



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

R. W. Landsman D. I.  
RTIII

SSINS 6000

295

MAY 29 1981

MEMORANDUM FOR: H. A. Wilber, Reactor Projects Section, DRRRI, IE

FROM: E. J. Gallagher, Mechanical Structural & Metallurgical  
Section, REB, DRR, IE

SUBJECT: SUMMARY OF APRIL 26-27, 1980 MEETING ON STRUCTURAL BACKFILL AT  
SOUTH TEXAS PROJECT UNITS 1&2 (DOCKET No. 50-498; 50-499)

On April 26-27, 1980 a meeting was held at the IE office in Bethesda, Maryland to discuss the resolution and review of the South Texas Project (STP) investigation findings concerning the structural backfill.

Those in attendance were:

IE Headquarters

R. E. Shewmaker  
E. J. Gallagher

Regional Staff

R. E. Hall (Region IV)  
J. I. Tapia (Region IV)  
S. K. Chaudhary (Region I)

STP Investigation Team Members

D. W. Hayes (Region III)  
R. B. Landsman (Region III)

NRR (LPM)

D. E. Sells

A list of references used for the discussion and review are included as Attachment A.

The meeting discussion focused on the following main issues:

- o Technical adequacy of the structural backfill to meet design requirements.
- o QA/QC aspects of backfill construction.
- o Resolution of investigation findings identified in report 79-19.
- o Review of Houston Lighting and Power (HL&P) responses to Show Cause Order Item 2, Category I Structural Backfill.

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JUN 01 1981

DEPOSITION  
EXHIBIT

LANDSMAN 8

1. Technical adequacy of the structural backfill to meet design requirements

A consensus was reached that the structural backfill meets project design requirements. This conclusion was based on the results of the field investigation borings which are presented in references 4 and 5; coupled with the in-place density test results performed during construction. Fifteen borings demonstrate the backfill material to be compacted to a density above specification. The extent of the four local areas found as a result of the show cause order with densities below 80% relative density were identified by thirty-four additional borings. An analysis was performed for the potential of liquefaction based on the standard penetration test values. The results indicate a factor of safety greater than 1.5 (with the exception of one test at 1.35) as presented in reference 15, section 4.3, Figures 18 & 19).

It was agreed that the liquefaction analysis and results of these four areas as well as the material beneath the foundation mat would be subject to review by NRR geotechnical engineering branch. A task interface agreement has been issued with the end of August as a completion date.

In addition to the field borings, the in-process field density tests exhibit relative densities in excess of specification requirements. NRC inspectors who observed the field and laboratory tests agreed that the test results are reliable. The results of these tests are presented in reference 15, appendix C.

2. QA/QC Aspects of backfill construction

Investigation report 79-19 identified certain QA/QC deficiencies with respect to backfill construction activities which included:

- o Backfill compaction was not performed in accordance with a qualified procedure (finding 79-19-18).
- o Corrective action had not been taken to correct nonconforming laboratory test equipment (finding 79-19-22).
- o Procedures for a systematic sampling (i.e., location and depth of soil tests) had not been established (finding 79-19-21).
- o Quality control inspections did not document specific controls (i.e., soil layer thickness or number of roller coverages) identified as construction requirements (finding 79-19-24).
- o Soil penetration tests were performed using nonconforming equipment (i.e., hammer weight and split spoon size)(findings 79-19-27 and 79-19-28).

HL&P submitted reference 3 on May 23, 1980 affirming the above findings and identified corrective actions taken. It was agreed that the actions taken by HL&P were acceptable.

Notwithstanding the above findings, the conclusion reached on the technical adequacy of the backfill to meet design requirements remains valid.

### 3. Resolution of Investigation Findings

The summary of the NRC investigation findings contained in report 79-19 (reference 1), HL&P's response to the investigation report to show cause order item 2 (references 3 and 7) and the status of Region IV inspection followup (references 6, 9, 11, 12, 13, 14, and 16) are presented in Attachment B.

The resolutions to each of the investigation findings (items of noncompliance and unresolved items) were discussed. With the exception of five items, all present agreed that the findings have been satisfactorily resolved. The five items include:

- o Findings 79-19-18 and 79-19-58 pertain to the compaction method used and the basis for the specification limit of 8 roller passes and a maximum 18 inches layer thickness. The differences in approach to resolving these items are academic since the field borings demonstrate the in-place material was compacted to above specification requirements with varying methods used during compaction.
- o Findings 79-19-19, 79-19-26 and 79-19-30 pertain to the values used in the liquefaction analysis presented in the SAR and the liquefaction potential of material actually used. It was agreed that the resolution of these items are further subject to NRR geotechnical engineering branch review.

### 4. Review of HL&P Responses to Show Cause Item 2, Category I Structural Backfill

On July 28, 1980, an HL&P submittal (reference 7) addressed show cause order item 2(a) through (e). The submittal indicated an independent review committee was retained to assess the engineering acceptability of the Category I structural backfill. On February 27, 1981, HL&P submitted the "Final Report Concerning Show Cause Order Item 2, Structural Backfill Investigation" (reference 15).

A review of the HL&P final report was made resulting in the following comments:

- o The overall conclusion (Pg 56) that the condition of the fill meets the project requirement is supported. This was based on the results of the field borings and in-place density tests as previously described.
- o The statement "that the vibratory rollers are capable of compacting the specified lift thickness to the required densities" (Pg 56) is accurate, however, it does not qualify under what conditions 18 inches lift thickness can be compacted to achieve the required results (i.e., moisture content, no. of passes, equipment speed). The text of the report (Pg 30) does state that, "It is to be noted that 16 to 20 or more passes are presently needed to consistently meet the specifications." This is illustrated in reference 15, figure 16. The specification required only a minimum of 8 roller passes, however, it included a performance criteria of 80% relative

density. Specifying a minimum method that does not consistently achieve the desired "end results" is not an effective manner to assure a uniformly compacted material.

- o The final report concludes (Pg 56), that, "eight roller passes is a satisfactory minimum compaction to obtain engineering integrity and safety, and a proper starting point for acceptance testing" During the meeting it was determined that a high degree of original Q.C. tests did not achieve specification requirement and necessitated rework of the area until a retest was taken to accept the material (i.e., Unit 1: total of 2571 tests with 619 retests (24%); Unit 2: total of 3127 test with 854 retest (27%)). This may indicate that 8 roller passes was not an effective starting point for testing and assuring a uniformly compacted fill. The in-process tests are intended to be representative of material previously placed to that point during construction.
- o The final report concludes (Pg 55), "that with the type of compaction equipment used, the number of passes actually accomplished and the thickness of the layer placed, a dense, homogeneous, compacted structural backfill resulted which is adequate for the intended use and is generally in accordance with specification requirements."

What was "actually" accomplished is not documented, however, it is agreed that in order to achieve the in-process test results (reference 7, Appendix C) it must have been in excess of the minimum required. It was agreed that the fill is in accordance with specification requirements except for local areas as identified by the borings.

##### 5. Summary Conclusions

- o Structural Backfill meets project design requirements based on results of in-place density tests and field investigation borings required as a result of the show cause order.
- o QA/QC deficiencies were identified in report 79-19 and HL&P has taken corrective action.
- o Investigation findings have been satisfactory resolved with the exception of those subject to NRR geotechnical engineering branch review concerning liquefaction potential.

- o HL&P conclusion in final report response to the show cause order that the fill meets project requirements is supported.

*Eugene J. Gallagher*

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Mechanical, Structural  
& Metallurgical Section  
Reactor Engineering Branch, RRRI, IE

Enclosures: Attachments A & B

cc: J. H. Sniezek, IE  
E. L. Jordan, IE  
R. W. Woodruff, IE  
R. E. Shewmaker, IE  
H. Wong, IE  
R. E. Hall, RIV  
J. I. Tapia, RIV  
S. K. Chaudhary, RI  
D. W. Hayes, RIII  
✓ R. W. Landsman, RIII  
D. E. Sells, LPM, NRR  
D. Gupta, NRR

## LIST OF REFERENCES

1. April 28, 1980: IE Investigation Report 79-19.
2. April 30, 1980: Show Cause Order.
3. May 23, 1980: HL&P's Response to Investigation Report 79-19.
4. May 28, 1980: Woodward-Clyde Report 6000-11-1, Relative Density of Structural Backfill, STP.
5. May 28, 1980: Woodward-Clyde Report 6000-09-1, Relative Density of Structural Backfill, STP.
6. July 16, 1980: IE Inspection Report 80-17.
7. July 28, 1980: HL&P's Reponse to Show Cause Order.
8. August 6, 1980: Woodward-Clyde Report, Analysis of Soil Test Boring Split-Barrel Shoe Configuration.
9. August 8, 1980: IE Inspection Report 80-19.
10. September 30, 1980: Woodward-Clyde Report, Standard Penetration Test Evaluation and Validity Report.
11. November 6, 1980: IE Inspection Report 80-24.
12. December 3, 1980: IE Inspection Report 80-30.
13. January 30, 1981: IE Inspection Report 80-38.
14. February 11, 1981: IE Inspection Report 81-03.
15. February 27, 1981: HL&P's Final Report Concerning Show Cause Item 2, Structural Backfill Investigation.
16. May 7, 1981: IE Inspection Report 81-10

SUMMARY OF SOILS INVESTIGATION FINDINGS,  
HL&P RESPONSES AND INSPECTION FOLLOWUP

NRC INVESTIGATION REPORT <u>FINDINGS 79-19-( )</u>	<u>DESCRIPTION</u>	<u>HL&amp;P RESPONSE OF 5/23/80 TO INVESTIGATION FINDINGS</u>	<u>HL&amp;P RESPONSE OF 7/28/80 TO SHOW CAUSE ORDER</u>	<u>REGION IV INSPECTION FOLLOWUP</u>	<u>STATUS</u>
18 (noncompliance) Show Cause Order Item 2(a) & 2(e)	Backfill material was not compacted in accordance with a qualified procedure based on results of a test fill.	Item A-2 Page 10-12	Item 2(a), Pg 2-8 to 2-12. Item 2(e), Pg 2-31 to 2-32.	80-17, Pg 3 80-24, Pg 17 80-30, Pg 3	Closed
19 (unresolved) Show Cause Order Item 2(d)	Concern that the upper portion of the last lift of backfill underlying building mat foundations was not compacted to require density.	No response required	Item 2(d), Pg 2-28 to 2-31	80-24, Pg 10	Closed
20 (unresolved)	Observation of excessive number of roller coverage during test fill program.	No response required	No response required	80-24, Pg 11	Closed
21 (noncompliance)	Systematic sampling for soil testing program had not been established.	Item A-4, Pg 15-16	No response required	80-17, Pg 5	Closed

22 (noncompliance)	Corrective action was not taken to correct nonconforming soil testing equipment.	Item A-3 Pg 13-14	No response required	80-17, Pg 4.	Closed
23 (unresolved) Show Cause Order Item 2(c)	Quality records did not document lift elevation corresponding to soil test.	No response required	Item 2(c), Pg 2-17 to 2-27	81-10, Pg 2	Closed
24 (noncompliance)	Inspection verification of soil placement lift thickness and number of roller coverage was not documented.	Item A-5 Pg 17-18	No response required	80-19, Pg 2	Closed
25 (unresolved)	Laboratory density tests were not performed wet & dry as prescribed by ASTM procedure.	No response required	No response required	81-03, Pg 3	Closed
26 (unresolved) Show Cause Order Item 2(t)	Observation that minimum & maximum densities determined in the field differed from those values used for liquefaction analysis & results presented in the SAR.	No response required	Item 2(b), Pg 2-12 to 2-17	80-24, Pg 11	Closed



27 (noncompliance)	Nonconforming hammer weight was used during standard penetration test borings.	Item A-16	No response required	80-17, Pg 5; 80-19, Pg 5,	Closed
28 (noncompliance)	Nonconforming equipment (split spoon size) used during test borings.	Item A-17	No response required	80-17, Pg 6	Closed
29 (unresolved)	Comparison of Standard Penetration Test borings using nonconforming equipment (i.e., hammer & split spoon).	No response required	No response required	80-24, Pg 11	Closed
30 (unresolved) Show Cause Order Item 2(d)	Loose material identified during boring #204, near base of unit 2 foundation mat.	No response required	Item 2(d), Pg 2-28 to 2-31	80-24, Pg 12	Closed
58 (unresolved) Show Cause Order Item 2(e)	Basis for specification requirement for backfill compaction with 18 inches lift thickness.	No response required	Item 2(e), Pg 2-31 to 2-32	80-30, Pg 5 80-24, Pg 19	Closed
80-17-01 (unresolved)	Procedure for sampling top layer of backfill.	No response required	No response required	80-24, Pg 5	Closed

80-11

4-27-81 meeting in HQ on STP

-17-24

Q-1

P.11

- interviews - Russel Perous - B/R QA subcontractor
- Tom Jones - " " "
- Ray Meyers - B/R construction supervisor
- Jim Pyer - PTL

I talked to \*

Joe Balistic - PTL

Kay Nicoloes - PTL

\*

Tim Logati - HCFP QA supervisor

Jay Colman - B/R construction

Robinson - B/R

can't believe

79-19-21

Q-2

~~what about~~ what about in place staff

S-1

I-3 Retests

2571 test	} cat I d II
619 retest	
3127	
854 retest	

I-4 vertical / uniformity, not horizontal

I-5 inspection reports originated by inspector  
 checklists originated by superintendent  
 p. 21 d 22 Final Report

Blow counts high because of gravel - check

because of fuck up → borings show ok

Review of  
Final Report By Consultants  
dated 2-27-01

✓ 3.1 design

✓ 3.2 geotechnical reports

3.3 specifications

where did 18" - 8 passes come from also 12 on surface

[ Documented Interviews - like to see ]  
16-20 passes knowable site personnel  
W.H.O.

p. 12 performance with requirements were marked  
on soils inspection checklists - BY WHOM?

material tested in FSAR is the same as (engineering properties) p. 2

material onsite also - that density  
show some variability?

