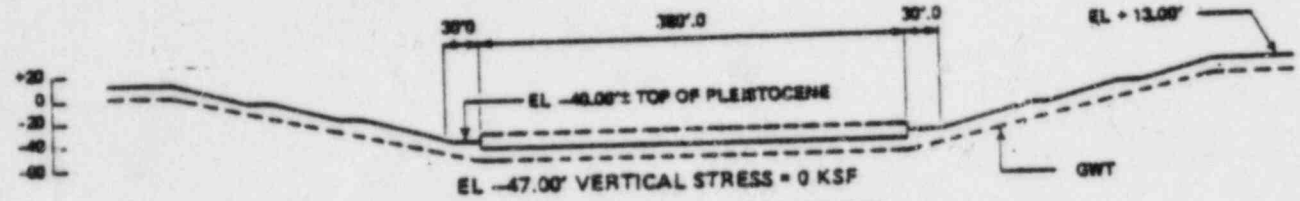
Waterford Steam Electric Station

PIEZOMETER, HEAVE POINT AND EXTENSOMETER RESPONSES (UPDATE)
SHEET 6 OF 8

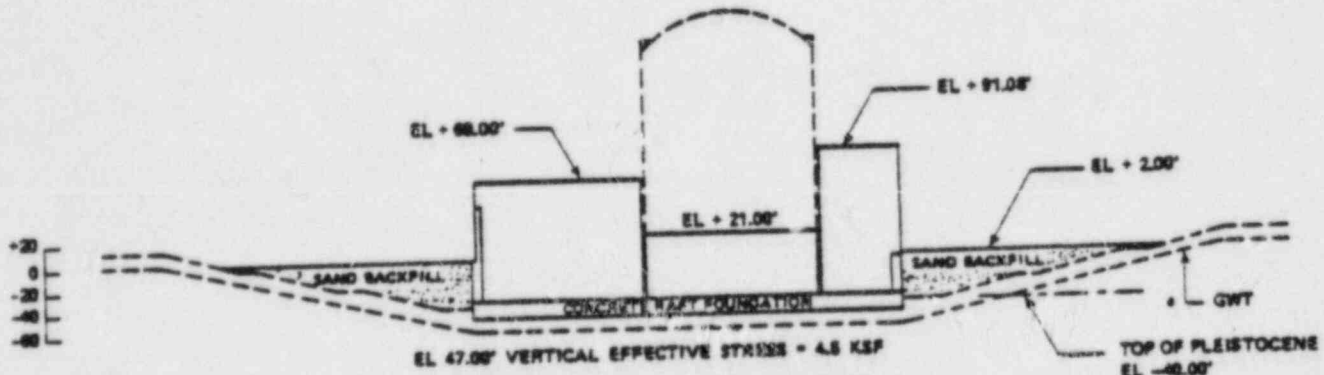
FIGURE 2.5-113



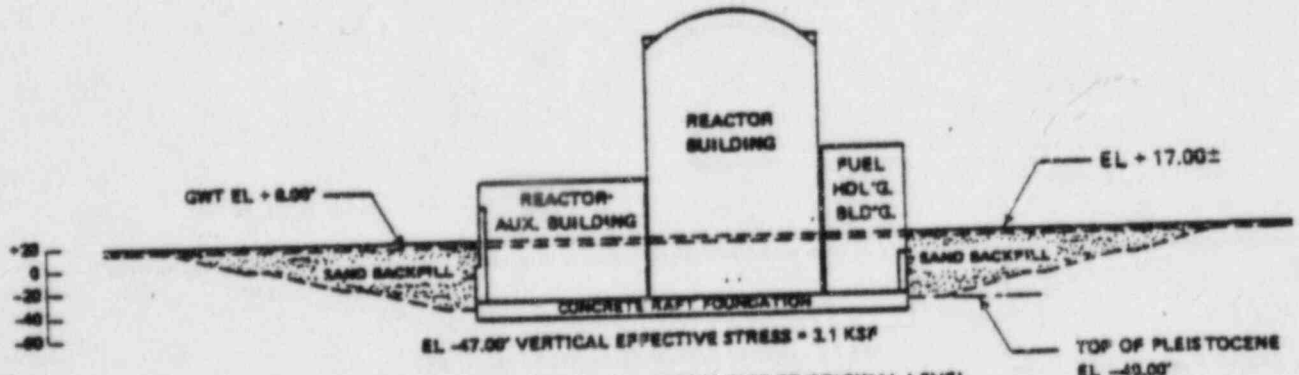
INITIAL CONDITION



EXCAVATION PHASES I THROUGH IV COMPLETED



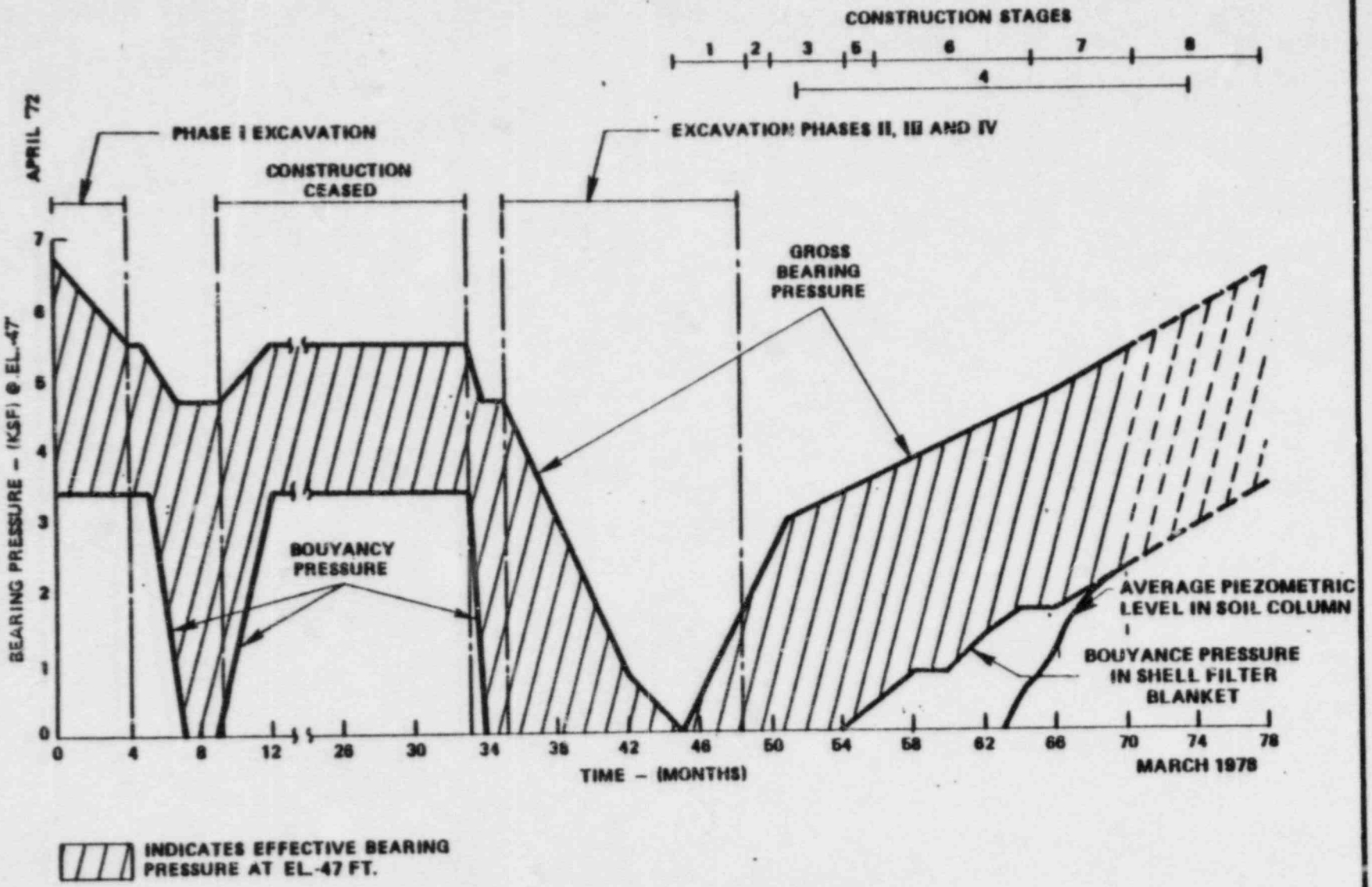
INTERMEDIATE STAGE – CONSTRUCT BUILDINGS
TO LEVELS SHOWN
BACKFILL WITH COMPACTED SAND
TO EL +20.0' (APPROX.) BEGIN SATURATION



COMPLETED CONDITION – ALLOW GWT TO RISE TO ORIGINAL LEVEL
BY RELEASING DEWATERING & SATURATING BACKFILL
COMPLETE CONSTRUCTION OF STRUCTURES
BACKFILL TO FINAL GRADE

LOUISIANA POWER & LIGHT CO. Waterford Steam Electric Station	DESIGN CONCEPT OUTLINE	Figure 2.5–102

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station



BEARING PRESSURE HISTORY AT -47 FT. SL

Figure 2.5-103

6. Provide the foundation loading history under each block during construction of the mat and walls. This should include the distribution of pressure under each block. Include the location and history of loads due to backfilling adjacent to foundation blocks.

Response:

A computer program was developed and maintained weekly to monitor the placements made. Accumulative soil stresses were identified and maximum/minimum total stresses were noted. These figures and the differential stresses were reviewed. Differential stress did not exceed the maximum allowable of 1.0 KSF.

define

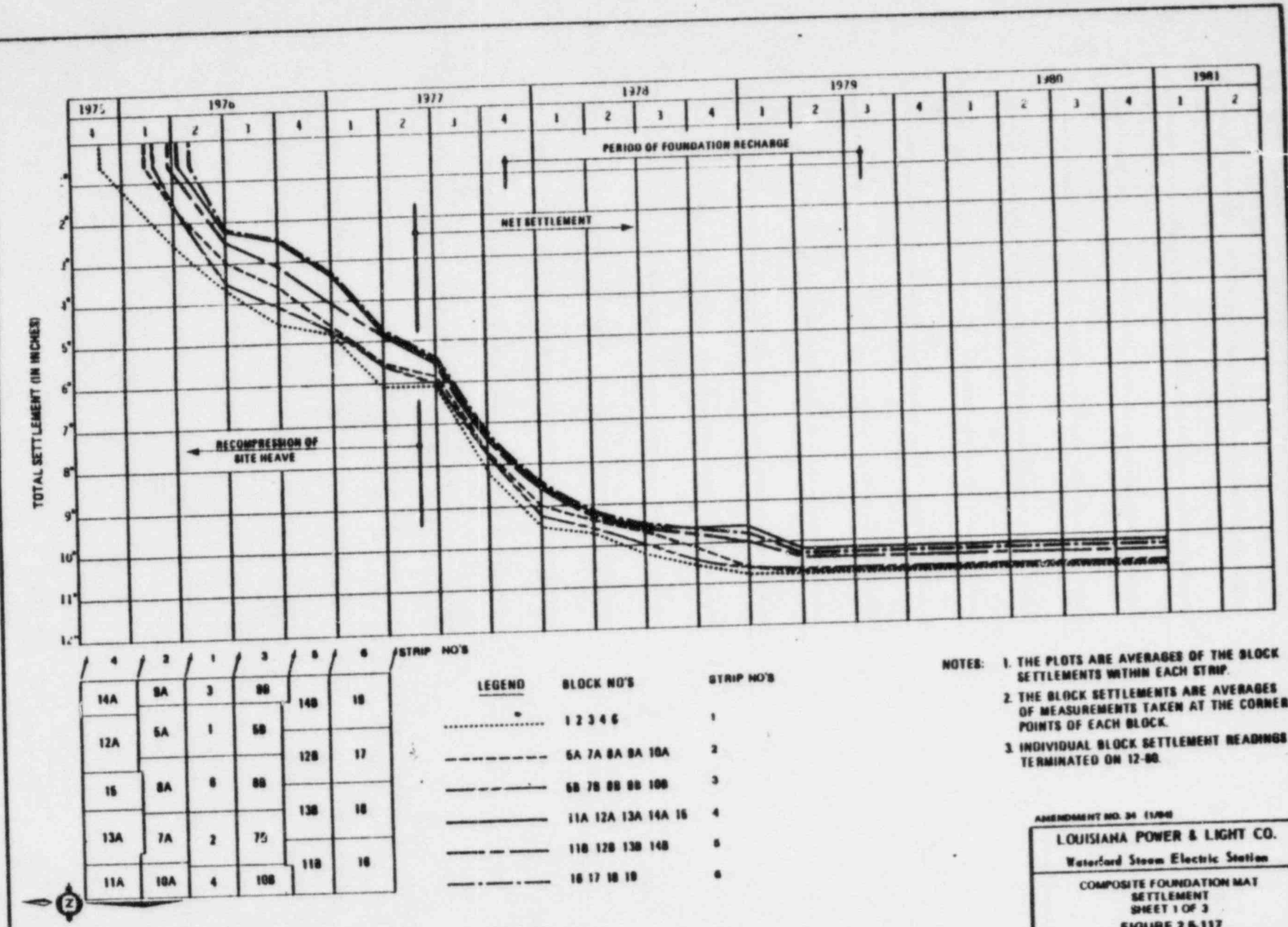
As can be noted on the Composite Foundation Mat Settlement (Figure 2.5-117 in the FSAR), recharging of the water table began in late 1977 and was gradually charged until completion in late 1979. Recharging commenced based on total stresses achieving the 4.5 KSF criteria. The initiation of recharging the mat was approximately week no. 85 of construction.

Distribution of pressure under each block was not maintained since the mat was considered as a single mat.

Backfilling and concrete construction was established through drawing no. LOU-1564-G-490, "General Nuclear Plant Island Structure Construction Sequence". This drawing provided the evaluation criteria for top of concrete as related to top of fill. Generally, construction was sequenced to place concrete (walls/floors, etc.) uniformally by constructing the buildings with minimal differentiation in loading. Consequently, backfilling operations followed suit and maintained a uniformity of placement as well.

Lyman Heller
more Q's
given to LP&L

"All placements done before backfill put in." - LP&L


1975
1976
1977
1978
1979
1980
1981
PERIOD OF FOUNDATION RECHARGE
NET SETTLEMENT
RECOMPRESSION OF SITE HEAVE
TOTAL SETTLEMENT (IN INCHES)
STRIP NO'S
14A
12A
15
13A
11A
9A
5A
8A
7A
10A
3
1
6
2
4
8B
5B
8B
7B
10B
14B
12B
13B
11B
18
17
16
19
LEGEND
BLOCK NO'S
STRIP NO'S
1 2 3 4 6
5A 7A 8A 9A 10A
5B 7B 8B 9B 10B
11A 12A 13A 14A 15
11B 12B 13B 14B
16 17 18 19
NOTES:
1. THE PLOTS ARE AVERAGES OF THE BLOCK SETTLEMENTS WITHIN EACH STRIP.
2. THE BLOCK SETTLEMENTS ARE AVERAGES OF MEASUREMENTS TAKEN AT THE CORNER POINTS OF EACH BLOCK.
3. INDIVIDUAL BLOCK SETTLEMENT READINGS TERMINATED ON 12-80.
AMENDMENT NO. 34 (1/84)
LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station
COMPOSITE FOUNDATION MAT SETTLEMENT
SHEET 1 OF 3
FIGURE 2.5-117

7. Provide complete settlement history for each block from initial pouring until the present time.

Response:

The settlement drawings listed (attached) in response to question four (4) provide the settlement picture by block placement until 1981. At this time, the number of settlement points was reduced to eight (8).

Lyman Heller
propagation of water
thru cracks
-lyman thinks water
propagating very
quickly

8. Analyze and discuss the relationship of the above variables (Qs 5-7) on the history of all observed mat cracks and leaks.

Response:

The initial detection of mat cracks was made in mid 1977 when the concrete surface beneath the reactor containment was cleaned up and prepared for concrete fill placement. These cracks were identified by the minor water seepage caused by the temporary high groundwater level beneath the mat. This high groundwater level was shortly thereafter lowered by increasing the capacity of the dewatering system.

No other cracks were detected at that time and no organized search was made for such.

In 1983, a series of cracks was detected and mapped. These cracks, along with those found in 1977, show a pattern generally following the pattern of mat differential settlement. The width of the cracks and the spacing of them shows a very low state of stress. The cracks were found to be not measurable in width and could be identified in some cases only by moist concrete and in some cases only by a line of old leachate now dry. This shows that the cracks were created at some time previous to 1983 since it takes considerable time for leachate to form a measurable residue when the moisture flow carrying it is very low.

The entire process which resulted in mat differential settlements, namely stressing the underlying soils above a level which they originally had been exposed to, was completed in mid 1979 and no further significant net or differential settlements have occurred since and are not expected in the future.

9. What basis is there for accepting the adequacy of construction of the first 3 blocks?

Response:

Waterford 3 Quality Standard

Prior to Placement 6, on December 2, 1975, the Waterford 3 Project underwent extensive development and gained significant construction QA experience during the extended qualification programs for the concrete batch plant, the concrete materials (cement, aggregates and admixtures) and the design mixes. During this period prior to Placement 6, the project also gained experience in the development and conduct of quality programs for soils, reinforcing steel and cadwelding. LP&L takes credit for establishing a high quality standard for the whole project during the pre-placement period, which carried over into the placement of the basemat. This high quality standard has been established and maintained throughout the project history.

Observation of Placement 6

Since basemat Placement 6 was the first Class I placement, there was much interest in LP&L, Ebasco, and the concrete contractor to assure that the placement was carried out in a quality manner. Preplacement inspections were extremely detailed and received input from many project personnel beside those inspectors who actually signed the inspection reports. In addition to the official Quality Control efforts of both Ebasco and the concrete contractor (which, alone, represents considerably more than minimum Quality control coverage), the placement was observed by several LP&L QA employees, LP&L project employees, Ebasco QA employees, management personnel of Ebasco and the concrete contractor and two NRC inspectors. It is not typical to document such participation, but many of these observers can attest to their presence during the placement.

During the conduct of Placement 6, several problems were encountered. The problems were formally documented by Ebasco (JG-75-12-2, dated 12-2-75) and LP&L (W3S-75-63S, dated 12-2-75). It is noteworthy that, despite the deficiencies which were documented, neither author made any direct statements or recommendations that the quality of the placement itself should be investigated. On the contrary, both authors (and others) attest to the fact that in-process corrective action was taken, thus preventing the placement itself from being suspect.

Consistent with the project quality standards, however, neither the author of the two reports, nor their superiors, desired the continued necessity for the type of intense in-process corrective action required during placement 6. The purposes of the reports, as attested by their authors, were to cause generic and programmatic corrective action by the concrete contractor, so as to assure that future placements would be conducted with better control. To further assure mutual understanding of the deficiencies and to expedite their resolution, a meeting was held on December 5, 1975

Response: (Continued)

which included representation from LP&L, Ebasco and the concrete contractor. Resolution of the documented deficiencies were adequate to allow the concrete contractor to proceed with the next placement.

Basemat Placement 1

Basemat Placement 1 occurred on December 8, 1975. Corrective action on the deficiencies recorded during Placement 6, was obviously effective. No QA deficiency reports were issued. The improvement in concrete contractor performance was, therefore, adequate to allow the concrete contractor to proceed with the placement sequence.

Basemat Placement 2

Basemat Placement 2 occurred on December 11, 1975. The corrective action effected during Placement 1, although present to some extent during Placement 2, obviously did not meet the quality standard of LP&L. An LP&L QA surveillance report (W3S-75-64S, dated 12-11-75) was issued, listing deficiencies detected during the conduct of Placement 2. Since the concrete contractor apparently could not sustain the quality standards expected during the conduct of concrete placements on the basis of QA audit reports, surveillance reports, and meetings, LP&L QA decided to issue Stop Work Order Number 1 (SWO-1) in order to assure both Ebasco and the concrete contractor that LP&L was serious about project quality standards. Again, it is noteworthy that neither the LP&L QA surveillance report nor the Stop Work Order itself, make mention of any need for investigation into the quality of Placement 2. Participants attest to the fact that the placement itself was accomplished satisfactorily, albiet with considerable effort.

Follow-on concrete placements

Following the issuance of SWO-1, a high level meeting was called to discuss and resolve the SWO-1 issues. Following implementation of programmatic corrective action to the satisfaction of LP&L, the Stop Work Order was lifted and placement of the basemat proceeded without significant incident, with the exception of placements 10B and 19.

During the conduct of placements 10B and 19, the concrete contractor encountered problems which were unique to those placements. It is noteworthy that these two placements were subjected to substantial investigation and repair, including a combined total of 302 core borings. The purpose in pointing out these intensive efforts (including an independent evaluation in the case of Placement 10B) is to emphasize that LP&L has not been bashful in demanding assurance of the quality of Waterford 3 construction. Had the actual quality of Placements 6, 1, and 2 been suspect, LP&L and/or Ebasco would most assuredly have demanded investigative measures.

Response: (Continued)

Phearson memorandum

On December 15, 1975, four days after Basemat Placement 2, a hand-written "Afteraction Report" was written by a Mr. F. L. Phearson, an Ebasco Quality Assurance Engineer who participated in Placement 2, to Mr. W. C. Griggs, then Ebasco Senior Quality Control Supervisor. The Phearson memorandum lists deficiencies in the conduct of Placement 2 which are equivalent to some of the deficiencies listed in the previously discussed LP&L and Ebasco QA reports of December 2 and 11, 1975. Mr. Griggs does not recall seeing the memorandum at the time, and LP&L first became aware of it in mid 1983. LP&L wishes to make one speculative and two factual points regarding the Phearson memorandum.

1. Factual - The deficiencies listed in the Phearson memorandum had already been identified in LP&L and Ebasco QA reports, along with other deficiencies not mentioned in the Phearson memo.

2. Speculative - On the hypothetical assumption that Mr. Griggs actually saw the memorandum (he does not recall seeing it), it is reasonable to assume that he would consider it moot, since he already had in his possession the LP&L QA surveillance report, which included the same deficiencies and more.

3. Factual - The Phearson memorandum does not specifically state that Placement 2 is suspect, nor does it recommend or imply the need for investigation of the placement. Phearson did not leave the Waterford 3 project until mid April, 1976.

Considering the recommendation in his memorandum, it is reasonable to conclude that Phearson's motives in writing the memorandum were similar to those of others who reported deficiencies in the conduct of Placements 2 and 6 - that is, to effect programmatic improvements in the conduct of future concrete placements.

Conclusion:

Based on this information, the actual performance of the mat to date, the internal review and evaluation, the independent review and evaluation and the extreme conservatism in the mat design, LP&L has adequate confidence that the basemat will perform satisfactorily in service.

10. If engineering judgement was involved in accepting those blocks, what was the basis for that judgement? Where is it documented?

Response:

Placements 6, 1, and 2 were conforming placements. As such, no engineering evaluations nor engineering judgements were required to support their adequacy. See also the responses to Questions 9, 11, 22, 24, 25, 26, 27, 28, and 29.

11. What corrective actions were necessary for the first 3 blocks? What corrective actions were taken, and provide specifics for each pour? Where are these actions documented?

Response:

Two types of corrective action were effected with respect to basemat Placements 6, 1, and 2, the first three basemat placements. The following discussions characterize both.

A. In-process corrective action

During the conduct of basemat placements 6 and 2, and to a smaller extent, placement 1, corrective action was taken as deficiencies were detected. These corrective measures resulted from the fact that there were so many "inspectors", including the official Ebasco and concrete contractor inspectors (who would actually sign the inspection documents), Ebasco and LP&L QA personnel, and others. Although these placements occurred in excess of eight years ago, the significance of these placements (essentially the first substantial permanent safety related work at Waterford 3) and review of site records have refreshed the memories of key personnel. Attachment A represents the recollection of in-process corrective actions taken during each of the three placements.

B. Programmatic Corrective Action

Because of the recurrence of some operational problems requiring in-process correction, LP&L issued Stop Work Order #1. The Stop Work Order was not issued because there was concern about the integrity of the work completed or in progress, but to stress the urgency of eliminating the recurrence of problems. Stop Work Order #1 was based on the findings in three QA audit reports:

1. Ebasco Audit Report JG-75-12-2 written on Placement499502-6 on December 2, 1975.

2. LP&L QA Site Surveillance Report W3S-75-64S written on Placement 6 on December 2, 1975.

3. LP&L QA Site Surveillance Report W3S-75-63S written on Placement 2 on December 11, 1975.

Attachment B presents each of the audit findings, the contractor responses, and the final LP&L resolution for each item. Attachment B addresses the first and third placements (Placement 6 and 2). The second placement (Placement 1) was quite uneventful and no QA audit report was generated.

Response: (1 Continued)

ATTACHMENT A

Audit Report No. JG-75-12-2 (Placement 499S02-6)

ITEM 4: Not enough vibrators were provided for adequate vibration or to make provisions for breakdown of equipment.

This finding directs attention to the fact that the auditor was unable to locate (within the immediate area of the placement) extra vibrators for backup in the event of malfunction of vibrators in use. However, no malfunction of vibrators was actually detected. The corrective action response from the contractor to Ebasco Q.A. states that..."During the actual pour, a total of twelve (12) vibrators were in operation with ten (10) more as back-up directly adjacent to the pour area." Therefore, the auditor concluded that the contractor's personnel contacted for verification of this item was not aware of where the back-up vibrators were located and that in reality no finding may have actually existed. Subsequent to this pour, the contractor instituted pre-pour meetings attended by all cognizant supervisory personnel to assure a complete understanding of the contents of applicable work procedures and the applicable pour plan.

ITEM 5: Workmen deviated from placing procedure; it was apparent that workmen were not cognizant with placing procedure.

This finding identified that workmen deviated from the placing sequence depicted on the pour plan. Concrete placement inspection report dated 12-2-75 indicates that at 9:00 a.m. the contractor was not placing the concrete using the stepping procedure as outlined in their placement diagram. It further states that steps were taken to correct this condition by building up the north side at a faster rate.

ITEM 12: It was observed that improper use of vibrators and insufficient vibration resulted in honeycomb.

The auditor observed that improper use of vibrators and insufficient vibration resulted in honeycomb. This statement relates to an exterior surface area of the placement examined once forms were removed. The condition observed is documented on concrete pour plan form dated December 8, 1985. Extent of honeycomb was relatively minor and was concentrated around the horizontal waterstop located towards the top edge of the placement. Repairs were satisfactorily accomplished as noted on the concrete pour plan form.

Response: (11 Continued)
Attachment A

ITEM 13: At times height of drop exceeded the 5 foot limit.

While in certain isolated instances the height of drop for the concrete exceeded the 5 foot limit, no actual separation/segregation was detected. These occurrences were brought to the attention of the contractor's supervisory personnel who in turn verbally issued corrective action directives.

ITEM 16: It was observed that for some loads that as much as 15 minutes elapsed before the discharge time was recorded; consequently, an incorrect time was recorded.

The auditor monitored the actions of the inspectors checking the incoming concrete mixers and on a couple of instances noticed that the time elapsed between the start of discharge of concrete and recordation by Q.C. was approximately 15 minutes. These occurrences were brought to the attention of the Q.C. Supervisor/Lead present. Action taken wa to assign an additional inspector to monitor this facet of the operation. Additionally, a check of the batch tickets revealed that all tracks were discharged within the one hour time limit.

ITEM 21: Improper handling of cylinders resulted in uncircular specimens, also Hi-Lo thermometers were not provided until late evening.

The observation made detected that one set of concrete cylinders were somewhat out-of-round at the top. Also, that thermometers were not readily available to monitor the curing of test cylinders. These occurrences were a one time isolated event and corrective action included re-instruction of personnel and an adequate supply of thermometers procured and made available at point of need prior to initiation of concreting operations.

ITEM 24: Skip pan was observed to stand on top of the mat for several minutes prior to testing of the concrete which was in the skip pan.

The concern expressed was that the skip pan which contained the concrete to be used for testing was observed to remain on the mat for an extended period of time prior to testing. This condition was a one time occurrence due to insufficient number of cranes available for use handling the sampling of concrete. Action taken was to provide equipment assigned solely to the sampling of concrete.

Response: (11 Contined)
Attachment A

Item #25: Workmen were observed to shovel concrete from the ground into the pumps, thus contaminating the conrete with shell.

This finding identifies that A workman was observed shoveling concrete that had spilled on to the ground from the pump hopper back into the hopper. The corner edge of the shovel caught a bit of shell which in turn was dumped into the hopper. The amount of shell was insignificant but practice of picking up concrete from the ground was discouraged. This was a one time occurrence which was corrected on the spot by the contractor's Superintendent. On subsequent placements, the use of plywood was utilized under the pumps to keep any concrete that may spill over off the ground.

Item #26: Documentation of tests and checklists were observed to be in error and omissions of data and signatures exists.

A review of concrete placement records subsequent to completion of the placement revealed certain irregularities. Corrective action taken was re-instruction of Q.C. personnel and information retrieved which permitted correction of the irregularities. It should be noted that none of the irregularities impacted the as-built condition of the placement.

Response: (11 Continued)
Attachment A

Audit Report No. W3S 75-64S (Placement 499 S02-6)

OBSERVATIONS:

1. Contrary to Section I Paragraph 10.9, concrete was placed even though it exceeded specification requirements.

COMMENT:

This observation resulted from a difference in understanding between LP&L and Ebasco. Ebasco Engineering has stated in a November 24, 1975, memorandum that the slump could range between 1 and 5 inches. Since only one latch exceeded the requirement (5 3/4 inch slump), this was a non-problem. This one case of out-of-specification slump was documented and resolved on D.N. #C-77.

2. Contrary to Section II, Paragraph 5.2, concrete received disturbing shocks and vibrations from reinforcing steel which was set in motion by concrete pump discharges.

COMMENT:

This problem was noted early in the placement. It was quickly corrected by J. A. Jones long before any concrete had set. The purpose of the comment was to formally notify J. A. Jones and Ebasco concerning this observation so that it could be prevented on future placements.

3. Contrary to Section II, Paragraph 4.13, concrete was inadequately vibrated.

COMMENT:

There were some instances during the placement where minor deviations from the correct vibrating procedure was noted. These deviations occurred when the operator slightly exceeded the required spacing between vibrating operators, or did not insert the vibrator in a perfectly vertical manner. These deviations were minor in nature and were corrected by J. A. Jones on the spot.

4. Contrary to Section II, Paragraph 5.1, curing water was not continuously maintained on all exposed surfaces.

Response: (11 Continued)
Attachment A

COMMENT:

The word "all" is important here. There were a few instances where standing water was not on a few square feet of localized high surface area of the placement. These areas were damp. This was not a major problem as J. A. Jones was conscientious in maintaining adequate curing during all placements. J. A. Jones took immediate action to assure that all areas of the placement were continuously covered.

5. Contrary to ACI 318 - Rebar was improperly spaced in some areas of the placement.

COMMENT:

This was a practical problem caused by bulkheads, interferences with embedded items, and cleaner for concrete pumping equipment. The deviation from drawings were minor in nature, usually amounting to fractions of an inch. These problems were corrected by J. A. Jones on the spot.

6. Personnel involved in placement activities were not aware of or failed to follow J. A. Jones Co., "Concrete Pour Plan".

COMMENT:

This comment centered around difficulty in keeping with the inter "stair stepping procedure" for concrete placement. Documentation to this effect can be found in the Ebasco Concrete Placement Inspection record (form no. 6C1P 7-1, 11-30-75) for placement no. 499 S02-6 (12-2-75). See 0900 hours entry in the record.

7. Several Ebasco concrete test records (form no. QC18-7-2, 11-30-75) were not completely filled out.

COMMENT:

Problems with the records noted during the placement were minor in nature and were usually corrected on the spot. Considering that this was the first placement, the inspection documentation was, in fact, very good.

Response: (11 Continued)
Attachment A

ITEM 11: Corrective action not taken by some of Ebasco personnel after being brought to their attention by LP&L.

COMMENT:

This corrective action was taken by LP&L. (Corrective action giving directions in problem areas were needed, but also to make Ebasco aware of some training was needed by their personnel.)

ITEM 12: Complete failure by most to meet requirements of procedures and specifications.

COMMENT:

Complete failure by most to meet requirements of procedures and specifications does not imply that all personnel were not qualified to perform their duties, but there were some which indeed needed training. Such as:

1. The limit of acceptable drop of concrete from end of tremie or hose.

2. The proper thickness of placement layers not exceeding the 20 inches.

3. Proper use of vibrators.

ITEM 13: No evaluation of crack growth in west wall of pour #6 until brought to the attention of supervisors by LP&L.

COMMENT:

Was so stated to make Ebasco evaluate the crack and take necessary action on the matter. See Ebasco response to this observation dated December 17, 1975, F-4614 4.0.

Response: (11 Continued)
Attachment A

ITEM 11: Corrective action not taken by some of Ebasco personnel after being brought to their attention by LP&L.

COMMENT:

This corrective action was taken by LP&L. (Corrective action giving directions in problem areas were needed, but also to make Ebasco aware of some training was needed by their personnel.)

ITEM 12: Complete failure by most to meet requirements of procedures and specifications.

COMMENT:

Complete failure by most to meet requirements of procedures and specifications does not imply that all personnel were not qualified to perform their duties, but there were some which indeed needed training. Such as:

1. The limit of acceptable drop of concrete from end of tremie or hose.

2. The proper thickness of placement layers not exceeding the 20 inches.

3. Proper use of vibrators.

ITEM 13: No evaluation of crack growth in west wall of pour #6 until brought to the attention of supervisors by LP&L.

COMMENT:

Was so stated to make Ebasco evaluate the crack and take necessary action on the matter. See Ebasco response to this observation dated December 17, 1975, F-4614 4.0.

Response: (11 Continued)
Attachment A

Surveillance Report W3S-75-63S (Placement No. 499502-2)

OBSERVIATIONS:

1. Rejected concrete being used.

2. Ebasco inspector's rejection of concrete overriden by Ebasco QC Supervisor.

COMMENT:

This statement was made on Batch No. 001441, so action would be taken, correcting any doubt about a concrete mix in question. See Ebasco response to Surveillance Report No. W3S-75-63S, which states in part: "instructed all Ebasco Q.C. personnel this date to have verification test made on questionable items prior to release for use.

3. Concrete allowed to be placed that could not be vibrated under rebar.

COMMENT:

This concrete was removed from the placement immediately. After notification by LP&L Q.A the cause of the problem was from a plugged pump line.

From there on a container was used to catch out of specification concrete.

4. Concrete being vibrated in order to flow from truck chute.

COMMENT:

This was being done by a J. A. Jones' laborer to assist the flow of concrete to pump hopper. This procedure was stopped when he first started by LP&L Q.A.

Again stated to employment corrective action.

5. Continuous use of low slump out of specification concrete after being warned by LP&. (Had to have QA Corporation at Placement correct).

COMMENT:

This was stated because of a dryer mix which could cause pumping problems and delays in placement.

This concrete was acceptable, but had a lower slump for concrete to be pumped.

Response: (11 Continued)
Attachment A

Item #6: Concrete being controlled before pump hoppers by J. A. Jones.

COMMENT:

This was stated so J. A. Jones would not have any control on acceptance or rejection of concrete which they placed.

Item #7: Dry concrete being removed from discharge hose and being permitted to drop in placement area. (Was made to remove by LP&L).

COMMENT:

Again stated so J. A. Jones would school their employees in the useof a catch plan. See J. A.Jones reply to W3S-75-63S, which states in part: "when a transport line becomes plugges, the area underneath the cleaning operations on the top mat will be covered to prevent the concrete dropping through the top mat into the pour area.

Item #8: Improper placement of concrete.

COMMENT:

So stated even though corrections were on the spot, so J. A.Jones would be aware of these problems and make necessary corrections to these areas.

1. Improper use of vibrators by not inserting the vibrator in the proper vertical position.

2. At times height of drop exceeded the 5 foot limit.

3. Allowing the concrete triemie to swing while pumping concrete.

Item #9: Inadequate supervision by J. A. Jones.

COMMENT:

So stated so J. A. Jones would increase their supervision at placement areas.

Item #10: Inadequate supervision by Ebasco.

COMMENT:

So stated so Ebasco would increase their supervision at placement area.

Response: (11 Continued)

ATTACHMENT B

SWO #1 (Ref. 1, 2)
Rejected Items/Responses/Resolutions

GENERAL OBSERVATIONS (Ref. 6)

1. All J. A. Jones responses and corrective action to non-conformances are to be accepted by Ebasco.

2. Ebasco will be required to have site management conduct audits to see that programs developed for the corrective action are being implemented and adhered to.

I. EBASCO AUDIT REPORT JG-75-12-2 ON PLACEMENT 6 (Ref. 3, 4)

ITEM 4: Not enough vibrators were provided for adequate vibration or to make provisions for breakdown of equipment.

J. A. Jones Response (Ref. 5):

The approved Concrete Pour Plan dated November 26, 1985 specified that six (6) Electrical and three (3) Air-Powered Vibrators were planned for use on Pour #6. Just prior to pour, twelve (12) Electrical and ten (10) Air-Driven Vibrators were verified for frequency of vibration and certified for use on subject pour. During the actual pour, a total of twelve (12) Vibrators were in operation with ten (10) more as back-up directly adjacent to the pour area. J. A. Jones considers the allegation as stated unfounded.

Ebasco Response (15):

It has been verified by this department that 23 vibrators are available for subsequent placements and that the lack of vibrators would be highly unlikely in the event of equipment failure.

LP&L Resolution (Ref. 6):

LP&L considered the response controversial.

Response: (11 Continued)
Attachment B

ITEM 5: Workmen deviated from placing procedure; it was apparent that workmen were not cognizant with placing procedure.

J. A. Jones Response (Ref. 5):

Subsequent to this pour, J. A. Jones instituted pre-pour meetings attended by all cognizant supervisory personnel to assure a complete understanding of the contents of J. A. Jones Work Procedure W-WP-7 and the applicable pour plan. J. A. Jones will continue these meetings and will place even greater emphasis on the contents of the placing procedures.

Resolution (Ref. 6)

LP&L observed that the response appeared to be acceptable.

ITEM 12: It was observed that improper use of vibrators and insufficient vibration resulted in honeycomb.

Ebasco Response (Ref. 5):

A formal training class was presented on December 16, 1975 by J. A. Jones Quality Engineering covering proper techniques for vibrator operators. This class, which presented the reasons for and the required method of vibrator operation, was attended by all operator personnel assigned to Pour #3 and those Construction Supervisors responsible for placement operations. Course contents, graphic illustrations and attendance has been documented and is available on request. It is our intention to conduct this training for any new vibrator operators assigned to subsequent concrete placement operations.

LP&L Resolution (Ref. 6):

LP&L observed that the response appeared to be acceptable.

ITEM 13: At times height of drop exceeded the 5 foot limit.

J. A. Jones Response (Ref. 5):

Cognizant Construction Supervisory personnel have been counciled subsequent to this pour and fully understand that the dropping of concrete from a height of more than five (5) feet onto exposed reinforcing steel can cause separation of the aggregate. They have been further instructed that in the future it is mandatory that the approved procedural direction must be followed at all times.

Response: (11 Continued)
Attachment B

LP&L Resolution (Ref. 6):

J. A. Jones response must be in the form of written instructions similar to that described in Item 1 on Report W3S-75-63S. Objective evident of implementation is required. J. A. Jones complied via Ref. 14 which directed personnel to read and understand a) Ebasco Specification LOU-1564.472, Section II, b) J. A. Jones Concrete Pour Plan, and c) Concrete Placement and consolidation training session and class notes.

ITEM 16: It was observed that for some loads that as much as 15 minutes elapsed before the discharge time was recorded; consequently an incorrect time was recorded.

Ebasco Response (Ref. 7):

The time that is stamped on the batch ticket at the point of discharge is the discharge completion time.

The driver will not leave until he has the ticket returned to him. A check of the batch ticket did not reveal any discrepancies. All trucks were discharged within the one hour time limit.

LP&L Resolution (Ref. 6):

LP&L observed that the response appeared to be acceptable. Ebasco QA has verbally accepted the response.

ITEM 21: Improper handling of cylinders resulted in uncircular specimens, also Hi-Lo thermometers were not provided until late evening.

Ebasco Response (Ref. 7):

All Inspection and Testing Personnel have been instructed as to the proper method of handling concrete test cylinders.

The Hi-Lo thermometers have been mounted in the concrete cylinder curing boxes.

LP&L Resolution (Ref. 6):

LP&L observed that the response appeared to be acceptable. Ebasco QA has verbally accepted the response.

Response: (11 Continued)
Attachment B

ITEM 24: Skip pan was observed to stand on top of the mat for several minutes prior to testing of the concrete which was in the skip pan.

Ebasco Response (Ref. 7):

The skip pan was moved to the testing area as quickly as it was possible. There were a few times that the crane was being used for another operation and could not be used immediately but was released for the testing as soon as possible.

LP&L Resolution (Ref. 6):

LP&L observed that the response appeared to be acceptable. Ebasco QA has verbally accepted the response.

ITEM 25: Workmen were observed to shovel concrete from the ground into the pumps, thus contaminating the concrete with shell.

Ebasco Response (Ref. 7):

Ebasco's Q.C. notified J.A. Jones during the placement that this was not permitted. J.A. Jones Superintendent instructed their personnel as to the requirements.

Ebasco Response (Ref. 15):

It should be recognized that workmanship does have an effect on the quality of concrete, therefore, caution must be exercised to eliminate any possibilities of contamination. On subsequent placement the use of plywood should be utilized on the ground by the pumps.

LP&L Resolution (Ref. 6):

LP&L observed that the response appeared to be acceptable. Ebasco QA has verbally accepted the response.

ITEM 26: Documentation of tests and checklists were observed to be in error and omissions of data and signatures exists.

Ebasco Response (Ref. 7):

Concrete testing and inspection personnel have been re-instructed in the proper use of forms. Subsequent placement reveals much improved documentation.

Response: (11 Continued)
Attachment B

ITEM 26:

LP&L Resolution (Ref. 6):

LP&L observed that the response appeared to be acceptable. Ebasco QA has verbally accepted the response.

Response: (11 Continued)
Attachment B

II. LP&L-QA SITE SURVEILLANCE REPORT W3S-75-64S OBSERVATIONS (Ref. 2, 8)

ITEM 1: Contrary to Section I Paragraph 10.9, concrete was placed even though it exceeded specification requirements.

Ebasco Response (Ref. 9):

Section I, Article 10.9, of the Concrete Masonry Specification LOU 1564.472 gives a range of slumps for various types of construction. Our Concrete-Hydraulic Engineering Department interpreted this paragraph regarding slumps for the common mat foundation and provided the site with direction in memorandum from R. Vine/A. Wern to J.O. Booth dated November 24, 1984 (Ref. 6). This memorandum stated that slumps could range between 5 inches and 1 inch. This is consistent with the first paragraph of Section I, Article 10.9, which states that concrete shall be of a consistency and workability suitable for the conditions of the job. A review of the concrete Test Records, Form No. QCIP-7-2, show that only one batch of concrete (5-3/4 inch slump) was used for Block No. 499S02-6 that exceeded the specified requirements concerning slumps.

Ebasco Response (Ref. 12)

Please refer to the supplemental response to Item 5 of Site Surveillance Report No. W3S-75-63S.

LP&L Resolution (Ref. 6)

Memorandums of interpretation of specifications are to be on controlled distribution as discussed under Item 5 of the preceding report (i.e., W3S-75-63S)

ITEM 2: Contrary to Section II, Paragraph 5.9, concrete received disturbing shocks and vibrations from reinforcing steel which was set in motion by concrete pump discharges.

J. A. Jones Response (Ref. 10):

The discrepancy was observed at the start of the pumping operation and was corrected prior to placing second lift of concrete which was vibrated into a homogeneous mix eliminating any detrimental effect on the placement.

Response: (11 Continued)
Attachment B

ITEM 2:

In the future, transport lines and conveying equipment will be properly supported and restrained to eliminate transporting shock to forms and embedded items in the placement. We have ordered additional concrete pipe fittings to install a shock absorber on the pump lines to help minimize this shock effect. (J. A. Jones purchase order No. 75-317/po311)

ITEM 3: Contrary to Section II, Paragraph 4.13, Concrete was inadequately vibrated.

J. A. Jones Response (Ref. 10):

Adequate equipment for proper vibration of the concrete was on hand and the craft has been instructed in the proper use of the equipment with written instructions of required spacing between vibrating operations and depth of vibrations, copy attached (Ref. 17). The craft had inadequate experience in the use of the equipment resulting in some instances in inadequate vibration.

We feel adequate instructions have since been presented to the craftsmen and that they have now gained more experience and a better understanding of why concrete is vibrated.

We have experienced better workmanship on the subsequent pours and consequently, efficiency will increase throughout the life of the project.

LP&L Resolution (Ref. 6):

Response acceptable.

ITEM 4: Contrary to Section II, Paragraph 5.1, Curing water was not continuously maintained on all exposed surfaces.

J. A. Jones Response (Ref. 10):

A crew of personnel have been assigned the sole task of continuous placement of water on all exposed concrete surfaces for the required period of seven (7) days.

More areas will be covered with burlap in the future to aid in holding the moisture.

Response: (11 Continued)
Attachment B

ITEM 4:

We feel that these corrective actions are sufficient to eliminate the problem completely. Additional personnel will be added as required.

ITEM 7: Several Ebasco concrete test records (Form No. QCIP-7-2, 11-30-75) were not completely filled out.

Ebasco Response (Ref. 9):

Concrete Test Records for Block No. 499S02-6 have been reviewed by the Quality Control Civil Supervisor. Incomplete information was retrieved, where possible, and recorded. This was the first permanent plant concrete for this project, and prior to the next placement, our Quality Control personnel were instructed and are required to record all data on the forms as the work is being performed. A review of our records for subsequent Blocks No. 499S02-1 and 499S02-2 indicates that this is being accomplished. As further assurance that concrete is satisfactory, 27 of 30 test cylinders broke in excess of 4,000 psi with the lowest of the remainder being 3,530 psi.

Resolution (Ref. 6):

Response acceptable.

Response: (11 Continued)
Attachment B

III. LP&L-QA SITE SURVEILLANCE REPORT W3S-75-63S OBSERVATION (Ref. 2, 11)

ITEM 1: Rejected concrete being used.

ITEM 2: Ebasco inspector's rejection of concrete overriden by Ebasco QC Supervisor.

Ebasco Response (Ref. 7):

Items 1 & 2 No rejected concrete was used in Block No. 499S02-2. Our understanding of these two items is that LP&L is concerned about one truck load of concrete which was initially rejected by our Quality Control Inspector and later allowed to be used. This incident occurred once with Batch No. 001441. Upon arrival at the site, a visual inspection of this load indicated that it probably had a slump; consequently, a slump test was performed. The results were 7-3/4 inches and the Quality Control Inspector rejected the load for placement at that time. The truck stood turning its drum at agitating speed. After a period of time, which did not exceed the one hour limit, the Quality Control Civil Supervisor visually examined this load of concrete and judged the slump to be less than 5 inches and the concrete acceptable for placement. The load was subsequently used in the placement.

It is the responsibility of the Quality Control Supervisor to review the evaluations/decisions of inspectors under his supervision. In this regard, we feel that his decision to override the Inspector was correct. We have instructed all Ebasco Q.C. personnel this date to have verification tests made on questionable items prior to release for use.

Ebasco Response (Ref. 12):

The Sr. Quality Control Supervisor via written memorandum dated December 18, 1975, has instructed the Quality Control Engineers, Supervisors, and Inspectors to perform verification tests on suspect materials prior to release for use.

LP&L Resolution (Ref. 6):

The Ebasco position is acceptable provided the instructions to Ebasco QC Personnel are in writing indicating the date that the instructions are to be implemented and executed by the responsible individual in Ebasco for implementation.

12. a) Were any cracks discovered in 1977 outside of the ringwall? Provide documentation. b) If none were discovered outside ringwall why not infer that these three blocks were poorly constructed?

Response: 12a)

No, the only NCRs generated against "cracking" are as follows:

1. NCR #W3-535 supplement 1-3 was initiated 7/28/77. This NCR deals with cracking inside RCB only. (see attached)

2. NCR #W3-6212 was initiated 5/11/83. This NCR deals with cracking in the RAB. (see attached)

Also see answer to Question #8

Response: 12b)

The implementation of the Quality Program in the construction of the base mat assures that all blocks are properly constructed. All procedural deficiencies identified during the placement of the first 3 blocks were corrected at the time at the direction of Quality Program personnel.

It is the applicant's position that the mat is properly constructed, that hairline cracks which may be penetrated by moisture are normal and not an indicator of any deficient condition, and that the mat is fully capable of performing satisfactorily for the life of the plant.

6008-1 (R12-75)

EBASCO SERVICES INCORPORATED

QUALITY ASSURANCE

NONCONFORMANCE REPORT

REPORT NO. (1) W3-535-Supp #1 & 2

Distribution:
White - PQAE or Site QA Supervisor
Yellow - Organization recommending disposition
Pink - Initiator of NCR

INSTRUCTIONS: (See back of form)

CLIENT OR PROJECT (2)	DRAWING NO./SPEC NO. (3)
Waterford SES Unit #3	PSAR Section 5.2.2.10
SUPPLIER, CONSTRUCTION QC OR CONTRACTOR (4) Construction / P.O. NO. (5)	
DESCRIPTION OF COMPONENT, PART OR SYSTEM (6) Common Foundation Mat	

I. DESCRIPTION OF NONCONFORMANCE (7) (Items Involved, Specification, Code or Standard to Which Items Do Not Comply, Submit Sketch if Applicable)

The top of the mat beneath the containment structure contains a number of cracks which were discovered to be weeping water. The rate of weeping is generally enough to show the crack and to moisten the surrounding concrete. ~~It appears that these radial cracks are the result of the concave shape which the material has assumed due to differential settlement.~~ 7-28-77

NAME AND SIGNATURE OF PERSON REPORTING NONCONFORMANCE (8)	TITLE	DATE (9)
R. A. Hartnett	Q. A. Site Supervisor	7-28-77

II. RECOMMENDED DISPOSITION (10) (Submit Sketch if Applicable)

SEE ATTACHED SHEET.

SEE PRI No. 8

REPORTABLE	YES	NO
10CFR50.55(e)	☐	☑
10CFR21	☐	☑

Reviewed by [illegible] 8/16/77

NAME AND SIGNATURE OF PERSON RECOMMENDING DISPOSITION (11)	TITLE	DATE (12)
W.C. GRIGGS W.C. Griggs	RES. ENG'R. - FIELD	7/29/77

III. EVALUATION OF DISPOSITION BY EBASCO, REASON FOR DISPOSITION (13)

After the attached test method for repairs of cracking is performed a detailed test report is to be presented to ENGR for review & final evaluation. A detailed work procedure for final repairs shall then be written prior to ~~completing work~~ Continuing 7-29-77

☒ ENGINEERING	☐ QUALITY ASSURANCE	☑ CONSTRUCTION	☐ OTHER AUTHORIZED PERSONNEL
NAME (SIGNATURE) E J Gallagher	NAME (SIGNATURE)	NAME (SIGNATURE)	NAME (SIGNATURE)
DATE 7-29-77	DATE	DATE	DATE
☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS

IV. VERIFICATION OF DISPOSITION ☒ REQUIRED ☐ NOT REQUIRED (14)

(15) BY Joe Gutierrez (EBASCO VENDOR QA OR QA ENGINEERING) SIGNATURE Joe Gutierrez TITLE Civil Dept Engr DATE 1-5-77

Refer to Supp #3

DISPOSITION FOR
NONCONFORMANCE W3-535

In order to establish a method of repair, perform the following operations and resubmit the nonconformance with results.

A. Drill and grout in place three 1/8" pipe nipples to a depth of two-three inches. The above to be performed on at least two cracks. Pipe nipples to be approximately 8" ±2" c.c.

B. Seal the surface of the crack using a quick setting epoxy. A window may be provided between selected nipples in order to monitor the flow of epoxy which is to be injected as follows.

C. Pressure inject Concressive 1380 epoxy as manufactured by Adhesive Engineering into the middle pipe nipple. Grouting pressure to be increased gradually as required to make the epoxy flow. Maximum pressure to be used is 180 PSI. New York Engineering (ESSE) to witness the grouting operation and provide final disposition of nonconformance.

Rev. 1

SUPPLEMENT TO NCR W3-535

EVALUATION

August 3, 1977

After an unsuccessfull attempt at pressure injecting epoxy grout into the cracks, the following procedure should be used to effectivelv control the leakage or weeping of water through the cracks.

1 - Chip a 1" deep trench along the length of the crack.

2 - Roughen (by sandblasting or bush hammer) and clean the surface thoroughly along the crack as well as a 1 ft. strip on either side of the crack.

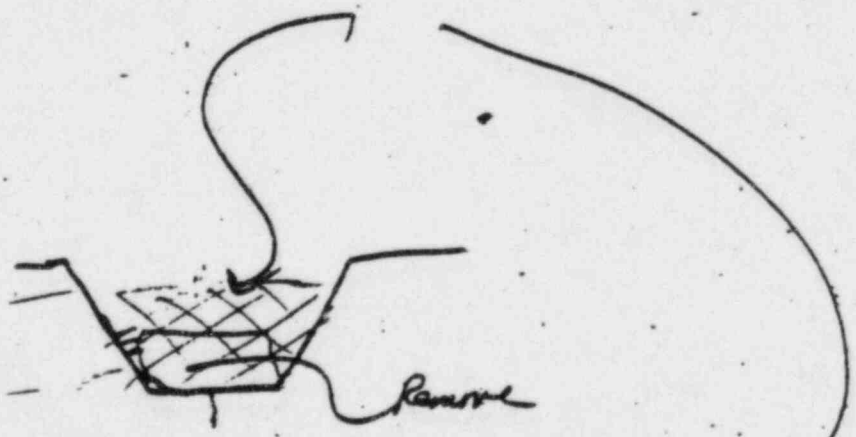
3 - Fill the 1" deep trench with SIKA Hi-Mod-LV epoxy which may be used as a seal coat in the dry, damp or wet area in accordance with manufacturer instructions and surface preparation.

4 - After the epoxy is tack free, apply a brush coat of the Hi-Mod-LV to the roughened and clean surface 2 ft. wide along the crack length.

5 - Monitor the repairs for 1 day to visually inspect that leakage has ceased to penetrate the cracks. At this time, the concrete placements may continue.

Hi-Mod w/ Site quarte Aggre filler

E J Gallagher



1. Coat w/ Neat Coat - Hi-Mod
2. Fill w/

Accepted
E Gallagher

W3-535

The attached evaluation sheet for epoxy grout repairs does not affect the original disposition of this nonconformance report.

SUPPLEMENT #2 TO NCR W3-535

August 5, 1977

All cracks in placement 502-6 have been inspected and found satisfactorily repaired according to the outlined procedure in supplement #1 of NCR W3-535. There is no indication of water weeping since the application of the SIKA Hi-Mod epoxy. All subsequent cracks detailed on the attached mat drawing should be repaired in an identical manner.

Placement 502-6 may proceed after Quality Control performs normal pre-placement inspection.

E. J. Gallagher
Civil Site Support Engineer

0007005

6008-11/12-75

EBASCO SERVICES INCORPORATED

QUALITY ASSURANCE

NONCONFORMANCE REPORT

REPORT NO.(1) W3-535 - Supp #3

Distribution:
White - PQAE or Site QA Supervisor
Yellow - Organization recommending disposition
Pink - Initiator of NCR

INSTRUCTIONS: (See back of form)

CLIENT OR PROJECT (2): Waterford SES - Unit No 3

DRAWING NO./SPEC NO. (3): PSAR Section 5.2.2.10

SUPPLIER, CONSTRUCTION QC OR CONTRACTOR (4): Construction

P.O. NO (5):

DESCRIPTION OF COMPONENT, PART OR SYSTEM (6): Common Foundation Mat Within the RCB Wall

I. DESCRIPTION OF NONCONFORMANCE (7) (Items Involved, Specification, Code or Standard to Which Items Do Not Comply, Submit Sketch if Applicable)

This supplement provides additional information on the crack pattern and documents the crack patterns on the attached Field Sketch No 1564-4.1-G-28.

REPORTABLE	YES	NO
10CFR50.55(e)	☐	☑
10CFR21	☐	☑

Reviewed by [illegible] Date 7/84

NAME AND SIGNATURE OF PERSON REPORTING NONCONFORMANCE (8): R A Hartnett

TITLE: Q A Site Supervisor

DATE (9): 8-25-77

II. RECOMMENDED DISPOSITION (10) (Submit Sketch if Applicable)

Refer To Eng. For Evaluation and Disposition

NAME AND SIGNATURE OF PERSON RECOMMENDING DISPOSITION (11): Fred D. Rose

TITLE: SR QC. Sup.

DATE (12): 8/26/77

III. EVALUATION OF DISPOSITION BY EBASCO, REASON FOR DISPOSITION (13)

See attached supplement #3 to NCR W3-535 for evaluation

☐ ENGINEERING	☐ QUALITY ASSURANCE	☐ CONSTRUCTION	☐ OTHER AUTHORIZED PERSONNEL
NAME (SIGNATURE): E J Galloyle	NAME (SIGNATURE):	NAME (SIGNATURE):	NAME (SIGNATURE):
DATE: 8-26-77	DATE:	DATE:	DATE:
☐ ACCEPTED ☐ REJECTED ☑ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS

IV. VERIFICATION OF DISPOSITION ☑ REQUIRED ☐ NOT REQUIRED (14)

(15) BY Joe Gutierrez (EBASCO YENDOR QA OR QA ENGINEERING) SIGNATURE Joe Gutierrez TITLE Quality Assurance Engr DATE 1-5-77

NONCONFORMANCE REPORT
CLOSURE VERIFICATION

NCR No. W3-535
and Supp #1
#2
#3

REINSPECTION: ☒ Required ☐ Not Required

Repair or rework to be witnessed by Ebasco's Q.C. Inspector ☒ Yes ☐ No

Corrective Action Taken (Use sketch if necessary)

the subject surface cracks on the mat within the Reactor Bldg have been satisfactorily repaired in accordance with supplement to NCR W3-535 dated Aug 3, 1977. Visual inspection has been performed & indicates successfull repair of any weeping of water from the cracks. -

Q.C. to verify the above & placement of thru 14 may proceed - E Gallagher 8/18/77

Cracks that were identified after the 8/18/77 were also repaired in accordance with the Ebasco disposition attached to NCR W3-535 & found satisfactory. 9/13/77 E Gallagher

☐ Accept
☐ Reject

Contractor's Q.C. Inspector N/A Date —

Ebasco's Q.C. Inspector _____ Date _____

See reverse side. Ebasco 9/13/77 →

Form No. ASP-III-7-4 (3-16-76)

EVALUATION OF DISPOSITION TO NCR SUPPL. #3 W3-535

The newly identified cracks which are indicated by the dashed line on the attached sketch, are to be sealed and repaired according to the Supplement #2 attached to NCR W3-535. All such cracks beneath a specific concrete placement must be sealed and dry prior to concrete placement. These cracks, after being repaired, will not cause any further effect on the structural capabilities of the foundation mat. If any of the construction joints indicate leakage, the entire construction joint is to be sealed until all leakage ceases.

Quality Control should carefully inspect the cracks prior to placement to verify that no cracks have been missed due to surface dust or placement equipment and that the cracks that have been repaired are not continuing to leak.

E. Gallagher 8-26-77
Site Concrete-Hydraulics Engineer

9.11'3.77

EBASCO SERVICES INCORPORATED

QUALITY ASSURANCE

NONCONFORMANCE REPORT

Distribution:
White - PQAE or Site QA Supervisor
Yellow - Organization recommending disposition
Pink - Initiator of NCR

REPORT NO. (1) W3-6212

INSTRUCTIONS: ~~See back of form~~ — TRND TREND CODE: 2000.00.69 SUS# 99C

CLIENT OR PROJECT (2)
WATERFORD SES UNIT NO. 3

DRAWING NO./SPEC NO. (3)
F.S.A.R. -

SUPPLIER, CONSTRUCTION QC OR CONTRACTOR (4)
J.A. JONES CONSTRUCTION CO.

P.O. NO. (5)
W3-2IY-4

DESCRIPTION OF COMPONENT, PART OR SYSTEM (6)

I. DESCRIPTION OF NONCONFORMANCE (7) (Items Involved, Specification, Code or Standard to Which Items Do Not Comply, Submit Sketch if Applicable)

There are concrete cracks in the base mat of the Reactor Auxiliary Building. This is evidence by the percolation of water in small amounts, up through these cracks. These cracks are located in the Gas Surge Tank Room, Waste Gas Tank Room, and Waste Gas Compressor "B" Room, all at elevation -35.00. See attached F.S.A.R. requirements for supplemental information. NOTE: These are examples of where cracks were found.

ITEM NO: 43

NAME AND SIGNATURE OF PERSON REPORTING NONCONFORMANCE (8)	TITLE/COMPANY	DATE (9)
S. Horton Sam Horton	Q.A. Surv. Engr./Ebasco	5-11-83

II. RECOMMENDED DISPOSITION (10) (Submit Sketch if Applicable)

ACCEPT AS FS.

See ATTACHMENT III.

REPORTABLE	YES	NO
10CFR50.55(e)	☐	☐
10CFR21	☐	☐

Date: 5/25/83

NAME AND SIGNATURE OF PERSON RECOMMENDING DISPOSITION (11)	TITLE/COMPANY	DATE (12)
GEORGE EDWARDS	QA - EBASCO	5-25-83

III. EVALUATION OF DISPOSITION BY EBASCO, REASON FOR DISPOSITION (13)

5/25/83

IV. CORRECTIVE ACTION (14) ☐ Required ☒ Not Required

5/25/83

V. (15) ☒ ENGINEERING	☐ QUALITY ASSURANCE	☐ CONSTRUCTION	☐ OTHER
NAME (SIGNATURE) Brian Grant	NAME (SIGNATURE) E. Edwards	NAME (SIGNATURE)	NAME (SIGNATURE)
DATE 5/25/83	DATE 5/25/83	DATE	DATE
☒ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☒ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS	☐ ACCEPTED ☐ REJECTED ☐ ACCEPTED WITH COMMENTS

VI. VERIFICATION OF DISPOSITION ☐ REQUIRED ☒ NOT REQUIRED (16)

5/25/83

(17) BY _____ SIGNATURE _____ TITLE _____ DATE _____
EBASCO VENDOR QA OR QA ENGINEERING

3.4 WATER LEVEL (FLOOD) DESIGN

3.4.1 FLOOD PROTECTION

All seismic Category I structures, safety-related systems, and components necessary for safe shutdown are located within the Nuclear Plant Island Structure (NPIS), which is designed against high water levels and wave run-up associated with probable maximum flood (PMF) to elevation +30.0 ft. MSL. The NPIS is a reinforced concrete box structure with solid exterior walls with few doors and penetrations. All exterior doors in structures which house and protect safety related equipment and penetrations below elevation +30.0 ft. MSL are watertight. The plant grade around the structure slopes from elevation +27.1 ft. elevation on the north side to elevation +24.5 ft. on the south side. 2

FOR INFORMATION ONLY

All seismic Category I structures, safety-related systems, and components are protected against PMF by the following: 2

a) The NPIS is the common structure of Reactor Building, Reactor Auxiliary Building, Fuel Handling Building and Component Cooling Water System Structure. It is a rectangular box-like reinforced concrete structure 380 ft. long, 267 ft. wide and extending 64.5 ft. below grade. The general structural layout is shown in Figure 3.8-1. Its common foundation mat and exterior wall system are designed to withstand all loadings of postulated floods as well as to provide a watertight barrier. 2

The common foundation mat is 12 ft. minimum in thickness and provided with double layers of nine inch PVC waterstop at all construction joints. The walls subjected to floods are waterproofed up to plant grade. In addition, vertical construction joints of the walls between plant grade and elevation +30.00 ft. MSL are provided with minimum six inch PVC waterstops (Figure 3.4-1). Uplift forces created by the PMF to elevation +30.0 ft. MSL are accounted for in the design as described in Subsections 3.8.4.3.1 and 3.8.4.3.2.

b) Housing within another structure (NPIS) designed to protect against flooding. The Reactor Building is enclosed within the NPIS and is thus protected against PMF.

Table 3.2-1 lists the flood protection criteria applied to plant structures, systems and components. The a or b designation in the table refers to item a or b above.

Figure 3.4-1 shows details of penetration, waterproofing and waterstops for the exterior walls of seismic Category I structures.

All exterior doors of the NPIS at plant grade or below the PMF elevation, which house and protect safety related equipment, are designed to withstand the hydrostatic pressures due to PMF and are watertight. The doors, which are located in the Reactor Auxiliary Building, are swing type (single or double) for protection against tornado missiles and PMF. The doors are made watertight by continuous neoprene gasket on the inner face and sealed by the

MAY 11 1983

VOID

use of eight quarter-turn latch and dog devices placed around the perimeter of the door as shown in Figure 3.4-2.

There are a total of eight watertight access doors below elevation +30.0 ft. MSL. In the Reactor Auxiliary Building there are three of the flood doors located in the east exterior wall, and two located in the west exterior wall above elevation +21.0 ft. MSL (Figure 1.2-9). In the Component Cooling Water System area there is one flood door located in the west exterior wall above elevation +21.0 ft. MSL (Figure 1.2-24). In the Fuel Building area there is one removable watertight gate located by the spent fuel cast decontainmination area above elevation +20.0 ft. MSL (Figures [illegible]).

FOR INFORMATION ONLY

[illegible] below elevation +30.0 ft. MSL are shown on Drawings LOU1564 G-499S04 to S06 for the [illegible] G-499S01 to S03. The penetrations in the exterior walls of Component Cooling Water System structures are shown in Sections A-A, B-B and E-E of Drawings G-499S04 to S06. Those in the exterior walls of Reactor Auxiliary Buildings are shown in Sections A-A, B-B and F-F of Drawings G-565 to 567. Those in the walls subjected to flood in Fuel Handling Building are shown in Sections B-B, C-C, F-F and Y-Y of Drawings G-593S01 to S03. Some of the penetrations are located in the temporary blockout as indicated in the drawings. All the temporary blockouts are provided with keyways and continuous PVC waterstop to assure watertightness and they are placed and filled with concrete after pipe installation. A typical detail of waterproofing membrane at pipe penetration is shown in FSAR Figure 3.4-1 and Drawing LOU1564 G-499S05. (Drawings submitted under separate cover). The NPIS is designed to withstand hydrostatic loadings due to postulated floods, and water leakage because of cracks in exterior structures, leaking waterstop and/or wind wave action is not expected. In the NPIS is also provided with floor drainage system capable of disposing the accumulated water through the waste management system (Refer to Section 11.2). 2 *

As discussed in Subsection 2.4.14, additional specific provisions for flood protection include administrative procedures to assure that all watertight doors below elevation +30.0 ft. MSL will be locked closed in the event of a flood warning. 1

3.4.2 ANALYSIS PROCEDURES

The maximum water level in front of the Nuclear Plant Island Structure following a collapse of the Mississippi River levee in the immediate vicinity of the plant concurrent with the PMF and from windwaves superimposed on the overland PMH surge through Barataria Bay has been established in Section 2.4. It is calculated that the effective maximum water including dynamic head on the exterior wall is at elevation +27.6 ft. MSL. The NPIS is designed to withstand a static water level at elevation +30.0 ft. MSL, thus providing an adequate safety margin. in addition, the subject structure is designed to withstand a static water level at elevation +21.5 ft. MSL plus an additional uniform dynamic loading equivalent to 500 lb per sq. ft. of exposure below elevation +21.5 ft. MSL. 1 17

In the design of walls and foundation slab of NPIS, the loads under flood condition are considered using the following load combination equation. 1

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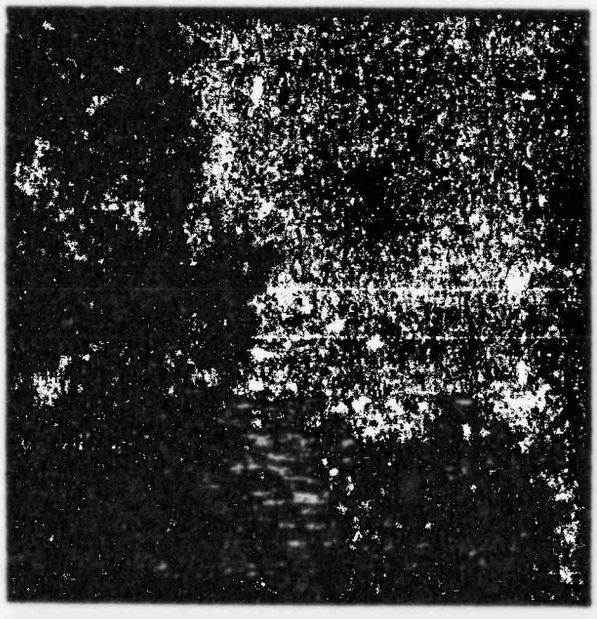
- GAS SURGE TANK



- WASTE GAS TANK C

NCR W3-6212
PAGE 1

ATTACHMENT III

The effect of postulated widespread hairline cracking of the basemat has been investigated by Civil Engineering for stability of the Containment Vessel against flotation and overturning under buoyant conditions caused by postulated groundwater intrusion and by Corrosion Engineering for groundwater induced corrosion of reinforcing steel and Containment Vessel bottom head. THESE WERE THE ONLY POTENTIAL PROBLEM AREAS IDENTIFIED IN THE INVESTIGATION. 5-26-83

Based on their findings that there are no stability or corrosion problems it is concluded that no corrective action is required.