3.4 inspection & test procedures

[ statement - min-max values have shown  
very uniform results ]

"one of these inspections each site"  
i.e. not continuous inspection

"each inspector prepared checklist and EIR"  
 ↑ BULLSHIT ↑

DTR's were prepared by <sup>each</sup> inspector

### 3.5 In-place results

the point is not the frequency in which they were run - but at what depth below the surface 95%

### 3.6 borings

Phase I - 25 borings

Phase II - 28 borings to define 4 soft spots

p.25

Would like to see VCC's punching shear analysis

because they say "thinner wall would result

in less drag resistance thus lower blow counts - however the blunter nose would tend to increase blow counts by a higher factor thus removing the conservatism.

## Area 1 by B204

p.27 records do not show any of what the report says - records show everything ok

also your report says for areas 2, 3, 4 records show nothing wrong

" Since no other areas of similar construction difficulties were disclosed by documents "

the above for Area 1 also didn't show it, leads are not to trust records

J3.7 ———

J3.8 ———

### 3.9 Test fill

p.30 "16 to 20 passes are presently needed"

test fill only had high number of passes on top lift only (extra 10)

Statement that 'density reach 80% in middle of  
underlying lift after 8 passes - however you fail  
to state that everywhere else its below 80%

p.30 b) "there is <sup>have to use with them</sup> uniformity <sup>its horizontal</sup> of compacted density"  
 ↑ BULLSHIT ↑  
 look at figures

c) contradictory statements telling where to  
run tests but not essential to set  
specific depth ~~fit~~

d) "backfill close to 80% voids"

Except for top 1/2 of lift which  
is what I always questioned  
away.

show cause items

2a) test fill - surface protection

2b) relative density values might be off

2c) construction sequence not documented

2d) adequacy of existing backfill

2e) rationale of construction procedures

#### 4.0 special studies

##### 4.1 min-max densities

field 105.4 -

Chan

128.7

∴ test addresses field min a little high resulting in conservative in-place densities - what about field max also a little low resulting in higher in-place densities than should be

##### 4.2 settlement

##### 4.3 liquefaction bases on SPT data

wouldn't liquefy



4.4 liquefaction right under mats

you address it wouldn't liquefy, will it settle?

4.5 does wet marked relative give higher  $\gamma_{max}$ 's

in the range 125 pcf  $\downarrow$  to 130 pcf  
dry  $\leftarrow$  ?  $\rightarrow$  wet

You state that dry falls within  $\pm 1$  or 2 percent of wet, however ASTM says it in excess of one percent do always wet, the pt. is that the site never ran wet until I asked them to

You state again that the PTL rain was high,

You fail to state that the PTL max was low  
(according to Clans test)

4.6 statistical - how many below 80%

4.7 SPT's vs density

using Phase I borings - wrong spoon

Just proving that SPT's reflect density if no more borings are needed

4.8 sequence of construction (2C)

They are using the EIR's and check lists which were prepared in the office - not by inspectors.

4.9 (EIR's)

You address 4 inconsistencies with EIR, saying they are minor, they are not p.50, should have been NCR's written on them.

Your example #1) placements without tests are your answer "that testing frequencies

were sufficient" would be adequate if there was full time QC on the plants to document that compaction provided "like always".

#### 4.10 Review of <sup>H&DP</sup> Audits

p.54 would like to see "corrective action reports" which committee generated,

#### 5.0 conclusions

21 borings (Phase I) <sup>other 28 borings (Phase II to determine + pockets)</sup> located 4 pockets, which were not evident from EIRs, and you say that no more borings are needed.

#### p.56 4 conclusions on test fill

- 2) there isn't uniformity throughout lifts
- 3) because of 2) testing depth is critical
- 4) 8 passes is not satisfactory

CH. EVENTS

B #65

I was there Dec 17, 1979 - Feb 7, 1980

314

Report 79-19 issued April 30, 1980  
along with show cause order

I was there June 23-26 1980

Report 80-17 issued July 16, 1980

July 10 memo

July 23 Dec's memo

Their 3 reports dated Aug 4, 1980 80-19

Closed without my participation or concurrence

Nov 7, 1980 80-24

Dec 1980 80-30

Dec - Jan 1981 - repeated requested esting for test fill report

HLdP { Test Fill report issued 9-29-80

Committee's Final report 2-27-81  
says supersedes previous reports

closed items based on interim report not final

DEPOSITION EXHIBIT  
CAVDSMAVII  
A-11

7949 report  
report

~~• N 21 (C17)~~ → U 80-17-1 (C24)

• N 18 (018) (C30)

• U 58 (C30)

• U 19 (C24)

• U 20 (C24)

~~• N 22 (C17)~~

• U 23 (C81-10)

• N 24 (017) (C19)

• U 25 (C81-03)

• U 26 (C24)

• N 27 (017) (C19)

~~• N 28 (017)~~

• U 29 (C24)

• U 30 (C24)

2nd section of  
report & then  
their closure  
& then my comments  
add my signing of report

show cause order

2(a) (C24)

(b) (C24)

(c) (C81-10)

(d) (C81-10)

(e) (C24) (C30)

Review of  
Report 1979 items

#18 (2a) no test fill

didn't address water application  
 didn't address surface protection

shows 16-20 passes needed

on (2a) text says lower lift from 1976 - no lower lift  
 also 1976 → 12 passes

text says economic consideration

committee says fill at 95% relative density

#19 (2d) upper part of 1st lift not compacted  
 text says 4'-10" @ 98 & 99% density  
 NFR

is is going to settle

#20 roller overlap on Feb test fill  
OK

Gene  
 598-4577

#21 sand cone depth

OK

what depth did they finally decide on?

committee says it is essential to set testing depths  
because of  $\sigma$  vs depth curve  
what about in place stuff

#22 no relative density tests

OK

#23 (2c) construction signage

OK

committee says 1) EIR prepared by inspectors  
2) knowledgeable site personnel → 16-20 passes

#24 did not document # passes of lift thicknesses

OK

closure addresses procedure changes - what about  
in place stuff

#25 did not run wet % relative max.

OK

#26 (2b) FSAR % relative values to field

1.1.1

FSAR	93.5	128.1
Field	105.3	123.6
	↑	
	80% the same	

text says this change has been shown not to significantly affect materials properties?  
Engineering

(2b) text says the apparent discrepancy was caused by



#27 wrong hammer wt.

OK text addresses handling of nonconformances

what the hell is their tolerance on the hammer

#28 wrong spoon

OK

see #29

also was told that it was used for only 4 borings & they would be discarded

#29 correlation of blow counts to standard blows

OK

text says 142 #/hammer  
consultant report p.25 says 0.2 lb less

calculations (would like to see)

#30 (2d) boring 204  
NFF

closed it based on response to (2d)

no documentation of committee says happened - testing passed →  
leads? to remaining also other 3 areas no records

#58 (2e) rational behind spec ~~10" g~~ passes with 10" lifts

79-19-18

B 200

321

In addition, the FSAR in Section 2.5.4.5.6.1 states that the maximum lift thickness for structural backfill would be 18 inches where there was unrestricted placement. B&R Specification 3Y069YS029, Rev. F, also indicates the 18 inch maximum lift thickness. The inspector reviewed the document purported to represent the results of the test fill program (See Section E.3.b herein). This indicated that the test fill program resulted in the determination that for 18 inch maximum lift thickness, it would be necessary to make 12 passes with the compaction equipment. The inspector reviewed the associated construction procedure, STP-QCP A040KPCCP-2, Rev. 2, Structural Backfill, and determined it required only 8 passes with the compaction equipment for the maximum lift thickness of 18 inches.

The failure to complete backfill compaction, a special process, in accordance with a procedure that reflected the qualification procedures used for an activity affecting quality is a noncompliance and is contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion IX as discussed in Appendix A of the report transmittal letter (498/79-19-18 and 499/79-19-18).

80-17

(Open) Infraction 50-498/79-19-18; 50-499/79-19-18: Failure to Complete Backfill Compaction in Accordance with a Qualified Procedure. During this inspection, Brown & Root (B&R) Technical Reference Document (TRD) No. 3A700GP002-A, "Test Program for Compaction of Category I Structural Backfill," dated June 2, 1980, was reviewed. The purpose of this test program was to provide assurance that the construction methods defined in B&R Construction Specification A040KPCCP-2 were sufficient to produce a backfill which satisfied PSAR commitments of 80% Relative Density throughout the layer, including that backfill in the top of previously

placed layers. Preliminary test data were reviewed from the test fill program performed for 2, 4, 6, 8 and 12 passes of the compaction equipment. These data verified increased compaction of the interlayer boundary; however, did not produce consistent results above 80% relative density for the entire underlying layer. The test is continuing, and results will be incorporated into the response to Show Cause Order Item Number 2. Portions of the compaction of the test fill area were observed during this inspection; measurement of the vibration frequency of the compactor and three subsequent sand cone in-place density tests (ASTM D-1556) were observed being performed in the test fill. No discrepancies with the TRD were observed during this inspection. During these observations, two differences between the test fill and normal backfill placement and compaction were noted:

- a. The water application methods observed for the test fill were different in that water was applied immediately on the roller and immediately ahead of the roller during the test fill. For normal backfill, wetting of the area is more generally applied.
- b. Surface protection and preparation for rolling of the test fill were more carefully controlled relative to normal backfill.

The potential for these differences affecting test results will require evaluation in the test fill final report.

Results of the original test fill program (1976) and the construction procedure verification program (1977) were also reviewed. These data apparently formed the original basis for the backfill placement procedure requirement to compact the newly placed lifts with at least eight passes of the compactor before relative density testing. These tests, though not well documented, were apparently used as the basis for change early in construction from 12 to 8 passes before testing.

Since the test fill program is not yet complete, and since the soil boring and test program is still being evaluated to support a response to Show Cause Order Item Number 2, this item will remain open.

80-30

(Closed) Infraction (50-498/79-19-18; 50-50-499/79-19-18): Failure to Complete Backfill Compaction In Accordance With a Qualified Procedure. Brown & Root Technical Reference Document (TRD) No. 3A700GP002, Revision B, "Test Program for Compaction of Category I Structural Backfill," dated September 29, 1980, was reviewed during this inspection. This TRD revision documents the completed test fill program and includes a synopsis of previous test fills and of the unrestricted lift qualification program. The latter program was required by the backfill specification to demonstrate, in the first twenty in-place density tests, that satisfactory densities could be achieved prior to proceeding with full scale backfill placement in Category I areas. The specification requirement was used as the basis for documenting the adequacy of the construction procedure. The complete TRD report has also been reviewed by the Independent Review Committee and the conclusions have been incorporated in the licensee's response to the Show Cause Order. The response to Show Cause Order Items V.A.(2)(a) and V.A.(2)(e) were reviewed during Inspection No. 50-499/80-24; 50-499/80-24, and specifically address the test fill program which established the in-place density testing criteria and the use of 18 inch loose lifts.

Based on the review of these Show Cause Order responses and of the TRD, this item of noncompliance is closed.

3

80-24

(Closed) Show Cause Order, Item V.A.(2)(a): Provide Information to Address the Test Fill Program Which Established the Soil Conditions.

17

Lift Thickness, Compactive Effort, and Equipment Characteristics Necessary to Develop the Necessary In-Place Densities. A test fill program was performed by the licensee for the purpose of providing new data to support the field placement criteria previously established. This test fill program was addressed during NRC inspection No. 50-498/80-12; 50-499/80-12. During this inspection, the IE inspector reviewed the procedure used to perform the test fill program, Technical Reference Document No. 3A700GP002-A, "Test Program for Compaction of Category I Structural Backfill," and the results of the program as documented in the licensee's response. In addition, Memorandum No. BC-00998-JDG, dated June 16, 1976, documenting the test fill originally used to establish the construction methods and equipment to be used in the placement of Category I structural backfill, was reviewed. This memorandum shows that the density of the lower 18" lift is increased significantly by compaction of the lift above it. The results of this test fill were used to establish the minimum number of passes required before testing was initiated in the lower lift. This criteria was established as an economic consideration to limit commencement of the in-place density tests until it was felt that specification density had been achieved. The criteria chosen was a minimum of 8 passes on an 18" lift before testing commenced. If density was not reached, additional passes were then added. The adequacy of this construction procedure was verified by the most recent test fill program. The Expert Committee of Independent Engineers (Dr. H. Bolton Seed, Professor of Civil Engineering, University of California; Dr. A. J. Hendron, Jr., Professor of Civil Engineering, University of Illinois; Stanley D. Wilson, P.E., Consulting Engineer) have reviewed the test fill program results and have documented their findings in the "Interim Report to Brown & Root on Adequacy of Category I Structural Backfill." This report is attached, as Exhibit 9, to the licensee's show cause response. The independent committee has concluded that testing of the upper portion of the underlying lift produces conservative results when a minimum of 8 passes is used. The construction procedures used were also judged by the independent committee, "correct to determine the point of starting in-place density testing." Based on the reviews performed during this inspection, the licensee has satisfied the Show Cause Order to provide information to address the test fill program used to establish in-place density testing criteria.

No lower lift (backfill)

12)?

GIVE GORE my comments on report

cut below true have 812 testing 3 layers alternating

This item is closed.

80-24

(Closed) Show Cause Order, Item V.A.(2)(e): Provide Information to Address the Rationale Behind the Use of 18 Inch Loose Lifts Compacted by 8 Passes of the Equipment to Achieve the Required Densities. During this inspection, the IE inspector reviewed the licensee's response to this show cause item. The 8 passes referred to is the minimum required compactive effort prior to in-place density testing. The use of this number is based on the test fill program conducted in May 1976 and on recommendations from the vibratory roller manufacturer. This construction criteria has been verified by the test fill program conducted in June 1980. See the closure of Show Cause Order Item V.A.(2)(a) for more detail. Based on the review performed by the IE inspector during this inspection, the item is considered resolved.

This item is closed.



79-19-19

Because of observations in the field, Woodward-Lundgren's special study, discussions with the B&R soils engineer and HL&P field personnel and a literature review, it is evident that the upper part of the last lift of the backfill material used at STP "cannot" be compacted using the current methods. Given this fact, at least six to nine inches of material beneath Category I buildings probably does not meet compaction criteria. B&R's cognizant engineer, when questioned about the loose fill, indicated that they have literature that indicates loose material under the structures is satisfactory. This item remains unresolved pending review of the B&R literature (498/79-19-19 and 499/79-19-19).

80-24

(Closed) Unresolved Item (50-498/79-19-19; 50-499/79-19-19): Compaction of Upper Part of Last Lift. This item was addressed in Inspection Report No. 50-498/80-17; 50-499/80-17 as a part of infraction No. 50-498/79-19-21; 50-499/79-19-21. The licensee response to the NRC Show Cause Order, Section (2)(d) addresses the performance of the top layer of backfill immediately below mat foundations during postulated earthquake loading conditions. Dr. H. Bolton Seed, a member of the South Texas Project Independent Review Committee, analytically determined the factor of safety against liquefaction for a four inch layer of backfill at forty-five percent of relative density and a layer four to ten inches deep at a relative density of sixty percent. The minimum factor of safety against liquefaction was determined to be 1.85. The fact that the top layer of backfill placement is subject to additional roller passes according to the construction procedure indicates that the relative density of the top lift is higher than that assumed in the analysis. This fact is also based on the statistical results which show mean relative densities of the layer from four to ten inches deep for Units 1 and 2 of ninety-eight and ninety-four percent, respectively. In addition, the top four inches of backfill is subject to the cementitious effect of the mortar in the six inch mud slab which is applied directly on the upper backfill lift. The high confining stress resulting from the building load will also serve against the buildup of excessive pore pressures. These factors resolve this item.

This item is closed.

Subsequently, on February 6, 1980, as a result of the NRC findings, the licensee conducted a site test fill to demonstrate that 18 inch lifts could indeed be compacted with only eight one-way passes of the equipment in use. The results of this test fill had not been fully evaluated as of February 21, 1980 and had not been provided to the NRC. During the conduct of the retest of fill placement the NRC inspector and the licensee's representative observed that the compaction equipment roller was overlapping a full half drum width. Thus, the center section of the test fill would have received 16 passes instead of the specified eight of the field procedure. The licensee, following questioning by the NRC, stopped the improper rolling of the test fill. The matter remains unresolved pending review of the test fill results (498/79-19-20 and 499/79-19-20).

80-24

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(Closed) Unresolved Item (50-498/79-19-20; 50-499, 19-20): Excessive Number of Roller Passes. The NRC observations of excessive overlap were based on the test fill program attempted in February. This test was performed without a procedure addressing maximum permissible roller overlap. Revisions to Construction Procedure No. CCP-2 in August 1980 specify maximum roller overlap criteria. The test fill program was subsequently performed in adherence to the requirements during the period of June through July 1980. Observations by IE inspectors, during the July test fill development, confirmed the proper use of the compaction equipment. This retesting resolves the matter.

This item is closed.



The above documents were reviewed for basic scope, completeness, consistency with referenced codes, standards and NRC regulatory guides and for reference during inspection of field activities and in the review of quality records. The following procedural deficiency was discussed with the licensee: PTL's QA Procedure No. IS-511-D-1556-64 requires that the in-place density measurements are to be performed according to ASTM D-1556. However, there are no instructions in the PTL procedures as to what depth below the backfill lift surface the test should be performed. A review of PTL's density records and discussions with soil inspectors indicated that PTL inspection personnel have been performing density tests at various test depths.

This failure to establish procedures for a systematic sampling technique as part of a testing program to verify that the required densities are being obtained throughout the placement lifts is contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion V, as discussed in Appendix A of the report transmittal letter (498/79-19-21 and 499/79-19-21).

80-17

(Closed) Infraction 50-498/79-19-21; 50-499/79-19-21: Failure to Establish Procedures for Systematic Sampling as Part of Soil Testing Program. The IE inspector reviewed the changes in procedures effected by Document Change Notices 3Y069YS029-F/DCN/2-14-80, and 2Y060SS033-C/DCN/2-14-80 and 6-5-80. These documents and PTL Field Change No. 042, dated February 19, 1980, to the QC Procedure QC-ST, Revision 4 were reviewed for content, and applicability of the proposed changes to the items of noncompliances.

Based on the review of the above indicated documents and discussion with licensee and consultant personnel, the IE inspector determined that the changes effected in the procedures by the above documents adequately resolve the noncompliances regarding depth and location of in-place testing of granular backfill in all layers except the very top layer. These procedural changes are consistent with the HL&P answer to this item of noncompliance; however, the licensee indicated that the resolution of the in-place density test depth and location in the top layer is still under engineering evaluation. This resolution will be based on experience obtained with the new procedure and analysis of the test fill program. Procedures relating to the sampling of the top backfill layer will be revised to incorporate the requirements at a later date; but before the work on the top layer begins. A DCN to Specification 3Y069YS029-F (DCN 6-25-80) has been issued to prevent placement of top lifts of Category I structural backfill until sampling provisions can be defined and incorporated into the specification.

This infraction is closed; however, during a subsequent inspection, the anticipated changes to the specification and resultant procedures changes will be reviewed. This is considered an unresolved item. (Unresolved Item 50-498/80-17-1; 50-499/80-17-1.

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80-24

This item is closed.

(Closed) Unresolved Item (50-498/80-17; 50-499/80-17): Procedure for Sampling Top Layer of Backfill. The IE inspector reviewed the change to the structural backfill specification effected by Document Change

No. 3Y069YS029-F/DCN/7-23-80. This change provides criteria for testing of backfill top lifts immediately below foundations. Pittsburgh Testing Laboratory (PTL) Field Change Request and Approval No. PT-FCR-049 was also reviewed. This revision to the PTL procedure for backfill testing incorporates the B&R specification criteria. These criteria are based on detailed studies performed by the Independent Review Committee and conservatively satisfy the unresolved item. See closure of Unresolved Item 50-498/79-19-19; 50-499/79-19-19 in this report for details of the analysis performed by the committee.

c. Soil Sampling Program

A comprehensive soil sampling (testing) program must be implemented at the beginning of backfill operations to verify the consistency of the backfill placement procedures and to insure that the specified densities were obtained.

The FSAR in Section 2.5.4.5.6.2.4 and B&R's Specification No. 3Y069YS029, Revision F, paragraph 9.e, and B&R's Procedure No. A040KPCCP-2, paragraph 3.3.3.5 require that at least one relative density test be performed for every fourth field sand cone density test. A review of PTL's relative density laboratory data on December 18, 1979, indicated that a relative density test had not been performed since November 17, 1979, although plant backfill material continued to be placed during that period. Furthermore the testing laboratory personnel failed to document and correct this nonconforming condition. Discussions with the PTL cognizant individual indicated that the relative density test apparatus had been out of service since November 17, 1979 and had been breaking down periodically during the previous month. The test equipment was replaced and relative density testing was resumed on January 7, 1980, nearly two months later. Plant backfill continued to be placed during the entire period of the equipment breakdown. Subsequent tests on the retained samples indicated that the required relative densities had been met.

The failure to take prompt corrective action once the defective equipment was identified and the failure to preclude repeated cases of tests not being performed is in noncompliance with Criterion XVI of 10 CFR 50, Appendix B as discussed in Appendix A of the report transmittal letter (498/79-19-22 and 499/79-19-22).

30-17

(Closed) Infraction 50-498/79-19-22; 50-499/79-19-22: Failure to Take Prompt Corrective Action When Test Apparatus Failed, Halting Testing. During this inspection, it was verified that a backup vibratory head and a spare mold for measuring relative density had been procured and both were available on site. B&R Instruction Letter SQA-3329, dated February 1, 1980, was reviewed relative to clarifying subcontractor responsibilities concerning identification and reporting of nonconforming conditions. It was verified through review of Pittsburgh Testing Laboratory (PTL) Document Dissemination signature sheet that each PTL employee on site had reviewed SQA-3329. This item is closed.

B&R Specification No. 3Y069YS029, in paragraph 7.1.e, requires that the backfill material be placed in uniform layers not exceeding 18 inches of loose thickness. Paragraph 3.3.3.2 of B&R Procedure No. CCP-2 requires that the minimum number of passes of compaction equipment will be eight one-way passes. A review of the test records and procedure indicated that neither the procedure or the test record Form SF-6, "In-Place Density Test by Sand Cone Method," required this important information to be documented.

It was determined from discussions with PTL's personnel that the lift number on the test record has no relationship to lift elevation in a specific area. The NRC inspector and H&P personnel attempted

to obtain elevation data on consecutive lifts in a specified area from other QA records to establish that the fill had been placed systematically and uniformly in 18 inch layers and compacted accordingly. However, due to the method of lift numbering and system of filling, this could not be accomplished during the inspection. The licensee is continuing their efforts to assemble this data. Further review is planned for future inspections on this unresolved item (498/79-19-23 and 499/79-19-23).

DETAIL1. Persons ContactedPrincipal Licensee Engineer:

- R. A. Frazar, Manager, Quality Assurance
- \*R. A. Carvel, Project QA Supervisor - Civil
- L. D. Wilson, Project QA Supervisor - Welding
- R. J. Viers, Senior QA Specialist
- B. R. Schulte, Civil QA Specialist
- T. H. McGriff, Civil QA Specialist
- G. W. Steinmann, Lead Site Engineer - Civil

Other Personnel

- B. C. Pettersson, Lead Geotechnical Engineer, Erown and Root (E&R)
- R. Rozier, Area Civil Engineer - RCB-1, B&R
- G. Cook, Field Engineer, B&R
- C. Younger, Project Site Engineer - Civil/Structural, B&R
- P. Steger, Lead Site Engineer - Civil/Structural, B&R
- C. M. Singleton, Civil QC Superintendent, B&R

The NRC inspector also contacted other licensee and contractor personnel including members of the QA/QC and engineering staffs.

\*Denotes attendance at the exit interview.

2. Licensee Action on Previous Inspection Findings

During this inspection, licensee action taken to resolve the following unresolved item identified in Investigation Report No. 50-499/79-19, 50-499/79-19 was reviewed:

(Closed) Unresolved Item (50-499/79-19-23; 50-49-74-19-23): Records of Fill Lifts Versus Location in Order to Reconstruct Fill Placement Procedure Lacking. The subject unresolved item has been incorporated in the licensee's response to Show Cause Order Item VA(2)(c). Plan views and profiles to show the sequence of backfill placement have been developed. The closure of the Show Cause Order Item in paragraph 4 of this report resolves the issue originally generated by this unresolved item.

3. Concrete Placement

By letter, dated January 8, 1981, the licensee requested a limited restart of complex concrete placement. Attachment I to the letter defined the scope of work as seven specific placements by number. The review of licensee actions taken by the licensee, as of the date of the request, resulted in concurrence with the request for a limited restart of complex concrete. The seventh placement was observed by the NRC inspector during the course of the

This placement (No. CIS-W18) consisted of the concrete for Unit 1 Reactor Containment Building. The observed placement and consolidation techniques were found to be in accordance with Quality Control Construction Procedure No. A040XPCCP-25 and consistent with standard industry practices for the successful placement of concrete.