See attached memorandums:

1. Memorandum COR-LW3-77-55M from A.W. Peabody/M.D. Oliveira to P. Grossman, dated August 5, 1977.

2. Memorandum from P.C. Liu to B. Grant dated May 24, 1983.

5-25-83

Attachment #1
NCR W3-6212
PAGE 2

August 5, 1977
COR-LW3-77-55M

To: P Grossman

From: A W Peabody/M D Oliveira

Subject: LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES UNIT 3
CORROSION OF REINFORCING STEEL AND
STEEL CONTAINMENT VESSEL PLATES IN CONTACT WITH WATER

In accordance with your telephone request, we have analysed a possible situation in the common mat where supposedly ground water weeping from concrete cracks found on the surface of the mat could corrode the reinforcing steel and the outside bottom plates of the Steel Containment Vessel.

It is a proven fact that concrete by its alkaline nature passivates carbon steel embedded in it.

It is also known that water in contact with concrete becomes alkaline and consequently its corrosivity to steel decreases considerably.

In addition to these factors, assuming that ground water is left inside the crack network to a certain extent, this water will be near stagnant and without replenishment of oxygen. Consequently, the rate of corrosion under the above circumstances, if any, will be negligible. This applies to the reinforcing rebars as well as to the outside of the vessel bottom plates, in case the repairs presently being conducted do not fully prevent the water from reaching the vessel.

MDO/hn
cc: R K Stampley
J O Booth/B D Fowler
D N Galligan
L Skoblar
W F Gundaker

MAY 26

NCR-W 83-6212
PAGE 3

Rec'd
5/24/83

S/T

To: B. Grant ... Call x277
From: P C Liu

EBASCO

Interoffice Correspondence

DATE May 24, 1983 FILE REF. File: 6-S-20

OFFICE LOCATION Waterford Site

TO B Grant

OFFICE LOCATION 87 WTC

FROM P C Liu

SUBJECT LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES UNIT NO. 3
STEEL CONTAINMENT STABILITY

This is to confirm our conversation that the steel containment stability has been reviewed for an imaginally condition that the exterior of the containment would subject to subsurface water up to EL-1.50 ft. The results of the review have concluded that under such a condition the stability of the containment will not be compromised. The stability calculations will be included in Volume II, FSAR Design Input - 6W12-FSAR-002.

PCL:dg

cc: C A Kanakaris
E S Kowaleski
P C Liu
Project File

RECEIVED
MAY 25
1983

13. a) Did Kominsky recopy illegible cadweld records? b) Under whose direction? c) Why? d) What happened to the original records?

Response:

a) Kaminski did recopy illegible cadweld records.

b) It is not apparent that he received any specific direction to recopy the records.

c) He has stated that while he was Supervisor of Inspection for J. A. Jones that "work sheets" were used during the actual inspection of cadwelds. Some of the records became dirty or wet. At the end of each shift or day, the information on the "work sheet" was transferred to a clean report by himself or another inspector.

d) One inspector has stated that the originals were attached to recopied reports. However, LP&L has been unable to locate the originals of the inspection reports.

14. a) Provide summary of actions taken following Hill's presentation of QA deficiencies. b) Provide detailed report on document review undertaken and all results.

Response: 14 (a)

Deficiencies discovered by Hill were being aggressively addressed even before he left the Waterford 3 site.

1. On June 8, 1983, Hill's supervisor forwarded his June 6, 1983 memorandum to the Ebasco Site QA Program Manager and recommended that the scope of the concrete records review be expanded.

2. In a meeting of July 7, 1983, Hill recommended that all concrete placement packages and soil packages be reviewed.

3. On July 11, 1983, project management decided to review a 10% sample of the concrete placement packages, and LP&L directed Ebasco to begin the review. (NOTE: Hill left the site on July 31, 1983).

4. In August 1983, the review of concrete placement packages was begun. In September, 1983, the review program was expanded to include 100% of the concrete placement packages. The review is now complete and 33 new NCRs were written as a result of this review, none of which identified significant physical deficiencies and all of which have been properly dispositioned.

5. Soils and backfill records were previously subjected to a comprehensive review by Ebasco. All records were reviewed for existence of required records, their completeness, and for proper organization by elevation and fill number. Approximately 50% of the records were re-reviewed for technical adequacy. No additional soils non-conformances were identified.

6. To gain an even greater level of confidence, LP&L personnel, in accordance with standard procedures, are currently performing additional reviews of concrete placement and backfill records. Certain types of civil records are being 100% reviewed by LP&L during this review process.

Response 14 (b)

In August of 1983, four (4) Ebasco Sr. QA specialists were requested to report to Waterford III. The scope of this request was to take a 10% sampling of J.A. Jones Concrete Placement packages and to do an unbiased cursory review (based on the individuals past background of other jobsites civil documentation) to establish an understanding of the general condition of the packages with respect to records accuracy, completeness, legibility and adequacy of record availability. Following a brief orientation period, the 10% review and summary was conducted. The sampling included 100% of the base mat placement packages and a selection from the Fuel Handling Bldg., Reactor Auxiliary Bldg, Shield, Dome, Ringwall and the Reactor Containment Bldg.

The recommendation proposed to Ebasco/LP&L top management after the review, based on the general concerns noted, was that a 100% review should be performed prior to these packages being turned over to the client.

A brief synopsis of the concerns noted in this initial review is as follows:

1. Some packages had embed logs which, at the time, were not obtainable in the package.

2. Some packages had cadweld maps which, at the time, were not obtainable in the package.

3. Some packages had missing concrete test records which at the time were not obtainable in the package.

4. Some packages had curing records which were inadequate.

5. Some packages had concrete mix designs which were indicated as being used but which had no apparent engineering approvals.

6. Some packages had no traceability as to which concrete mix design was used.

7. Some packages had batch tickets which, at the time, were not obtainable in the package.

8. Some packages had problems with respect to the timely certification of inspectors.

Following this 10% sampling review, Ebasco and LP&L management agreed that a 100% review of these records was essential. A new review group was formed in September 1983, (which consisted of two (2) of the original reviewers and four (4) other participants). This group, for a two (2) week period, scanned all applicable procedures, specifications, and standards in order to establish a review procedure which would assure a uniform and

acceptable method for the review of packages involved. This procedure (QA-9 Supplement 48-3), which formed the basis for the review, also established acceptance criteria for the review. The following are examples of the minimum records which were required.

1. Preplacement checklist
2. Placement checklist
3. Field Test Records
4. Lab Reports
5. Repair Documents

Items within the scope of these records which required review, as a minimum, were items such as:

1. Personnel certifications
2. Curing Adequacy
3. DNs, DRs, and NCRs were initiated and closed where applicable
4. Concrete placed was approved for use
5. All testing and results were acceptable
6. Documentation was legible and complete

NOTE: Also taken into consideration was. The fact that, during the mat placements, Ebasco performed independent Quality Control functions. When J.A. Jones records were not available, Ebasco duplicate inspections were substituted per Ebasco Procedure QAI-9 Rev. 0 Para. 6.1.4 which states, "In case of illegible or missing Jones documentation, the parallel Ebasco QC Inspection can be utilized as supporting documentation . . ." During the 10% review, this duplication was not taken into consideration.

During the 10% sample review, many items appeared to be discrepant. The 100% review resolved many of these apparent discrepancies. Some examples are as follows:

1. Missing records were retrieved from applicable contractors records.
2. Missing records were retrieved from other placement packages (misfiled).
3. Missing records were retrieved due to misfiling in the vault.
4. Since some placements were conducted at the same time as others, missing records were retrieved from other packages. (i.e.) If placement No. 10 and 11 were placed together the records generated would reference both placement numbers. The inspector would make (1) one copy of each record and compile (2) two packages. (1) one package would be No. 10 and (1) one No. 11. The placement number pertaining to each unique package would be circled or in some cases highlighted to show which set of records went to which package. While during the review, if the review had, for instance, a preplacement record missing for placement No. 10, he would look t another record that was obtainable in package No. 10 to determine if a this placement occurred at the same time. If, for instance, he looked at a postplacement record in No. 10 and saw that No. 11 was also entered on this document, the reviewer would go to package No. 11, pull the missing preplacement record, copy, and place this document into package No 10-thus making a completed package.

4. Finally at the conclusion of this reorganization and review of these Civil Records, 33 Nonconformance Reports were generated, which adequately documented discrepancies outstanding. The following are the discrepancies which were documented as a result of the review. Some of these areas were covered under other reviews in the past, however, since this review was a 100% re-review, new documentation was initiated.

   Although every placement has been documented in this manner, the following listing only deals with the Basemat. Any discrepancies not noted within the following seven (7) NCRs generated against the basemat were either satisfactorily corrected prior to the conclusion of this review (or) were satisfactorily identified on previous NCRs. (See the response to Question 1).

NCR #W3-7152 (Eye Exams)

Description (4) Jones Inspectors performed inspection prior to having eye exam on file (10) common foundation structures.

Disposition Two of the four inspections were certified on 11-24-75 and 11-26-75 apparently eye exams lost. Other two inspectors listed on NCR#W3-7150.

NCR #W3-7153 (Cold Weather Cure)

Description Surface temp. of concrete dropped below 50° on (6) occasions and ambient below 45° on (19) occasions without notifying engineering or an NCR written.

Disposition ACI require concrete to be maintained to a min. of 40° for Class I structure 72" thick lowest temp. recorded was 42°. Test results on 28 days exceeded 5000 psi therefore on (6) occasions this did not affect the 4000 psi required strength.

NCR #W3-7154 (Cure Records)

Description On (19) nineteen placements records of curing are not complete

Disposition Method of curing is on Jones Inspection Reports and on Pour Plans. No average temperature occurred to prevent hydration. Cure records shown that moisture was sufficient for proper curing.

NCR #W3-7353 (Mix Design)

Description Mix designs were used without engineering approval

Disposition Mix designs were approved by engineering. Mix design number was apparently misprinted batch tickets give all quantities.

NCR #W3-7150 (No Certification on File)

Description (2) Jones Inspectors performed inspection without certification on file

Disposition Resumes and Dual Inspections by Ebasco rendered work as being acceptable.

NCR #W3-7149 (Inspectors Certifications)

Description Six inspectors performed inspections prior to certification

Disposition Use-as-is based on prior experience/training and currently have records of completing certification

NCR #W3-7151 (Eye Exams)

Description (9) Jones inspectors performed inspections prior to eye exams

Disposition (9) Jones inspectors have exam after the fact. Eye sign usually gets worse rather than better without corrective means

After the review of all packages was concluded, but prior to turnover, additional steps were taken to aid in future handling of subject packages. All concrete placement package numbers as well as all DNs, DRs and NCRs were entered into the Waterford III Site computer program. Printouts were developed to aid in package retrievability as well as traceability to discrepancies per package and total placement accountability. Other steps taken were to compile various back-up record traceability through means of various record matrixes (which can be seen in attachment to Item No. 20) to aid in the retrieval of applicable documents which are related although not generally found within the concrete placement package itself.

In January, 1984, all records were turned over to the QA Records Vault as being completed for review and closure of all corrective actions taken.

15. Provide LP&L's evaluation of adequacy of Harstead's third report. Does LP&L assert that it represents their views as well?

Response

LP&L contracted with Harstead Engineering Associates (HEA) to perform a review of the records associated with the Basemat. Their review was independently performed and copies of the report (HEA 8304-3) were distributed in parallel to LP&L and the NRC.

LP&L has reviewed this report and concludes that the technical review of the records necessary to assure the adequacy of the Basemat was indeed performed by HEA. Further, LP&L strongly endorses the conclusions reached in HEA 8304-3, Harstead's third report.

16. Provide specific basis for Harstead's conclusion that the documentation problems do not affect their prior conclusion as to basemat's strength. What documents did Harstead review? What did he look at? Did he see the Phearson-Brigg memo? Hill's NCR's? Other NCR's?

Response:

HEA Report No. 8304-3, dated 01/09/84, summarizes the results of the review of construction documentation performed on behalf of Louisiana Power and Light Company.

The following items were reviewed:

a) Concrete pour packages
b) Cadwelding activities including testing
c) Clam shell filter blanket under the basemat
d) Waterstop splicing and testing

There are 28 concrete pour packages that make up the basemat: 499S02-1, 2, 3, 4, 5A, 5B, 6, 7A, 7B, 8A, 8B, 9A, 9B, 10A, 10B; 499S01-11A, 12A, 13A, 14A, 15; 499S03-11B, 12B, 13B, 14B, 16, 17, 18, 19.

Each concrete pour package contains the following documents.

1) Concrete pre-placement checklist record (J.A. Jones)
2) Concrete pre-placement checklist record (Ebasco)
3) Daily concrete inspection (Ebasco)
4) Concrete placement inspection (Ebasco)
5) Concrete curing log (J.A. Jones)
6) Concrete curing record (Ebasco)
7) Concrete test record (Ebasco)
8) Concrete physical tests (Ebasco)
9) Concrete pour plan (J. A. Jones)
10) Embed map log (J. A. Jones)
11) Cadwelded locations (as-built)
12) Requisition on warehouse
13) Concrete mix delivery tickets

These documents were reviewed in their entirety.

The following documents were totally or partially reviewed for the basemat cadwelds.

1) Daily cadweld inspection reports (J. A. Jones)
2) Cadweld daily inspection-visual (Ebasco)
3) Reports of tensile tests-cadweld splices (Ebasco)
4) Weekly cadweld or rebar test reports (J. A. Jones)

Emphasis was placed on a review of the tensile test reports and daily inspection reports.

Sections 4 and 5 of the referenced HEA report detail the review performed for items (c) and (d), the clam shell filter blanket and waterstop splicing.

The Phearson memo, although not a formal document, was provided to HEA by Louisiana Power and Light as part of the documentation comprising Stop Work Order No. 1 (see HEA Report No. 8304-1 dated 09/19/83, Subsection 4.1).

HEA considers that the issues raised in the Phearson memo (dated 12/15/75) are adequately addressed in Stop Work Order No. 1 (dated 12/16/75).

Following is the list of NCR's that were reviewed by HEA.

NCR NO.	Title	Comment
W3-10	Concrete Placement	
W3-24	Pour 499S02-7A-Air Content	
W3-25	Pour 499S02-7A-Slump	
W3-26	Removal of Formwork	
W3-27	Placement 499S02-8A-Embedded Elephant Trunk	
W3-29	Foundation Mat-Air Content	
W3-31	Common Mat-Air Content	
W3-32	Common Mat-Number of Revolutions	
W3-33	Common Mat-Air Content	
W3-39	Common Mat-Strip #3, Section 10B	
W3-93	Common Mat-Placement No. 499S03-19	
W3-5563	FHB Bridge Crane-Connection Tests	N.A.*
W3-5564	FHB Stairs-Welding and Bolting Inspection of Seismic Class I Stairs	N.A.*
W3-5565	FHB Bridge Cran	N.A.*
W3-5598	Tubing	N.A.*
W3-5973	FHB Tornado Door Frame	N.A.*
W2-5997	Clam Shell Filter Blanket Under the Nuclear Plant Island	
W3-5998	Production Cadwelding	
W3-6234	Cadwelding	
W3-6245	Daily Cadweld Inspection Reports	
W3-7149	Concrete Placement Packages-Common Foundation	
W3-7150	Concrete Placement Packages	
W3-7151	Concrete Placement Packages-Common Foundation	
W3-7152	Concrete Placement Packages-Common Foundation	
W3-7154	Concrete Placement Packages	
W3-7353	Concrete Placement Packages	
W3-7481	Cadweld Tensile Test Reports	

* Not applicable or related to Basemat

17. Provide differential settlement contours for 6 month periods, starting from early 1977 to present.

Response:

Attachments are provided which present differential settlement contours as available.

These attachments represent a period between April 1977, and August 1979.

Where is the bench mark
≒ mile down the road

What is Placement & settlement →

- measurements taken at 4 corners of block - then averaged.
- total settlement - from benchmark
- diff settlement - difference from Placement 6

EBASCO SERVICES
INCORPORATED
NEW YORK

BY GFG DATE 4/22/77 SHEET NO. ____ OF ____
CHKD. BY ____ DATE ____ E.O. NO. ____ DIV. ____

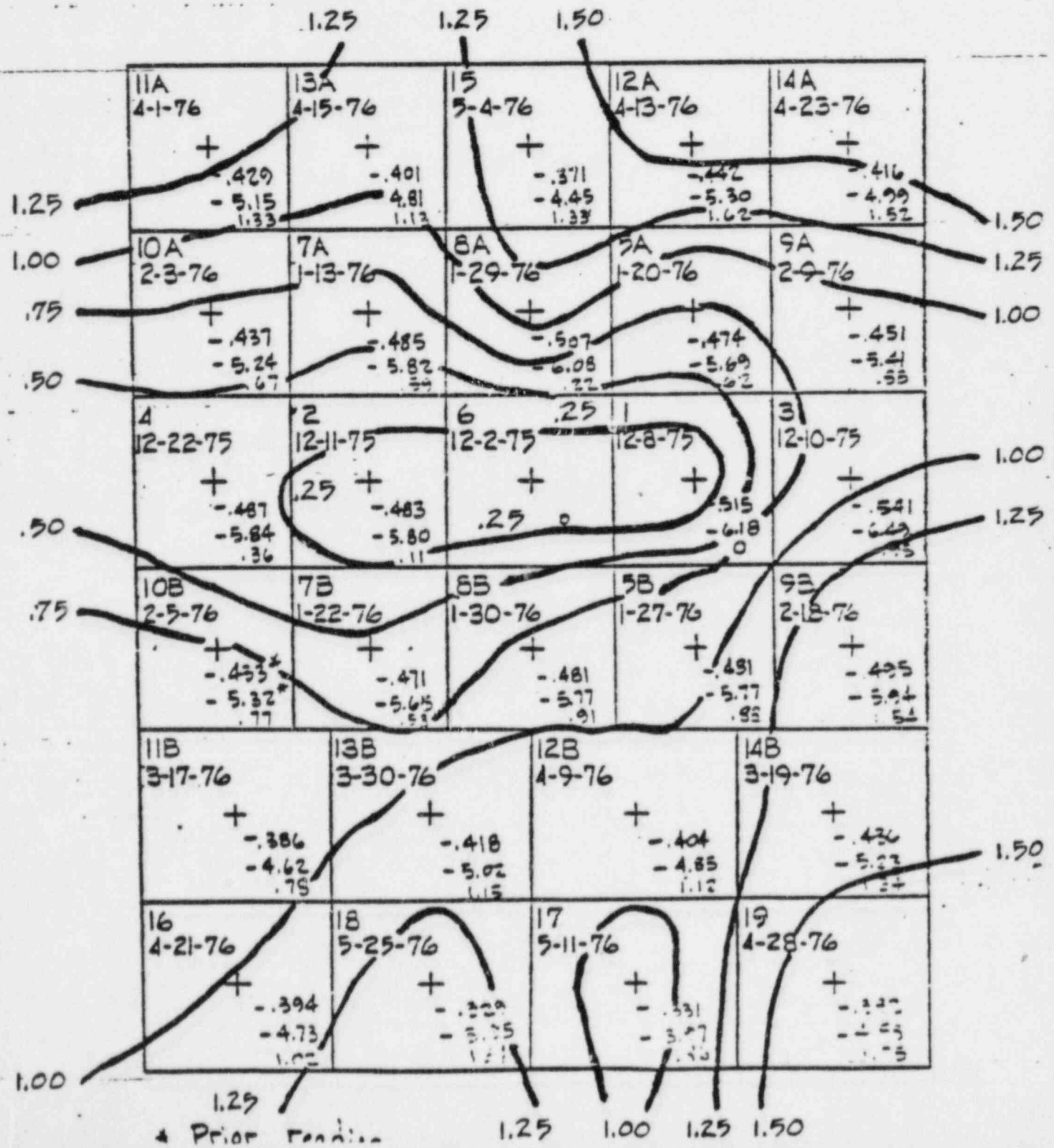
COMPANY Louisiana Power and Light Company

PROJECT Waterford Unit #3

SUBJECT Mat Settlement - APRIL, 1977

1st No - Total Settlement 'F
2ND No - Total Settlement 'F
3RD No - Diff Settlement

DIFFERENTIAL SETTLEMENT CONTOURS (IN)



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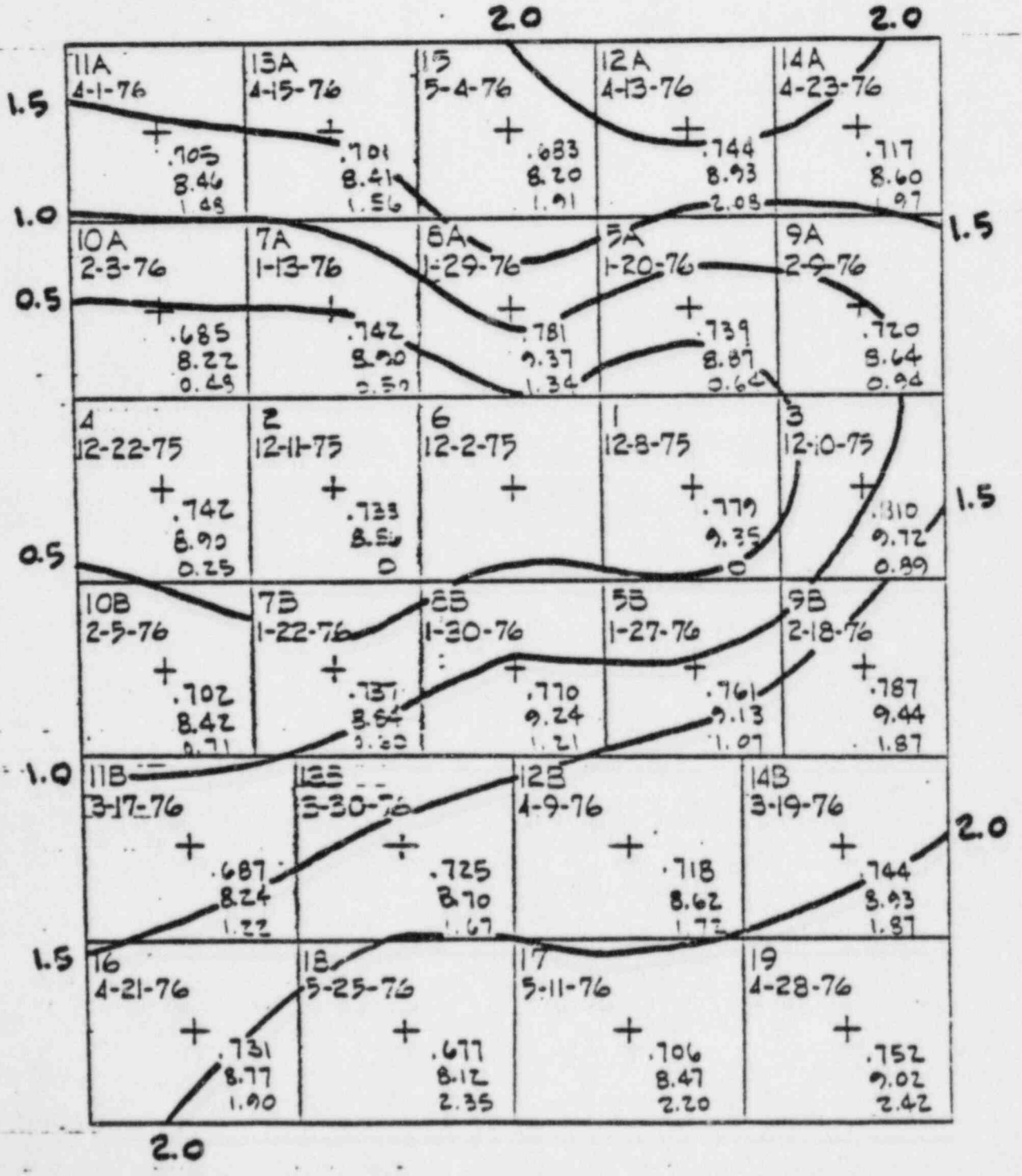
BY GFG DATE 2/24/78 SHEET NO. ____ OF ____
CHKD. BY ____ DATE ____ E.O. NO. 4294.541 DIV. EE1
COMPANY Louisiana Power and Light Company
PROJECT Waterford Unit #3
SUBJECT Mat Settlement - JANUARY 1978

DIFFERENTIAL SETTLEMENT CONTOURS

1ST No - TOTAL SETTLEMENT (FT)
2ND No - TOTAL SETTLEMENT (IN)
3RD No. - DIFFERENTIAL SETTLEMENT (IN.)



EBASCO SERVICES INCORPORATED
NEW YORK

BY GFG DATE 3/28/78 SHEET 1 OF 1

CHKD. BY ____ DATE ____ OFS NO. 42945-11 DEPT. NO. 551

CLIENT LOUISIANA POWER & LIGHT COMPANY

PROJECT WATERFORD UNIT #3

SUBJECT MAT SETTLEMENT - FEBRUARY 1978

DIFFERENTIAL SET. CONTOURS

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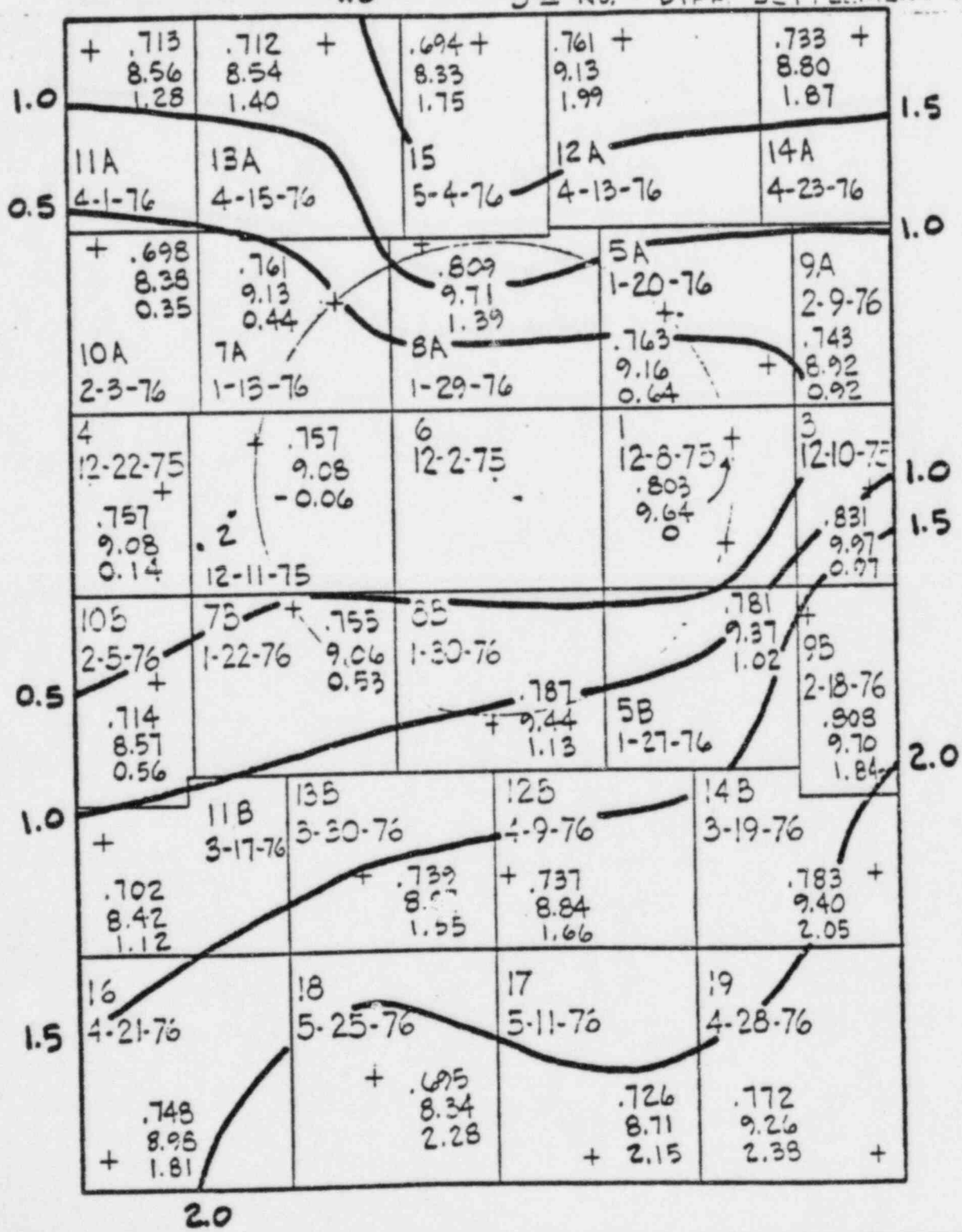
2ND No. - TOTAL SETTLEMENT (IN.)
3RD No. - DIFF. SETTLEMENT (IN.)