A review was conducted of the quality control records for the first six complex concrete placements. From this review and through discussions with cognizant personnel, it was determined that no testing for air content of Grout Mix Identification No. A-0-3-15 had been performed. Brown and Root Interoffice Memorandum No. BY-40007, "Approved Concrete Mixes," requires that the air content for Grout Mix Identification No. A-0-3-15 not exceed 10 percent. This memorandum is an attachment to approved Field Change Request No. B-0-001047 to Brown and Root Specification No. 2A0100S001-G, "Concrete Supply." The Field Change Request served to document the current approved concrete and grout mixes. The failure to test for air content of grout in order to assure compliance with the design maximum amount allowed represents a failure to meet the requirements of Criterion 1 of Appendix B to 10 CFR Part 50 and is therefore a violation.

#### Licensee Response to Show Cause Order

The NRC inspector reviewed the licensee's response to the Show Cause Order transmitted to HL&P by NRC letter, dated April 11, 1984. The following items were addressed:

(Closed) Show Cause Order Item # 2 (a). Provide information to address the Sequence of Construction of Existing Backfill. Include the Loose Lift Thickness and Number of Passes of the Equipment. Independent Expert Review Committee's "Final Report concerning Show Cause Order Item 2," dated January 30, 1984, was reviewed during inspection. Section 4.8 of the Committee's report discussed the review of the B&R/HL&P Special Task Force effort to reconstruct the Show Cause Order Item. It was the Committee's determination that backfill placements can be reconstructed from the quality control records. The Task Force effort is documented in Technical Reference Document No. BA700GP001-E, "Data on Structural Backfill Placement and Quality Control Data." This document which was also reviewed during this inspection reports eight representative cross sections, four from each unit, which were developed from the review of Earthwork Inspection Reports, Soils Inspection Checklists and Soil Test Reports. The cross sections show the compacted lift thickness, lift inspection Checklist notations that the lift thickness was 12 inches or less. The lift numbering sequence established for each placement area also gives the particular lift elevation. The report further states that the total number of lifts placed, although not stated, was such that the compactive effort satisfied the minimum of eight one way passes per lift.

density testing. The development of the cross sections from the quality control records is used as a basis to demonstrate that the backfill was placed in a determinate sequence. Based on the review of this documentation performed during this inspection, the NRC Inspector concluded that the licensee has satisfied the Show Cause Order to provide information to address the sequence of construction of existing backfill including the loose lift thickness and number of passes of the equipment.

This item is closed.

(Closed) Show Cause Order Item VA(2)(d): Provide Information to Address the Adequacy of Existing Backfill Material Including That Under Structures Founded on Backfill. The Independent Expert Review Committee's "Final Report Concerning Show Cause Order Item 2" also addresses the engineering adequacy of the in-place density of the Category I structural backfill. Their evaluation is based on considerations of the backfill material properties, the construction techniques, the in-place density test results, and the boring program. The Committee has concluded that "a dense, homogeneous, compacted structural backfill resulted which is adequate for the intended use and is generally in accordance with specification requirements." Four small, isolated zones detected by the boring program, which indicated a relative density less than construction quality control criteria, were analyzed and found to have a factor of safety against liquefaction of greater than 1.5 for three zones and a minimum factor of safety of 1.35 for the fourth. The Committee further concluded that, since the boring locations were selected in an unbiased manner, their number is adequate to provide a representative sample of fill conditions. The actual field control procedures for placement of the fill and for determining relative density were found to yield a statistically determined mean relative density of 95 percent with a standard deviation of 0.81. The statistical analysis further shows, with a 90 percent level of confidence, that less than 4.0 percent of the backfill volume has a relative density less than 80 percent, and that 0.05 percent is less than 70 percent. Based on these results, the Committee reports that "even if portions of the structural backfill have relative densities as indicated by the statistical analysis results, we still conclude that there is no risk of liquefaction." A similar conclusion was reached for the analysis of thin layers immediately below mat foundations at a relative density of 45 percent. The factor of safety against liquefaction for this analysis was found to be in excess of 1.2. The need for this analysis resulted from the results of the June 1985 test fill program in which it was shown that there is uniformity of compaction throughout the backfill placed in 16 inch lifts, except for the upper portion of the top lift. The test fill program also showed that the density testing depth below the backfill surface is not a primary factor and that eight roller passes is a satisfactory starting point.

to commence acceptance testing. Based on the reviews performed during this inspection of the Independent Expert Review Committee's "Final Report Concerning Show Cause Order Item 2" and of the Task Force's Technical Reference Document, the licensee has concluded that the existing backfill material satisfies the design intent.

The above noted Independent Expert Review Committee's "Final Report Concerning Show Cause Order Item 2" was also reviewed during this inspection to confirm that items previously closed by the NRC Inspector, based on the Committee's interim and status reports, were consistent with the final report. There were no differences noted between the interim and status and final reports which affect previous item closures. At the request of IE Headquarters, the final report will also be reviewed by the Geotechnical Branch of the NRC's Office of Nuclear Reactor Regulation (NRR). In particular, the Committee's conclusions relative to the calculations supporting the liquefaction potential, the adequacy of the methods previously utilized for backfill placement and compaction, and the significance of noted shifts in maximum and minimum densities from values reported in the FSAR will be evaluated by NRR.

This item is closed.

#### 5. Show Cause Order Commitments

The NRC Inspector reviewed the implementation of the commitments described in the attachment to HLSP letter ST-HL-AC-533, dated September 18, 1980. The following commitments, utilizing the identification numbers in the attachment to the LH&P letter, were reviewed:

(Closed) Items A20, A21, A25, A27, A28, A29, A30, A31, M10, M11, M13, and M16: The listed items relate to and serve as the basis for the closure of the Show Cause Order items listed in paragraph 4 of this report. In addition, the above listed commitments were individually reviewed and found to have been met and were therefore closed.

#### 6. Exit Interview

The NRC Inspector met with the licensee representative identified in paragraph 1 on April 9, 1981, for the purpose of summarizing the scope and the findings of the inspection.



Discussions with B&R excavation personnel indicated that no instructions as to minimum number of passes to make with the compaction equipment are given to the compactor operators. The operators are told to roll an area until told to stop. This information was obtained through an interpreter since the compactor operator did not speak English and his foreman didn't speak Spanish. B&R's excavation superintendent also indicated that "there are no project requirements on number of passes of equipment since each compactor has different characteristics, and to specify number of passes would be meaningless." PTL's soil inspectors indicated that they have no idea on how many passes of the compactor the fill area received before they test it, only that the B&R supervisor calls them over to perform a test.

Failure to document the lift thickness and the number of passes of the compaction equipment, which are needed to assure that the backfill material is being systematically placed and compacted, is contrary to the requirements of 10 CFR 50, Appendix B, Criterion XVII as discussed in Appendix A of the report transmittal letter (498/79-19-24 and 499/79-19-24).

80-17

(Open) Infraction 50-498/79-19-24; 50-499/79-19-24: Failure to Document Soil Lift Thickness and Number of Passes of Equipment as Part of QA Records. This item will remain open since the revision of PTL procedures had not been completed as indicated in the HL&P response to this item.

80-19

(Closed) Infraction (50-498/79-19-24; 50-499/79-19-24): Failure to Document Soil Lift Thickness and Number of Passes of Equipment as Part of QA Records. The IE inspector reviewed the changes in procedures effected by Revision 4 to Brown & Root (B&R) Quality Construction Procedure A040XPCCP-2, "Structural

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Backfill," and by Pittsburgh Testing Laboratory (PTL) Field Change No. PT-FCR-046 to PTL Procedure QC-ST, Revision 7, "Soils Inspections and Tests - Field." These document changes were reviewed for content, and applicability of the proposed changes to the items of noncompliance. The changes now require documentation of loose lift thicknesses and number of roller passes. The specific roller pattern to be used is also defined. Based on this review, the IE inspector determined that the changes effected in the procedures by the above documents resolve the item of noncompliance.

This item is closed.

A review of the Woodward-Lundgren drilling procedure indicated that they were to conduct the soil penetration tests according to ASTM D-1586, "Penetration Test and Split-Barrel Sampling of Soils."

The resident NRC inspector determined on January 30, 1980 after several tests were run, that the required ASTM 140 pound hammer on the test rig did not have a weight certification. Upon further examination it was determined that the hammer had been weighed on January 28, 1980 and was found to be in nonconformance with the requirements of ASTM D-1586. This nonconformance was documented on a Woodward-Lundgren "Nonconformance and Corrective Action Report" dated January 28, 1980. Although disposition of this nonconformance was not completed until February 4, 1980, site soil penetration testing activities were allowed to continue during the period

January 28 to February 4, 1980, using this hammer which had been identified as nonconforming.

This is contrary to the requirements of 10 CFR 50, Appendix B, Criterion XV as discussed in Appendix A of the report transmittal letter (498/79-19-27 and 499/79-19-27).

80-17

(Open) Infraction 50-498/79-19-27; 50-499/79-19-27: Failure to Control the Use of a Nonconforming Hammer for Penetration. Woodward-Clyde Consultants' letter to Brown and Root, "Evaluation of Nonconformance Reports (NCR)," dated February 24, 1980, was reviewed. This letter documented the fact that the initially reported weight of the hammer (148.9 lb.) included the weight of the hoisting chain. Actual hammer weight as found to be 138.9 lbs. Another hammer used by Younger Drilling Company weighed 142 lbs. Since ASTM D-1586 does not prescribe acceptance tolerances, both hammer weights were considered acceptable by Woodward-Clyde Consultants. The initial hammer was within 1% of the weight specified by ASTM D-1586, and the Younger Company hammer, though slightly heavier than the ASTM D-1586 requirement, would result in conservative test results since a slightly lowered blow count would be obtained because of the small excess weight. The consultant stated to the IE inspectors that any variability introduced by these minor weight variations would be masked by other uncontrollable variables of the test such as hammer fall distance, friction of the hammer, friction of the boring tool, etc.

Woodward-Clyde was committed to revise site work procedures for handling of NCRs prior to resumption of their work activities. At the time of this inspection, these revised procedures were not yet available (due by July 2, 1980). These procedures will be reviewed during a subsequent inspection.

IE review of the revised procedures relative to NCR resolution will be required prior to closure of this item. This infraction remains open.

80-19

(Closed) Infraction (50-498/79-19-27; 50-499/79-19-27): Failure to Control the Use of a Nonconforming Hammer for Penetration. The IE inspector reviewed the revised Woodward-Clyde procedures which now define the handling of nonconformances. Revision 2 to the Woodward-Clyde STP Quality Assurance Manual also establishes the position of Quality Assurance Monitor(s) for the purpose of reviewing, monitoring and reporting on the quality assurance of work items assigned. A Nonconformance and Corrective Action Report form generated for the purpose of reporting and processing nonconformances was also reviewed.

Previous corrective actions to this infraction have already been reviewed by the IE inspector (see Inspection Report No. 50-498/80-17; 50-499/80-17). This completes inspection of the committed corrective action.

This item is closed.

On February 5, 1980 the NRC inspector measured the inside diameter of the split-spoon cutting edge to be 1.50 inches. ASTM D-1586 requires the spoon inside diameter of the cutting edge to be 1.375 inches. Also, the required 0.75 inch taper on the end was 0.50 inches and the cutting edge was very rough. From discussions with the Woodward-Lundgren engineer responsible for logging in the borings, it was determined that he was not aware that the split-spoon should be 1.375 inches.

This failure to identify a deviation from the specified ASTM test procedures is in noncompliance with Criterion XI of 10 CFR 50, Appendix B as discussed in Appendix A of the report transmittal letter (498/79-19-28 and 499/79-19-28).

80-17

(Closed) Infraction 50-498/79-19-28; 50-499/79-19-28: Failure to Control the Dimensions of the Split Spoon in Soils Test Control. Woodward-Clyde Consultants' letter to Brown and Root, "Evaluation of Nonconformance Reports (NCR)," dated February 27, 1980, dispositioned the dimensional differences between the Terzaghi spoon used and the spoon specified by ASTM D-1586 as having no effect on the standard penetration test results. Their disposition indicates that the thinner annular wall of the shoe would, if anything, reduce driving resistance producing conservative blow count results. The length of the bevelled tip (1/2" as opposed to 3/4") was judged to have little or no influence on blow count results.

The IE inspector requested the calculations supporting the conclusions described above; however, since they were not available on site, they will be reviewed during a subsequent inspection. Unresolved Item 50-498/79-19-29; 50-499/79-19-29 incorporates the requested analysis.

On the basis that the licensee's consultant has concluded that the dimensional variations had little, if any, impact on test results, and since the Terzaghi shoe was replaced with an ASTM D-1586 shoe early in the test program, this infraction is considered closed; however, Unresolved Item 50-498/79-19-29; 50-499/79-19-29 will remain open pending review of the technical basis for blow count shear resistance calculations or disregard of Standard Penetration Test Data from tests performed with the Terzaghi shoe.

The recorded blow counts with these two deviations (i.e., hammer weight and split spoon size) cannot be compared to "Standard Penetration Test-Relative Density Curves" since they are not "standard" blow counts. This item is currently under review by Woodward-Lundgren to determine if the recorded blow counts can be transformed into "standard" blow counts. This item is considered unresolved pending review of the results of this study (498/79-19-29 and 499/79-19-29).