FORM 881 REV 7-71

EBASCO SERVICES INCORPORATED
NEW YORK

BY GFG DATE 4/17/78 SHEET 1 OF 1

CHKD. BY _____ DATE _____ OFS NO. 4294.541 DEPT. NO. 551

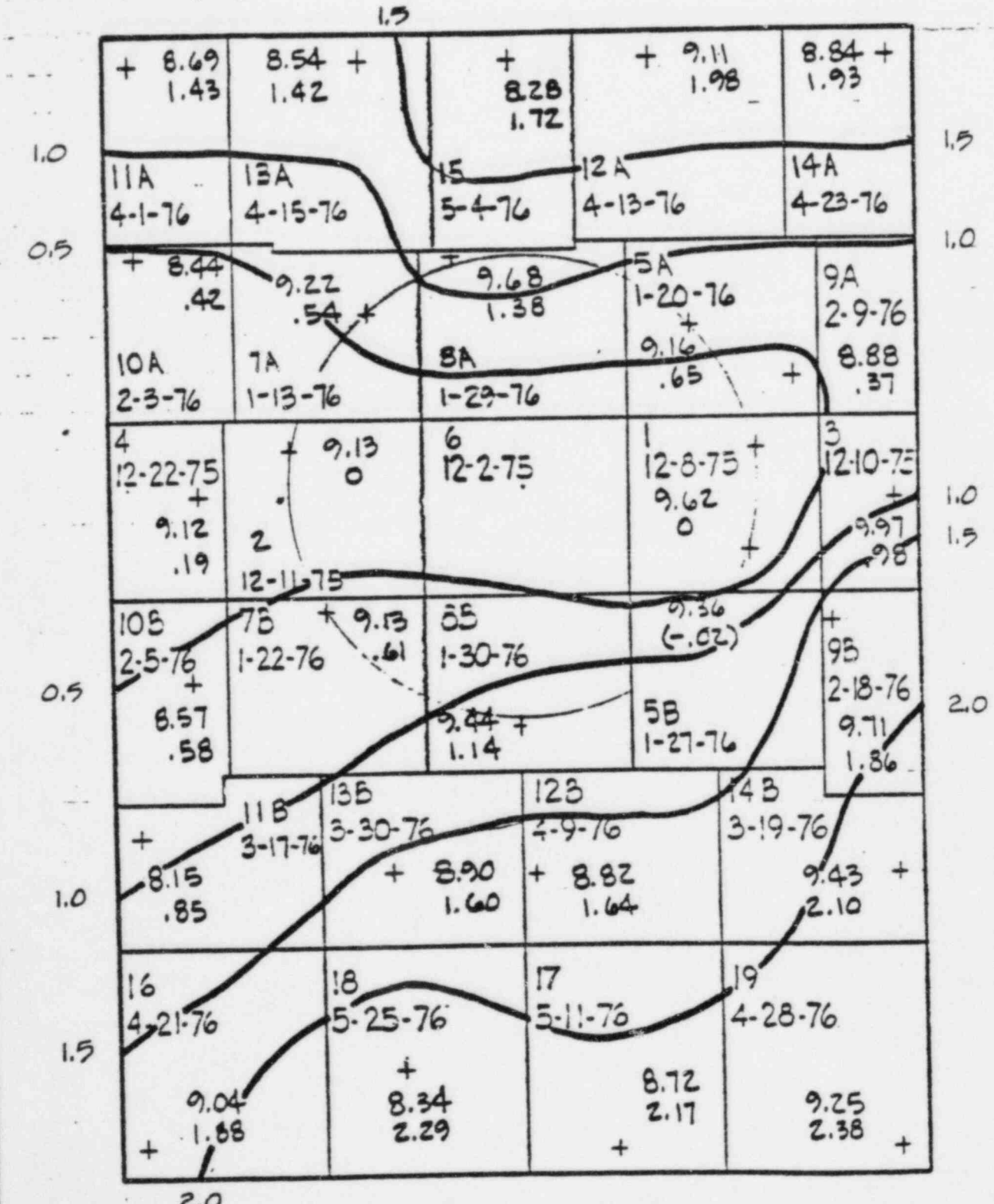
CLIENT LOUISIANA POWER & LIGHT COMPANY

PROJECT WATERFORD UNIT #3

SUBJECT MAT SETTLEMENT - MARCH, 1978

DIFFERENTIAL SETTLEMENT

1ST No.- TOTAL SETTLEMENT (IN
2ND No.- DIFF. SETTLEMENT (IN



FORM 581 REV 7-71

EBASCO SERVICES INCORPORATED
NEW YORK

BY CSG DATE 4/9/74 SHEET 1 OF 1

CHKD. BY _____ DATE _____ OFS NO. 4294.521 DEPT. NO. 551

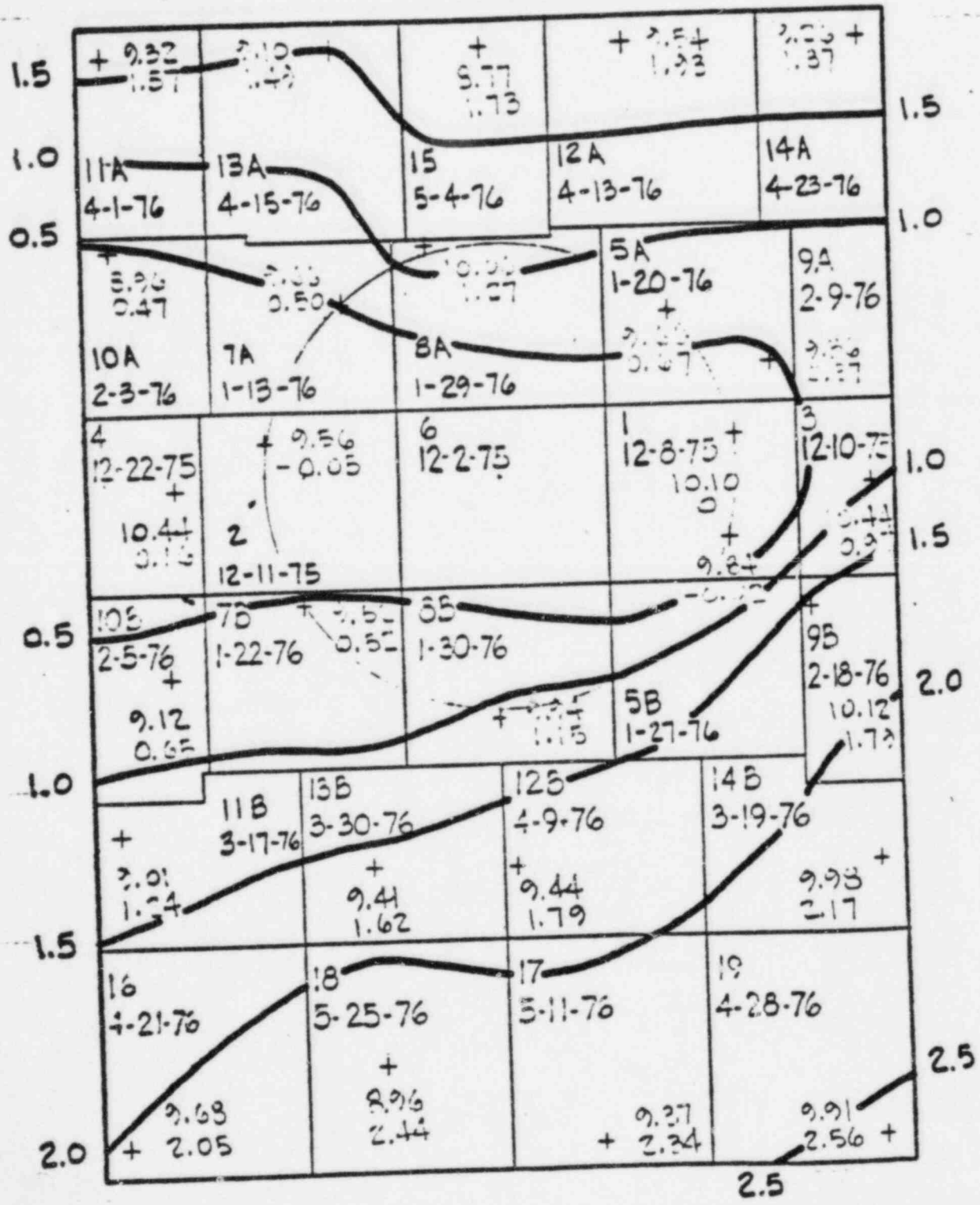
CLIENT LOUISIANA POWER & LIGHT COMPANY

PROJECT WATERFORD UNIT #3

SUBJECT MAT SETTLEMENT

DIFFERENTIAL SETTLEMENT CONTOURS

1ST No. - TOTAL SETTLEMENT
2ND No. - DIFF. SETTLEMENT



FORM 561 REV 7-71

EBASCO SERVICES INCORPORATED

NEW YORK

BY GFG DATE 10-9-79 SHEET 1 OF 1

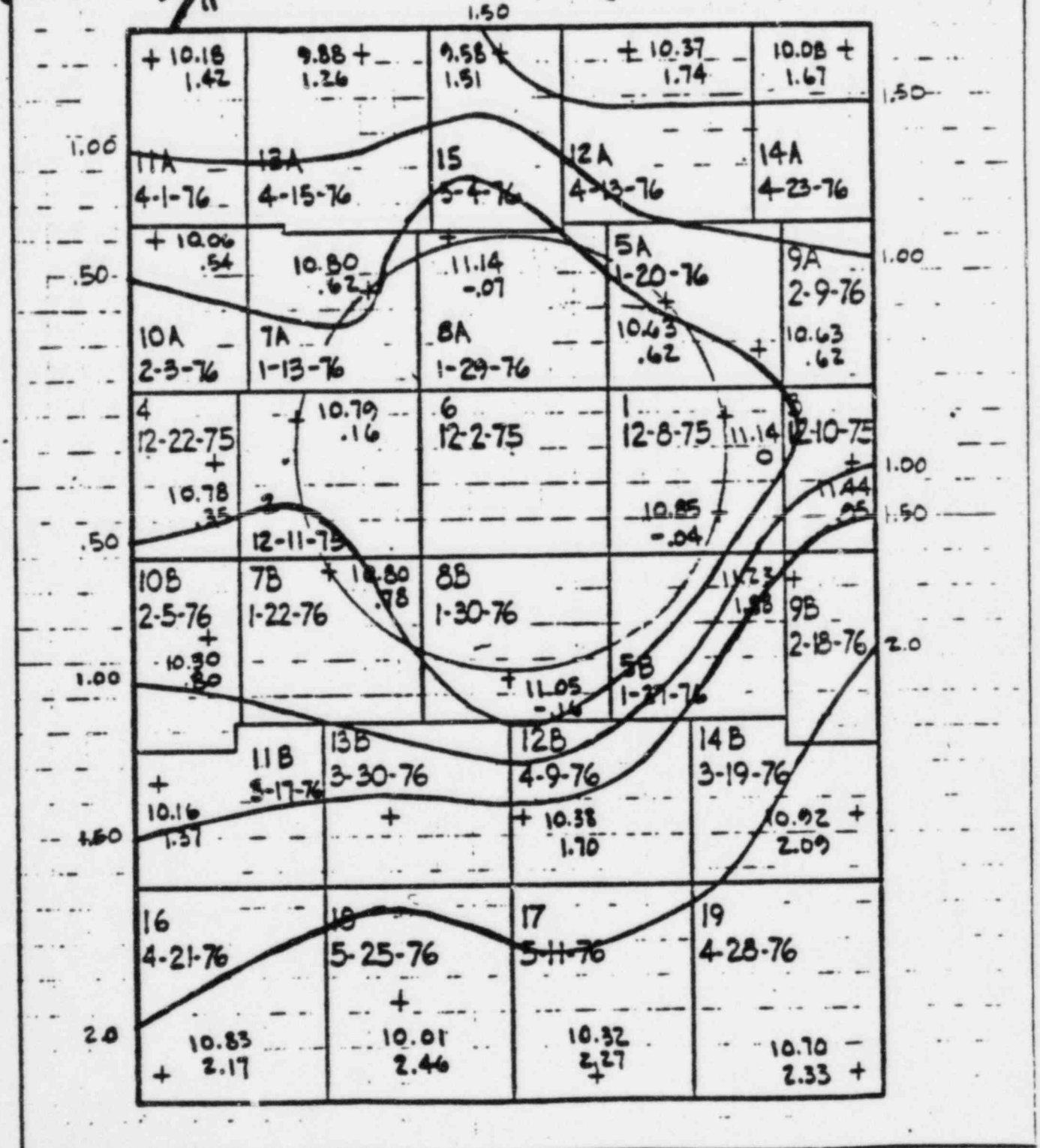
CHKD BY ____ DATE ____ OPS NO. 4294541 DEPT. NO. 551

CLIENT LOUISIANA POWER & LIGHT COMPANY

PROJECT WATERFORD UNIT #3

SUBJECT MAT SETTLEMENT - AUGUST, 1979

1ST No - TOTAL SETTLEMENT (IN)
2ND No - DIFF. SETTLEMENT (IN)



FORM 301 REV 3-71

18. According to the settlement contours shown in figure 2.5.118 the curvature in concave downward in both directions. This implies cracks on the top surface in both directions which would not penetrate all the way through.

In view of the above why did the water seep thru? Why doesn't the crack pattern match the given differential settlement?

Is it possible that there are localized convex surfaces on the mat which are not shown in the figure (the grid is quite rough)?

Response:

The crack pattern does follow generally the pattern of mat differential settlement. The contours of differential settlement show a pronounced greater convexity in the north-south direction than in the east-west. The general crack pattern lies east-west reflecting the pronounced north-south convexity.

The minor water seepage showing at some hairline cracks in the surface of the mat has been identified as originating at flexural cracks at the bottom of the mat and following embedded items which intersect these cracks, such as structural steel rebar support structures and conduit, horizontally and vertically through the mat to an intersection with hairline racks at the top of the mat.

Localized reversal of curvature (convex surface) may occur in the immediate vicinity of heavy loads. These may be undetected by the settlement monitoring program.

How would you get these.

19. Please provide all soil properties (re. results of soil tests, reports confirmed compression test results, boring records, shear modulus, etc.).

Response:

Soil properties, boring logs, test reports and results are provided in FSAR Chapter 2.5 and Appendices.

20. Provide all concrete property data, rebar data, placement data, (ie also detailed as built drawings of mats).

Response:

Attachment "A" consists of a listing of documentaion which typically exists in the Waterford 3 concrete placement packages. This documentation is available for review at the Waterford 3 site.

Attachment "B" provides a list of associated quality records generated (not filed in the placement packages) which can be found in other QA record vault locations.

ATTACHMENT "A"

CONCRETE PACKAGE CONTENTS

I Required Documents

A. Preplacement Checklist Records.

1. Concrete

   A. Sandblast
   B. Greencut
   C. Treatment

2. Forms

   A. Dimensions
   B. Line and Grade
   C. Clean
   D. Tight
   E. Braced
   F. Coating
   G. Chamfer Strips
   H. Key Ways
   I. Block Outs
   J. Whalers and Strongbacks
   K. Waterstops
   L. Release Agent

3. Reinforcing

   A. Bar Quanity
   B. Spacing
   C. Elevation
   D. Cadweld Mapping

4. Embeds

   A. Quanity
   B. Line and Grade
   C. Elevation
   D. Identification

5. General

   A. Cleanliness
   B. Instrumentation
   C. Weather Protection

B. Daily Concrete Inspection Report

1. Q.V. Inspector

A. Placement Area/Location
B. Area/Location Released by Engineer
C. Concrete Delivery Acceptable
D. Concrete Placement Acceptable
E. Consolidation Acceptable
F. Finishing Acceptable
G. Curing Acceptable

C. Concrete Curing Log

1. Q.V. Inspector
A. Date
B. Time
C. Current Temperature
D. High Temp.
E. Low Temp.
F. Continuous Moisture
G. Maintain log for seven (7) days for Items A thru F

D. Concrete Physical Test Records

Many Concrete Packages contain test records, but not all. A complete file of test records can be found in the vault arranged by placement dates.

E. Repair Documents

This documentation could be for such items as: repair of bent rebar, addition of stub-ups, or a possible weld repair on an embed plate. If there is any damage by whatever means, these items were documented on NCRs.

II Support Documents

A. Concrete Four Plan
B. Embed Map Log
C. Cadweld Maps and Map Logs
D. Requisitions on Warehouse
E. Batch Tickets

ATTACHMENT "B"

I Inspector Certifications

A. J.A. Jones

1. Cadwelds
2. Concrete Placement

B. Ebasco

1. Batch Plant
2. Concrete Test Station
3. Placement
4. Backfill

C. Barrow-Agee/Peabody/GEO

1. Concrete Lab
2. Concrete Field Testing
3. Concrete Batch Plant Insp. and Mix Design
4. Soils Lab and Field Testing
5. Rebar Tensile Testing

II Concrete Materials

A. MTLs Receiving Docs/Certs

1. Admixtures
2. Cement Types I & II - Midlothian & Artesia
3. Aggregate

B. Materials Acceptance Tests

1. Calibration of Test Equipment
2. Test Reports on
   a. water quality
   b. sand - daily, weekly, monthly, bi-annually
   c. ½" - daily, weekly, monthly, bi-annually
   d. 1" - daily, weekly, monthly, bi-annually
   e. rebar pull tests (tensile)
3. Offsite test Reports
   a. cement
   b. water
   c. ice
4. Cadweld tensile tests

C. Miscellaneous

1. DNs
2. DRs
3. NCRs

21. Provide any revised calculations that include settlement efforts.

Response:

No revised calculations were made. The original calculations included provisions for differential settlement effects utilizing variable spring constants to provide sufficient conservatism in the strength of the mat to accomodate differential settlements.

22. Is the Phearson memo accurate? What kind of actions has LP&L taken to respond to and resolve his allegations?

Response:

It is improper to characterize the content of the Phearson memorandum as "allegations." The LP&L and Ebasco QA Reports for basemat placements 6 and 2 include "findings" which are, in technical content, identical to the items listed in the Phearson memorandum, and other findings not included in the Phearson memorandum. To that extent, the Phearson memoranum may be characterized as "accurate," although the proper method of reporting these findings, the formal QA reporting process, was not followed by Phearson.

Since findings essentially identical to the Phearson findings were included in the official QA reports and since the QA reports required formal closure, the Phearson findings were effectively addressed through the formal QA process. These actions were taken regardless of the fact that LP&L was not even aware of the Phearson memorandum at the time corrective action was being carried out.

It is reasonable to conclude that Phearson himself was satisfied that adequate corrective action was taken since, to the best of LP&L and Ebasco knowledge, he did not ever formally report dissatisfaction with the corrective action, or recommend investigation of the quality of placements 6, 1, or 2 during the remainder of his tenure on the Waterford 3 project. Phearson left the project in mid April, 1976, some 4 months after issuance of Stop Work Order 1.

23. Memos of inspectors Hill and Davis, as reported in GAMBIT, stated that they found a broad range of deficiencies in virtually every record package examined and the situation demanded a complete review of all civil/ structural records. What is your response to this allegation?

Response

Messrs. Hill and Davis were document reviewers. Their assigned duty was to review construction records and to identify records deficiencies. Their memoranda identified records deficiencies. The deficiencies documented in their memoranda were appropriately entered into the programmatic process required by the Waterford 3 Quality Assurance Program to assure the proper dispositioning of such deficiencies. As a result of the memoranda, the records review program evolved to include a complete review of all civil/structural records.

Corrective action on deficiencies, identified during the expanded records review program, are now essentially complete. Little physical corrective action has been required. Also, see Response to Question 28.

24. GAMBIT reported that there was falsification on cadweld splices of reinforcing bars. What is LP&L's response to this allegation?

Response:

See attached Affadavit of Thomas F. Gerrets, dated January 12, 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Appeal Board

In the Matter of	)	
	)	
LOUISIANA POWER & LIGHT COMPANY	)	Docket No. 50-382 OL
	)	
(Waterford Steam Electric Station, Unit 3)	)	

AFFIDAVIT OF THOMAS F. GERRETS

THOMAS F. GERRETS, being duly sworn according to law, deposes and says:

1. My name is Thomas F. Gerrets. I am employed by Louisiana Power & Light Company as the Corporate Quality Assurance Manager, with principal duties related to the design and construction of the Waterford Steam Electric Station, Unit 3.

2. The December 10, 1983 issue of Gambit alleges on page 22 that at Waterford 3 there are "...missing [QA] documents that have been replaced by phony documents manufactured after the fact; faulty documents that have been altered or 'doctored'; and some instances involving possible forged signatures on safety inspections okaying the workmanship on critical safety-related structured." I and others in my quality assurance organization have investigated these allegations, and we have found no

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instance of any records containing false or manufactured test or inspection data and no instance of malfeasance in the generation of testing or inspection reports.

3. I can only speculate on the source of these unexplained charges. The articles describe a meeting with George Hill, a QA records reviewer, myself, and other QA personnel which took place on July 7, 1983. Reference was made by Mr. Hill to a previously existing Nonconformance Report ("NCR"), NCR W3-6245, dated May 20, 1983, which identified 13 daily cadweld inspection reports (out of thousands of such reports) containing questionable initials of quality control inspectors whose job it was to inspect each cadweld of the reinforcing steel for the foundation mat. Each instance was investigated and supplementary and backup documentation, as well as personal on-site inspection of the reports by three of the inspectors involved, verified that the involved welds had, in fact, been properly performed and inspected. On this basis, the welds were determined to be acceptable, and the NCR was duly resolved in accordance with the QA program procedures.

4. I know of one other instance where questions arose concerning the authenticity of record signatures or initials. This is identified on NCR W3-7481, and involves cadweld tensile test laboratory reports where both an original and a reconstructed duplicate exists. The laboratory which performed the tests was contacted as well as other Ebasco personnel who

were involved with these specific records. The individual who was the manager of the testing lab during the time when the documents were generated has inspected the documents on site and has certified the original documents. Both the testing laboratory personnel and Ebasco personnel familiar with the procedure which were in effect at the time the documents were generated confirm that, in some cases during construction, it was thought that the original test document was lost and therefore a duplicate was constructed from original test data which existed in the testing laboratory log books. In all cases, the tensile test data on the duplicate document has been verified to be identical to that which exists on one or more of the following documents: the original document, a photocopy of the original document, and the original or a photocopy of "Record of Rebar User's Testing" (Form #QC-28). On this basis, the test data were determined to be proper and acceptable, and the NCR was duly resolved in accordance with QA program procedures.

Thomas F. Gerrets

Thomas F. Gerrets

Subscribed and sworn to before me
this 13th day of January, 1984.

Linda P St. Amant

Notary Public

My Commission expires June, 1984

25. What were the problems in the seven NCR's on QA deficiencies in concrete, as mentioned in the last column on page 28 of GAMBIT, and how were they disposed of?

Note: GAMBIT (p.28) quotes Hill's memo as follows: "These NCR's are each broad in scope and identify multiple deficiencies."

Response:

Hill's memo to Czyrko dated June 6, 1983 (Subject: Review of Seismic Class I Concrete Records) references

NCR W3-5563: Fuel Handling Building Bridge Crane
NCR W3-5564: Fuel Handling Building Stairs
NCR W3-5565: Fuel Handling Building Bridge Crane
NCR-W3-5973: Fuel Handling Bulding Tornado Door
NCR-W3-6245: Daily Cadweld Inspection Reports
NCR-W3-5997: Clam Shell Filter Blanket
NCR-WE-5998: Sample Splice Failure Rates

and describes these NCRs as examples of deficiencies discovered during a "Review of Seismic Class I Concrete Records".

The problems and disposition of these NCRs are as follows:

NCR W3-5563 (Fuel Handling Building Bridge Crane)

This NCR was written against Jane Ogea (trainee who was inspecting bolts on the FHB Bridge Crane on 11/6/79) and states that a trainee cannot implement, evaluate, or report inspections and test results. The disposition called for Ebasco QC to reinspect the questioned areas, Ebasco Engineering evaluated the recommended disposition and revised it to the following: J. Pertuit was to cosign all applicable inspections by Ogea. Pertuit was her Level II Supervisor. As a result of this NCR, Pertuit submitted signed testimony dated 7/11/83 stating that he was present and supervised all inspections by Ogea and this NCR was closed.

Note that this NCR has nothing to do with concrete or the common mat. It is not broad in scope and does not involve multiple deficiencies.

NCR W-3-5564 (Fuel Handling Building Stairs)

This NCR states that no welding or bolting inspection reports existed for the FHB stairs. The disposition instructs reinspection of bolting and welding. This reinspection was performed by Ebasco QC (Roger West) and was accepted. (Report # C-0032 dated 11/7/83)

Note that this NCR has nothing to do with concrete or the common mat. It is not broad in scope and does not involve multiple deficiencies.

Response: (25 Continued)

NCR-W3-5565 (Fuel Handling Building Bridge Crane)

This NCR is very similar to NCR W3-5563 in that it was written against Jane Ogea because her supervisor, J. Pertuit, neglected to cosign her inspection reports. As a result of this NCR, Pertuit submitted signed testimony dated 7/11/83 that he was present and supervised all inspections by Ogea. On that basis, this NCR was closed. The inspections were on the crane reaving on 8/15/79 to 8/22/79.

Note that this NCR has nothing to do with concrete or the common mat. It is not broad in scope and does not involve multiple deficiencies.

NCR W3-5973 (Fuel Handling Building Tornado Door)

This NCR states that 1) inspector D. Noss was not a certified weld inspector, and 2) two welds on the door frame were first rejected and subsequently accepted without additional inspection reports.

The NCR was closed on the basis that both welds had previously passed RT and MT examinations and visual inspection was not necessary. It should be noted that D. Noss was technically qualified, by experience and education, at the time the inspections were performed, and was subsequently formally certified on 8/24/77.

Note that this NCR has nothing to do with concrete or the common mat. It is not broad in scope and does not involve multiple deficiencies.

NCR W3-6245 (Daily Cadweld Inspection Reports)

This NCR states that certain Daily Cadweld Inspection Reports have five (5) inspectors' signatures or initials with noticeable differences which renders their authenticity indeterminate.

The NCR was initially closed, on the basis that documentation was found which showed that the cadwelds were previously inspected and accepted. This closure accepted the cadwelds "As-Is" with no corrective action.

Subsequently, the NCR was reopened and attachments 9, 10, 11, and 12 were added to the NCR package. These attachments included signed statements by Sam Horton, H. Don Ernst, Nicholas M. Donlick, and Leonard Kaminski giving explanations for the appearance of irregular signatures and confirming their authenticity. (Original documents were soiled in the field and were re-written.) The NCR was closed 1/12/84. See also the response to Question 13.

NCR W3-5997 (Clam Shell Filter Blanket)

This NCR is very lengthy (about 200 pages) and addresses 64 individual findings detailed in Attachment 1 to the NRC (copy attached).

Response: (25 Continued)

The NCR was closed after evaluation and satisfactory conclusions by the Site Soils Engineer. The bases for closure are detailed in Attachment IV of the NCR (copy attached).

It should be noted that the purpose of the clam shell filter was to ensure a uniform water pressure under the mat during recharge. Settlement data shows that settlement of the mat has stabilized with acceptable differential settling. Thus, it is concluded that the clam shell filter successfully fulfilled its primary purpose.

NCR-W3-5998 (Sample Splice Failure Parts)

This NCR finds that

1) the failure rate in one group of sample splices exceeded the specification limit of 1 failure in 15 consecutive samples.

2) splicing was not terminated as required by the specification.

3) the cadwelder was not recertified as required by the specification.

4) additional samples were not obtained and tested as required by the specification when the failure rate exceeds the specified limit.

The recommended disposition stated that the author of the NCR (G. Hill/ H. Savage) erred (miscounted) and in fact the failure was only 1 in 15, not 2 in 15 as stated. Consequently, it was not necessary to terminate the splicing, re-certify the cadwelder, or take additional samples.

The engineering evaluation agreed with the recommended disposition, but required some additional evaluation (Attachment 5 of NCR-W3-5998) of the test data based based on AEC clarification of Reg. Guide 1.10 in AEC memo dated May 15, 1973. (Attachment 6 of NCR-W3-5998) Although we believe the required evaluation was done, it was not properly documented. At the request of Mr. William Crossman (USNRC), this NCR was reopened on 3/14/84 and the evaluation per Attachment 5 of the NCR was performed. We expect the NCR to be expeditiously closed.

Note that this NCR is hardly "broad in scope, involving multiple deficiencies" and the failed sample splices did not come from the common mat. Of four failed sample splices addressed by this NCR, two came from the Fuel Handling Building, one came from a pressurizer wall, and one came from the primary shield wall.

0 0 7 1 1 0 1 5 5 Response : 25

Attachment I - Detailed Description of Nonconformance W3-

Item I: Compliance of Clam Shell Filter Blanket construction with the Test Fill.

A) Description of Nonconformance

Contrary to ANSI-N-45.2, para. 6, The Test Fill Report (Att. III) does not provide specific criteria required by Q.C. in order to verify compliance with requirements of Spec. LOU.1564.482, para. 6.2h or Spec. LOU.1564.482, Attachment entitled Clam Shell Filter Blanket Placement and Compaction Procedures, page 14, top paragraph.

1) This condition renders:

a) the acceptability of the source of the material actually used during construction indeterminate and

b) the acceptability of the compactive equipment actually used during construction indeterminate.

2) The absence of quantitative acceptance criteria renders the acceptability of the in-place density test results, for the in-place clam shell, indeterminate. Affects all work.

B) Description of Nonconformance

Contrary to ANSI-N-45.2, para. 6 and Spec. 1564.482 and Attachment entitled Clam Shell Filter Blanket Placement and Compaction Procedure, the construction work performed on the Filter Blanket uses techniques not provided for during the Clam Shell Filter Blanket Test Fill. These violations, by strip, are as follow:

1) ~~Strip~~ Strip I (dt 2/3/76)

a) Report dated 10/24/75 indicates clam shell was not in place and Gunite was placed on entire horizontal surface of Strip 1. The test fill program made no provision for clam shell compaction, and effect of compaction on shell, on large gunite surfaces. (See Att. II, page 1)

b) Lift thickness for placement dated 10/28/75 is indicated as 15 ½". Lift thickness for placement dated 10/29/75 is indicated as 15". A lift thickness of 14 ½" maximum is required. Site Soils Engineer review and approval of this modification is not documented on an Ebasco NCR, FCR, or DCN. (See Att. II, pages 5 and 17)

2) Strip 2

a) Report dated 2/23/76 does not indicate authority for replacement of gunite with 3 ft. thick concrete wall. There are no concrete inspection records for the concrete as required by Ebasco Procedures QCIP-6 and QCIP-7 and J.A. Jones Procedure W-SITP-7. Site Soils Engineer review and approval of this modification is not documented on an Ebasco NCR, FCR, or DCN. (See Att. II, page 30)

b) Report dated 12/13/75 indicates shell placement in standing water. Site Soils Engineer review and approval for this modification is not documented on an Ebasco NCR, FCR, or DCN. (See Att. II, page 42)

c) Report dated 12/15/75 indicates pan vibrator used on entire surface of strip. Site Soils Engineer authorized use on "soft spot" only. Test Fill does not provide for use of hand compactors except for restricted areas. (See Att. II, page 53)

3) Strip 5

a) Report 3, dated 2/10/76 does not indicate authority for replacement of gunite with 3 ft. thick concrete wall. There are no concrete inspection records for the concrete as required by Ebasco Procedures QCIP-6 and QCIP-7 and J.A. Jones Procedure W-SITP-7. Site Soils Engineer review and approval of this modification is not documented on an Ebasco NCR, FCR, or DCN. (See Att. II, page 97)

b) Test fill requires 10 passes of a vibratory roller on the clam shell. The Test Fill Report analyses the effect of up to 14 passes on the gradation and permeability characteristics of the clam shell. The inspection records indicate 40 passes of the vibratory roller were applied to this strip. The effect, on the gradation and permeability characteristics, of this overcompaction are indeterminate. Site Soils Engineer review and approval of this modification is not documented on an Ebasco NCR, FCR, or DCN. (See Att. II, pages 98, 103, 105, 108, and 110a)

Item II: Traceability/Location Deficiencies

A) Description of Nonconformance

Contrary to ANSI-N-45.2, para. 18 and ANSI-N-45.2.9, para. 3.2.1, records for the Clam Shell Filter Blanket do not provide sufficient data to accurately locate the individual placement strips by co-ordinates. Therefore, the square footage of the strips (individually) cannot be determined. Testing frequencies are based on square footage of the placement. This renders compliance, with the required testing frequency, indeterminate. (This affects all strips)

B) Description of Nonconformance

Contrary to ANSI-N-45.2, para. 18, report dated 2/13/76 adds as area to strip 5, the location of which is indeterminate. (See Att. II, page 111)

Item III: Engineer's approval prior to shell placement

A) Description of Nonconformance

Contrary to QCIP-1, para. 6.1, the following placements of shell proceeded without the prior (or subsequent) approval of the Site Soils Engineer documented on Ebasco Form QC-132.

1) Strip 1

a) Placement on 10/24/75, 10/27/75, 10/28/75 or 10/29/75

2) Strip 4

a) Placement on 2/13/76 or 2/14/76

3) Strip 5

a) Placement on 2/5/76, 2/9/76, 2/10/76 or 2/13/76

4) Strip 6

a) Placement on 3/10/76

Item IV: Certification of Personnel

A) Description of Nonconformance

Contrary to ANSI-N-45.2.6, the following individuals performed inspection without certification to a level and/or to activity.

1) Strip 1

a) Inspector Kaminski (Jones)
(See Att. II, pages 1, 2, 7)

b) Inspector Phillips (Ebasco)
(See Att. II, pages 4, 16)

c) Technician T. Hazel (Site Test Lab)
(See Att. II, pages 20, 22, 23, 24, 26)

2) Strip 2

a) Inspector Frick (Jones)
(See Att. II, pages 37, 36, 50, 53)

Item IV: A) 2) (cont.)

b) Technician T. Hazel (Site Test Lab)
(See Att. II, pages 58, 60)

3) Strip 3

a) Inspector Kaminski (Jones)
(See Att. II, page 70)

b) Technician T. Hazel (Site Test Lab)
(See Att. II, pages 81, 83)

c) Inspector Eiff (Jones)
(See Att. II, page 70)

4) Strip 4

a) Inspector Frick (Jones)
(See Att. II, page 85)

b) Technician T. Hazel (Site Test Lab)
(See Att. II, page 92)

5) Strip 5

a) Inspector Frick (Jones)
(See Att. II, page 98)

b) Inspector Horton (Jones)
(See Att. II, page 111)

c) Technician T. Hazel (Site Test Lab)
(See Att. II, pages 117, 118, 119, 120, 121)

6) Strip 6

a) Inspector Frick (Jones)
(See Att. II, page 126)

b) Technician T. Hazel (Site Test Lab)
(See Att. II, pages 132, 133)

Item V: Testing

A) Description of Nonconformance

Contrary to ASTM-D-2167 - '66, in-place density test holes do not meet minimum 0.1 ft^3 required test hole size, per Table 2. In addition moisture determination used in computation of in-place density was not performed in accordance with para. 4.4 Instances are as follow:

Item V: A) (cont.)

1) Strip 1 (See Att. II, pages 20, 22, 23, 24, 26)

2) Strip 2 (See Att. II, pages 58, 60)

3) Strip 3 (See Att. II, page 81)

4) Strip 4 (See Att. II, page 92)

5) Strip 5 (See Att. II, pages 117, 118, 119, 120, 121)

6) Strip 6 (See Att. II, page 132)

B) Description of Nonconformance

Contrary to Spec. LOU-1564.469, para. 5.2 and Spec. LOU-1564.482, page 14, Attachment, which give testing frequencies in terms of square footage of placement for the foundation and filter blanket, the inspection records do not provide sufficient data to determine the square footage of the areas inspected. The compliance of the testing program with the testing frequency is indeterminate. (All strips are affected)

C) Description of Nonconformance

Contrary to ANSI-N-45.2, para. 18 and ANSI-N-45.2.9, para. 3.2.1, the location of all in-place density tests on the foundation and the Clam Shell Filter Blanket are indeterminate. The tests were performed in a three dimensional medium, but were located in only two dimensions. (All tests for all strips are affected)
NOTE: Tests for Strip 1 do not fall anywhere within the Nuclear Plant Island as per co-ordinates given compared with co-ordinate grid attached to test report (See Att. II, pages 26, 27) (Test #453, #454, #455)

D) Description of Nonconformance

Contrary to ANSI-N-45.2.9, para. 3.2.I, the in-place density tests on the foundation material cannot be traced to the corresponding Laboratory Moisture-Density Relation Test Report used in conjunction with per-centage of compaction determination. (All foundation tests are affected. See QC-83 Forms containing foundation tests, located in Att. II)

E) Description of Nonconformance

Contrary to ANSI-N-45.2.9, para. 3.2.6, the following test reports (by strip) contain improper changes by unknown personnel. These alterations change test locations or test readings. As determined from the original, at the Site Test Lab, the original entry had been noted on the report contained in Att. II.

Item V: E) (cont.)

1) Strip 1

a) Form QC-83 for tests 452 thru 461 exists in two distinct versions. The two versions give different hole volumes for Test #452. Percentage compaction is indeterminate. Other differences have been indicated on the reports. (See Att. II, pages 24, 26) These Xerox copies have ink entries by unknown.

b) Form QC-83 for tests 486 thru 495 exists in two distinct versions. One is dated 10/28/75, the other is dated 10/29/75. Both are Xerox copies containing ink entries by unknown personnel. (See Att. II, pages 20, 22)

2) Strip 5

a) Forms QC-83 contain improper changes made by unknown personnel. The changes consist of erasure of original data and entry of new data. The original records, completed in pencil, were reviewed at the Site Test Lab, and, where possible, the original data had been noted on the report contained in Att. II. (See Att. II, pages 117, 118, 119, 120) (This is for dispositioning purposes only.)

3) Strip 6

a) Forms QC-83 contain improper changes made by unknown personnel. The changes consist of erasure of original data and entry of new data. The original records, completed in pencil, were reviewed at the Site Test Lab, and where possible, the original data had been noted on the report contained in Att. II. (See Att. II, page 133)

F) Description of Nonconformance

Contrary to the Clam Shell Filter Blanket Test Fill Report, Att. III, the required value of 102 lbs./ft^3 was not used to compute the percentage of compaction of in-place clam shell.

1) Test 800 used 105.0 lbs./ft.^{3} (See Att. II, page 119)

2) Tests 833 thru 837 used 102.7 lbs./ft.^{3} (See Att. II. pg. 132)

Item VI: Documented Deficiencies without Documented Corrective Action

A) Description of Nonconformance

Contrary to ANSI-N-45.2, para. 18, the records do not indicate corrective action for the following documented deficiencies.

Item VI: A) (cont.)

1) Strip 1

a) Report dated 10/27/75 does not indicate status of, impact on, or re-compaction of, in-place clam shell when gunite previously applied, was replaced. (See Att. II, page 2)

2) Strip 2

a) Report dated 12/10/75 indicates unacceptable trim of gunite and unacceptable removal of surplus material and overspray. Remarks section indicates the wooden stakes were not removed. No corrective action is indicated. (See Att. II, pages 28, 29)

b) Report dated 12/12/75 does not indicate adequate corrective action for the 4", compacted lift thickness, clam shell. (See Att. II, pages 36, 42)

c) Report dated 12/13/75, first shift, indicates water standing in West half of strip. Contractor allowed to place shell. Site Soils Engineer review and approval of this modification is not documented on an Ebasco NCR, FCR, or DCN. See note by M. Tenchin at bottom of page 37 of Att. II. (See Att. II, page 42)

d) Report dated 12/12/75 indicates 5 temporary sumps were dug. There is no indication of subsequent placement and compaction of clam shell in these sumps. (See Att. II, page 33)

e) Report dated 12/15/75 indicates "West" area was cut and part of "East" area was filled. This disturbed the surface. Only one pass was applied with a pan vibrator. (See Att. II, pages 51, 52)
NOTE: Refer to Item IB2c for use of pan vibrator on large, non-restricted area.

3) Strip 3

a) Report dated 12/19/75 indicates "... drainage ditch dug on both sides of Strip 3 ... lined with Mirafi cloth and filled with shell ..." The area identified is indeterminate. Verification of the foundation material exposed is not documented. (The Test Fill makes no provision for compaction of the 2 ft. lift thickness used for this work.) (See Att. II, page 68)

b) Report dated 12/19/75 indicates "... temp. drainage ditch dug on North side of Strip 3. App. 2 ft. deep and 3 ft. wide. Covered with Mirafi paper and loose clam shell ... No compaction." The area identified is indeterminate. There is no documented evidence of subsequent compaction. (See Att. II, page 69)

Item VI: A) (cont.)

4) Strip 4

a) Report dated 2/11/76 indicates unacceptable trim of gunite. This entry has been changed to acceptable by unknown personnel. The acceptability of corrective action is not documented or verifiable. The current status of this work is indeterminate. (See Att. II, page 84)

b) There is no record of slope protection for the east two-thirds of the North Wall or on an indeterminate length of the north portion of the East Wall. Length of exposure time of the foundation material to the elements is indeterminate. (Ref. Spec. LOU.1564.482, Attachment, page 12, 2nd. para.)

5) Strip 5

a) Reports 1 and 2 dated 2/5/76 indicates unacceptable trim of gunite and unacceptable removal of surplus material and overspray. No quantitative description of these deficiencies is given. No corrective action is indicated. (See Att. II, pages 95, 96)

b) Report 2 dated 2/5/76 indicates "some" contamination of the clam shell due to overspray. No corrective action is indicated. (See Att. II, page 96)

c) Report dated 2/13/76 indicates alternate methods of compaction used are unacceptable (per the Site Soils Engineer). No corrective action is indicated. (See Att. II, page 111)

6) Strip 6

a) Reports 1 and 2 dated 3/9/76 indicates unacceptable trim of gunite and unacceptable removal of surplus material and overspray. No quantitative description of these deficiencies is given. No corrective action is indicated. (See Att. II, pages 124, 125)

b) There is no record of slope protection for the West Wall or for approximately 177 ft. of the South, starting from junction with West Wall and moving eastward. Length of exposure time of the foundation material to the elements is indeterminate. (Ref. Spec. LOU.1564.482, Attachment, page 12, para. 2)

Item VI: A) (cont.)

7) Strip 2

a) Report dated 12/12/75 indicates the clam shell filter blanket was penetrated by a "mud spurt" of approximately 120 ft.^{2}. There is no indication of corrective action, particularly placing Mirafi over area and subsequent replacement and compaction of clam shell. (Ref. The Clam Shell Filter Blanket Test Fill Report, para. 4.2, page 5 (Att. III to the NCR)) (See Att. II, pages 35, 36)

Based on the deficiencies noted above the acceptability of the Clam Shell Filter Blanket is indeterminate.

Response: 25

ATTACHMENT IV

ENGINEERING DISPOSITION OF
NONCONFORMANCE REPORT W3-5997

ITEM I: Compliance of Clam Shell Filter Blanket Construction With Test Fill:

I-A-1-a - Use As Is:

The test fill for the Clam Shell Filter Blanket was performed on September 10, 1975. The Clam Shell used was supplied by Brothers Construction Inc. (A Giambelluca Construction, Inc.) who was supplying Clam Shell to the site since August, 1974 under temporary purchase order W3-848 (Pg. 133). The purchase specification for P.O. W3-848 required that all clam shell material come from Lake Ponchartrain as shown in the typical supplement #5 to PO W3-848 presented as page 134.

On September 10, 1975, Brothers Construction company was delivering 672 yd^3 of clam shell for general surfacing repair of roads, and laydown yards (pg. 135). Several trucks of shell were taken from this delivery order to build the test fill. All subsequent clam shell used for the construction of the filter blanket was delivered by Brothers Construction, Inc. taken from Lake Ponchartrain as shown in the typical material received report attached as page 136 and on each Ebasco Inspection Report Form QC-93 typically shown on page 4. Therefore, the material used during construction is found to be from the same source as the test fill.

I-A-1-b - Use As Is:

Compaction of the Clam Shell Filter Blanket Test Section was performed by a rubber tire, self propelled, smooth drum vibratory roller imparting a minimum of 10 tons of energy in accordance with the test fill construction procedure CP-203, Section 6.3.4 (Attachment III, Page 3 of 8) and as shown in Clam Shell Filter Test Fill Report, November, 1975 (Attachment III, Photo No. 8).

The compaction of the Clam Shell Filter Blanket itself was performed by an identical rubber tire, self propelled, smooth drum vibratory roller as documented on the Ebasco Inspection Reports (QC-93) typically shown in Attachment II, Pages 5, 33, 72, etc. and in the Waterford Record Photograph #648 dated 3-16-76 showing the roller on the side of strip #6 (pg. 137).

Specification requirements in LOU 1564.482, Section 6.2h requiring compatibility of test fill and production compaction equipment type or model refer to generic type or model, such as smooth drum vibratory versus static tandom wedgefoot roller and were compiled with.

I-A-2 - Use As Is:

The Clam Shell Filter Blanket was installed in accordance with an attachment to technical specification LOU-1564.482. This attachment was a direct result of the Clam Shell Filter Blanket Test Report (Attachment III) and is a method specification. It requires a roller type and a number of passes on suitable clam shell. Compliance with this method specification is documented on the Ebasco Inspection Report Forms QC-93 typically shown in Attachment II Pages 5, 33, 72, etc. In place density tests were run for information to be provided to the Site Soils Engineer for review and technical evaluation.

I-B-1A - Use As Is:

The Gunite installed on the west wall of Strip #1 and on the adjacent 3 foot horizontal berm at el -40 Attachment II, page 1 was authorized by the Site Soils Engineer, prior to the placement of Clam Shell at this area. This was done to comply with specification requirements stated in the Clam Shell Filter Blanket Attachment to the technical specification LOU-1564-482 (Attachment III) requiring slope protection of the exposed vertical faces of the final phase IV excavation within 8 hours of excavation. Delays in Clam Shell placement prevented the placement of the shell prior to the gunfting; therefore, to protect exposed faces, guniting was approved out of sequence by the Site Soils Engineer. The horizontal surface mentioned was on the EL -40 berm at the top of the vertical face and not in Strip #1 as indicated in the NCR. No effects were realized on the Clam Shell Blanket.

I-B-1b - Use As Is:

The thickness requirements of 10-inch minimum and 14½ inch maximum for the Clam Shell Blanket as defined in the Attachment to technical specification LOU-1564.482 Page 13, "Placement" (Attachment III) were designed for the following reasons:

1. The 10-inch minimum thickness was specified to provide the required permeability of the filter blanket.

2. The 14½ inch maximum thickness was specified so as not to allow an overthick clam shell layer which could conceivably encroach into the base mat above elevation -47 and effect the concrete cover thickness under the bottom rows of rebar.

Practical experience gained during the actual Phase IV excavation indicated that excavation usually exceeded the elevation -48.25 goal. Over thick shell areas (plus 1-2 inches) were therefore found to be below the elevation of the bottom of the mud mat and not into the area of the structural mat. In cases where thick shell areas were measured, the shell was either shaved or the mud mat thickness was adjusted. In all cases however, the bottom of the Class I foundation mat was kept to El -47.

The recorded thickness of 15½" on 10-28-75 (Attachment 2, page 5) and 15" on 10-29-75 (Attachment 2, page 17) are therefore found to be acceptable as is.

I-B-2A - Use As Is:

In localized areas where the permanent vertical faces of the Phase IV excavations caved in, and the gunite slope protection was destroyed, lean concrete backfill was used to reconstruct the vertical face and gunite layer. Since these areas were very localized, and since the lean concrete always provided the strength of the pleistocene clay it replaced and offered a vertical face to form the structural mat against, this backfill procedure was approved and used as necessary throughout the Phase IV excavation operation. The case described in 2-23-76 (Attachment II Page 30) is a typical example where concrete backfill was used for repair without influencing the design of the structural mat. Ebasco procedures QCIP-6 and 7 and J. A. Jones procedure W-STIP-7 covers structural concerete only. Therefore, no PCR or DCN was required for the use of lean concrete as a substitute for soil.

I-B-2b - Use As Is:

A review of the referenced inspection report (Attachment II, Page 42) indicates the possibility of placement of clam shell into standing water however, it is not clearly defined. The record further states that a meeting was held between construction (K. Flanigan) and Engineering (B. Watt) and the Site Soils Engineer (M. Temchin) allowing placement of shell. A review of the technical specification LOU-1564.482, Attachment on clam shell, shows that the only moisture content requirement is after compaction. In-place density tests on this Strip [Attachment II Page 58, Tests 2-3 (670) and 2-4 (671)] indicate moisture contents of 5.5 and 5.7% respectively. Therefore, the after compaction moisture content tests show the shell fill to be acceptable.

I-B-2c - Use As Is:

Note: Refer to page 51 for problem statement, in addition to page 53.

The inspection report referenced in Attachment II, Page 51 is explained in greater detail on page 53. From page 51, it is noted that no new shell was placed, only that localized areas of thick shell on the west half of Strip #2 were bladed to thin sections on the east half of Strip #2. These localized areas were then recompacted by the pan (plate) vibrator. Page 53 clearly indicates that the entire Strip #2 was properly compacted with a large roller. The exception of the localized repair areas which were properly compacted with the pan vibrator to the Site Soils Engineers satisfaction is in accordance with the specification requirements.

I-B-3A - Use As Is:

This is an identical case as described in Section I-B-2a of this NCR. Please see that disposition, which applies in this case as well.

I-B-3b - Use As Is:

In a review of the number of passes placed on Strip #5 clam shell the following understandings were developed:

1. Shell placed and compacted - 2-9-76 day (Pg. 102-103)

2. Thickness checked - 2-9-76 night (Pg. 104-105) Notation of 6 passes given in previous shift is in error. Should have read 10 passes

3. Shell recompacted with 10 passes - 2-10-76 day (Pg. 107-109)

4. Survey error in width of Strip #5 lead to the addition excavation of a narrow strip of soil on the south end of Strip #5 (approximately 8' wide). Clam shell was placed and properly compacted on this narrow strip on 2-13-76 (Pages 110-113).

5. Site Soils Engineering approval of the original (narrow strip) was given on 2-11-76 (Pg. 109) prior to the discovery of the survey error.

6. Approval was given for the narrow strip on 2-13-76 by the Site Soils Engineer (Pg. 111).

In conclusion, it appears that 20 passes were given to the originally cut Strip #5 which is contrary to the method specification stated in the attachment to LOU-1564.482, requiring 10 passes.

The effects of this overcompaction of the clam shell are found to have a negligible effect on the quality of the final clam shell blanket for the following reasons:

1. An extrapolation of the Settlement vs number of passes curve from the Clam Shell Filter Blanket Test Report (Attachment III) presented as page 138, Attachment IV indicates that less than ½" of addition settlement is realized by the application of the addition 10 passes of compaction equipment.

2. An extrapolation of the % compaction vs. number of passes curve from the Clam Shell Filter Blanket Test Report (Attachment III) presented as page 139 indicates that approximately 1% additional compaction will be realized by the additional 10 passes of compaction equipment.

3. An Extrapolation of the gradation vs. number of passes curve from the Clam Shell Filter Blanket Test Report (Attachment III) presented as page 140 indicates that although the surface of the clam shell may undergo some slight additional breakdown from the 3/4" to #16 size screens, no additional - #200 particles will be created which could effect the permeability of the shell blanket.

In conclusion, the overcompaction of the Clam Shell Filter Blanket in Strip #5 created a less compressible, slightly denser blanket without effecting the permeability of the filter which is therefore found to be acceptable.

ITEM II - Traceability/Location Deficiencies

II-A - Use As Is:

The documented sizes of each of the Clam Shell Filter Blanket strips is presented in the geologic mapping report dated February, 1977 Figure No. 1 attached as page 141 in Attachment IV. The square footage of each of the strips is thus calculated to be:

		Number of Tests	
Strip No.	Surface Area ft^2	Required	Actual
1	267(97.5) = 26,032	6	6
2	267(58.5) = 15,619	4	4
3	267(70) = 18,690	4	5
4	267(48.5) = 12,976 ft..	3	4
5	267(58.5) = 15,619	4	5
6	267(47.0) = 12,549	3	5
	267(380)	24	29

Review of the above table indicates that each of the six strips had at least the required number of tests and in fact, five (5) additional tests were performed in total.

II-B - Use As Is:

As previously described in the response to NCR Item I-B-3B, due to a survey error, Strip #5 was cut 8 feet too narrow in the North-South direction. The addition strip excavated on 2-13-76 is documented to be on the South side of Strip #5 (pg. 110) and is documented to be called the "Deyo Strip", and is 8 foot wide (pg. 112).

Item III - Engineer's Approval Prior To Shell Placement

III-A-(1-4) - Use As Is:

In all of the strip placements listed except Strip #1, the J. A. Jones Clam Shell Filter Blanket Inspection Report Form W-SITP-2 was signed by the Site Soils Engineer on the line entitled "Release for Installation and Compaction Obtained Yes X No_____."

It is true that the Ebasco Site Soils Engineer Release Form QC-132 From QCLP-1 cannot be found. However, the existing signatures on the J. A. Jones Documentation and the Release on Strip #1 indicate that the engineers approval was given. Refer to the following Site Soils Engineer Releases:

Strip #1	Page 6 & 7
2	31, 37 & 38
3	64 & 70
4	85
5	98
6	126

Item IV - Certification of Personnel - Use As Is

Certification of the personnel referenced in this section of the NCR has been reviewed by Ebasco QA, GEO QA, and the Site Soils Engineer. In their responses to this issue, attached in Attachment IV, pages 154 - 159, it is stated that all of the personnel listed in this NCR were qualified to perform the inspection they did, at the time they did them, although Employer Certification did not exist. Therefore, the inspection by these personnel, based on their qualification, is acceptable.

Item V - Testing

V-A-1-6 - Use As Is:

An analysis of the gradation of the compacted Clam Shell After 10 passes indicates that over 90% of the shell is smaller than 3/4 of an inch (page 140) and over 60% of the material is smaller than ½ of an inch.

In accordance with the Site Soils Engineer's interpretation of the intent of Table 2 of ASTM D-2167-67 it is our understanding that a minimum test hole volume ranging from .050 (½" material) to 0.075 (1" material) ft^3 would be acceptable (page 142) using this interpretation all of the 29 clam shell density tests are found to be valid. The variance in the use of minor reduced volume in the size of the density hole has a negligible effect on the test result in this case.

V-B - Use As Is:

As stated in the response to NCR Section II-A, the Clam Shell Filter Blanket Testing frequencies were compiled with using the requirements for density testing of 1 test per 5000 ft^2 for the foundation materials, 24 tests were required and 27 tests were performed as shown in foundation material property table presented in Attachment IV on page 141.

V-C - Use As Is:

Based upon the geometry of the phase IV excavation, as shown on design drawing LOU 1564-G-489, Section A-A, the elevations of the foundation and clam shell tests are known as follows:

Bottom of Plant Island Material:		-47.00
2-3" Mud Mat	(Avg. 3")	-47.25±
10-14 Shell Blanket	(Avg. 12")	-48.25±

Using this information, elevations recorded on each Ebasco Inspection Report (QC-93) typically shown on pages 32, 65, etc., and the North-South and East-West coordinates on the density tests forms typically shown on pages 81, 132, etc., the three dimensional location of all foundation tests (El -48.25) and clam shell tests (El -47.25) is found.

Relative to the note on the location of clam shell density tests 453-455, these tests were located properly but plotted on the wrong grid (pg. 27). A second grid was used for the foundation and clam shell testing program locations as typically shown on pages 61, 82 etc. Replotting the density tests 453-455 on this grid, as shown on Attachment IV, page 143 shows these tests to fall randomly within Strip #1 as indicated on page 27.

V-D - Use As Is:

In accordance with page 9 of the geologic mapping report dated February, 1977, and enclosed in Attachment IV, Page 144, each foundation density test had a proctor test run on the density hole material and surrounding material (50# sample) to determine the exact percent compaction. The results of the in-place density tests and their corresponding proctor tests are presented on the final geologic map presented in Attachment IV, page 141 along with the minus 200 data and the exact location of the test within the appropriate strip. Final acceptance of foundation density tests was made in NCR-W3-193 copy attached as pages 145-149.

V-E - Use As Is:

A general review of all of the changes discussed in this section of the NCR are the result of a review of by testing results performed by the laboratory itself. Although the changes were improperly entered on the test records, it is believed that these changes were performed in the interest of correcting errors detected during quality reviews within the testing laboratory itself and are therefore acceptable.

V-E-1-a - Use As Is

The following discussion may explain the discrepancy in the volume recorded in test 452.

On the initial density record recorded in the field (QC-83 Pg. 24) a volume of .0736 ft^3 was recorded yielding a density of 85.0 $\#/ft^3$. Upon review in the lab, on the same day, the inspector noted that the volume of this hole was larger than the two following holes he dug which he may have felt was not true due to his memory of the situation. He therefore adjusted the volume to .0636 ft^3, a .01 ft^3 adjustment which he believed could have been a reading error on the sight tube on the densometer (pg. 26). This is a possible explanation of the change and if it is accepted or not, this test 452 can be voided without influencing the quality of the shell since it was taken after only 6 passes, and not included in the permanent record of required tests taken after 10 passes.

V-E-1-b - Use As Is:

The Density Test Record on page 20 is a field copy dated 10-28-75. Due to a significant number of changes and noted recorded in the field, the form was rewritten for clarity on the following day (page 22 10-29-75) and a recording error in density test 495 in volume (8.01 ft^3) was corrected. In addition, foundation proctor valves were inserted in the proper boxes and percent compactions were calculated. The form shown on page 22 a corrected record and superceded the form on page 20 and is acceptable as is.

V-E-2a, 3A - Use As Is:

A review of these records indicates that in several places, data was erased and changed. In all cases, corrected data appears to be consistent with other data recorded in this strip. It can only be concluded that these changes were made on the spot by the inspector for the purpose of correcting errors in recording the data. Example; page 118 test number 751 changed to 752; Test 748 location E6-84N changed to 74N.

Although these changes were documented improperly the corrected data is consistent with the valves of unaltered test data on the same strip and is therefore considered to be acceptable.

V-F-1 & 2 - Use As Is:

On page 119 of Attachment II the note at the bottom of the page indicates that in the inspectors opinion (due to a local compaction operation by the hand operated plate compactor) the clam shell was broken to a greater extent than normal. In this case the increase in Lab Standard Density from 102 to 105#/Ft^3 was more severe on the % compaction calculation and is considered to be conservative and acceptable.

In a similar manner, the use of a clam shell maximum proctor valve of 102.7#/Ft^3 instead of 102.0#/ft^3 on page 132 could only yield a slightly lower % compaction and is therefore considered acceptable.

Item VI - Documented Deficiencies Without Corrected Action

VI-A-1a - Use As Is:

As per the NCR response to Section I-B-1a and I-B-2a, the replacement of gunite is outside of the neat line of the Class I excavation and above the shell blanket. This type of operation was performed so as not effect the quality of the in-place shell blanket. Even if minor effect were realized on the surface of the shell blanket, this area (10' wide) is so localized that effects on the permeability of the shell will be negiglible.

VI-A-2a - Use As Is:

The wooden stakes referred to in inspection reports for gunite in Strip #2 page 29 and 29 are in the 3 foot horizontal gunite berm at El -40 at the top of the Class I vertical face. They are outside of the Class I area and although it was preferable to remove these stakes after guniting, in some cases they were left in place to support the gunite facing without any effect on the quality of the slope protection.

VI-A-2B - Use As Is:

The defective shell thickness shown on page 36 (12-12-75) of Attachment II was corrected as stated on page 42 (by blading shell from the west half of the strip). The final thickness of 9½ inches is documented on the inspection report attached as page 41 with the statement "OK on 12-12-75". The East half of Strip #2 was reviewed by the Site Soils Engineer the following day on 12-13-75 and found acceptable for mud mat placement as documented on page 45 of Attachment II.

VI-A-2c - Use As Is:

As per the inspector's notes on page 42 of Attachment II, in a decision between the Site Soils Engineer and the Construction Superintendent, clam shell was placed in standing water (in order to preserve the condition of the foundation materials which would continue to swell and then dry and crack if left uncovered). In place density tests performed on the West half of Strip #2 numbered 670 and 671 (pg. 58) indicate that at the time of final compaction the standing water had drained away and moisture contents of 5.5 and 5.7% were realized compared to a maximum allowable moisture content of 20%.

VI-A-2d - Use As Is:

A review of the documentation from Attachment II pages 32 through 53 indicate that in two locations on the South half of the East half of Strip #2 contained saturated localized spots of foundation silts. Upon compaction of the Clam Shell Blanket, water from these silt foundation materials was vibrated to the surface of the shell rendering the shell compaction unacceptable. Five shell drainage sumps were excavated and pumped to remove excess water. Upon further compaction, foundation silts pumped up through the shell causing a small localized "MUD" pocket. The sumps were backfilled with shell and recompacted with a plate vibrator (pg. 37) and the mud pocket was allowed to relieve its hydrostatic pressures for a day (pg. 36). Similar liquification problems of the foundation silts were noted and treated (pg. 46) on the West half of Strip #2. Final approval of the entire strip was given by the Site Soils Engineer on 12-15-75 as stated on page 45 & 53 noting hand compaction of mud pocket areas and that the sumps adequately compacted and approved.

VI-A-2e - Use As Is:

The understanding of the cut and fill operation documented on pg. 51 of Attachment II is as follows:

12-13-75 - day	Cut & Fill +2 passes	Pg. 42
12-13-75 - Night	4 passes	Pg. 43
Total So Far 6 passes As Per		Pg. 46
12-14-75 - Day	Remainder of 6 passes	Pg. 47, 48

This documentation indicates that the original Clam Shell Filter Blanket was compacted with twelve passes prior to the cut and fill operation documented on page 51. The inspection report on page 51 indicates that only one inch of material was moved and that the plate compaction of this one inch of loose material was found acceptable by the Site Soils Engineer as documented on page 53 approving the entire Strip #2.

VI-A-3a, 3b - Use As Is:

Based upon the problems documented in Strip #2 concerning liquification of the foundation silts during compaction, drainage ditches were cut along the North and South lengths of Strip #3. This is partially documented on page 69 of Attachment II. The drainage ditches were 2 foot deep and 3 foot wide, covered with Miraff; Filter cloth and filled with shell. The normal Clam Shell Filter Blanket was then placed on top of these ditches (acting as foundation material) and due to their narrow size needed no special compaction since compaction to a reasonable density would be achieved during Clam Shell Filter Blanket Compaction Operations.

This same drainage scheme was used in Strip #5 and is adequately documented as to location and geometry on page 100 of Attachment II which is typical for Strip #3 as well.

VI-A-4a - Use As Is:

No special knowledge is known of how this change was made. Documentation available indicates that gunite placement on the West third of the North Wall of Strip #4 originally need to be trimmed. Later during the shift, the gunite was trimmed and the original form entry was changed by J. S. G. or D. S. G. or MR "X" (unknown).

Since the gunite was later inspected and accepted by the Site Soils Engineer prior to clam shell placement (page 85, Attachment II) on 2-13-76 and since the gunite is not a Class I material and is documented to be structurally thick enough the gunite, as placed should be considered to be trimmed back in an acceptable manor.

VI-A-4b - Use As Is:

Although missing documentation is indicated in the placement of gunite on Strip #4, the Strip #4 was released for clam shell placement by the Site Soils Engineer on 2-13-83. Completed gunite slope protection is indicated in Ebasco Record Photographs #607 (West Face And West Half of the North Face), #620 (Entire East Face) and #624 which indicates a portion of the East half of the North face of Strip #4. Copies of the photo's are attached as page 150 of Attachment IV and originals are available from the site photographer.

VI-A-5a - Use As Is:

Review of the inspection reports on the gunite placement of both faces of Strip #5 dated 2-5-76 (pages 95 & 96, Attachment II) indicates that the overspray gunite was not trimmed off. The same day, the Site Soils Engineer and Field Engineer approved the strip for clam shall placement (pg. 98). This indicates that either the overtrim was removed or it was located in a spot (example the outer edge of the 3' horizontal berm on El -40) that would not affect the Class I clam shell blanket or structural foundation mat. Therefore, the overspray is found to be acceptable without removal.

IV-A-5B - Use As Is:

As in the discussion above, without the adequate documentation, it can only be assumed that the gunite contamination of the clam shell along the West wall of Strip #5 was on the small amount of shell exposed . . the Southwest Corner Strip #3 under the mud mat. This is believed to be the case since Clam Shell Placement in Strip #5 itself did not start until 2-9-76 - 4 days after the placement of the gunite slope protection (pages 102-108, Attachment II). In all strips excavated, clam shell in the common excavation face (in this case, the South edge of Strip #3 is the North edge of Strip #5) was cut back to key the new shell into the existing shell blanket if the filter cloth was not present. Although not documented for Strip #5, this was a required construction operation, documented on the QC-93 form under the heading "KEYING" on page 1 of the form.

Review of this item on pages 102, 104 and 107, indicates that the localized nature of this contamination (3' from the West wall in the Northwest corner) by the documented entry "None". Keying was not required for this strip when the filter blanket itself was placed. Therefore, it is believed that the small quantities of contaminated clam shell were removed and replaced and found acceptable by the Site Soils Engineer on 2-11-76 (pg. 109, Attachment II).

VI-A-5c - Use As Is:

A review of the Clam Shell Filter Blanket Inspection Report for the "DEYO" strip added to the South side of Strip #5 (pg. 111, Attachment II) indicates that the Site Soils Engineer approved the compaction of this Strip (Line 8) and indicated that alternate methods of compaction were not used (Line #9). The "DEYO" strip was cut after most of Strip #5 was already finished due to a survey error. The original planned size of Strip #5 (55') was originally cut to 50' wide and then expanded by 8' to a total width of 58'. The 3' oversize (58' compared to 55') was specified so as to allow for normal compaction of this strip by the 12 ton rubber tire, vibratory smooth drum roller which is 8' wide.

The "No" on Line 9 is a statement that alternate methods were not used. This strip is therefore found acceptable.

VI-A-6-a - Use As Is:

As stated previously in responses to similar portions of this NCR the gunite is not a safety related material. In this case (pg. 124-125 Attachment II) the Class I Clam Shell was not in place when the gunite was placed. The trim and overspray indicated are primarily associated with gunite placement at the top of the vertical face on the El -40 berm. Therefore, no impacts on the Clam Shell Blanket or Structural Foundation Mat can be realized by the lack of trimming activities on the gunite slope protection. Signatures by the Site Soils Engineer and the Field Engineer (pg. 126, Attachment II) indicate that the minor trimming activities documented on 2-9-76 were indeed performed and approved prior to the placement of Clam Shell the following day.

VI-A-6b - Use As Is:

Record photographs #648 (3-16-76), #650 (3-18-76), #662 (4-2-76) and #666 (4-2-76) located on the strip key plan (Attachment IV Pg. 151) and shown on pages 152 and 153 show the presence of the gunite slope protection in question. Although there exists at the present date, no documentation on its placement, it is known to exist and Clam Shell Filter Blanket Placement against it was found to be acceptable and approved by the Site Soils Engineer on 3-12-76 (pg. 130, Attachment II).

VI-A-7 - Use As Is:

As per the discussion presented in this response to the NCR for section VI-A-2d. The corrective action for the "Mud Spurt" was found to be acceptable by the Site Soils Engineer and approved on 12-15-75.

26. What were the problems of soils, waterstops, cadweld splices, and the placement of concrete, as mentioned in the third column on page 22 of GAMBIT, and how were they resolved?

Response:

The GAMBIT article did not identify the specific "records packages" which contained the alleged deficiencies. However, it is known that Hill generated the NCRs addressed in Question 25 which pertain to these subjects.

The "soils documents" referred to by GAMBIT are probably those addressed by NCR-W3-5997 (about 200 pages pertaining to the clam shell filter blanket). Each of the 64 findings are detailed in Attachment I to NCR-W3-5997 and are summarized in the response to Question 25. Each of the 64 findings were resolved by the Site Soils Engineer in Attachment IV of NCR-W3-5997 .

The cadwelding problems referred to are probably those documented in NCR-W3-5998 also addressed in Question 25.

The waterstop problems were generally gouges or nicks which were repaired. Waterstops are not Class I items; their function is to prevent inleakage of groundwater thereby minimizing the amount of water routed through the Waste Management System.

The concrete placement problems were addressed in Question 9.

27. Do the allegations described in Phearson's memo and the Gambit article reflect generally what happened during the constructin of the mat? If yes, how would these non-conformance of QA/QC requirements affect the structural integrity of the mat? If not, identify those allegation which are unfounded and the basis thereof.

Response:

See response to Questions 9, 11, 14, 22, 24, 25, 26 and 28.

28. In light of the allegations, documented NCRs, and QA/QC deficiencies, what has LP&L done or what does LP&L intend to do in order to resolve the allegations and deficiencies?

Response

LP&L letter W3K84-0629, copy attached, provides a summary LP&L response to allegations regarding Waterford 3 quality. The general LP&L conclusions included in W3K84-0629 are as follows:

1. The allegations did not uncover any significant new information regarding Waterford 3 quality.
2. Deficiencies in the physical and records quality of Waterford 3 have been and are being addressed under the programmatic requirements of the Waterford 3 Quality Assurance Program.
3. LP&L has exerted extraordinary efforts in the resolution of deficiencies.
4. The general tone of the allegations, and the insinuations that LP&L motives are questionable, are totally erroneous.
5. Continuing Waterford 3 activities in the Quality Assurance areas are designed to redouble LP&L confidence in Waterford 3 quality.

LP&L 100% review on reduced reads

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MIDDLE SOUTH UTILITIES SYSTEM

March 16, 1984

ROTH S. LEDDICK
Senior Vice President
Nuclear Operations

W3K84-0629
Q-3-A35.02.36

Mr. John T. Collins
Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

SUBJECT: Waterford 3 SES
Docket No. 50-382

Dear Mr. Collins:

At a public meeting with NRC in Arlington, Texas on February 1, 1984, LP&L presented a status report on the results of its review of public allegations concerning problems with Waterford 3 quality assurance documentation. We agreed at that meeting to provide NRC with a written summary of our actions and the results. Enclosed is a summary report of LP&L efforts in those areas which relate to recent allegations regarding Waterford 3 quality. Documentation supporting this summary is located at the Waterford 3 site and is available for the NRC review.

Yours very truly,

R. S. Leddick

RSL:cmb

cc: E.L. Blake, W.M. Stevenson, D.M. Crutchfield, J. Wilson, G.L. Constable

8404110362

bcc: R.P. Barkhurst, F.J. Drummond, T.F. Gerrets, G.G. Hofer (Ebasco),
W.A. Cross (LP&L Bethesda Office)

LP&L RESPONSE TO ALLEGATIONS REGARDING WATERFORD 3 QUALITY

PURPOSE

The purpose of this document is to provide a summary of LP&L efforts in those areas which relate to recent allegations regarding Waterford 3 quality. Documentation supporting this summary is located at the Waterford 3 site and is available for NRC review.

DISCUSSION

Allegations of Quality Assurance failures and faulty construction at Waterford 3 have surfaced via a reporter, writing for a New Orleans, Louisiana weekly newspaper (the alleger). The identified source of information for the alleger has been a person who was employed to review Quality Assurance documents for Ebasco Services, Inc., the construction manager of Waterford 3. Although the newspaper accounts strongly insinuate that the actual construction is unacceptably faulty, the allegations are essentially limited to alleged discrepancies in the installation documentation. For simplicity, the allegations are grouped according to content under nine categories, along with LP&L responses based on review and research conducted to date.

I. ALLEGATIONS THAT THE MANAGEMENT OF THE WATERFORD 3 PROJECT, PARTICULARLY IN LP&L AND EBASCO, CHOSE TO IGNORE OR TO COVER UP DEFICIENCIES.

Allegations that the management of the Waterford 3 Project chose to ignore or to cover up deficiencies are totally erroneous. LP&L is committed to the rigorous quality assurance requirements of nuclear power plant construction and operation, and has responsibly fulfilled this commitment throughout the project history.

1. A multi-layered Quality Assurance Program, meeting the requirements of 10CFR50, has been in effect throughout the project history. Although criteria and interpretation of criteria for nuclear projects have generally become more conservative over the project history, the Waterford QA Program has kept pace by increasing the Quality Assurance effort.

2. To date, there has never been a significant project-specific Quality Assurance breakdown on the project which was discovered other than through operation of the W-3 Quality Assurance program itself.

   The only such "breakdown" which might truly be classified as significant resulted in imposition of a $20,000 fine by NRC in early 1983. This "breakdown" was discovered within the W-3 Quality Assurance Program, and LP&L established a broad corrective action program. Mitigation of the fine by NRC from $40,000 to $20,000 occurred because of NRC recognition of the broad corrective action taken by LP&L and the LP&L role on identifying and reporting the "breakdown."

3. LP&L has, from the outset, let it be known that the company's interest is to construct and operate Waterford 3 properly. The first official representation of this interest in quality was in the Preliminary Safety Analysis Report, issued in the last days of 1970. The LP&L policy statement in the first LP&L QA Manual for Construction, issued in June 1971, reiterated this interest, as did subsequent revisions of the manual.

   Since early 1980, this interest in quality has been further emphasized by a letter from LP&L management, posted conspicuously in various locations on the site, urging all project personnel to make known any deficiencies of which they are aware.