80-24

(Closed) Unresolved Item (50-498/79-19-29; 50-499/79-19-29): Attempt to Correlate Standard Penetration Values to Those From Oversized Blunt Spoon and Nonconforming Hammer. During NRC inspection No. 50-498/80-17; 50-499/80-17, infractions No. 50-498/79-19-27; 50-499/79-19-27 and 50-498/79-19-28; 50-499/79-19-28 were addressed by the IE inspector. These infractions involved, respectively, the apparent use of a hammer

weight and a split barrel spoon not in strict compliance with ASTM D-1586, "Penetration Test and Split-Barrel Sampling of Soils." Both infractions have been closed out (also see Inspection Report No. 50-498/80-19; 50-499/80-19). The hammer weight in question was found to be two pounds heavier than the ASTM specified weight of 140 pounds. This weight was considered a minor variation which would result in a conservative test result, if in fact, any effect were noticed. The dimensional difference between the Terzaghi spoon used and the spoon specified by ASTM D-1586 was determined as having no effect on the penetration test results. The calculations supporting the determination are the subject of this unresolved item (50-498/79-19-29; 50-499/79-19-29) and were made available to the IE inspector during this inspection. The mathematical analysis of the force required to drive the different spoon configurations was reviewed. The results of the analysis show that the small difference in spoon configuration is not a significant factor in the blow count determinations of the borings made in the STP structural backfill.

This item is closed.

During the subsequent inspection it was also learned that Boring 204, near containment building No. 2 encountered loose material near the base of the foundation mat. The extent and thickness of the area of loose material had not been determined as of February 21, 1980 but B&R indicated that this matter was being evaluated. B&R engineering indicated that there had been a slope washout at that location during August 1977 before any backfill material was placed. However, a review of PTL's inspection reports for backfill material placed in the same area met density requirements. The NRC is currently waiting for the Woodward-Lundgren subgrade verification report for that area. Pending receipt and review of this report this item is considered to be unresolved (498/79-19-30 and 499/79-19-30).

80-24

(Closed) Unresolved Item (50-498/79-19-30; 50-499/79-19-30): Boring 204, Loose Material Near Base of Unit 2 Foundation Mat. Woodward-Clyde Consultants have completed a comprehensive study of the density of backfill in Units 1 and 2. The IE inspector reviewed the report submitted to Brown & Root by Woodward-Clyde. The area of Boring 204 was extensively addressed. Twenty additional borings were taken in the adjacent area. The report submitted to Brown & Root will subsequently be reissued by Houston Lighting & Power Company in response to Section VA (2)(d) of the Show Cause Order. This response will provide information to address the adequacy of all existing backfill material. The subject of Boring 204 will be specifically addressed in the response.

This item is closed.

79-19-58

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The NRC inspector also determined from conversations with the cognizant B&R engineer initially responsible for specifying the lift thickness that 12 inch lifts had originally been specified. The lift thickness was changed to 18 inches as a result of a suggestion by the soils consultant, Woodward-Lundgren, during the review of the B&R specification. Woodward-Lundgren in making that recommendation also suggested that a test fill section should be completed to demonstrate that 18 inch lifts could be consistently compacted to the required density. This item remains unresolved pending further review (498/79-19-58 and 499/79-19-58).

80-30

(Closed) Unresolved Item (50-498/79-19-58; 50-499/79-19-58): Basis for Specification Requirement for Backfill Lift Thickness of 18 Inches. The subject of this unresolved item is an integral part of Infraction No. 50-498/79-19-18; 50-499/79-19-18, "Failure to Complete Backfill Compaction In Accordance With A Qualified Procedure." The actions taken by the licensee in response to the infraction serve to address the issue originally generated. These actions have resulted in closure of the infraction and therefore resolve this item.

This item is closed.

e. Field Activities

PTL's testing activities were observed both in the soils laboratory and in the field. PTL personnel were interviewed as to responsibilities and procedural requirements and acceptance criteria.

A laboratory relative density test was observed and was performed in accordance with the procedure. However, a review of PTL's laboratory data on relative density determinations indicated that PTL had run only dry maximum density determinations in the laboratory. ASTM D-2049-69, the reference testing standard states in Note 2 that, "While the dry method is preferred from the standpoint of securing results in a shorter period of time, the highest maximum density is obtained for some soils in a saturated state. At the beginning of a laboratory testing program, or when a radical change of materials occurs, the maximum density test should be performed on both wet and dry soil to determine which method results in the higher maximum density. If the wet method produces higher maximum densities, (in excess of one per cent) it shall be followed in succeeding tests." Therefore, the inspector requested that a maximum density test be run wet and a Modified Proctor test be run to determine if the maximum density that PTL is using to control the backfill placement is indeed the maximum density. The results of these tests indicated that the

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placement is indeed the maximum density. The results of these tests indicated that the relative wet maximum density was less than the relative dry density. In fact, the material in the relative density mold became looser under vibration with the addition of water. This matter was discussed with B&R and HL&P personnel to determine what effect this might have on the plant backfill material under earthquake conditions in view of the normal plant high water table. HL&P and B&R representatives indicated that they would look into it. The problem of possible liquefaction is considered unresolved pending completion of their review. (498/17-19-25 and 499/79-15-25)



DETAILS1. Persons ContactedPrincipal Licensee Employees

- \*R. A. Frazar, Manager, Quality Assurance
- \*R. A. Carvel, Project QA Supervisor - Civil
- \*L. D. Wilson, Project QA Supervisor - Welding
- R. J. Viens, Senior QA Specialist
- G. W. Steinmann, Lead Site Engineer - Civil
- \*T. J. Jordan, Supervisor, Quality Systems

Other Personnel

- \*W. J. Friedrich, Project QA Manager, Management Analysis Company, MAC
- L. M. Campbell, Senior Project Engineer, Woodward-Clyde Consultants
- \*R. L. Hand, Project QA General Supervisor, MAC
- B. C. Pettersson, Lead Geotechnical Engineer, Brown & Root (B&R)
- J. L. Ruud, Supervisor, Civil QA Engineering, MAC
- G. Y. Yalsley, Civil QA Engineer, MAC
- \*F. G. Miller, Project Welding Engineer, B&R
- D. Eller, Piping General Foreman, B&R
- \*D. J. Harris, Manager of Quality Engineering, B&R
- L. A. Weigel, Level III Inspector, US Testing
- \*G. L. Hall, Quality Engineering Coordinator, B&R

The IE inspectors also contacted other licensee and contractor employees including members of the QA/QC and engineering staffs.

\*Denotes those attending the exit interview.

2. Licensee Action on Show Cause Order Commitments

During this inspection, the following unresolved item identified in IE Investigation Report No. 50-498/79-19; 50-499/79-19 was reviewed:

(Closed) Unresolved Item (50-498/79-19-25; 50-499/79-19-25):  
Decrease in relative density of compacted material in wet state under vibration. Maximum density tests were conducted by Mr. C. K. Chan of the University of California, using both the wet and dry methods. The results are presented in the Independent Review Committee's "Interim Report to Brown & Root, Inc. on Adequacy of Category I Structural Backfill," dated July 12, 1980. The maximum density determined by the wet method was shown to be less than that of the dry method. The Independent Review Committee's "Status Report on Adequacy of Category I Structural Backfill," dated October 24, 1980, further addresses the matter.

density, as determined by the wet method. The dry method for purposes of such a control test. The technical justifications presented in the state report has received concurrence with the Committee's analysis that the wet method, as determined by the dry method, is valid.

This item is closed.

Licensee Action on Show Cause Suspension:

a. The IE inspector reviewed implementation of the licensee's response to the Show Cause Order by the licensee and contractor representatives and by review of items described in the attachment to HL&P letter ST-144-912 of September 18, 1980. The following commitments, utilizing the identification numbers in the attachment to the HL&P letter, were re-

(Closed) Item A26: The Task Force has completed a tabulation of density test with depth in the backfill placements and field verification of lift thickness in accessible areas. During the verification, the IE inspector discussed the field verification program on site with the Woodward-Clyde Consultant (WCC) Project Engineer. The tabulation of density test with depth was addressed in the observation of the backfill mapping being performed under the direction of the WCC Project Engineer.

(Closed) Item A32: The Independent Review Committee has reviewed all pertinent aspects of the structural backfill design studies, specification criteria, construction procedures and inspection and testing documentation. The Committee has submitted the following two reports, which address the listed backfill structures with adequate satisfactory design:

"Interim Report to Brown & Root, Inc. on behalf of the Independent Review Committee, Category I Structural Backfill," dated [redacted]

"Status Report to Brown & Root, Inc. on behalf of the Independent Review Committee, Category I Structural Backfill," dated October 24, 1980.

The final response to the Show Cause Order will incorporate both reports in a format which will address all aspects of the backfill adequacy.

(Closed) Item A91: Unresolved concerns were identified in the normal course of the review of the backfill design. The "Status Report" by the Task Force on Concrete Verification, dated August 15, 1980, was reviewed by the IE inspector. Page 11 of the report documents the Committee's "Review of Additional Concerns." This review includes NF, HL&P and

The Modified Proctor test showed a maximum dry density of 127.5 pounds per cubic foot which agreed with the values documented in the SAR. The minimum-maximum relative density values referenced by the FSAR (93.5 and 128.1 pcf) represent those values noted originally in the PSAR. These were different from those being used in the field (105.3 and 123.6 pcf). In light of discussions with PTL personnel who indicated that the material properties haven't changed during the course of the work, the inspector questioned what backfill material was tested to obtain the SAR's values. Since the values documented in the SAR's were used for liquefaction studies, further review of this matter is needed. This item remains unresolved pending this further review (498/79-19-26 and 499/79-19-26).

80-24

(Closed) Unresolved Item (50-498/79-19-26; 50-499/79-19-26): Discrepancies in Minimum and Maximum Densities of Backfill Used Versus Those Reported in the SAR for Liquefaction Analysis. The licensee response to the NRC Show Cause Order, Section (2)(b) addresses the compliance of the backfill material placed with the design basis material characteristics described in Section 2.5.4.8.3 of the STP FSAR. The backfill material placed originates from the same geologic formation and has the same gradation and particle shape characteristics as the material used in the determination of the cyclic loading characteristics. The backfill material listed in the STP FSAR had a minimum dry density of 93.5 pounds per cubic foot (pcf) and a maximum dry density of 128.1 pcf. The values observed during NRC Investigation No. 50-499/79-19; 50-499/79-19 were 105.3 pcf for minimum dry density and 123.6 pcf for maximum dry density. Computation of 80% relative density for both sets of minimum and maximum dry density values results in values of 119.27 pcf and 119.45 pcf, respectively. This shows that the dry density weights at 80% relative density are approximately identical. This value is the weight to which dynamic test specimens were compacted in the design phase liquefaction analysis. For the dry density weight at 80% relative density used, the liquefaction analysis showed a factor of safety greater than 2.5 against initial liquefaction, and greater than 3.5 for liquefaction at  $\pm 10\%$  strain. The variation, in minimum and maximum dry densities noted in NRC investigation No. 50-498/79-19; 50-499/79-19, can be attributed to subtle changes in the gradation and coefficient of uniformity which have occurred over the four years of structural backfill placement. Since this change has been shown to not significantly affect the material's engineering properties with respect to liquefaction, the liquefaction analysis performed for the design and presented in the FSAR is considered valid and applicable to the backfill material placed.

This item is closed.

(Closed) Show Cause Order, Item V.A.(2)(b): Provide Information to Address the Comparison of Materials Tested and Described in Section 2.5.4.8.3 of the FSAR Addressing Liquefaction With Those Used in the Field. The licensee's response was reviewed and found to resolve the apparent discrepancy in densities of material used in the design with those placed. The apparent discrepancy was caused by a failure to compute the 80 percent relative density values for purposes of comparison.

- 18 -

Computation of this value, which was used in the liquefaction analysis results in a 0.18 pound difference between the design 80 percent relative dry density and the field 80 percent relative dry density. This issue is further addressed in this report in the closure of Unresolved Item No. 50-498/79-19-26; 50-499/79-19-26. Based on the IE inspector's review, the liquefaction analysis performed for the design and presented in the FSAR is considered valid and applicable to the backfill material placed.

This item is closed.

U. S. NUCLEAR REGULATORY COMMISSION  
REGION III

TRANSMISSION SERVICE REQUEST

OUTGOING

DATE: <u>8/7/80</u> NO. OF PAGES <u>10</u>	METHOD OF TRANSMISSION: Facsimile <input checked="" type="checkbox"/> Mag Card _____
TO - NAME <u>Wayne Reinhardt, TE:40</u>	FOR WPU USE ONLY
LOCATION: E/W Towers <input checked="" type="checkbox"/> Silver Springs _____ Landow _____ H Street _____ Phillips _____ H Street _____ RI _____ RII _____ RIV _____ RV _____	
OTHER _____ (Designate - include fax number)	Rapifax _____ 3-M _____ Setting (min/sec) _____ FTS _____ Commercial _____ Time Started _____ Time Completed _____ By (Operator) _____
DESCRIPTION: <u>HL + P's Response</u>	
FROM: <u>Rosa B Landsman Contr.</u> <u>Branch, Region III</u>	

INCOMING

TE: _____ NO. OF PAGES: _____	METHOD OF TRANSMISSION: Rapifax _____ 3-M _____ Mag Card _____
DESCRIPTION: _____	
NAME (NAME/LOCATION): _____	Time Completed _____
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OTHER _____	

DEPOSITION  
EXHIBIT  
LANDSMAN 12

10/79

A-12

## HLdP's Response

### Item 23 Test Fill Program

p. 2-8 ✓ Can not make final judgement on test fill without reviewing Test Fill Report. During June inspection, HLdP was still doing field work on the test fill so the report was not available for review.

✓ Also, the Independent Review Committee's final report must be reviewed before making final judgement on item 23.

p. 2-9 The self-imposed test fill program is still invalid for the reasons listed in inspection report 79-19.

p. 2-10 The response only addresses the June 1980 test fill, what about the other two 1980 test fills. Why were there several test fills in 1980?

p. 2-11 (1) The response states "a uniform density distribution was achieved" however

it fails to state that the density is below the required 80%.

(2) The response states "the zones specified... for testing... are... representative... there is no engineering need to set specific testing depths." The zones were specified only after the NRC cited H&P for not specifying anything. The majority of fill was placed without any depth specified, i.e. random testing depth.

(3) The response states "After 10... passes... the ~~density~~ lower and middle portions of the surface... lift are representative of the density... in the underlying lift." They fail to state that this density is only 70%.

General

As addressed in inspection report 80-17, the differences between the test fill placement and

compaction and the production placement and compaction were not discussed, i.e.

- a) water application method
- b) surface protection
- c) vibration frequency control

Their results indicate that after 12 passes the top of the underlying lift is still at 70% relative density, please explain how this is within the 80% specified?

Please explain why the raw data plot of 12 passes (obtained during June Inspection) has changed in final plot - Figure 5 - 12 passes - data point in middle of test lift #1 has shifted from 120.5 lb/ft<sup>3</sup> to 121.8 lb/ft<sup>3</sup>.

Please explain why after 12 passes, densities only reached ~80% relative while production densities averaged 95% relative.



How many passes of compaction equipment are required to achieve 95% relative density.

Also please explain why 24 passes were required on the base lift of the June 1980 test fill?

### Item 2b Description of Fill Material

General Address the potential for the wet maximum densities (performed during the June inspection) being higher than the dry maximum densities? These higher values should affect all in place density tests since they would reduce the percent relative density obtained in the field.

### Item 2c Construction Sequence

General Can not make final judgment without reviewing "comprehensive Engineering evaluation" which is

not yet completed.

Address the adequacy of past activities (i.e. no defined testing depth) on verification of fill compaction (noncompliance 7919-21)

Address noncompliance 7919-24, the fact that lift thicknesses and number of roller passes were never recorded.

Item 2d Adequacy of Existing Backfill

2.2-29

✓

Analysis done for 4 inches of loose material under mats, please address 9 inches of loose (±5% relative density) underneath mats.

Can not make final judgement without reviewing Boring Report which was not available during June inspection.

Within Boring Report, the engineering evaluation of the

non ASTM spoon should be discussed as reported in inspection report 80-17.

2-30

Exactly how large is the area west of Unit #2 containment and what's going to be done about it.

Item 2e Rationale of Construction Procedures

General

They missed the point. The point is, where did the 8 pass criteria come from?

Item 10

FSAR Description

2-35

The response states "QC inspectors recorded the observations on checklists", please provide samples of checklists and who recorded them? The inspector determined that these observations were never recorded, or in the case of roller passes were never observed.

7

as discussed on inspection report 7919.

## Committee's Interim Report

- general Cannot make final judgement without seeing final Report
- 8 Report states "knowledgeable site personnel interviewed all reported that 16 to 20 or more passes was generally obtained". Please, we would like names of knowledgeable people since all the cognizant personnel interviewed during report 79-19 indicated that they had "no idea" of how many passes were made since nobody ever watched or counted.
- 11 Please discuss <sup>how</sup> the wet maximum density tests performed during the June inspection affect the Report statement "the wet method used for one sample had a lower maximum density than by the dry method"
- 15 Please present a technical analysis of evaluation of spoon dimensional differences instead of "judgments".

Infraction 7919-28 was closed based upon the inspectors being told that only 2 or 3 borings were drilled with the wrong spoon. The report states that 12 borings were drilled with this spoon. It was also closed based on the promise that an engineering evaluation of spoon size and shape would be made.

16417

Please provide construction records for Area #1 which substantiate report statements since the inspector could not locate any written documents to that effect while on site.

24

In view of the statement "there is not a significant difference between 8 and 12 passes for densities" please explain obtaining 95% relative density in the field when 12 passes only reached 80% density.

5 " Below the upper portion of the top lift and final lift, there is uniformity of compacted density " The results do not substantiate this statement in that the density in the upper lift<sup>#2</sup> is less than the lower lift #1.

0 ✓ 4" ? What is assumed 45% density layer thickness used in analysis

5 Please address a 0-10" layer of 45% density in the liquefaction analysis not a 4" layer of 45% and a 4 to 10" layer of 60% density since we all agree that the top half of the surface lift "cannot" be compacted and it is sitting under the Cat I buildings.

# HL&P's Response Review

8/7/80

B 57  
1  
358

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as discussed in inspection report 79-19

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What is assumed 45% density layer thickness used in analysis

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Houston Lighting & Power Company

Audit 505-401

BLIND CC LIST: D. R. Keating  
J. W. Estelle  
P. W. Ratter  
C. L. Grover  
~~Z. K. Logan~~  
R. H. Jennings  
D. G. Long  
B. S. Norris

DEPOSITION  
EXHIBIT  
LANDSMAN 13  
A-13

**The Light  
company**

Thompson Lighting &amp; Power P.O. Box 17100 Houston, Texas 77244 (713) 224-9211

May 3, 1984

ST-HS-YQ-00805  
File No.: Q16.4Mr. L. W. Hurst  
Project QA Manager  
Bechtel Energy Corporation  
P.O. Box 15  
Bay City, Texas 77414SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
PROJECT AUDIT REPORT S05-401

Dear Mr. Hurst:

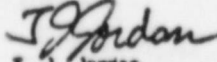
Attached is the Project Audit Report for Category I Backfill Activities including ECU, Audit Number S05-401, conducted on March 26 through April 3, 1984. The results are summarized as follows:

	<u>TOTAL</u>	<u>BEC</u>	<u>ESI</u>	<u>PTL</u>
*Number of Items Reviewed:	696			
*Number of Deficiencies:	53	22	15	16
*Number of Concerns:	8	2	4	2
*Number of CARs:	16	10	4	2
*Number of DRs:	7	2	1	4
*Number of NCRs:	1	0	1	0

All deficiencies and concerns identified that required a response were issued to Bechtel on April 10, 1984, Corres. Number ST-HS-YQ-00761.

Bechtel Quality Assurance is requested to distribute the appropriate sections of this audit report to Ebasco and Pittsburgh Testing Laboratory.

Sincerely,

  
 T. J. Jordan  
 Project QA Manager  
 South Texas Project
TJJ/JWE/SSB:lr  
Attachment

## Houston Lighting &amp; Power Company

Mr. L. M. Hurst  
ST-HS-YO-00805  
Page 2

cc: G. W. Oprea, Jr.  
J. E. Geiger  
D. G. Barker  
R. J. Maroni  
S. H. Dew  
J. W. Williams  
R. L. Ulrey  
E. A. Turner  
A. R. Beavers  
J. G. Dewease  
J. H. Goldberg  
L. B. Morrigan  
R. P. Murphy  
T. H. McGriff  
D. T. Krishna (BPC)  
B. L. Lex (BEC)  
R. V. Miller (BEC)  
K. R. Dotterer (BEC)  
B. R. McCullough (BEC)  
C. L. Hawn (ESI) w/o attachment  
J. Crnich (ESI) w/o attachment  
L. B. Triplett (PTL) w/o attachment  
Audit File 505-401  
STP-RMS (2) w/o attachment  
Site Library

## SOUTH TEXAS PROJECT AUDIT REPORT

Page 1

AUDIT: No. SDB-407  
Category I Backfill  
Activities including ECM

AUDIT DATES:  
March 26-April 3, 1984

AUDITED ORGANIZATIONS:  
Bechtel Energy Corporation  
P.O. Box 15  
Bay City, Texas 77414

AUDIT TEAM:  
T. H. McGriff (Team Leader)  
C. L. Grover (Auditor)  
T. K. Logan (Auditor)  
R. N. Jennings (Tech. Spec.)  
D. G. Long (Tech. Spec.)

Ebasco Services, Inc.  
P.O. Box 1647  
Bay City, Texas 77414

Pittsburgh Testing Laboratories  
P.O. Box 15  
Bay City, Texas 77414

*Thomas H. McGriff* March 3, 1984  
Lead Auditor Date

*D. K. Grover* 5-3-84  
Audit Supervisor Date

## PERSONNEL CONTACTED:

Name	Title	Pre-Audit	During Audit	Post Audit	
				Site	Houston
E. B. Luder	BEC Lead QA Engineer	X	X	X	
L. B. Triplett	PTL Manager	X	X	X	
G. M. Morgan	BEC QA Engineer	X	X		
R. G. Schulman	BEC Lead Site Engineer (Civil)	X	X	X	
J. M. Little	BEC Site Quality Engineer	X	X		
J. R. Gebhardt	BEC Geotechnical Engineer			X	X
J. V. Williams	M&P Site Manager			X	
L. Yao	BEC Soils Group Supervisor			X	X
J. Talmage	BEC Geotech Coordinator			X	X
J. L. Barker	M&P Site Engineer			X	
E. M. Smith	BEC Reservoir Coordinator				X
T. Hitchman	BEC Lead Contracts Coordinator		X	X	
G. C. Gunkal	BEC QC Engineer		X	X	
C. J. Staffeld	BEC QC Engineer		X	X	
W. J. Putrell	BEC Site Project Engineer (Civil/Structural)			X	

Audit Report SOS-401

Page 2

## PERSONNEL CONTACTED: (CONTINUED)

Name	Title	Pre-Audit	During Audit	Post Audit	
				Site	Hours/Con
K. W. Miller	BEC Project QA Engineer (Site)			X	
F. W. Joyce	BEC QA Engineer		X	X	
R. G. Peck	ESI QA Site Supervisor		X	X	
J. R. Downs	BEC Deputy Manager Construction			X	
A. K. Priest	BEC Project Manager Construction			X	
J. E. Geiger	HL&P Manager, QA				X
G. B. Jones	BEC Assistant Project Manager (Quality Services)				X
K. R. Dottarer	BEC Project QA Engineer (Houston Design Office)				X
H. E. Powell	HL&P Lead Engineer				X
R. R. Hernandez	HL&P Supervising Project Engineer				X
R. L. Rogers	BEC Project Engineering Manager				X
J. L. Hurley	BEC Project Engineer				X
D. W. Halligan	BEC Vice President, Program Manager				X
J. H. Goldberg	HL&P Vice President, Nuclear Engineering and Construction				X
D. G. Barker	HL&P Project Manager				X
S. M. Dew	HL&P Engineering Manager				X
T. J. Jordan	HL&P Project QA Manager				X
J. A. Stevens	ESI Lead QC (Soils)		X		
E. S. Smith	ESI Quality Control		X		
J. E. Peel	ESI Quality Control		X		
W. M. Senn	BEC Lead QC Engineer (Receiving)		X		
J. E. Barlow	BEC Material Control Supervisor		X		
W. P. Priest, Jr.	BEC Receiving Supervisor		X		
J. C. Ford	BEC Warehouse Supervisor		X		
D. O. Dubose	BEC Procurement Supplier Quality Supervisor		X		
R. N. Christian	ESI Lead Civil Engineer, BOP		X		
A. J. Bloenberg	BEC Civil Superintendent		X		
W. E. Nifong	BEC Supplier Quality Representative		X		
M. U. Boston	ESI Record Specialist		X		
S. R. Dana	ESI Lead Civil QC Engineer X		X		X
D. R. Keating	HL&P Project QA General Supervisor				X
D. F. Bednarczyk	HL&P Project QA Supervisor, Civil/Structural				X

Audit Report SOB-401

Page 3

PURPOSE/SCOPE OF THE AUDIT:

To verify proper translation of FSAR technical and quality requirements for Category I and ECI Backfill operations into design disclosure documents and implementing procedures. Additionally, implementation of these requirements associated with material receipt, construction activities, inspection, and testing is included. Also, the audit included a review of Bechtel Contract letters to PTL to assess design change impact.

AUDIT SUMMARY:

Bechtel Energy Corporation

Bechtel's performance was judged unacceptable based on the large number of deficiencies identified. Two areas of major importance were identified:

- 1) The translation of FSAR technical and quality requirements to design disclosure documents and implementing procedures is deemed unacceptable based on the large volume of FSAR violations/unapproved exceptions discovered.
- 2) Bechtel Quality Control is not implementing procedures to assure the quality of daily backfill activities. Receiving Inspection of Category I Backfill material as well as Effectiveness Inspections and Quality Control Surveillances of daily backfill activities, were all found to be inadequate in verifying implementation of requirements.