   Recently, LP&L has initiated a Quality Awareness Hotline Program. This program allows any person on the project to report unresolved quality concerns to a telephone number which is manned during the normal workday and recorded during off hours. Anonymity is assured, if desired by the caller. Each call must be followed up by a responsible LP&L Quality Assurance Engineer. The hotline program posters are located throughout the site, and personnel have been individually notified by distribution of hotline information with their paychecks. Since publication of the Hotline program on December 19, 1983, there have been no calls to report deficiencies.

4. In an effort to further educate craft foremen with regard to the importance of quality assurance, LP&L directed Ebasco to implement a Foremen Training Program. The Foreman Training Program was carried out in the summer of 1981.

5. 10CFR50.55(e) and 10CFR21 require reports to the NRC for certain types of deficiencies. A formal program has been in existence at Waterford 3 to assure compliance with these regulations. The procedure requires that Ebasco Nonconformance reports (NCRs) be reviewed for reportability. Primary responsibility for NCRs, including reportability review, has been delegated to Ebasco.

   In addition to performing formal audits, LP&L Construction QA is on distribution for Ebasco NCR correspondence. Formal in-process LP&L action with NCRs was not required. However, LP&L QA has actively participated, by commenting on Ebasco's performance of this task and by causing increased attention to particular NCRs as appropriate. LP&L has recently reviewed a sample of approximately 1,100 NCRs (of about 8000 total) using LP&L QA personnal, to make doubly sure that the reportability review has been properly accomplished by Ebasco. No additional 10CFR50.55(e) or 10CFR21 reportable items have been identified in this sample review, although one item is currently under further review for reportability. LP&L is accomplishing a 100% review of NCRs in this manner prior to fuel load.

6. Most recently, LP&L has conducted interviews with over 400 QA/QC personnal at Waterford 3. Anonymity was offered and 7% of interviewees chose to remain anonymous. The results are that:

   a. None of the interviews resulted in the need for significant corrective action.

   b. 82% either identified no concerns or offered comments supportive of the quality and integrity of Waterford 3 QA activities.

   c. 5% identified minor concerns which were already being addressed.

   d. 13% identified concerns for which LP&L intends to respond to the interviewees. These concerns can best be characterized as representing communications shortfalls (e.g., the interviewee was not informed of the corrective action on a deficiency which he/she identified) or lack of understanding by interviewees of Quality Assurance Program elements outside of the interviewee's scope of work. LP&L intends to provide written responses to the individuals identifying these concerns.

   This series of interviews confirmed that intimidation of QA/QC personnel is essentially non-existent. Such intimidation has not been tolerated on the Waterford-3 project and, in at least one instance, a person has been terminated for such intimidation. Good job discipline is one reason why Waterford-3 has achieved a better-than-average record among U.S. nuclear projects. Disciplinary action for cause does not constitute intimidation as used in this context although, in the minds of those personnel who have been disciplined, it might. During the course of the project, allegations of intimidation or harrassment were followed up promptly by Ebasco and LP&L. LP&L is not aware of any situation whereby quality information has been withheld by an individual, including alleger's information source, or whereby inspectors accepted deficient work because of intimidation or harassment.

7. LP&L efforts have clearly been directed toward quality, including the identification and correction of deficiencies. On the other hand, the motives of the alleger must seriously be questioned, since alleger publicly boasts that, apparently through alleger's own deliberate effort, the NRC was unsuccessful in "seeking to discover what other facts (alleger) might know about problems at Waterford 3...."

II. ALLEGATIONS THAT THE ALLEGER HAS BEEN RESPONSIBLE, THROUGH ITS "INVESTIGATIONS," FOR SHEDDING SIGNIFICANT NEW LIGHT ON THE QUALITY OF THE WATERFORD-3 PROJECT.

Allegations that alleger's "investigations" have identified, for the first time, any significant new information regarding Waterford 3 quality are totally erroneous. On the contrary, discovery and correction of all significant quality deficiencies has occurred within the bounds of the Waterford 3 Quality Assurance Program itself.

A. Basemat Cracks

1. Allegers "disclosure" of concrete problems ("cracks" in the Waterford-3 basemat) appeared publicly, for the first time, long after the first appearance of hairline cracks in the basemat. Cracks were initially discovered in 1977, within the project QA hierarchy and were formally dispositioned in accordance with project procedures. Following the initial discovery, there have been several additional instances of crack identification, reporting, and dispositioning. "Cracks" were most recently identified on May 9, 1983 by Ebasco Quality Assurance, and an Ebasco nonconformance report was issued on May 11, 1983. None of the more recent discoveries cast doubt on the validity of the 1977 disposition.

2. As a consequence of the allegations, an independent consulting firm was contracted to perform an independent review of the basemat installation. It should be recognized that "crack" widths were so small as to be undetectable using standard inspection techniques. This expense was authorized by LP&L despite overwhelming advice from knowledgable civil engineers that the "cracks" posed no threat to safe plant operation. That is, the study was authorized even though LP&L had already achieved more than an adequate level of confidence in the basemat installation.

   The independent consulting firm was allowed to have any information which it desired to complete its evaluation. At the outset of the study, the independent consulting firm was given copies of the Significant Construction Deficiency (SCD) packages relating to the basemat. The consulting firm concluded that "...there is no evidence of any process which has been or could be detrimental to the structural integrity of the foundation mat."

   As a further consequence of the more recent allegations, the same independent consulting firm was contracted to review all basemat concrete placement packages and related documentation. The consulting firm reported, as expected by knowledgeable civil engineers, that "...no modifications are necessary to the conclusions reached previously in (consulting firm's) reports regarding the structural adequacy of the basemat."

B. Construction Records

1. Construction records discrepancies have been found and corrected as a matter of routine, using project procedures designed for this purpose. Additional records discrepancies were discovered during a final review prior to turning over systems to LP&L Startup forces for testing in early 1982. A typical response to such a discovery is to expand the review program to determine the extent of similar discrepancies, and such a program expansion was directed by LP&L in the fall of 1982.

2. The alleger's information source, among others, was hired for the purpose of reviewing larger samples of construction documentation and identifying any other discrepancies so that the discrepancies could be properly dispositioned. The allegations played no part in the identification of discrepancies or in the development or implementation of corrective action regarding such discrepancies.

III. ALLEGATIONS RELATING TO A MEMORANDUM WRITTEN BY MR. JOSEPH D. DAVIS, ON DECEMBER 9, 1982, AND MR. DAVIS' CHANGE IN ASSIGNMENT.

The allegations relating to the memorandum written by Mr. Joseph D. Davis on December 9, 1982, and Mr. Davis' change in assignment are totally erroneous.

Mr. Davis was involved in a records review program which had grown out of the discovery of records discrepancies, in early 1982, during a final records review prior to turning over systems to LP&L Startup forces for testing. Mr. Davis' job was to identify records discrepancies.

1. Mr. Davis did write a December 9, 1982 memorandum. The memorandum was written to aid Ebasco in determining an appropriate sample size of civil records to review. The nature of the problems identified by his memorandum reflected poor record-keeping rather than actual safety problems.

2. Mr. Davis was not "transferred to other, less sensitive duties," as alleged. To the contrary, Mr. Davis was actually placed in a position which allowed him to overview all of the individual QAIRG record review groups.

3. Following the allegations in early December, 1983, Mr. Davis was interviewed by LP&L management and was asked to comment on project document reviews conducted since his December 9, 1982 memorandum. Mr. Davis issued a memorandum on December 22, 1983, which reads, in part, as follows:

   "In summary, my review of nonconformance reports and related correspondence indicates that items addressed in memorandum dated December 9, 1982, have been adequately addressed and/or are being corrected in accordance with Ebasco's program."

4. Alleger's information source was formally invited, by the LP&L Senior Vice President-Nuclear Operations, to discuss his concerns in light of more complete information resulting from the expanded records review program begun in early 1982. The LP&L intent, in extending this offer, was to allow alleger's information source to decide for himself, as did Mr. Davis, whether or not corrective action for discovered discrepancies had been satisfactorily carried out at Waterford 3. The alleger's information source formally declined the LP&L invitation.

IV. ALLEGATIONS THAT WATERFORD 3 MANAGEMENT CHOSE TO IGNORE ALLEGER'S INFORMATION SOURCE.

Allegations that Waterford 3 management chose to ignore any information source are totally erroneous. Such an alleged posture is totally contrary to LP&L policy. Furthermore, deficiencies discovered by alleger's information source were being aggressively addressed even before alleger's information source left the Waterford 3 site.

1. In a meeting of July 7, 1983, alleger's source recommended that all concrete placement packages and soil packages be reviewed.

2. On July 11, 1983, project management decided to review a 10% sample of the concrete placement packages, and LP&L directed Ebasco to begin the review. (NOTE: Alleger's information source left the site on July 31, 1983.)

3. In August 1983, the review of concrete placement packages was begun. In September, 1983, the review program was expanded to include 100% of the concrete placement packages. The review is now complete and 33 new NCRs were written as a result of this review, none of which identified significant physical deficiencies and all of which have been properly dispositioned.

4. Soils and backfill records were previously subjected to a comprehensive review by Ebasco. All records were reviewed for existence of required records, their completeness, and for proper organization by elevation and fill number. Approximately 50% of the records were re-reviewed for technical adequacy. No additional soils non-conformances were identified.

5. To gain an even greater level of confidence, LP&L personnel, in accordance with standard procedures, are currently performing additional reviews of concrete placement and backfill records. Certain types of civil records are being 100% reviewed by LP&L during this review process.

V. ALLEGATIONS THAT LARGE NUMBERS OF INSPECTORS WERE NOT CERTIFIED.

Allegations that large numbers of inspectors were not certified are totally erroneous.

1. Inspector certification audits have been performed at every level of the hierarchy of the Waterford-3 Quality Assurance Program throughout the project history. Where deficiencies existed, formal corrective action has been implemented. The only significant problem of this type occurred in relation to the Nuclear Steam Supply Sytem (NSSS) installation in 1980. In that case, a Stop Work Order was issued until the contractor's inspector certification program was upgraded. Corrective action involved significant review and reinspection of prior work and revision of the contractor's Quality Assurance Program.

2. Recent reviews of non-conformance reports and inspector certification records related to concrete placement support the conclusion that there are no significant problems in the area of inspector qualification.

   Qualifications of inspectors involved in concrete placement were re-reviewed in detail by both Ebasco and LP&L. The documentation indicates that several inspectors had performed certain inspections prior to formal on-site certification. Further review verified that most of these inspectors were well qualified to perform the inspection functions, based on completion of onsite training and examination or based on their significant previous experience. It appears that four inspectors may have performed up to ten concrete curing (post placement) inspections prior to being certified. However, these inspections require only that the inspector be capable of reading a thermometer and determining whether or not a concrete surface is wet.

   In one isolated instance, cadwelds were inspected and accepted by an individual several weeks prior to his formal certification. At that time, the inspector had 6 years of experience and training on commercial civil projects, including experience as a civil Quality Control Inspector prior to joining the Waterford 3 project. An engineering evaluation of this situation has shown that the installation meets design criteria.

3. Although LP&L already has an adequate level of confidence in the inspector certification conditions at Waterford-3, LP&L QA has embarked on an additional review of inspector certification documents to redouble its confidence.

VI. ALLEGATIONS THAT THERE HAS BEEN A "SYSTEMATIC PROGRAM" TO ALTER, "DOCTOR", OR REPLACE DOCUMENTS WITH "PHONY" DOCUMENTS.

Allegations that there has been a "systematic program" to alter "doctor", or replace documents with "phony" documents are totally erroneous. To LP&L's and Ebasco's knowledge, there has never been any concerted effort to falsify records in any facet of the Waterford 3 project.

1. When document discrepancies are discovered, nonconformance reports (NCRs), or lower level documents, are written to assure that the discrepancies are corrected.

   Approved procedures require correction of document discrepancies under controlled conditions. Such corrective action, based on the nature of the discrepancy, may involve resolution in a wide spectrum of choices including, if necessary, reinspection, repair, rework, or replacement of installed materials or equipment. Nonconformance of materials or equipment installation with design documents constitutes a discrepancy. When such conditions are discovered, they may be corrected either by reworking, replacing, or repairing the nonconforming installation or by changing the design document to reflect the "as-built" condition. However, changes in design documents must be reviewed by engineering personnel to assure that the changed design remains in conformance with the approved design criteria.

2. In order to further improve its confidence that the corrective action process has been properly performed, LP&L has embarked on an additional review of a sampling of nonconformance reports (NCRs). NCR's involving "Accept-As-Is" and NCR's involving physical work will be selected (sample basis) and will be reviewed to verify that:

   1. The disposition appropriately addresses the identified condition.
   2. Any required work was properly accomplished. This will involve some field verification.
   3. The NCR was dispositioned in accordance with the applicable procedures.

3. The Waterford 3 Quality Assurance Program includes elements which provide reasonable confidence that document falsification would be detected. At Waterford 3 three situations have been discovered in which falsification was suspected. These situations were investigated and properly dispositioned.

   In two of the suspect situations, the personnel involved explained that the records in question were reproduced because the originals were either lost (they were later found) or in poor condition from field use. In some instances the inspectors worked in teams whereby one inspected and the other recorded. The accuracy of records has been confirmed by supplementary and backup documentation.

The third situation brought into question the quality of a very small quantity of materials used in a safety related installation. Documentation of traceability of the heat number for the materials was suspected to have been falsified. Since the suspect signature was that of an employee who was no longer on the project, since the amount of materials in question was small, and since this was obviously a very isolated incidant, it was decided to simply replace the suspect materials with properly certified materials.

VII. ALLEGATIONS THAT DOCUMENT DISCREPANCIES REFLECT LARGE DEFICIENCIES IN THE PHYSICAL PLANT.

Allegations that document discrepancies reflect large deficiencies in the physical plant are totally erroneous.

1. Every discovered document discrepancy must be dispositioned in accordance with approved procedures.

2. The number of physical corrections, required as a result of document reviews, including the expanded records review begun in 1982, has been small and physical corrective action has been, or is being, accomplished.

VIII. ALLEGATIONS THAT ALLEGED DEFICIENCIES IN THE MASTER TRACKING SYSTEM CONSTITUTES A SERIOUS QUALITY ASSURANCE BREAKDOWN.

Allegations that alleged deficiencies in the Master Tracking System constitutes a serious quality assurance breakdown are totally erroneous.

1. The Master Tracking System is performing very well at Waterford 3. The Master Tracking System is, as the name implies, merely a tool for tracking work items. The alleger has been informed of this fact several times beginning more than a year ago.

IX. ALLEGATIONS WITH RESPECT TO SPECIAL LP&L RELATIONSHIPS WITH THE NUCLEAR REGULATORY COMMISSION. (NRC)

Allegations that LP&L and NRC have entered into special agreements are totally erroneous.

1. The allegations insinuate that LP&L has entered into special agreements with NRC regarding questions posed by the allegations. There are no such agreements.

29. Does (LP&L) maintain that the mat possesses adequate capability to resist the design loads and confirm to the criteria commited to in the FSAR despite all the deficiencies and allegations listed? If yes, provide the supporting technical basis. If not, propose specific means to resolve them and thus render the mat acceptable to the staff.

In any case, the "as-built-mat" should be shown by the applicant, if feasible, to maintain adequate safety margins to perform its safety function and maintain its structural integrity.

A quantitative demonstration of the "as-built" mat capacity, including adoption of test, monitoring and strengthening programs, if need, should be provided for staff review.

Response:

It is our conclusion that the mat, as constructed, possesses adequate capability to safely resist the design loads. Deficiencies and allegations brought to our attention either refer to problems in maintaining a clear record of the construction or have been corrected. We therefore conclude that the quality of construction was substantially in accordance with the plans and specifications.

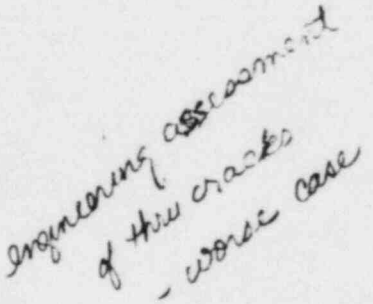
A monitoring program has been provided for NRC Staff review. This program consists of three areas of monitoring and has been provided in the form of Technical Specifications as requested by the Staff and suggested by the Atomic Safety and Licensing Appeal Board (ASLAB). The first area of the program is to extend the previously agreed to basemat settlement monitoring program for the current three year commitment to a continuing program. Secondly, periodic sampling and testing of the ground water chemistry will be conducted to assure that significant corrosion of the rebar due to ground water intrusion is not expected and that the ground water remains "non-aggressive". The third area evolves periodic inspection of the exposed areas of the basemat to document any new cracking, if it should occur, and to survey the existing cracks to determine if significant changes in crack size have occured during the inspection interval. Specific proposals for each phase of the program have been submitted.

30. What is LP&L's technical rationale for explaning what has happened (including, water seepage, potential through-thickness cracks, predominently on-way cracks within containment region, even settlements, etc.) to the mat? What monitoring program(s) has been implemented is underway? What are the results of these programs? Did the monitoring data show that both the cracking and water seepage problems have stabilized and there is not sign of continued degration? What improvements, could be applied to the on-going programs?

Kesponse:

It is our conclusion that minor flexural cracking of the mat has occured related to the differential settlement of the mat and that those cracks have intercepted minor moisture paths within the mat. These minor moisture paths are associated with the embedded steel construction support members for the reinforcing steel and embedded conduit. Under the high water pressure head (about 55 feet) these paths allow the passage of trivial amounts of moisture to the surface of the mat.

The only portion of the monitoring program described in the response to Question 29 above which has been implemented is the basemat settlement monitoring program. This program has been in effect since the start of the basemat construction. This program has indicated no additional settlement since 1979 and, as such, supports the conclusion that the basemat has stabilized. The proposed monitoring program (Question 29) is considered to adequately address the issue of potential basemat settlement, corrosion of rebar, and basemat stability.



31. Are there any known voids of some significant size to affect the mat structural integrity? If yes, what are the sizes (best estimates) and extent of these voids? What is LP&L's suggested disposition to the issue of voids. If no disposition is needed, what is the technical basis?

Response:

The basemat design and the approved procedures for construction of the basemat include provisions to minimize the formation of significant voids in the basemat placements. There are no known significant voids in the basemat. All significant voids detected during the placements have been repaired.

what size ?

32. Conservatively assuming the existence of extensive through-cracks of the mat, assess the impact of the presence of water on the long-term structural integrity of rebars and mat capacity. Also assess the same impacts due to other potential corrosive elements.

Response: (EBASCO)

The assessment has been provided in the "Applicant's Answer to Joint Intervenor's Motion to Reopen Contention," dated September 30, 1983. Affidavit of William F. Gundaker, and in a memorandum dated August 5, 1977 by A. W. Peabody/M. D. Oliveira, titled "Corrosion of Reinforcing Steel and Steel Containment Vessel Plates in Contact with Water," which reads in part, "...we have analysed a possible situation in the common mat where supposedly groundwater seeping from concrete cracks found on the surface of the mat could corrode the reinforcing steel and the outside bottom plates of the Steel Containment Vessel.

> It is a proven fact that concrete by its alkaline nature passivates carbon steel embedded in it.
>
> It is also known that water in contact with concrete becomes alkaline and consequently its corrosivity to steel decreases considerably.
>
> In addition to these factors, assuming that groundwater is left inside the crack network to a certain extent, this water will be near stagnant and without replenishment of oxygen. Consequently, the rate of corrosion under the above circumstances, if any, will be negligible."

Response: (HEA)

The "existence of extensive through cracks" as hypothesized, considering the hydrostatic pressure acting at the base of the mat, would be manifested by substantial bleeding of groundwater through such cracks. HEA reiterates the summary of a site inspection performed on 08/30-09/02/83. During this time all accessible areas of the basemat were inspected and any cracks found were mapped (See HEA Report No. 8304-1, dated 09/19/83). Subsection 4.6 of the referenced report notes that:

> "The amount of moisture noted during this inspection period was minimal. In some instances dampness/moisture were present. There was, however, no evidence of seepage or migration that might have been deduced by the presence of standing water or draining along the local slope of the basemat."

MEETING SUMMARIES

APR 6 1984

Docket File (50-382)
NRC PDR
Local PDR
PRC System
NSIC
LB#3 Reading
J. Lee
Project Manager J. Wilson
Attorney, OELD
G. W. Knighton

W. Lovelace (Caseload Forecast Panel Visits)
OPA (Caseloac Forecast Panel Visits)

NRC PARTICIPANTS

AWang
DCrutchfield
LLazo
JITapia
DCJeng
GLear
JSMa
JTChen
WACrossman
STurk
LHeller
MKarman
MWPeranich
PKesnisnian
JEGagliardo
SSarma
PCWang
MReich

B/24

STOP WORK ORDER

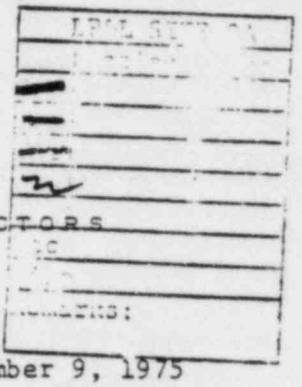
PACKAGE

84-455

PC 5

EBASCO SERVICES
INCORPORATED

UTILITY CONSULTANTS - ENGINEERS - CONSTRUCTORS
P.O. Box 70
Killona, Louisiana 70066



December 9, 1975
W3QA-230
15.33.3

J.A. Jones Construction Company
P.O. Box 110
Hahnville, Louisiana 70057

Attention: Mr. G.A. Greathouse

Gentlemen:

Attached for your information and action is a copy of Mr. Gutierrez's Audit Report No. JG-75-12-2, entitled "Concrete Placement Operations Audit".

Please correct the noted deficiencies and notify this office in writing of the disposition and measures to prevent recurrence. Reply required within twenty (20) working days.

Very truly yours,

Iktidar Hussain

Iktidar Hussain
for Quality Assurance Site Supervisor

IH/dg

Enclosure

cc: W.C. Griggs
J.O. Booth
J.M. Brooks
C.V. Diz
D.N. Galligan
R.K. Stampley
— T.F. Garrets
A.E. Henderson
W3QA File
QAS File

B/1

1311-2 (QA) 3-74

EBASCO SERVICES INCORPORATED

QUALITY ASSURANCE ENGINEERING
GENERAL AUDIT REPORT

REPORT NO.
JG-75-12-2

DATE OF REPORT
December 2, 1975

CLIENT OR PROJECT
WATERFORD SES UNIT NO. 3

SUBJECT
CONCRETE PLACEMENT OPERATIONS AUDIT

REFERENCE DOCUMENTS
LOU 1564.472, QCIP-5 , ASTM-C31, QCIP-7

AUDITOR
J. Gutierrez

QUALITY COMPLIANCE SUPERVISOR
R.A. Hartnett

ITEM	REFERENCE DOCUMENTS	FUNCTION	ACCEPT	REJECT
1	1564.472, 4.13a	Vibrators calibrated.	X	
2	1564.472, 3.3	Buckets, chutes and elephant trunks clean and in operating	X	
		condition.		
3		Trucks operating properly.	X	
4		Backup equipment.		X
5	1564.472, 4.1	Placing procedure approved and workmen are cognizant of		X
		procedure.		
6	1564.472, 6.1	Forms tight, clean, oiled and adequately braced.	X	
7	1564.472, 4.9	Mudmat clean.	X	
8	1564.472, 4.9	Rebar clean and adequately braced.	X	
9	1564.472, 4.8	Placing by pumping per specification.	X	
10	1564.472, 4.11	Thickness of layers from 6 inches to 20 inches.	X	
11	1564.472, 4.12	Bedding of layers approximately horizontal.	X	
12	1564.472, 4.13	Adequate vibration.		X
13	1564.472, 4.5	Height of drop does not exceed 5 feet.		X
14	1564.472, 4.18	Placing concrete through reinforcing steel.	X	
15		Batch tickets complete and accurate.	X	
16	1564.472, 3.1 QCIP-5	Time interval between mixing and placing.		X
17	QCIP-7, 6.3.1.1	Slump - each batch.	X	
18	" "	Temperature - each 50 c.y.,	X	
19	" "	Air content - each 50 c.y.	X	
20	" "	Unit weight - each time cylinders are cast.	X	
21	ASTM-C31	Cylinders protected and cured properly - one set of 4		X
		per 150 c.y.		

131-7 (QA) 3-74

EBASCO SERVICES INCORPORATED

QUALITY ASSURANCE ENGINEERING
GENERAL AUDIT REPORT

REPORT NO. JG-75-12-2 PAGE 2

DATE OF REPORT December 2, 1975

CLIENT OR PROJECT
WATERFORD SES UNIT NO. 3

SUBJECT
CONCRETE PLACEMENT OPERATIONS AUDIT

REFERENCE DOCUMENTS
LOU 1564.472, QCIP-5, ASTM-C31, QCIP-7

AUDITOR
J. Gutierrez

QUALITY COMPLIANCE SUPERVISOR
R.A. Hartnett

ITEM	REFERENCE DOCUMENTS	FUNCTION	ACCEPT	REJECT
22	1564.472, 3.2	Addition of water in accordance with the specifications.	X	
23	1564.472, 14.0	Weather conditions.	X	
24	1564.472, 12.1	Sampling of concrete at point of delivery into the form.		X
25		Workmanship.		X
26		Documentation.		X

1222-1 (QA) 3-74

EBASCO SERVICES INCORPORATED

QUALITY ASSURANCE ENGINEERING

AUDIT REPORT

REJECTION CONTINUATION SHEET

REPORT NO. JG-75-12-2

DATE OF REPORT December 2, 1975

CLIENT OR PROJECT

WATERFORD SES UNIT NO. 3

REFERENCE DOCUMENT	QUALITY COMPLIANCE REPRESENTATIVE
LOU 1564.472, QCIP-5, ASTM-C31, QCIP-7	J. Gutierrez

ITEM	REASON FOR REJECTION
4	Not enough vibrators were provided for adequate vibration or to make provisions for breakdown of equipment.
5	Workmen deviated from placing procedure; it was apparent that workmen were not cognizant with placing procedure.
12	It was observed that improper use of vibrators and insufficient vibration resulted in honeycomb.
13	At times height of drop exceeded the 5 foot limit.
16	It was observed that for some loads that as much as 15 minutes elapsed before the discharge time was recorded; consequently an incorrect time was recorded.
21	Improper handling of cylinders resulted in uncircular specimens, also Hi-Lo thermometers were not provided until late evening.
24	Skip pan was observed to stand on top of the mat for several minutes prior to testing of the concrete which was in the skip pan.
25	Workmen were observed to shovel concrete from the ground into the pumps, thus contaminating the concrete with shell.
26	Documentation of tests and checklists were observed to be in error and omissions of data and signatures exists.

I HAVE READ THIS REPORT [signature] 12/9/75

1322-7 (QA) 3-74

EBASCO SERVICES INCORPORATED

MATERIALS ENGINEERING AND QUALITY COMPLIANCE
SITE AUDIT SUMMARY REPORT

REPORT NO.
JG-75-12-2

DATE OF REPORT
December 2, 1975

CLIENT OR PROJECT
WATERFORD SES UNIT NO. 3

AREA AUDITED
CONCRETE PLACEMENT OPERATIONS AUDIT

PROCEDURE
LOU 1564.472, ASTM-C31, QCIP-5 and 7.

QUALITY COMPLIANCE REPRESENTATIVE
J. Gutierrez

SUMMARY OF AUDIT FINDINGS Placement operations for pour 499S02-6 were audited to verify compliance with project specifications and procedures. Subcontractor supervision and quality verification personnel as well as Ebasco personnel were contacted.

It was observed that construction and Quality Control personnel were not in mutual understanding with placing procedure, quality control procedures and project requirements. Further investigation disclosed areas of concern in: concrete sampling and testing, vibration of concrete, sufficient backup equipment and personnel, placing procedure, documentation and overall workmanship.

RECOMMENDED CORRECTIVE ACTION It is recommended that construction and quality control supervision review construction activities and documentation more thoroughly and better aquaint themselves with project procedures and specification requirements.

Further, pour 499S02-6 was the first Class I concrete placement for this project and subsequent to the placement, a meeting was held by project management and construction supervision to discuss the audit findings.

VERIFICATION OF CORRECTIVE ACTION

☐ ACCEPT ☐ REJECT

QUALITY COMPLIANCE REPRESENTATIVE - DATE

Placement No. A99-SC9-S

Date 12-11-75

WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION UNIT NO. 3
CONCRETE PLACEMENT INSPECTION

Weather COOL AND CLEAR Ambient Temp. 56°

Design Mix Designation ~~W A6 AA~~ AA-14A6 Location Description Common Foundation Structure

A. Visual Inspection Excess Concrete on steel (see Remarks)

B. Time Started ~~9:3~~ 430 PM MKA Relieved Dave Blankenship

C. Method of Placement 2 Concrete pumps, 1 snorkel pump and one belt conveyor

D. Time Completed ~~9:15~~ ~~[illegible]~~ MKA 9:45 PM

E. Method of Finish for Unformed Surfaces Bull float

F. Protection of Fresh Concrete None

G. Time Curing Started 9:36 AM 12/12/75

H. Method of Curing Wet cure (Combination of spray & pond)

I. Remarks At one time, had to have excess concrete on steel cleaned.

REVIEW BY
LEAD Q. C. ENGINEER
DATE 1-16-76 SIG. [signature]

REVIEWED BY + ACCEPTED
[signature] 12/ /75
EBASCO Q. C. CIVIL
[signature] 1-12-76

Inspector [signature]

Form No. QCIP-7-1 (11-30-75)

B/2

Placement No. 199-SC2-2

Date 12-11-75

WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION UNIT NO. 3
CONCRETE PLACEMENT INSPECTION

Weather FAIR Ambient Temp. 68°

Design Mix Designation ~~14 A.6 4F~~ AA-14A6 Location Description COMMON FOUNDATION STRUCTURE

A. Visual Inspection FORMS, R/S, & BOTTOM CLEAN AT START OF POUR.

B. Time Started 9:37 am

C. Method of Placement BY HOSES FROM 2 PUMPERS, 2 SNORKEL PUMPERS, & BELT CONVEYER.

D. Time Completed 9:45 P.M.

E. Method of Finish for Unformed Surfaces BULL FLOAT

F. Protection of Fresh Concrete FORMS PROJECT ABOVE CONCRETE.

G. Time Curing Started 12/12/75 - 9:36 am

H. Method of Curing WATER SPRAY - PONDING/BURLAP

I. Remarks AT 10:45 am A SPILLAGE FROM A DISCONNECTED PUMPER PIPE FELL TO BOTTOM R/S NEAR EAST SIDE, THE CONCRETE BEING VERY DRY. IT WAS FINALLY CLEANED UP AT 2:15 PM.
IT WAS QUITE DIFFUCULT TO GET VIBRATOR OPERATORS TO HANDLE VIBRATORS PROPERLY.

REVIEW BY + ACCEPTED
LEAD Q. C. ENGINEER
DATE 1-16-76 SIG [signature]

REVIEWED BY
[signature] 12/18/75
EBASCO Q. C. CIVIL

Inspector [signature]

Form No. QCIP-7-1 (11-30-75)

[signature] 1-19-76

CONCRETE PREPLACEMENT INSPECTION CHECKLIST

NOMENCLATURE	INT.	DATE	N/A	REMARKS
6.3.3 Blockouts			X	
.1 Blockout Dimensions			X	
6.3.4 Preplacement Cleaning of Forms	L.S.P.	12-10		
6.4 REINFORCEMENT				
.1 Installed Reinforcing Steel	S.H.O.	12-10		
.2 Tie Wires	L.S.P.	12-10		
.3 Minimum Concrete Coverage	S.H.O.	12-10		
.4 Overlap Splices	L.S.P.	12-10		
.5 Mechanical Splices	[illegible]	12-10-75		
6.5 EMBEDDED ITEMS				
.1 Floor Drain Piping	[illegible]	12-10-75		
.2 Pressure Piping			X	
a Location	S.H.O.	12-10-75		
b Welding	[illegible]	12-10-75		
.3 Electrical Conduit	[illegible]	12-10-75		
.4 Ground Wire	[illegible]	12-10-75		
.5 Anchor Bolts	S.H.O.	12-10		
.6 Embedded Plates	S.H.O.	12-10		2 plates off 3" each [illegible] moved OK to place to -38" [illegible]
.7 Pipe Sleeves			X	
.8 Penetration Sleeves			X	
.9 Expansion and Contraction Joints			X	
.10 Waterstop	L.S.P.	12-10		

REVIEW BY + ACCEPTED
LEAD Q. C. ENGINEER
DATE 1-16-76 SIG. E. R. [signature]

REVIEWED BY
T. Hendry 12/15/75
EBASCO Q. C. CIVIL
[signature] 1-12-76

Form No. QCIP-6-2, Page 2 of 2 (11-29-75)

Placement No. 499502-2

WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
CONCRETE PREPLACEMENT INSPECTION CHECKLIST

ITEM DESCRIPTION CONTAIN FOUNDATION MAT

LOCATION Control Foundation Slab ELEVATION -47+00 TO -34.75

DRAWING NUMBER 499502 REV. 3 SPECIFICATION NO. CQV 1564.472 REV. 5

NOMENCLATURE	INT.	DATE	N/A	REMARKS
6.1 EXCAVATION AND FOUNDATION			X	
.1 Dimensional Location of Excavation	L.N.Q.	12-10	X	Marked N/A in error L.N.Q.
.2 Elevation of Principal Base Area	L.N.Q.	12-10	X	Marked N/A in error L.N.Q.
.3 Condition of Soil Base Preparation			X	
.4 Pile Group Installation			X	
.4.1 Number of Piles			X	
6.2 CONCRETE SURFACES				
.1 Underlying Concrete Surfaces			X	
.2 Surface Preparation	D.C.B.	12-11		
.3 Vertical Construction Joints	L.S.P.	12-10	X	Marked N.A. by error D.C.B.
.4 Wetting of Concrete Surfaces	D.C.B.	12-11		
6.3 FORMS				
.1 Form Alignment	L.N.Q.	12-10		
.2 Form Installation	D.C.B.	12-11		
.2.1 Bracing and Rigidity	R.H.	12/10		
.2.2 Form Material	L.S.P.	12-10		
.2.3 Tie Rods			X	
.2.4 Tie Wires	L.S.P.	12-10		
.2.5 Form Oil	L.S.P.	12-10		
.2.6 Chamfers and Fillets			X	
.2.7 Vertical Const. Joint Chamfers			X	
.2.8 Form Joints	L.S.P.	12-10		
.2.9 Reuse of Forms	L.S.P.	12-10		

WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3

CONCRETE PREPLACEMENT CHECKLIST RECORD

Location: COMMON FDN MAT PLACEMENT #2

Elevation: -47 to -39.75 Placement No. LOU 1564 G 492 50 -2

Detailed Description: COMMON FDN MAT -- BLOCK #2

ITEM	CONTRACTOR Time	Date	Int.	INSPECTOR Time	Date	Int.
Sandblast/Greencut/Foundation Treatment	6:[illegible] AM	12/9	[illegible]	0700	12/11/75	[illegible]
Forms (Line and Grade)	5:[illegible] PM	12/9	[illegible]	0720	12/11/75	[illegible]
Blockouts, Keys, Waterstop, etc.	5:[illegible] AM	12/9	[illegible]	0720	12/11/75	[illegible]
Reinforcing Steel	5:[illegible] PM	12/9	[illegible]	0725	12/11/75	[illegible]
Anchor Bolts, Embedded Steel	8:[illegible] AM	12/10	[illegible]	0910	12/11/75	[illegible]
Electrical	2:[illegible]	12/[illegible]/75	[illegible]	2:50 PM	12/10/75	[illegible]
Mechanical	1605	12/10/75	[illegible]	3:25 PM	12/10/75	[illegible]
Final Clean-up	9:[illegible] AM	12/10/75	[illegible]	0920	12/11/75	[illegible]

Remarks: NONE

REVIEW BY & ACCEPTED
LEAD Q. C. ENGINEER
DATE 12-16-75 SIG. [illegible]

Approved for Placing [illegible]
Contractor's Representative
Time 0920 Date 11 Dec 1975

Approved for Placing [illegible]
Ebasco's Q.C. Representative
Time 920 Date 12-11-75

(See Reverse Side for Instructions)

REVIEWED BY
[illegible] 12/18/75
EBASCO Q. C. CIVIL
[illegible]
1-12-76

QCIP-6-1 (11-29-75)

ATTACHMENT B

J. A. JONES CONSTRUCTION COMPANY

WATERFORD UNIT NO. 3

DAILY CONCRETE INSPECTION REPORT

Report No: 1 Date: 12-11-75 Shift: 1

Quality Verification Inspector: [illegible]

Placement Area/~~Location~~: PLACEMENT #2 STRIP #1

499502-2

Area/Location Released By Engineer (Ebasco): Yes ✓ No ____ Date: 12-11-75

Concrete Delivery Acceptable: Yes ✓ No ____ Comments: ____

Concrete Placement Acceptable: Yes ✓ No ____

Comments: VIBRATOR OPERATORS Required constant instruction & TAP proper use of vibrators

Consolidation Acceptable: Yes ✓ No ____ Comments/Results: ____

Finishing Acceptable: Yes ____ No ____ Comments/Results: NOT accomplished on this sheet

Curing Acceptable: Yes ____ No ____ Comments: None on this sheet

Other Comments or Remarks: ____

J. A. JONES CONS. CO. DEC 15 '75 QA/QC

8-9.76 SIG. [signature]

Form No. [illegible]-7.1

ATTACHMENT B

J. A. JONES CONSTRUCTION COMPANY

WATERFORD UNIT NO. 3

DAILY CONCRETE INSPECTION REPORT

Report No: 2 Date: 12-11-75 Shift: 2

Quality Verification Inspector: D. Zwist [illegible]

Placement Area/~~Location~~: Placement #2 Strip #1

499502-2

Area/Location Released By Engineer (Ebasco): Yes ✓ No ___ Date: 12-11-75

Concrete Delivery Acceptable: Yes ✓ No ___ Comments: ___

Concrete Placement Acceptable: Yes ✓ No ___

Comments: Same comment as on Point #1

Consolidation Acceptable: Yes ✓ No ___ Comments/Results: ___

Finishing Acceptable: Yes ✓ No ___ Comments/Results: ___

Curing Acceptable: Yes ___ No ___ Comments: Curing started at 6:00 AM 12-12-75 See Cure log for temp.

Other Comments or Remarks: ___

J. A. JONES CONST. CO. DEC 15 '75 QA/QC

8-9-76

Form No. W-SITP-7.1

File

MEMORANDUM

December 15, 1975

To: R. A. Hartnett

From: J. O. Booth W. C. Griggs
J. O. Booth/W. C. Griggs

Subject: LOUISIANA POWER AND LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
CONCRETE PLACEMENT OPERATIONS AUDIT

Ref: Quality Compliance Report No. W3QA-230

The following comments are offered. The item numbers correspond to those of the audit report.

Item 4 - Response by J. A. Jones

Item 5 - Response by J. A. Jones

Item 12 - Response by J. A. Jones

Item 13 - Response by J. A. Jones

Item 16 - Finding - It was observed that for some loads as much as 15 minutes elapsed before the discharge time was recorded: Consequently an incorrect time was recorded.

Response - The time that is stamped on the batch ticket at the point of discharge is the discharge completion time.

The driver will not leave until he has the ticket returned to him. A check of the batch ticket did not reveal any discrepancies. All trucks were discharged within the one hour time limit.

Item 21 - Finding - Improper Handling of cylinders resulted in uncircular specimens, also Hi-Lo thermometers were not provided until late evening.

Response - All Inspection and Testing Personnel have been instructed as to the proper method of handling concrete test cylinders.

The Hi-Lo thermometers have been mounted in the concrete cylinder curing boxes.

Item 24 - Finding - Skip pan was observed to stand on top of the mat for several minutes prior to testing of the concrete which was in the skip pan.

Response - The skip pan was moved to the testing area as quickly as it was possible. There were a few times that the crane was being used for another operation and could not be used immediately but was released for the testing as soon as possible.

B/3

Item 25 - Finding - Workmen were observed to shovel concrete from the ground into the pumps, thus contaminating the concrete with shell.

Response - Ebasco's Q.C. notified J.A. Jones during the placement that this was not permitted. J. A. Jones Superintendent instructed their personnel as to the requirements.

Item 26 - Finding - Documentation of tests and checklists were observed to be in error and omissions of data and signatures exists.

Response - Concrete testing and inspection personnel have been re-instructed in the proper use of forms. Subsequent placement reveals much improved documentation.

Although this Quality Compliance Report was addressed to J. A. Jones Construction Company, we have responded to the areas that are of concern to Ebasco's Quality Control. It is requested that in the future, separate audit reports be prepared discerning activities by J. A. Jones Construction Co. and Ebasco Services Inc.

FRH:grf

J. A. JONES CONSTRUCTION COMPANY

Waterford SES Unit #3 Contract #W3-NY-4 Job #75-317

ADDRESS REPLY TO:
P. O. Box 110
Killona, LA 70066

17 December 1975

Mr. Iktidar Hussain
Quality Assurance
Ebasco Services Incorporated
P. O. Box 70
Killona, LA 70066

Sub: Ebasco Quality Assurance Audit of Concrete Pour for Placement #6

Ref: Ebasco letter, W3QA-230, dated 9 December 1975

Gentlemen:

The following items are presented in response to each specific line item of Report #JG-75-12-2 considered as falling under J. A. Jones purview:

Item 4: Allegation states, "Not enough vibrators were provided for adequate vibration or to make provisions for breakdown of equipment." The approved Concrete Pour Plan dated 26 November 1975 specified that six (6) Electrical and three (3) Air-Powered Vibrators were planned for use on Pour #6. Just prior to pour, twelve (12) Electrical and ten (10) Air-Driven Vibrators were verified for frequency of vibration and certified for use on subject pour. During the actual pour, a total of twelve (12) Vibrators were in operation with ten (10) more as back-up directly adjacent to the pour area. J. A. Jones considers the allegation as stated unfounded.

Item 5: Subsequent to this pour, J. A. Jones instituted pre-pour meetings attended by all cognizant supervisory personnel to assure a complete understanding of the contents of J. A. Jones Work Procedure W-WP-7 and the applicable pour plan. J. A. Jones will continue these meetings and will place even greater emphasis on the contents of the placing procedures.

B/4

Item 12: A formal training class was presented on 16 December 1975 by J. A. Jones Quality Engineering covering proper techniques for vibrator operators. This class, which presented the reasons for and the required method of vibrator operation, was attended by all operator personnel assigned to Pour #3 and those Construction Supervisors responsible for placement operations. Course contents, graphic illustrations and attendance has been documented and is available on request. It is our intention to conduct this training for any new vibrator operators assigned to subsequent concrete placement operations.

Item 13: Cognizant Construction Supervisory personnel have been counciled subsequent to this pour and fully understand that the dropping of concrete from a height of more than five (5) feet onto exposed reinforcing steel can cause separation of the aggregate. They have been further instructed that in the future it is mandatory that the approved procedural direction must be followed at all times.

The above answers are presented to the best of our ability in the absence of definitive specific incidents. It is respectifully suggested that future audit reports contain specific deviations in lieu of broad, all encompassing statements which are extremely difficult to respond to effectively.

Very truly yours,

J. A. JONES CONSTRUCTION COMPANY

G. A. Greathouse
Project Quality Assurance Manager

GAG/shv

cc: W. C. Griggs
J. O. Booth
J. M. Brooks
C. V. Diz
D. N. Galligan
R. K. Stampley
T. F. Gerretts
A. E. Henderson
J. R. Leonard
H. E. Rice

J. A. JONES CONSTRUCTION COMPANY
Waterford SES Unit No. 3 Contract #W3-NY-4 Job #75-317

December 17, 1975

ADDRESS REPLY TO:
P. O. Box 110
Killona, LA 70066

Ebasco Services, Inc.
P. O. Box 70
Killona, LA 70066

Attn: Mr. J. O. Booth

Ref: Report No. W3S 75-64S
Concrete Placement 499-6

Sub: Louisiana Power & Light Q. A. Stop Work Order No. 1

Gentlemen:

The following is the listing of observations received on subject report and J. A. Jones' response to each observation on those items that are the responsibility of J. A. Jones.

Observation No. 2 - Contrary to Section 11, Paragraph 5.9, Concrete received disturbing shocks and vibrations from reinforcing steel which was set in motion by concrete pump discharges.

The discrepancy was observed at the start of the pumping operation and was corrected prior to placing second lift of concrete which was vibrated into a homogeneous mix eliminating any detrimental effect on the placement.

In the future, transport lines and conveying equipment will be properly supported and restrained to eliminate transporting shock to forms and embedded items in the placement. We have ordered additional concrete pipe fittings to install a shock absorber on the pump lines to help minimize this shock effect.

Observation No. 3 - Contrary to Section 11, Paragraph 4.13, Concrete was inadequately vibrated.

Adequate equipment for proper vibration of the concrete was on hand and the craft has been instructed in the proper use of the equipment with written instructions of required spacing between

vibrating operations and depth of vibrations, copy attached. The craft had inadequate experience in the use of the equipment resulting in some instances in inadequate vibration.

We feel adequate instructions have since been presented to the craftsmen and that they have now gained more experience and a better understanding of why concrete is vibrated.

We have experienced better workmanship on the subsequent pours and consequently, efficiency will increase throughout the life of the project.

Observation No. 4 - Contrary to Section 11, Paragraph 5.1, Curing water was not continuously maintained on all exposed surfaces.

A crew of personnel have been assigned the sole task of continuous placement of water on all exposed concrete surfaces for the required period of seven (7) days.

More areas will be covered with burlap in the future to aid in holding the moisture.

We feel that these corrective actions are sufficient to eliminate the problem completely. Additional personnel will be added as required.

Observation No. 5 - Contrary to ACI 318 - Rebar was improperly spaced in some areas of the placement.

This deficiency was corrected at the time of placing concrete over the top mat except where resteel went through the bulkheads and interferences of embedded items and strongbacks would not allow us to reposition the bars.

On subsequent pours, this is being watched more closely so that bars can be repositioned at the top of the bar and be within tolerances.

Observation No. 6 - Personnel involved in placement activities were not aware of or failed to follow J. A. Jones Co., "Concrete Pour Plan".

Due to poor communications on the first placement, all personnel were not supplied a copy of the Concrete Pour Plan, consequently, causing interpretation conflicts between the general work procedure for placing all concrete and the specific Concrete Pour Plan for the specific pour.

The concrete was placed over the entire area, however, by modifying lift depth, the concrete was kept alive and resulted in a slower pour rate but produced a satisfactory placement. This problem has been resolved by assuring that all personnel associated with the placement has a copy and understands the approved pour plan.

We feel through training and work experience obtained through subsequent pours that the discrepancies have been greatly reduced and will continue to be improved as the work progresses.

Should you have any questions or comments, please feel free to contact the writer.

Very truly yours,

J. A. JONES CONSTRUCTION COMPANY

Jerry P. Leonard

Jerry P. Leonard
Project Manager

JPL/AP-LT:gc

enclosure

cc: C. White
L. Elliott
Q. A.
Route
File
J. Ferguson

75-317(J)A&E #58

J. A. JONES CONSTRUCTION COMPANY

Waterford SES Unit No. 3 Contract #W3-NY-4 Job #75-317

December 17, 1975

ADDRESS REPLY TO:
P. O. Box 110
Killona, LA 70066

Ebasco Services, Inc.
P. O. Box 70
Killona, LA 70066

Attn: Mr. J. E. Booth

Ref: Report No. W3S 75-63S
Concrete Placement 499-2

Sub: Louisiana Power & Light Q. A. Stop Work Order No. 1

Gentlemen:

The following is the listing of observations received on subject report and J. A. Jones' response to each observation on those items that are the responsibility of J. A. Jones.

Observation No. 3 - Concrete allowed to be placed that could not be vibrated under rebar.

Concrete found to be too stiff for proper placing, at the point of placement, was rejected and the concrete already delivered and placed in the form was mixed with higher slump mixed concrete and vibrated to place properly around the reinforcing steel.

In the future, concrete entering our conveying equipment will be more closely observed and concrete of a consistency too thick for proper placement will be rejected and not placed in the form.

Observation No. 4 - Concrete being vibrated in order to flow from truck chute.

J. A. Jones' Supervisor rejected truck as soon as it was observed that the concrete did not flow from the truck chute. Instructed dump man not to dump concrete into conveying equipment that will not readily flow from truck dump chute. Vibrators should not be used to assist concrete to flow down truck chutes.

J. A. JONES CONSTRUCTION COMPANY

J. A. JONES CONSTRUCTION COMPANY
WATERFORD UNIT NO. 3

CONCRETE CONSOLIDATION DATA

VIBRATOR MODEL & MANUFACTURER	VIBRATOR CAPACITY	SPACING OF POINTS OF INSERTION	DURATION OF VIBRATION	DEPTH OF IMMERSION
WYCO 992½-MI The WYCO Tool Co.	20-35 yds./hr.	30"-3" slump 28"-2½" slump 26"-1" slump	10 seconds	into layer below
DART Bearingless Air Model A350 Koehring Construction Equip. Division	39 yds./hr.	27.72" - 1½ slump	11.66 seconds	into layer below

AVAILABLE EQUIPMENT

12 WYCO 992½-MI @ 20 YDS/HR = 240 YDS/HR
10 Dart Air Model A350 @ 35 YDS/HR = 350 YDS/HR
TOTAL VIBRATING CAPABILITIES = 590 YDS/HR

Observation No. 7 - Dry concrete being removed from discharge hose and being permitted to drop in placement area.

Concrete of a consistency too stiff to be conveyed by the pump was discharged into the conveying equipment consequently plugging the line. During the operation of breaking down and clearing the plugged line, concrete was allowed to drop through the top mat. This concrete was removed prior to placing concrete in the immediate area.

In the future, when a transport line becomes plugged, the area underneath the cleaning operation on the top mat will be covered to prevent the concrete dropping through the top mat into the pour area. The concrete will be removed from the protective cover and discarded.

Observation No. 8 - Improper placement of concrete.

Concrete was generally placed in accordance with our approved pour plan. The discrepancies noted were corrected on the spot resulting in a concrete placement in a workmanship-like manner. We are continuing to teach our people the proper pouring and placing techniques which will continue throughout the life of the project.

Observation No. 9 - Inadequate supervision by J. A. Jones.

During this initial training phase and observation of craft capabilities, J. A. Jones has increased top line supervision to expedite the training cycle.

Through this effort, we anticipate added assurance that procedures will be followed. Labor unions have been contacted and requested to supply craftsmen with capabilities more in line with the task to be performed. We have their assurance that this request will be granted in all cases possible.

Observation No. 12 - Complete failure by most to meet requirements of procedures and specifications.

The general intent of the procedures and specifications were followed as close as work area and equipment would allow. The requirements of the procedures and specifications were known by the supervision directing the work and incidents of non-conformance by the inexperienced craftsmen were corrected as they occurred throughout the placement.

Attached please find the Instruction Course Outline which has been presented to the personnel involved in the vibration of concrete. Training periods of this nature will continue to be performed in any area of work deemed necessary.

We believe the training, observations and closer surveillance of the work being performed will assure compliance with approved procedures and specifications.

The exposed surface of concrete on Placement 1 and 2 clearly indicates improvement in the placing and vibrations and we feel increased production and quality will continue.

Should you have any further questions or comments, please feel free to contact the writer.

Very truly yours,

J. A. JONES CONSTRUCTION COMPANY

Jerry P. Leonard

Jerry P. Leonard
Project Manager

JPL/AP-LT:gc

enclosure

cc: C. White
L. Elliott
Q. A.
Route
File
J. Ferguson

CONCRETE P EMENT AND CONSOLIDATION TRAIN. , SESSION

CLASS NOTES

OUTLINE

I. INTRODUCTION

II. PLACEMENT

- A. Separation
- B. Vertical Drop
- C. Final Position
- D. Lift Height

III. CONSOLIDATION

- A. Reasons for Vibration
- B. Proper Handling of Vibrators
- C. Improper Handling of Vibrators
- D. Effects of Improper Vibration

IV. INSPECTION OF PLACEMENT AND CONSOLIDATION

- A. Purpose
- B. Function
- C. Teamwork

INTRODUCTION

The purpose of this training session is to provide additional information on the requirements and proper methods of concrete placement and consolidation for craftsmen, foremen and supervision involved in the placement of concrete.

PLACEMENT

Placement is nothing more than the act of putting concrete into a certain area such as a form. Proper placement consists of placing concrete in such a manner as to make the entire mass of concrete as uniform as possible.

One of the main causes of non-uniform concrete is separation of the coarse aggregate ("rock") from the cement paste ("mortar").

One of the ways to prevent or reduce separation of the concrete is to limit the height that concrete is allowed to drop from the end of the chute or "elephant trunk". On this project, the height of drop is limited to a maximum of five feet. This is very important and should be closely watched at all times.

Another way to control separation is to place the concrete as close to its final position as possible. This is done to prevent having to move the concrete around; this makes less work as well as keeping the quality of the concrete high.

Separation can also be controlled by proper consolidation. Limiting the amount of concrete placed in any one area makes consolidation easier and more effective. The amount placed on this project is limited by specifying a maximum lift height of 18"-20". If concrete is placed deeper than this at one time, proper consolidation is difficult to achieve.

Proper consolidation is very important for obtaining good quality concrete. Consolidation is also defined as "vibration".

Concrete is vibrated to make it more uniform, to fill all areas, such as keyways, with good, solid concrete and to release entrapped air bubbles.

In order to obtain good consolidation, the following things must be done:

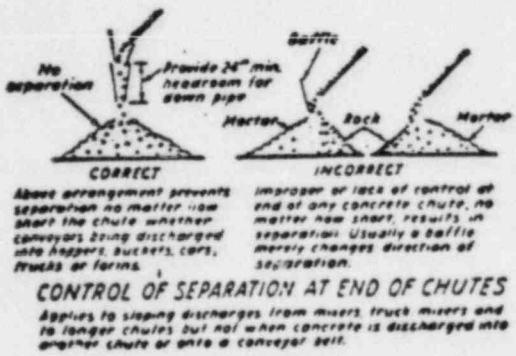
1. Vibrators must be inserted vertically, or as close to vertical as is possible.
2. Vibrators should be inserted about every two feet.
3. Vibrators should be left in place for about 8-10 seconds or until a "paste" appears above the vibrator.
4. Vibrator should penetrate into lower lift to insure proper melding of layers.
5. Taking special care when vibrating around embedded items, reinforcing steel and forms.

Some of the things which should not be done when vibrating concrete are:

1. Using vibrators to move concrete
2. Pulling vibrators through concrete
3. Vibrating too long in one spot
4. Vibrating too far apart
5. Holding vibrator against reinforcing steel

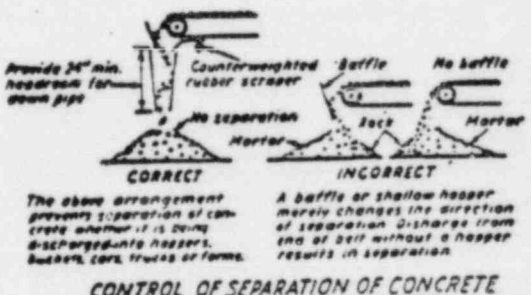
Too little vibration causes "pockets" of rock to form with little cement paste around the rock. These form weak spots and have to be removed. Too much vibration can cause "pockets" of cement paste which are also weak spots. Proper vibration is one of the most important keys to good quality concrete.

The purpose of inspection of concrete is to assure that the concrete is of good quality. The inspector's function is not to "spy" or to try to find something wrong, but to make sure that the job is being done right. Inspectors, craftsmen, foremen and supervisors are all a part of the same team and have the same goal - to get the job done correctly.

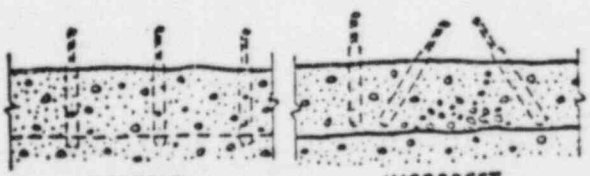


CONTROL OF SEPARATION AT END OF CHUTES

Applies to sloping discharges from mixers, truck mixers and to longer chutes but not when concrete is discharged into another chute or onto a conveyor belt.



CONTROL OF SEPARATION OF CONCRETE AT END OF CONVEYOR BELTS



CORRECT

Vertical penetration of vibrator a few inches into previous lift (which should not yet be rigid) at systematic regular intervals will give adequate consolidation.

INCORRECT

Haphazard random penetration of the vibrator at all angles and spacings without sufficient depth will not assure intimate combination of the two layers.

SYSTEMATIC VIBRATION OF EACH NEW LIFT

Fig. 40. Placing concrete. *Adapted from American Concrete Institute (ACI 614-42).*

TRAINING SESSION ROSTER

CONCRETE PLACEMENT AND CONSOLIDATION

NAME	BADGE NO.	DATE
[illegible]	1122	12/16/75
[illegible]	1337	12/16/75
[illegible]	1333	12/16/75
[illegible] Cotton	1331	12/16/75
[illegible]	1232	12/16/75
[illegible]	1210	12/16/75
[illegible]	1332	12/16/75
[illegible]		12/16/75
Mike Munn		4/16/75
[illegible]	1005	12/16/75
Andrew P. [illegible]	1317	12/16/75
Joseph Smith [illegible]	1242	12/16-75
[illegible]	1114	
[illegible]	1160	
C. [illegible]	1184	
[illegible]	1270	
[illegible]	1261	
W. J. [illegible]	1185	12/16/75
D. [illegible]	1253	12/16/75
J. [illegible]	[illegible]	12-16-75
[illegible]	[illegible]	12-16-75
[illegible]	1283	12-16-75
Donald [illegible]	1330	12-16-75
[illegible]	[illegible]	12-16-75

TRAINING SESSION ROSTER

CONCRETE PLACEMENT AND CONSOLIDATION

NAME	BADGE NO.	DATE
[illegible]	1003	12/4-15

LOUISIANA POWER & LIGHT
142 DELARONDE STREET
P. O. BOX 6008 • NEW ORLEANS, LOUISIANA 70174
MIDDLE SOUTH UTILITIES SYSTEM

LP&L SITE FILE
RECEIVED

December 17, 1975

File: LPL 4503
Q-3-A35.30.01

Mr. R. K. Stampley
Ebasco Services, Inc.
Two Rector Street
New York, New York 10006

SUBJECT: Waterford SES Unit No. 3
Stop Work Order No. 1

Dear Mr. Stampley:

Attached is Stop Work Order No. 1 issued December 16, 1975 to J. O. Booth, Construction Superintendent.

Yours very truly,

R. J. Meyer
Vice President - Engineering and Production

RJM:AEH:sc

cc: Ebasco (2), J.M. Brooks, J. O. Booth (2), D.L. Aswell, L. V. Maurin, A.E. Henderson, D. B. Lester, P.V. Prasankumar, L. Biondolillo, F. X. Shaughnessy, H. W. Otillio, T.F. Gerrets, C.G. Chezem, D.N. Galligan

B/5

Q-3A35.30
SWO No.: 1

LOUISIANA POWER & LIGHT COMPANY

QUALITY ASSURANCE

STOP WORK ORDER

PLANT: Waterford SES Unit No. 3 DATE: December 16, 1975

ISSUED TO: INDIVIDUAL: J. O. Booth

COMPANY: Ebasco Services, Inc.

FOR WORK BY: Ebasco and J. A. Jones, Inc.

REASON FOR SWO: This stop work order is issued due to recurring deficiencies and nonconforming work in the inspection and control of concrete mixing, transporting and placing of concrete and the concrete placment, curing and finishing as evidenced by the attached site surveillance reports W3S75-63S, W3S75-64S and Ebasco QA Report JG-75-12-2.

Before stop work order is cleared, Ebasco and J. A. Jones shall respond to each observation, deficiency and nonconformance in writing, with corrective action dates of full compliance.

DESCRIPTION OF WORK STOPPED: The inspection and control of concrete mixing, transporting and placing of concrete by Ebasco and concrete placement, curing and finishing by J. A. Jones, Inc.

Issued By: A. E. Henderson Jr.
(Signature)
12-16-75

cc: R. J. Meyer
D. L. Aswell
L. V. Maurin
A. E. Henderson
Power Production File (2)
Site QA File
J. M. Brooks

LPL Q-26 (12-75)

LPL-QA

SITE SURVEILLANCE REPORT

1.
Date of Surveillance: December 11, 1975 Report No.: W3S 75-63S

Company: Ebasco Services Incorporated & J.A. Jones Construction Company Company Escort: None

Location: Waterford SES Unit 3 Site Persons Interviewed: See Note - Section 3 Observations

Requirement(s): Ebasco Specifications LOU-1564.472, ANSI N45.2.5 - 1974 and Ebasco Procedures No. QCIP-4, QCIP-5, QCIP-6 and QCIP-7

2. Description of Subject of Surveillance:

The inspection and control of concrete mixing, transporting and placing of concrete by Ebasco and Concrete Placement, Curing and Finishing by J.A. Jones, Inc.

3. Observations: See attached.

Conclusion: ☐ Acceptable ☒ Follow-Up Required

QA Engineer Signature: B.R. Brown Date: 12-15-75

Project QA Engineer Signature: Thomas E. Curtis Date: 12-15-75

4. Follow-Up Status:

5. Final Status is Satisfactory:

Report Closed by: Date:

OBSERVATIONS:

1. Rejected concrete being used.
2. Ebasco inspector's rejection of concrete overriden by Ebasco QC Supervisor.
3. Concrete allowed to be placed that could not be vibrated under rebar.
4. Concrete being vibrated in order to flow from truck chute.
5. Continuous use of low slump out of specification concrete after being warned by LP&L. (Had to have QA Corporation at Placement to correct).
6. Concrete being controlled before pump hoppers by J.A. Jones.
7. Dry Concrete being removed from discharge hose and being permitted to drop in placement area. (Was made to remove by LP&L).
8. Improper Placement of Concrete.
9. Inadequate supervision by J.A. Jones.
10. Inadequate supervision by Ebasco.
11. Corrective action not taken by some of Ebasco personnel after being brought to their attention by LP&L.
12. Complete failure by most to meet requirements of procedures and specifications.
13. No evaluation of crack growth in west wall of pour #6 until brought to the attention of supervisors by LP&L.

NOTE: Personal contact with Ebasco and J.A. Jones with discussions of problems encountered during the transporting, mixing, and placement of concrete in Placement No. 2.

LPL-QA
SITE SURVEILLANCE REPORT

1.
Date of Surveillance: December 11, 1975 Report No.: W3S 75-63S

Company: Ebasco Services Incorporated & J.A. Jones Construction Company Company Escort: None

Location: Waterford SES Unit 3 Site Persons Interviewed: See Note - Section 3 Observations

Requirement(s): Ebasco Specifications LOU-1564.472, ANSI N45.2.5 - 1974 and Ebasco Procedures No. QCIP-4, QCIP-5, QCIP-6 and QCIP-7

2. Description of Subject of Surveillance:

The inspection and control of concrete mixing, transporting and placing of concrete by Ebasco and Concrete Placement, Curing and Finishing by J.A. Jones, Inc. - Concrete Placement #2.

3. Observations: See attached.

Conclusion: ☐ Acceptable ☒ Follow-Up Required

QA Engineer Signature: T.R. Brown Date: 12-15-75

Project QA Engineer Signature: Thomas F. Gerrets Date: 12-15-75

4. Follow-Up Status:

5. Final Status is Satisfactory:

Report Closed by: _____ Date: _____

OBSERVATIONS:

1. Rejected concrete being used.
2. Ebasco inspector's rejection of concrete overriden by Ebasco QC Supervisor.
3. Concrete allowed to be placed that could not be vibrated under rebar.
4. Concrete being vibrated in order to flow from truck chute.
5. Continuous use of low slump out of specification concrete after being warned by LP&L. (Had to have QA Corporation at Placement to correct).
6. Concrete being controlled before pump hoppers by J.A. Jones.
7. Dry Concrete being removed from discharge hose and being permitted to drop in placement area. (Was made to remove by LP&L).
8. Improper Placement of Concrete.
9. Inadequate supervision by J.A. Jones.
10. Inadequate supervision by Ebasco.
11. Corrective action not taken by some of Ebasco personnel after being brought to their attention by LP&L.
12. Complete failure by most to meet requirements of procedures and specifications.
13. No evaluation of crack growth in west wall of pour #6 until brought to the attention of supervisors by LP&L.

NOTE: Personal contact with Ebasco and J.A. Jones with discussions of problems encountered during the transporting, mixing, and placement of concrete in Placement No. 2.

LPL-QA

SITE SURVEILLANCE REPORT

1. Date of Surveillance: December 2, 1975 Report No.: W3S 75-64S

Company: Ebasco Services & J.A. Jones Company Escort: None

Location: Waterford SES Unit 3 Site Persons Interviewed: See sec. 3 "Observations".

Requirement(s): LOU-1564.472, R5

2. Description of Subject of Surveillance: The surveillance consisted of observation of Concrete Placement activities associated with Concrete Placement No. 6.

3. Observations: See attached sheet.

Conclusion: ☐ Acceptable ☒ Follow-Up Required

QA Engineer Signature: Thomas F. Gerrets Date: 12-15-75

Project QA Engineer Signature: Thomas F. Gerrets Date: 12-15-75

4. Follow-Up Status:

5. Final Status is Satisfactory:

Report Closed by: _____ Date: _____

OBSERVATIONS:

1. Contrary to Section I Paragraph 10.9, concrete was placed even though it exceeded specification requirements.

2. Contrary to Section II, Paragraph 5.9, Concrete received disturbing shocks and vibrations from reinforcing steel which was set in motion by concrete pump discharges.

3. Contrary to Section II, Paragraph 4.13, Concrete was inadequately vibrated.

4. Contrary to Section II, Paragraph 5.1, Curing water was not continuously maintained on all exposed surfaces.

5. Contrary to ACI 318 - Rebar was improperly spaced in some areas of the placement.

6. Personnel involved in placement activities were not aware of or failed to follow J.A. Jones Co., "Concrete Pour Plan".

7. Several Ebasco concrete test records (Form No. QCIP-7-2, 11-30-75) were not completely filled out.

NOTE: No written response is required at this time. These findings were presented to Ebasco and J.A. Jones Company in a meeting with LP&L on December 5. At that time, both Ebasco and J.A. Jones Company Supervision agreed to correct the above discrepancies.

Q-3A35.30.01

SWO No.: 1

LOUISIANA POWER & LIGHT COMPANY

QUALITY ASSURANCE

STOP WORK ORDER

PLANT: Waterford SES Unit No. 3 DATE: December 16, 1975

ISSUED TO: INDIVIDUAL: J. O. Booth

COMPANY: Ebasco Services, Inc.

FOR WORK BY: Ebasco and J. A. Jones, Inc.

REASON FOR SWO: This stop work order is issued due to recurring deficiencies and nonconforming work in the inspection and control of concrete mixing, transporting and placing of concrete and the concrete placement, curing and finishing as evidenced by the attached site surveillance reports W3S75-63S, W3S75-64S and Ebasco QA Report JG-75-12-2.

Before stop work order is cleared, Ebasco and J. A. Jones shall respond to each observation, deficiency and nonconformance in writing, with corrective action dates of full compliance.

DESCRIPTION OF WORK STOPPED: The inspection and control of concrete mixing, transporting and placing of concrete by Ebasco and concrete placement, curing and finishing by J. A. Jones, Inc.

Issued By: A. E. Henderson Jr.
(Signature)
12-16-75

cc: R. J. Meyer
D. L. Aswell
L. V. Maurin
A. E. Henderson
Power Production File (2)
Site QA File
J. M. Brooks

LPL Q-26 (12-75)

OBSERVATIONS:

1. Contrary to Section I Paragraph 10.9, concrete was placed even though it exceeded specification requirements.

2. Contrary to Section II, Paragraph 5.9, Concrete received disturbing shocks and vibrations from reinforcing steel which was set in motion by concrete pump discharges.

3. Contrary to Section II, Paragraph 4.13, Concrete was inadequately vibrated.

4. Contrary to Section II, Paragraph 5.1, Curing water was not continuously maintained on all exposed surfaces.

5. Contrary to ACI 318 - Rebar was improperly spaced in some areas of the placement.

6. Personnel involved in placement activities were not aware of or failed to follow J.A. Jones Co., "Concrete Pour Plan".

7. Several Ebasco concrete test records (Form No. QCIP-7-2, 11-30-75) were not completely filled out.

NOTE: No written response is required at this time. These findings were presented to Ebasco and J.A. Jones Company in a meeting with LP&L on December 5. At that time, both Ebasco and J.A. Jones Company Supervision agreed to correct the above discrepancies.