It is recommended that Bechtel assess the impact on ongoing work as well as evaluate the impact of the deficiencies on past work. Additionally, it is recommended that Bechtel review the evaluation methods used which ensure technical and quality commitments are adequately translated and tracked through design documents to implementing procedures and subsequently into actual work practices.

Ebasco Services, Inc.

Ebasco's performance was judged satisfactory except for the noted deficiencies which included two important items which were identified prior to this audit. (See ESI deficiency numbers 3 and 4). Greater attention to specification requirements and translation of those requirements to implementing procedures is recommended.

Pittsburgh Testing Laboratory

PTL's performance was judged satisfactory except for the noted deficiencies. Greater attention to detailed requirements contained in PTL procedures and ASTM testing procedures is recommended.

DEFICIENCIES:Bechtel Energy Corporation

- 1) Specification 2Y060YS044 invokes ARSI B45.2.6-1973 only and does not include Regulatory Guide 1.58 (Rev. 0, CS/73) as modified by positions C.5, C.6, C.7, C.8, and C.10 of Revision 1. (QAPD Part A requirement).  
HL&P CAR G-403 issued.
- 2) Specification 3Y069YS0043 does not require at least one relative density sample per shift to be obtained from the compacted backfill. This is a FSAR requirement.  
HL&P CAR G-404 issued.
- 3) Specification 3Y069YS0043 requires tests to be performed a minimum of once per an eight hour work day. The FSAR requires this frequency of test be per work shift.  
HL&P CAR G-404 issued.
- 4) Specification 3Y069YS0043 does not contain the FSAR requirement to obtain a minimum of three in-place density tests within each tested subgrade area.  
HL&P CAR G-404 issued.
- 5) PTL has been allowed to take exception to the hydrometer portion of ASTM D422-63 for Category I Structural Backfill, but the FSAR and Specifications 2Y060YS044 and 3Y069YS0043 do not make this exception.  
HL&P CAR G-405 issued.
- 6) The FSAR requires two bulk density determinations for each new bag of sand used for sand cone tests. The Specifications and PTL implementing procedures do not incorporate this requirement.  
HL&P CAR G-405 issued.
- 7) The FSAR requires bulk density sand to have 100% passing the No. 10 sieve and none passing the No. 200 sieve. This is an additional requirement to ASTM D1556-64, which is not incorporated into the Specifications or PTL implementing procedures.  
HL&P CAR G-406 issued.
- 8) No objective evidence was provided to show what changes were made to specifications and procedures to satisfy compliance with On-Going Show Cause Item YA(2)MS.  
HL&P CAR G-406 issued.



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DEFICIENCIES: (CONTINUED)

- 9) No objective evidence was provided to show what documentation has been generated by ESI and PTL to ensure compliance to On-Going Show Cause Item VA(2)M9.  
HL&P CAR G-406 issued.
- 10) Specification 3Y069Y50043 does not contain the FSAR commitment to obtain one sample for Relative Density testing (ASTM D2049-69) for the Category I backfill stockpile for each 20,000 cubic yards delivered.  
HL&P CAR G-407 issued.
- 11) The Receiving Inspection procedure, MPP/QCI-4.0, Revision 5 does not describe the process, methodology, specific document requirements, and the approval/release process employed when Category I backfill material is received on-site as Class 9 and subsequently upgraded to Class 3.  
HL&P CAR G-409 issued.
- 12) Personnel other than those assigned by the Receiving Supervisor are performing receiving functions for in-coming Category I backfill material (Construction personnel are performing this function).  
HL&P CAR G-411 issued.
- 13) "Hold for Receiving Inspection" tags are not applied to in-coming Category I backfill stockpiles up to the point of QC acceptance.  
HL&P CAR G-411 issued.
- 14) Receiving QC personnel have been stamping the "Accept" column of the Receiving Inspection Report (RIR) for Task No. 1.2, which requires a visual inspection for cleanliness of in-coming Category I backfill material, even though these personnel have not performed the required visual inspection.  
HL&P CAR G-411 issued.
- 15) The cognizant Supplier Quality Representative of Field Procurement, is not signing and dating MRR's for in-coming Category I backfill material as required.  
HL&P CAR G-411 issued.
- 16) Quality Control has not performed an Effectiveness Inspection of Category I backfill activities since October, 1982, a period of approximately 16 months.  
HL&P CAR G-410 issued.

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DEFICIENCIES: (CONTINUED)

- 17) Quality Control has not performed a surveillance of Category I backfill activities since the original issue of that procedure in October, 1983, a period of approximately 5 months.  
HL&P CAR G-410 issued.
- 18) The Contracts Manager issued a revision to specification requirements regarding the frequency of stockpile sampling by correspondence rather than by an approved design change document.  
HL&P CAR G-417 issued.
- 19) No objective evidence was provided to show approval by the Construction Manager of compaction control criteria to be utilized as required by Specification 2Y060YS044.  
HL&P CAR G-418 issued.
- 20) No evidence was provided to show that compaction control criteria was submitted prior to use as required by Form G-321-E, included as an attachment to Specification 2Y060YS044.  
HL&P CAR G-418 issued.
- 21) A Receiving Inspection Report (RIR) listed the wrong Material Receiving Report (MRR) number.  
HL&P DR-164 issued.
- 22) Testing frequencies are not directed by both the Constructor and the Construction Manager as required by Specification 2Y060YS044.  
HL&P DR-168 issued.

Ebasco Services, Inc.

- 1) The Quality Control Soils Inspection procedure does not provide criteria on density variation with depth to enable QC to determine the correct location for testing as required by Specification 3Y069YS0043 and the FSAR. Therefore, the field test elevation selection process does not give representative density information for all depth intervals within the lift.  
HL&P CAR G-415 issued.
- 2) The Soils Inspection procedure does not require test depths to be recorded and thus no evidence, in general, can be provided to demonstrate backfill installed by ESI has been tested at the required depths. Specifically, no evidence exists to demonstrate tests below the 20 inch diameter ECM pipes are taken at a depth of 7-inches below the invert. Additionally, test depth information is not provided to PTL.  
HL&P CAR G-415 issued.

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DEFICIENCIES: (CONTINUED)

- 3) The average minimum/maximum values obtained during the Relative Density determination were not applied in accordance with Specification 3Y069Y50043.  
Previously identified by BEC CAR F-302.
- 4) Backfill lifts are not tested prior to placing new material (i.e., the next lift).  
Previously identified on ESI QFR-1 of Audit EQA-090.
- 5) Quality Control has not obtained the BEC Foundation Verification Engineer's signature on backfill inspection reports to provide evidence that BEC has performed geologic mapping and accepted natural subgrade when encountered during the construction of safety-related duct banks and manholes.  
HL&P CAR G-414.
- 6) Compaction for local excavations for density testing within the fill was not performed as it was for the original placement.  
HL&P CAR G-412 issued. Additionally, NCR AC-00051 was issued to identify a hardware deficiency.
- 7) Quality Control was not notified by construction personnel that local excavations for density tests within the fill had been backfilled, compacted, and were ready for inspection.  
HL&P CAR G-412 issued. Additionally, NCR AC-00051 was issued to identify a hardware deficiency.
- 8) The Soils Inspection procedure does not require verification/inspection to insure the gradation and distribution of materials in the compacted areas is such that the backfill or fill is not segregated.  
HL&P CAR G-413 issued.
- 9) The Soils Inspection procedure does not require verification/inspection to insure fill surfaces are constructed so water will readily drain off at all times.  
HL&P CAR G-413 issued.
- 10) The Soils Inspection procedure does not require verification/inspection to insure compaction is not allowed within 300 feet of an area where in-situ density tests are being performed.  
HL&P CAR G-413 issued.
- 11) The Soils Inspection procedure does not require verification/inspection to insure if concrete mats and basement walls have been waterproofed, and that backfilling is performed so that the

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DEFICIENCIES: (CONTINUED)

protective waterproofing material is not damaged.

HL&P CAR 6-413 issued.

- 12) The Soils Inspection procedure does not require verification/inspection to insure backfill adjacent to structures or over portions of foundations is placed and compacted symmetrically and uniformly in a manner to prevent eccentric loading or unbalanced pressure upon or against the structures.

HL&P CAR 6-413 issued.

- 13) Verifications performed during the qualification program for Wacker vibratory plate compactors are not procedurally required to be recorded on the referenced "Attachment L".

HL&P DN-170 issued.

- 14) Verifications performed during the Test Fill for Qualification of Various Hand Operated Compactors are not procedurally required to be recorded on the referenced "Attachment B".

HL&P DN-170 issued.

- 15) No letter of approval from BEC Engineering for the results of the fill program for hand propelled vibratory plate compactors was contained in the document package.

Corrected during the audit.

Pittsburgh Testing Laboratory

- 1) Category I backfill samples are not prepared for testing as described in ASTM D421-58.

HL&P CAR 6-416 issued.

- 2) The length of mechanical sieving time and the thoroughness of sieving, as required by ASTM D422-63, has not been determined or documented.

HL&P CAR 6-416 issued.

- 3) Category I backfill samples passing the No. 10 sieve are not washed over a No. 200 sieve as required by ASTM D422-63.

HL&P CAR 6-416 issued.

- 4) The hardness of Category I backfill material is not recorded as required by ASTM D422-63.

HL&P CAR 6-416 issued.

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DEFICIENCIES: (CONTINUED)

- 5) Bulk density determinations for density sand utilized in sand-cone tests are not performed in strict compliance with the procedure described in ASTM D1556-64.  
ML&P CAR G-416 issued.
- 6) The volume of the mold utilized in the Relative Density determination is not calibrated in strict compliance with the procedure described in ASTM D2049-69.  
ML&P CAR G-416 issued.
- 7) Initial dial gage readings obtained during the maximum portion of the Relative Density test are not obtained as described in ASTM D2049-69.  
ML&P CAR G-416 issued.
- 8) "Match Marks" are not utilized when dial gage measurements are made during the maximum density portion of the Relative Density tests as required by ASTM D2049-69.  
NOTE: "Match Marks" are to be utilized so the measurements can be made in the same relative position for each maximum density determination.  
ML&P CAR G-416 issued.
- 9) Sample material is not placed in the mold for Relative Density determinations in strict compliance with the requirements of ASTM D2049-69.  
ML&P CAR G-416 issued.
- 10) No written procedure or instructions (by PTL) exist for sampling backfill material from the stockpiles.  
ML&P CAR G-408 issued.
- 11) The procedure used for determining the bulk density of sand utilized in sand cone tests does not adequately describe how the sand from different bags is thoroughly blended to ensure zones of different bulk density do not result within the container.  
ML&P DR-169 issued.
- 12) The method used (scoop or funnel) for determining the minimum density portion of the Relative Density tests is not recorded.  
NOTE: FCR 103 was generated by PTL on 01/26/84, requesting Bechtel's approval to incorporate this requirement. No such approval has been received to date.  
ML&P DR-167 issued.

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## DEFICIENCIES: (CONTINUED)

- 13) Retests reference the original test number but not the original report number and the retests are not filed with the original report as required by PTL Procedure QC-DC-1, Revision 11.  
MLSP DN-166 issued.
- 14) PTL procedure IS-S10-S049-69 references a superceded procedure for relative density table calibration rather than the current procedure in use.  
MLSP DN-165 issued.
- 15) Samples were being temporarily retained without appropriate status indicator tags.  
Corrected during the audit. No further action required.
- 16) A Relative Density table calibration was documented on a superceded form.  
Corrected during the audit. No further action required.

## CONCERNS:

- 1) No methodology has been devised to date to correct erroneous documentation (i.e., logs, inspection reports, test reports) or to cross-reference the accurate recalculations which were addressed by BEC CAR F-302.  
A response from Ebasco is required.
- 2) It is unclear how ESI QC determines which Category I backfill material source type is encountered (i.e., TH2, TXI, Parker Bros., etc.) at the required subgrade elevation during excavation to enable QC to accept the material as subgrade prior to subsequent backfilling or concreting operations.  
A response from Ebasco is required.
- 3) The control criteria (i.e., Relative Density Max/Min) is not consistent for all test fill programs. The sampling requirements and data application for Relative Density determinations is prescribed differently in ESI QC Procedure QCP-10.10 for "The Correlation Test Fill" (no requirements), "the Wacker vibratory plate compactor qualification program" (one R.D. taken on the top lift after application of eight one-way passes), and the "Test Fill for Qualification of various hand operator compactors" (running average of the last five maximum/minimum Relative Densities). Where "the average of the last five Max/Min Relative Densities" is mentioned it is unclear if this refers to production averages, or to what source material. Additionally, it is unclear why no requirements have been included in the "Correlation

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CONCERNS: (CONTINUED)

Test Fill" procedure for control criteria, R.D. sampling, or application of R.D. Max/Min results.

A response from Ebasco is required.