LPL-QA
SITE SURVEILLANCE REPORT

1.
Date of Surveillance: December 2, 1975 Report No.: W3S 75-64S

Company: Ebasco Services & J.A. Jones Company Escort: None

Location: Waterford SES Unit 3 Site Persons Interviewed: See sec. 3 "Observations".

Requirement(s): LOU-1564.472, R5

2. Description of Subject of Surveillance: The surveillance consisted of observation of Concrete Placement activities associated with Concrete Placement No. 6.

3. Observations: See attached sheet.

Conclusion: ☐ Acceptable ☒ Follow-Up Required
QA Engineer Signature: Thomas F. Gesicki Date: 12-15-75
Project QA Engineer Signature: Thomas F. Gesicki Date: 12-15-75

4. Follow-Up Status:

5. Final Status is Satisfactory:

Report Closed by: _____ Date: _____

LPL Q-29 (9-75)

Afteraction Report

To: W.C. Griggs Date: 12-15-75

From: F.L. Phearson

Ref.: Common Mat, Placement No. 499-2:

Listed conditions pertaining to the techniques employed by the Contractor during the emplacement of concrete under the referenced placement number were noted by the placement inspector and the Q.C. civil engineer for Ebasco, by the contractor's inspection personnel, and by the owner's representation present during the pour.

1. Contractor placement procedure: Without clearly defined pre-planned points of deposit and pre-set openings in the upper layers of resteel, the manner of depositing each lift did not adher to the procedure. Some pours were spaced too far apart.

1.2. Excessive build-up at a single pour point.

1.3. Stairstepping intent lost - excessive pile-up caused moving, and some times, folding over of concrete piles - concrete moved by vibrators.

1.4. By not following closely a sequential pour schedule, some areas stood for longer times unworked. Other areas, concrete was flooded over larger areas than the five foot limitation specified in the Ebasco Masonery Procedure No. LOU 1564.472.

1.5. Depositing of new layers on layers not vibrated, or vibrated fully

2. Use of vibrators:

2.1. Insufficient number of vibrators in use. At times throughout the pour, most of the vibrators were at rest with areas of concrete requiring vibration.

2.2. Tossing and dragging vibrators through the concrete. The spec. requires vertical penetration, and into the next lift below the new lift deposit.

2.3 Moving concrete due to excessive deposit at one point.

2.4. Leaving vibrators at rest in the concrete.

3. Manner of concrete deposit by the metal tube of the cretopump and the hoses of the snorkel pump and stationery pumps:

3.1. Instead of following a regulated plan of deposit points as inferred in the contrator's procedure, the deposits were often wider spread, with the hoses and tube moved at a pronounced angle from vertical to virtually spray the concrete over a wide area. The Ebasco concrete spec. and the ACI spec. 301 specifies vertical drop to preclude tendency of aggregate rollout and segregation, and incur minable amount of working the concrete with vibrators.

3.2 By not pre-setting the upper resteel to allow openings for the tube and hoses, rebars were moved by hammering with a steel hammer (sledge). Some bars were at rest against vertical shear bars and dowels. The vibration caused by hammering was transmitted to the concrete below. The spec. does not permit vibration of resteel or forms in contact with or enclosed in fresh concrete.

2. Continual efforts were made by the Ebasco Placement Inspector and by the Q.C. Civil Engineer to alleviate the above conditions by approaching the contractor's supervisory and Q.A. personnel.

3. The contractor's Q.A. personnel appeared ineffectual in correcting and controlling the aforementioned conditions.

Recommendations:

1. Pre-setting upper resteel layers to permit ease of tremie-type tube and concrete hoses and/or hopper tubes to be placed in an orderly manner.

2. Review with the Contractor, the requirements specified in the Ebasco concrete spec and the ACI spec. for vertical depositing of concrete.

3. Vibrator operators be more thoroughly trained and supervised closer during placement operations.

Recommendations (Cont'd)

4. Sequence of pour lifts by rows be more clearly defined including distances between each point of deposit to follow the stair-stepping type of procedure.

5. Establishing a set pattern of concrete vibrating in that a uniform technique of vibrating every 18 to 24 inches of concrete in a vertical manner and penetrating into the under layer will be performed.

6. The contractor's inspection personnel be indoctrinated in the full requirements of the Ebasco specification for the emplacement and working of concrete.

F. L. Pearson
G. C. Engineer, Civil

File

EBASCO SERVICES
INCORPORATED

UTILITY CONSULTANTS - ENGINEERS - CONSTRUCTORS

P. O. Box 70
Killona, Louisiana 70066

December 18, 1975
F-4617
W3-NY-4

J. A. Jones Construction Company
P. O. Box 110
Killona, Louisiana 70066

LOUISIANA POWER AND LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
YOUR RESPONSE TO STOPWORK ORDER NO. 1

Gentlemen:

We have received your response to stopwork order No. 1 and have the following comments:

1. Audit Report No. JG-75-12-2, entitled "Concrete Placement Operations Audit". Item No. 13: Your response should include objective evidence of how your personnel were instructed and dates of instruction.

2. Site Surveillance Report No. W3S-75-63S, Observation No. 3: Should include objective evidence that appropriate measures have been established to control concrete entering conveying equipment.

3. Site Surveillance Report No. W3S-75-63S, Observation No. 4: Reference should be made to your "Concrete Placement and Consolidation Training Session".

4. Site Surveillance Report No. W3S-75-63S, Observation No. 7: Need a procedure change to reflect your response; "In the future, when a transport line becomes plugged, the area underneath the cleaning operation on the top mat will be covered to prevent the concrete dropping through the mat into the pour area. The concrete will be removed from the protective cover and discarded".

B/6

5. Site Surveillance Report No. W3S-75-63S, Observation No. 8: Reference should be made to your "Concrete Placement and Consolidation Training Session".

6. Site Surveillance Report No. W3S-75-63S, Observation No. 12: Your general statement, "The general intent of the procedures and specifications were followed as close as work area and equipment would allow. This could be interpreted to mean that J. A. Jones does not intend to improve. We do not feel that this was your intent. Your statement should be clarified.

Yours very truly,

J. O. Booth

FRH:grf

cc: E. Boyd (2)

FORM 8010

EBASCO SERVICES INCORPORATED

MATERIALS ENGINEERING AND QUALITY COMPLIANCE

QUALITY COMPLIANCE REPORT

E.O. NO. LOU 4294 REPORT NO. W3QA-241

CLIENT OR PROJECT: WATERFORD SES UNIT NO. 3

DRAWING NO./SPEC NO.

VENDOR, MANUFACTURER OR CONTRACTOR

P.O. NO.

TO: J.O. Booth

FROM: R.A. Hartnett

DATE: December 18, 1975

SUBJECT: VERIFICATION OF CORRECTIVE ACTION TO AUDIT REPORT JG-75-12-2

All responses to deficient items included on Mr. Gutierrez's Audit Report JG-75-12-2 are acceptable contingent upon implementation of the following action:

Item 25: It should be recognized that workmanship does have an effect on the quality of concrete, therefore, caution must be exercised to eliminate any possibilities of contamination. On subsequent placements the use of plywood should be utilized on the ground by the pumps.

It has been verified by this department that 23 vibrators are available for subsequent placements and that the lack of vibrators would be highly unlikely in the event of equipment failure.

RAH/dg

cc: G.A. Greathouse
J.M. Brooks
W.C. Griggs
T.F. Gerrets
A.E. Henderson
D.N. Galligan
C.V. Diz
W3QA File
QAS File

Q-3-A35.30
Q-3-A35.30.01
RELEASE FOR SWO NO.: 1

RECEIVED
LP&L SITE
QA

LOUISIANA POWER AND LIGHT COMPANY

QUALITY ASSURANCE

STOP WORK ORDER

RELEASE

PLANT: Waterford SES Unit No. 3 DATE: December 18, 1975

SWO ISSUE DATE: December 16, 1975

REASON FOR SWO: This stop work order was issued due to recurring deficiencies and nonconforming work in the inspection and control of concrete mixing, transporting and placing of concrete and the concrete placement, curing and finishing as evidenced by site surveillance reports W3S 75-63S, W3S 75-64S, and Ebasco Quality Assurance Report JG-75-12-2.

REASON FOR RELEASE: In consideration of the timely and adequate response given by:

1. Ebasco Letter No. F-4614 dated December 17, 1975 and Ebasco letter F-4618 dated December 18, 1975.

2. Ebasco Quality Assurance acceptance of J.A. Jones' response to the Ebasco Quality Assurance Audit Report No. JG-75-12-2, as documented by Ebasco Letter No. W3QA-241 dated December 18, 1975.

3. Ebasco's acceptance of J.A. Jones' responses to the SWO attached to Letter No. F-4614, as documented by Ebasco Letter No. F-4619, dated December 18, 1975.

4. Ebasco's commitment to monitor and report to the Project Superintendent the effectiveness of corrective action taken as documented in the notes of the meeting between Ebasco and LP&L December 17, 1975.

The Stop Work Order No. 1 issued December 16, 1975 is hereby released this date December 18, 1975.

Issued By: A. E. Henderson 12-18-75
(Signature)
Quality Assurance Manager

B/8

cc: R. J. Meyer
D. L. Aswell
L. V. Maurin
A. E. Henderson
Power Production File (2)
Site QA File
J. M. Brooks

FORM 6010

EBASCO SERVICES INCORPORATED

MATERIALS ENGINEERING AND QUALITY COMPLIANCE

QUALITY COMPLIANCE REPORT

E.O. NO. LOU 4294 REPORT NO. W3QA-241

CLIENT OR PROJECT: WATERFORD SES UNIT NO. 3

VENDOR, MANUFACTURER OR CONTRACTOR | P.O. NO. | DRAWING NO./SPEC NO.

TO: J.O. Booth

FROM: R.A. Hartnett

DATE: December 18, 1975

SUBJECT: VERIFICATION OF CORRECTIVE ACTION TO AUDIT REPORT JG-75-12-2

All responses to deficient items included on Mr. Gutierrez's Audit Report JG-75-12-2 are acceptable contingent upon implementation of the following action:

Item 25: It should be recognized that workmanship does have an effect on the quality of concrete, therefore, caution must be exercised to eliminate any possibilities of contamination. On subsequent placements the use of plywood should be utilized on the ground by the pumps.

It has been verified by this department that 23 vibrators are available for subsequent placements and that the lack of vibrators would be highly unlikely in the event of equipment failure.

RAH/dg

cc: G.A. Greathouse
J.M. Brooks
W.C. Griggs
✓T.F. Gerrets
A.E. Henderson
D.N. Galligan
C.V. Diz
W3QA File
QAS File

B/7

Q-3-A35.30
Q-3-A35.30.01
RELEASE FOR SWO NO.: 1

RECEIVED
L P & L SITE
Q A

LOUISIANA POWER AND LIGHT COMPANY

QUALITY ASSURANCE

STOP WORK ORDER

RELEASE

PLANT: Waterford SES Unit No. 3 DATE: December 18, 1975

SWO ISSUE DATE: December 16, 1975

REASON FOR SWO: This stop work order was issued due to recurring deficiencies and nonconforming work in the inspection and control of concrete mixing, transporting and placing of concrete and the concrete placement, curing and finishing as evidenced by site surveillance reports W3S 75-63S, W3S 75-64S, and Ebasco Quality Assurance Report JG-75-12-2.

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The Stop Work Order No. 1 issued December 16, 1975 is hereby released this date December 18, 1975.

Issued By: A. E. Henderson Jr. 12-18-75
(Signature)
Quality Assurance Manager

B/8

cc: R. J. Meyer
D. L. Aswell
L. V. Maurin
A. E. Henderson
Power Production File (2)
Site QA File
J. M. Brooks

EBASCO SERVICES
INCORPORATED

UTILITY CONSULTANTS - ENGINEERS - CONSTRUCTORS

P. O. Box 70
Killona, Louisiana 70066

December 17, 1975
F-4614
4.0

Mr. R. J. Meyer
Vice President
Engineering & Production
Louisiana Power and Light Company
143 Delaronde Street
New Orleans, Louisiana 70174

LOUISIANA POWER & LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
STOP WORK ORDER REGARDING CONCRETE PLACEMENT ACTIVITIES

Ref: SWO No. 1, dated December 16, 1975

Dear Mr. Meyer,

This acknowledges receipt of the referenced Stop Work Order. It has been reviewed by both Ebasco Services, Inc. and J. A. Jones Construction Company.

Responses to LP&L Site Surveillance Reports Nos. W3S-75-63S and W3S-75-64S and to Ebasco Quality Assurance Report No. JG-75-12-2 are enclosed from both companies.

Very truly yours,

J. O. Booth

J. O. Booth
Project Superintendent

WCG:grf

cc: D. N. Galligan, D. L. Aswell, L. V. Maurin, A. E. Henderson, D. B. Lester, P. V. Prasankumar, Power Production Dept. (3), T. F. Gerrets, C. G. Chezem, H. W. Otillio, R. K. Stampley, J. M. Brooks, G. J. Lambrakos

B/9

Response to Site Surveillance Report No. W3S-75-63S:

Items 1 & 2

No rejected concrete was used in Block No. 499S02-2. Our understanding of these two items is that LP&L is concerned about one truck load of concrete which was initially rejected by our Quality Control Inspector and later allowed to be used. This incident occurred once with Batch No. 001441. Upon arrival at the site, a visual inspection of this load indicated that it probably had a high slump; consequently, a slump test was performed. The results were 7-3/4 inches and the Quality Control Inspector rejected the load for placement at that time. The truck stood turning its drum at agitating speed. After a period of time, which did not exceed the one hour limit, the Quality Control Civil Supervisor visually examined this load of concrete and judged the slump to be less than 5 inches and the concrete acceptable for placement. The load was subsequently used in the placement.

It is the responsibility of the Quality Control Supervisor to review the evaluations/decisions of inspectors under his supervision. In this regard, we feel that his decision to override the Inspector was correct. We have instructed all Ebasco Q. C. personnel this date to have verification tests made on questionable items prior to release for use.

Item 4

This item has been reviewed with the Ebasco Q. C. personnel, and although inspectors were deployed in accordance with placement plan, no one from Ebasco observed the use of a vibrator to assist the flow of concrete from a truck chute. However, instructions have been issued to Ebasco Q. C. personnel that this practice is not allowed.

Item 5

A review of the Concrete Test Records for Block No. 2 doesnot reveal a continuous use of low slump, out-of-specification concrete. Of 41 slump tests that were performed our records indicate that only three (3) batches of concrete exhibited unusually low slumps. Batch 001444 had a slump of 1-1/4 inches; Batch 001536, 1 inch; and Batch 001550, 1-1/2 inches. Although these slumps are low, they are within the ranges given in Concrete Masonry Specification LOU 1564.472, Section I, Paragraph 10.9 as interpreted by the Ebasco Concrete-Hydraulics Department in R. Vine/A. Wern's memorandum dated November 24, 1975, attached hereto.

Item 6

Our Quality Control Inspectors were controlling the acceptance or rejection of concrete. J. A. Jones personnel were observing the delivered concrete for workability, and they were requesting through Ebasco Q. C. Inspectors the addition of water as necessary to obtain workability. Water was added to approximately 35 percent of truck loads used in this placement. One addition of water to the concrete is permitted by the specifications. This addition of water is controlled within the limits of the w/c ratio established for Concrete Mix No. 14A6 which is being used for the common mat foundation.

Items 10 & 11

One Construction Supervisor, one Q. C. Civil Supervisor and nine Q. C. Civil Inspectors were assigned to each shift for this placement. The number of personnel assigned to Block No. 2 was consistent with our plans for project staffing. All Ebasco personnel are qualified by experience and education for work assigned to them and are receiving Q. C. training at the site to improve proficiency.

Item 12

The deviations that occured during Concrete Block No. 2 were typical of the problems encountered with concrete work, particularly in the early stages. These deviations were addressed as they occurred and the necessary action was taken by Q. C. personnel to have the problems corrected and bring the deviation back into compliance. The records for Block No. 2 show that the Q. A. Program is functioning effectively, and the statement of "Complete failure...to meet requirements of procedures and specifications." is not an accurate assessment. However, it is our intent to continue training with our personnel to further improve the effectiveness of the Q. A. Program at Waterford 3.

Item 13

Cracks which were observed by our Quality Control Inspectors were mapped, and a discrepancy notice was prepared. These cracks were evaluated with New York Engineering and determined to be surface cracks. Disposition was provided by the Senior Resident Engineer to remove the cracks by chipping and this was completed and reinspected the day before placing concrete. It is our understanding that a crack was detected by LP&L on the morning of the placement. This crack was also removed immediately after discovery prior to placing concrete.

Response to Site Surveillance Report No. W3S-75-64S:

Item 1

Section I, Article 10.9, of the Concrete Masonry Specification LOU 1564.472 gives a range of slumps for various types of construction. Our Concrete-Hydraulic Engineering Department interpreted this paragraph regarding slumps for the common mat foundation and provided the site with direction in memorandum from B. Vine/A. Wern to J. O. Booth dated November 24, 1975 (copy attached). This memorandum stated that slumps could range between 5 inches and 1 inch. This is consistent with the first paragraph of Section I, Article 10.9, which states that concrete shall be of a consistency and workability suitable for the conditions of the job. A review of the Concrete Test Records, Form No. QCIP-7-2, show that only one batch of concrete (5-3/4 inch slump) was used for Block No. 499S02-6 that exceeded the specified requirements concerning slumps.

Item 7

Concrete Test Records for Block No. 499S02-6 have been reviewed by the Quality Control Civil Supervisor. Incomplete information was retrieved, where possible, and recorded. This was the first permanent plant concrete for this project, and prior to the next placement, our Quality Control personnel were instructed and are required to record all data on the forms as the work is being performed. A review of our records for subsequent Blocks No. 499S02-1 and 499S02-2 indicates that this is being accomplished. As further assurance that concrete is satisfactory, 27 of 30 test cylinders broke in excess of 4,000 psi with the lowest of the remainder being 3,530 psi.

EBASCO SERVICES
INCORPORATED

UTILITY CONSULTANTS - ENGINEERS - CONSTRUCTORS

P. O. Box 70
Killona, Louisiana 70066

DEC 1 RECEIVED LP&L S...

December 18, 1975
F-4618
4.0

R. J. Meyer
Vice President
Engineering and Production
Louisiana Power and Light Company
142 Delaronde Street
New Orleans, Louisiana 70174

LOUISIANA POWER AND LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
STOP WORK ORDER REGARDING CONCRETE PLACEMENT ACTIVITIES

Dear Mr. Meyer,

Ref: 1) SWO No. 1, dated December 16, 1975
2) Ebasco Letter F-4614, dated December 17, 1975

The following comments supplement Reference 2):

Response to Site Surveillance Report No. W3S-75-63S:

Items 1 and 2: The Sr. Quality Control Supervisor via written memorandum dated December 18, 1975, has instructed the Quality Control Engineers, Supervisors, and Inspectors to perform verification tests on suspect materials prior to release for use.

Item 4: In the same memorandum as referenced above, the Sr. Quality Control Supervisor has instructed the Quality Control personnel that the use of a vibrator to assist the flow of concrete from a truck chute is not allowed at this project.

Item 5: As agreed, Ebasco shall initiate a program to control memorandums which contain an interpretation of an engineering document. The procedure for this shall be described in a revision to ASP-III-2, "Site Document Control". The date of full compliance for this commitment is February 2, 1976.

B/10

Item 13: As a follow-up to this item, the Sr. Quality Control Supervisor via written memorandum dated December 18, 1975, has instructed the Ebasco Quality Control placing inspector to inspect, just prior to start of a concrete placement, existing concrete surfaces for cracks.

Response to Site Surveillance Report No. W3S-75-64S:

Item 1: Please refer to the above supplemental response to Item 5. of Site Surveillance Report No. W3S-75-63S.

Information supplementing J. A. Jones Construction Company's response to Reference 1) is attached hereto (J. A. Jones Letter 75-317(J) A&E #062, dated December 18, 1975). Ebasco has reviewed this letter without comment.

Very truly yours,

J. O. Booth

J. O. Booth
Project Superintendent

WCG:grf

Enclosure

cc: D. N. Galligan, R. J. Meyer, D. L. Aswell, L. V. Maurin, A. E. Henderson, D. B. Lester, P. V. Prasankumar, Power Production Dept.(3), T. F. Gerrets, C. G. Chezem, H. W. Otillio, R. K. Stampley, J. M. Brooks, G. J. Lambrakos

C A D

J. A. JONES CONSTRUCTION COMPANY

Waterford SES Unit No. 3 Contract #W3-NY-4 Job #75-317

December 18, 1975

ADDRESS REPLY TO:
P. O. Box 110
Killona, LA 70066

Ebasco Services, Inc.
P. O. Box 70
Killona, LA 70066

Attn: Mr. J. O. Booth

Ref: J. A. Jones' letter, Mr. Greathouse to Mr. Hussain, and Letter Nos. 75-317(J)A&E#58 and 75-317(J)A&E#59 dtd December 17, 1975

Sub: Louisiana Power & Light Q. A. Stop Work Order No. 1

Gentlemen:

Per your request for further clarification of items in subject letters, we submit the following.

1. Mr. Greathouse to Mr. Hussain, letter dated 12/17/75, Item 13, subjective evidence is our "Concrete Placement and Consolidation Training Session Class Notes" which has been formally presented to personnel involved in placement of concrete.

2. J. A. Jones' letter 75-317(J)A&E#59, Observation No. 2, attached please find copy of J. A. Jones' purchase order No. 75-317/P0311 for materials required to install the shock absorber.

3. J. A. Jones' letter 75-317(J)A&E#59, Observation No. 3, subjective evidence is our "Concrete Placement and Consolidation Training Session Class Notes" which has been formally presented to personnel involved in placement of concrete.

4. J. A. Jones' letter 75-317(J)A&E#58, Observation No. 3, 4 and 7, subjective evidence is our Management Directive Memo "Concrete Placement Directives" dated 12/18/75, copy attached.

5. J. A. Jones' letter 75-317(J)A&E#58, Observation No. 8, subjective evidence is our "Concrete Placement and Consolidation Training Session Class Notes".

6. J. A. Jones' letter 75-317(J)A&E#58, Observation No. 12, to clarify our statement, J. A. Jones intends to continually improve work techniques, train personnel, and provide adequate equipment to obtain required results. In any case, we will exert any effort required to insure that the end product is completely acceptable to the Owner.

We trust the above properly clarifies your questions. Please advise if additional information is required.

Very truly yours,

J. A. JONES CONSTRUCTION COMPANY

Jerry P. Leonard

Jerry P. Leonard
Project Manager

JPL/AP:gc

encl.

cc: C. White
L. Elliott
J. Ferguson
Route
Q. A.
File

J. A. JONES CONSTRUCTION COMPANY

75-317/PO 914
NUMBER

GENERAL OFFICES
CHARLOTTE, N.C. 28201

ISSUED FROM: Highway 18
Taft, La.

Date December 9, 1975

To Southern Pump Crete
1517 MacArthur Avenue
Harvey, La. 70058

Ship to: J. A. JONES CONSTRUCTION COMPANY
Project Waterford # 3
Location Taft, La.

Delivery Required December 12, 1975

Terms Net 10 days F. O. B. Shipping Point

Instructions in invoicing:

1. Retain original copy. Sign and return other copies promptly.
2. Invoices and shipping lists must show order number, and be rendered in three (3) copies, to P.O. Box 110, Killona, La. 70066 office.

	QUANTITY	UNIT	ARTICLE	UNIT PRICE	TOTAL PRICE	ACCOUNT NUMBER
			The following listed concrete placing line and accessories to be as manufactured by Construction Forms, Inc. (For Concrete pump line shock absorber)			101 3010
1)	3	ea	5" Tee	$ 45.00	$ 135.00	
2)	3	ea	5" End cap	$ 13.00	$ 39.00	
3)	3	ea	#511A 5"x5" steel tube	$ 55.00	$ 165.00	
4)	4	ea	#55045A32, 5" 45° Elbow	$ 95.00	$ 380.00	
5)	4	ea	#GVX5A2, 5" lateral design, 2' long with shut-off	$140.00	$ 560.00	
6)	2	ea	#GVX5A5, 5" lateral design, 5' long with shut-off	$155.00	$ 310.00	
7)	12	ea	#CF050 coupling & gasket	$ 30.00	$ 360.00	
					$1,949.00	
			TOTAL		$ 389.80	
			Less 20%			
			LUMP SUM TOTAL		$1,559.20	
			PLUS APPLICABLE SALES & USE TAX			
			CONFIRMATION - DO NOT DUPLICATE			

GENERAL CONDITIONS ON REVERSE SIDE ARE A PART OF THIS AGREEMENT

J. A. JONES CONSTRUCTION COMPANY

ACCEPTED _____

BY _____

DATE _____

_____
PURCHASING AGENT

INTER-OFFICE CORRESPONDENCE

J. A. JONES CONSTRUCTION COMPANY

To: Al Prince

From: J. P. Leonard
Project Manager

Date: December 18, 1975

Re: Work Procedure W-WP-7
Revising Directive

Revised subject work procedure to incorporate the handling and disposition of concrete collected during the concrete conveying line unplugging operation.

This revision to be made and submitted to Ebasco for approval immediately.

INTER-OFFICE CORRESPONDENCE

J. A. JONES CONSTRUCTION COMPANY

To: All Personnel Involved In The Placement of Concrete

From: J. P. Leonard
Project Manager

Date: December 18, 1975

Re: Concrete Placement Directives

This memo is issued to give specific direction to any person involved in the handling and placing of concrete on this project.

1. The following is a superintendent and engineers' mandatory reading list that must be read and understood prior to placing of concrete. Any questions or requests for interpretation should be directed to the office of the Project Engineer.

   a. Ebasco Specification LOU-1564.472, Section II, Concrete Placing, Curing and Finishing.

   b. J. A. Jones' Concrete Pour Plan.

   c. Concrete Placement and Consolidation training session class notes.

2. The superintendent shall train and indoctrinate all foreman and craftsmen in the requirement contained in the mandatory reading list.

3. The concrete conveying equipment supervisor or operator shall not allow concrete to be placed in the equipment that will not flow unaided (raked or vibrated) down the truck chute. All concrete of this nature shall be brought to the attention of the Ebasco Engineer.

cc: Les Terry
Jim Foster
Mike Murray
Dick Anderson
C. Allen (5)
Al Prince
Mike Nolan (5)
Gene Greathouse

U. S. [illegible]
[illegible]
REGION IV

Inspection Report No. 50-382/75-10 Docket No. 50-382

Licensee: Louisiana Power & Light Company Category A2

Location: Taft, Louisiana

Facility: Waterford Steam Electric Station, Unit 3

Type of Licensee: CE, 1165 MWe PWR

Type of Inspection: Routine, Announced

Dates of Inspection: December 2-5, 1975

Dates of Previous Inspection: October 29-31, 1975

Principal Inspector: W. C. Hubbard, Senior Reactor Inspector 12/18/75 Date

Accompanying Inspectors: for R. C. Stewart, Senior Reactor Inspector 12/18/75 Date

W. A. [illegible], Senior Reactor Inspector 12/18/75 Date

Reviewed By: W. A. [illegible], Senior Reactor Inspector 12/18/75 Date

B/11

5

1. Principal Persons Contacted

Louisiana Power & Light Company (LP&L)

A. E. Henderson, Jr., QA Manager
T. F. Gerwets, Project QA Manager
O. P. Pipkins, QA Engineer
B. P. Brown, QA Engineer

Ebasco Services Incorporated (Ebasco)

R. A. Hartnett, Acting QA Site Supervisor
I. Hussain, QA Engineer
L. Waterman, QC Training Supervisor
B. D. Fowler, Senior Resident Engineer
R. W. Zafist, Office Resident Engineer

J. A. Jones Construction Company

C. A. Greathouse, QA Manager

2. Scope of Inspection

The purpose of the inspection was to observe work activities and review quality records related to placement No. 49ZS01-6 of safety related structural concrete for the common foundation mat. The inspectors reviewed site quality assurance and quality control procedures and records applicable to foundations and structural concrete, observed construction activities in progress and examined responses to previously identified noncompliance and unresolved items.

3. Status of the Project

Design engineering was 90.7% complete and procurement was 97.7% complete as of October 31, 1975. Construction was 2.40% complete as of December 2, 1975. The first placement of structural concrete for the common foundation mat was completed December 3, 1975.

The preamplifier was received at the WNP-3 site on November 10, 1975. The first of two steam generators was placed in temporary storage at a barge site in Houma, Louisiana on November 25, 1975.

(Continued)

8. Cadweld Splicing

The inspector observed rebar splicing activities in progress; however, cadweld splices for placement No. 6 of the containment had been completed prior to this inspection. Records of completed work were examined and included the following documents:

Form QCIP 9-1, "Cadweld Operator's Qualification Test Record"

Form QC-15, "Report of Tensile Tests Cadweld Splices"

Form W-SIIP-4.1, "Daily Cadweld Inspection Report"

Form W-SIIP-4.2, "Weekly Cadweld or [illegible] Test Report"

Cadweld location maps for placement No. 6

Within the scope of the inspection no items of noncompliance were identified.

9. Concrete Curing

Concrete placement was completed on December 3, 1975, and curing began at 4:00 p.m. Curing was to be accomplished by keeping exposed surfaces wet for 7 days by ponding on top and by spray on vertical surfaces when forms are removed. The inspector observed curing activities in progress but was unable to perform a record review as the curing process was still incomplete at the termination of the inspection. Curing records will be reviewed during the next inspection.

10. Specification Revisions Nonconformance with QA Program Requirements

During the review of the Ebasco "Concrete Test Record", Form No. QCIP 7-2, which reflect the recorded QC test data for concrete used for placement No. 6 of the containment, it was noted that several concrete slumps taken during the concrete placement were below the range specified in the Ebasco Specification No. LOU 1564.472, "Concrete Mixing and Delivery - Class 1", Section 10.9 Consistency and Slump, Revision 5, dated 3/11/75.

The specification, Section 10.9, provides a table giving a range of slumps which shall be used for various types of construction. The table indicates that for reinforced foundation walls and footings, the 10 batch slump average, shall be a maximum of 4 inches and a minimum of 3 inches, and for a single batch, the slump maximum shall be 5 inches and the minimum of 2 inches of slump.

The Ebasco Form QCIP-7-2 reflects slumps [illegible] of 1/2" to 1 3/4" and 10 batch slump averages below 3 inches.

(Continued)

EBASCO SERVICES
INCORPORATED

UTILITY CONSULTANTS - ENGINEERS - CONSTRUCTORS

P. O. Box 70
Killona, Louisiana 70066

December 18, 1975
F-4619
W3-NY-4

J. A. Jones Construction Company
P. O. Box 110
Killona, Louisiana 70066

LOUISIANA POWER AND LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
YOUR RESPONSE TO STOP WORK ORDER NO. 1

Reference: Your letter dated December 18, 1975. Number 75-317(J)
A&E # 062

Gentlemen:

We have received your response to our comments on your initial response to stopwork order No. 1. We have reviewed your response and have no further comments.

Yours very truly,

J. O. Booth
Project Superintendent

FRH:grf

B/12

DATE: December 19, 1975 TIME: 8:45 A.M., PM X

PARTY CALLING: W.G. Hubacek (Name) NRC (Company)

PARTY ANSWERING: T.F. Cerrets (Name) TSL (Company)

SUBJECT: Construction Status FILE: Q-3-A35.02.01

3-A1.04.02.02

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Mr. Hubacek called to inquire about the status of construction. More specifically, he wanted to know if we had released Ebasco from the stop work order. I told Mr. Hubacek that we had issued the stop work order release at 4:00 p.m. on December 18. I also told him that J.A. Jones was planning to place concrete today, but that they were temporarily being held up because some aggregate bins at the batch plant were frozen. Mr. Hubacek also wanted to know the reason why we issued the stop work order. I told him that we did so because of recurring problems with the concrete placement, especially with vibration. I told him that even though we had experienced problems, I felt that in the end, all placements were satisfactory. Mr. Hubacek stated that he was glad to see that we had everything under control. He asked if I would call him to notify him about the first concrete placement to be made in strip No. 2. I told him I would do so.

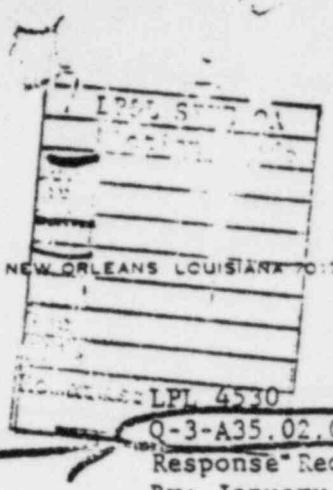
ACTION REQUIRED:

cc: [illegible]

B/13

LOUISIANA POWER & LIGHT / 142 DELARONDE STREET • P. O. BOX 6008 • NEW ORLEANS, LOUISIANA 70174
MIDDLE SOUTH UTILITIES SYSTEM

December 29, 1975



File

Response Required: Yes
By: January 7,1976

Mr. R. K. Stampley
Ebasco Services, Inc.
Two Rector Street
New York, New York 10006

SUBJECT: Waterford SES Unit No. 3
NRC Audit - December 2-5, 1975

Dear Mr. Stampley:

Attached is a copy of a letter dated December 22, 1975, from the NRC Office of Inspection and Enforcement - Region IV together with a copy of the NRC Inspectors Report concerning the audit conducted on December 2-5, 1975.

Please note the paragraph of the letter relative to proprietary information. We request you advise LP&L by January 7, 1976, as to whether or not you consider any information contained in the report to be proprietary.

If any information in this report is considered proprietary, your written response must be handled in an expeditious manner. Our response to the NRC must be made before Monday, January 12, 1976. If you do not contact us by January 7, 1976, we will assume you have no comments.

Because there has been a delay in sending the report to you, you may elect to inform our Mr. R. E. Hastings by telephone - (504) 366-2345, Extension 638 - as to whether or not you consider information in the report to be proprietary. Your written response can then follow the notification by telephone.

By copy of this letter to Mr. A. L. Gaines, we are asking CE to respond to this request in like manner.

Yours very truly,

R. J. Meyer
Vice President - Engineering and Production

B/14

RJM:REH:sc

Attachment

cc: Ebasco (2), J. M. Brooks, J. O. Booth (2), D. L. Aswell, L. V. Maurin,
A. E. Henderson, D. B. Lester, C. G. Chezem, F. X. Shaughnessy,
H. W. Otillio, T. F. Gerrets, P. V. Prasankumar, L. Biondolillo, D.N. Galligan
A. L. Gaines