- 4) Bechtel Specification 3Y069YS0043, Revision B, paragraph 7.8.12 states in part, "... For the final lift of a backfill operation, density tests shall be performed within two inches of the surface elevation . . ."

FSAR paragraph 2.5.4.5.6.2.3 states in part, "The top lifts to be located immediately below foundations are tested at depths between 6" and 12", regardless of lift thickness."

While it appears the current specification exceeds FSAR requirements for surface density tests, the specification conflicts with the description in the FSAR.

A response from Bechtel is required.

- 5) Inspection/verifications indicated in ESI QC Procedure QCF-10.10, Sections 5.2 and 5.3 are recorded on the Daily Backfill Inspection Report under "generic" checkpoints (i.e., Excavation, Compaction, etc.). Each "generic" checkpoint includes only one acceptance for several specific attributes. From the Backfill Inspection Report, it cannot be determined that each specific attribute contained in the procedures has in-fact been verified.

A response from Ebasco is required.

- 6) There is no traceability of acceptance tests to shipments of Category I backfill material other than the date of the test and the time (am or pm). As a result, it is not possible to determine if PTL is meeting the minimum test frequency (each 500 yards) prescribed in Specification 3Y069YS0043.

Additionally, this same concern applies to the bulk density determination performed on density sand for sand cone (in-place density) tests. It is not possible to determine if all bags of Ottawa sand received in a shipment have been tested.

A response from Pittsburgh Testing is required.

- 7) Review and approval of PTL generated FCRs (to PTL procedures) by BEC appears to take an excessive amount of time which could impact on-going activities. FCRs containing changes which are minor in nature and do not require extensive study or review have not been responded to by BEC for over one month. The following are examples: PTL FCR No. 097 (submitted to BEC 01/26/84), PTL FCR No. 098 (submitted to BEC 01/31/84), PTL FCR No. 103 (submitted to BEC 02/16/84), and PTL FCR No. 099 (submitted to BEC 01/31/84). PTL FCR No. 099 adds requirements to test for weight of rebar, a test requested to be performed as directed by BEC. As of April 2, 1984, these FCRs have

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## CONCERNS: (CONTINUED)

not been approved by BEC. Furthermore, as of May 2, 1984, only one of the four PTL FLRs has been approved.

A response from Bechtel is required.

- 8) PTL Procedure QC-AD-1, "Quality Assurance Program Addendum", is not referenced or addressed in other PTL implementing procedures. This procedure "modifies requirements in PTL Quality Control Procedures."

One of five PTL personnel questioned, as to the purpose and scope of AD-1, knew this procedure was an addendum to other PTL procedures utilized for STP. It is noted that PTL Manuals reviewed at the site testing laboratory contained hand written changes to the affected sections.

A response from Pittsburgh Testing is required.

## RECOMMENDATIONS:

In addition to the initial recommendations made previously in the summary of this audit report, the following are offered for consideration:

- 1) The Bechtel Quality Control Department should be evaluated to determine the root causes of their lack of involvement in controlling the quality of Category I backfill activities.
- 2) Quality Records generated as a result of inspections and tests must provide accurate information and reliability as to the quality of installed items. Erroneous documentation should be corrected per proceduralized requirements. (Concern No. 1)
- 3) Since different source types of backfill material may be encountered, a proceduralized method for determining which source type material is being inspected/tested should be devised to provide confidence the material is in fact the type documented by ESI QC and PTL. (Concern No. 2)
- 4) Since test fill and qualification programs are established to approximate actual field practices and demonstrate acceptable construction methodology and equipment performance in obtaining the desired acceptance of material, the control criteria (i.e. Relative Density determination) applied should be consistent for all test fill and qualification programs performed. (Concern No. 3)
- 5) Since the specification for testing the surface lift for compaction appears more conservative than the FSAR, the FSAR section should be considered for possible revision. (Concern No. 4)
- 6) The Backfill Inspection Report should be revised to include reference to the specific paragraph containing the attributes which are inspected/verified under each "generic" checkpoint. This could be provided



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**RECOMMENDATIONS: (CONTINUED)**

- adjacent to or in the block which identified each "generic" inspection checkpoint. (Concern No. 5)
- 7) Acceptance tests for incoming backfill materials should reference the load ticket numbers and date on the load tickets to provide traceability to specific shipments. (Concern No. 6)
  - 8) Tests for bulk density sand should reference specific shipments to insure traceability. (Concern No. 6)
  - 9) Bechtel should evaluate the contractor FCR system and determine how the system could be enhanced to reduce approval times and subsequent notification to the contractor for implementation. (Concern No. 7)
  - 10) PTL Procedure QC-AD-1 should be referenced in such that personnel utilizing PTL procedures are aware that modifications to requirements contained in those procedures are included in QC-AD-1. (Concern No. 8)

**ATTACHMENT:**

HL&P CAR: G-403, G-404, G-405, G-406, G-407, G-408, G-409, G-410, G-411  
G-412, G-413, G-414, G-415, G-416, G-417, G-418; all Revision G

HL&P DN: 164, 165, 166, 167, 168, 169 and 170

HL&P NCR: AC-00051

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The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. C-403  
(2) REVISION 1

(3) ORGANIZATION BEC Engineering (4) DEF REQUIRED  YES  NO (5) RESPONSE DUE DATE 10-20-84  
(6) DOCUMENT VIOLATED See continuation sheet (7) REV. 9/24/84  
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY See continuation sheet; See continuation sheet

1 See continuation sheet.

(8) INITIATOR [Signature] DATE 4/9/84  
(9) SUPERVISOR/LEAD AUDITOR Thomas W. Hill DATE 4/7/84  
(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
(13) CAUSE OF CONDITION

3 (14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE (17) HLP INITIATOR  ACCEPT  REJECT  AWAYED SUPERVISOR/LEAD AUDITOR DATE

AMENDED RESPONSE (18) CORRESPONDENCE NUMBER

(19) VERIFICATION COMPLETED (20) ACCEPT  REJECT  SUPERVISOR/LEAD AUDITOR DATE

4 (21) VERIFICATION ACTIONS TAKEN

(22) HLP CLOSURE (P.O.#) \_\_\_\_\_ DATE \_\_\_\_\_

- 2 - 1

MLAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-403  
(2) REVISION 1

BLOCK (6) DOCUMENT VIOLATED (CONT)

EDP-4.49, "Project Specifications", Rev. 4

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Paragraph 2.3 of EDP-4.49 states in part, "Personnel preparing specifications shall review the requirements to ensure applicable requirements are addressed.

- b. Applicable codes, standards, and regulatory requirements.
- f. Project Quality Program Requirements."

QAPO, Rev. 5, Part A, Table 1 (Also POAP, Rev. 3, Table 2.2) state in part that the qualifications of Inspection, Examination and Testim personnel conform to ANSI M45.2.6-1973 and R.G. 1.53 (Rev. 0, 8/73) as modified by positions C.5, C.6, C.7, C.8, and C.10 of Rev. 1.

However, to the contrary, BEC Specification 3106070-2, "Field and Laboratory Testing of Earthwork Construction" (also PTL Procedure QC-PD-2) only implies ANSI M45.2.6-1973 and does not permit conformance to R.G. 1.53 (Rev. 0, 3/73) as modified by positions C.5, C.6, C.7, C.8, and C.10 of Rev. 1.

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ISAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. 403

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

NOTE: Regulatory Guide positions impose stringent requirements at least in two areas as compared to ANSI NMS.2.6-1973:

a) Type of experience

b) Requiring documented objective evidence (i.e., procedures and record of written test) in the event capability demonstration is the criteria for personnel certification.

The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(11) CAR No. *G-404*  
(12) REVISION *1*

(3) ORGANIZATION *BEC Engineering & QA* (4) DEF REQUIRED *YES* (5) RESPONSE DUE DATE *04-20-84*  
(6) DOCUMENT VIOLATED *See Block (7)* (8) REV *See Block (7)* (9) PARA *See Block (7)*  
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1 *See continuation sheet.*

(8) INITIATOR *[Signature]* DATE *4/19/84*  
(9) SUPERVISOR/LEAD AUDITOR *William H. [Signature]* DATE *4/17/84*  
(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
(13) CAUSE OF CONDITION

3 (14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE (17) H&P INITIATOR  ACCEPT  REJECT  AWARDED SUPERVISOR/LEAD AUDITOR DATE

AMENDED RESPONSE (18) CORRESPONDENCE NUMBER (19) H&P INITIATOR  ACCEPT  REJECT  AWARDED SUPERVISOR/LEAD AUDITOR DATE

4 (20) VERIFICATION COMPLETED  YES  NO SUPERVISOR/LEAD AUDITOR DATE

(21) VERIFICATION ACTIONS TAKEN

(22) H&P QA CLOSURE (PASS) \_\_\_\_\_ DATE \_\_\_\_\_

2 - 2 - 2

MLP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-404

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

1) FSAR paragraph 2.5.4.5.6.2.4 states in part, "Whenever fill or backfill was placed during a work shift, at least one field test was conducted during the shift and a sample for laboratory relative density testing was obtained, provided that the compaction was completed in some area."

Contrary to the above, BEC Specification JYC69YS0043, Rev. R, requires:

- a) One test per eight hour work day and,
- b) Does not require sampling for laboratory relative density testing.

2) FSAR paragraph 2.5.4.5.6.2.5 states in part, "For subgrade preparations, a minimum of three additional in-place tests had to be performed within each tested area."

Contrary to the above, BEC earthwork specifications do not contain the above quoted requirements for subgrade preparation.

NOTE: BEC response must address the impact of the above deficiencies on the fill/backfill placed to date and future MR(s) accordingly.

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<b>The Light Company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOLSTON LIGHTING & POWER		(11) CAR No. <i>G-405</i>
		QUALITY ASSURANCE CORRECTIVE ACTION REPORT		(12) REVISION <i>1</i>
(3) ORGANIZATION <i>ELC</i>	(4) DEF REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	(5) RESPONSE DUE DATE <i>8-1-84</i>		
(6) DOCUMENT VIOLATED <i>See Block (7)</i>	REV. <i>See Block (7)</i>	PARA <i>See Block (7)</i>		
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY				
<i>1 See continuation sheet.</i>				
<i>2</i>				
(8) INITIATOR <i>[Signature]</i>	DATE <i>4/7/84</i>			
(9) SUPERVISOR/LEAD AUDITOR <i>[Signature]</i>	DATE <i>4/17/84</i>			
(10) REMEDIAL ACTION				
<i>3</i>				
(11) SIGNATURE				
DATE		(12) EFFECTIVE DATE		
(13) CAUSE OF CONDITION				
<i>3</i>				
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE				
<i>3</i>				
(15) REVIEW AND APPROVAL				
DATE		(16) EFFECTIVE DATE		
ORIGINAL RESPONSE	(17) HLEP INITIATOR	<input checked="" type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMEND <input type="checkbox"/> RESPOND	SUPERVISOR/LEAD AUDITOR
DATE	(18) CORRESPONDENCE NUMBER			
AMENDED RESPONSE	(19) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMEND <input type="checkbox"/> RESPOND	SUPERVISOR/LEAD AUDITOR
DATE	(20) VERIFICATION COMPLETED	<input type="checkbox"/> AT <input type="checkbox"/> IN PAST	SUPERVISOR/LEAD AUDITOR	
<i>4</i>				
(21) VERIFICATION ACTIONS TAKEN				
<i>4</i>				
(22) HLEP CA CLOSURE (DATE)				DATE

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MLP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-405  
(2) REVISION 6

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

FSAR Paragraph 2.5.4:5.6.2.5 states in part, "All testing was done in general accordance with ASTM Standards. Exceptions or clarifications to ASTM are noted hereunder for each test type.

✓ 1) f. Field density using the Sand-Cone Method-ASTM D1556-64 (1968).

NOTE: ✓ Two bulk density tests were run as a minimum for each new  
bso. Additional tests must be run if results deviated more  
than one percent. Standard sand had 100 percent passing the  
✓ No. 10 sieve and none passing the No. 200 sieve.

Contrary to the above, the two quoted commitments (stringent requirements) are not incorporated into PTL Procedures/Instructions.

2) d. ASTM D422-63. Grain size-sieve and hydrometer.

✓ Contrary to the above, PTL procedure QC-LT-1, Rev. 35 takes exception to ASTM D422 in that, the hydrometer portion of the test is not required to be performed for Category I structural backfill.



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**The Light company** SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
 HOUSTON LIGHTING & POWER  
 QUALITY ASSURANCE  
 CORRECTIVE ACTION REPORT

(17) CAR No. C-406  
 (23) REVISION 4

(13) ORGANIZATION ELC Engineering & QA (14) DEF REQUIRED  YES  NO (15) RESPONSE DUE DATE 12-28-84  
 (16) DOCUMENT VIOLATED On-Station Show Cause Commitment REV. VA(2) M9 PARA N/A

(17) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1 See continuation sheet

(18) INITIATOR [Signature] DATE 4/9/84  
 (19) SUPERVISOR/LEAD AUDITOR Thomas B. [Signature] DATE 2:0 24  
 (10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
 (13) CAUSE OF CONDITION \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_  
 (17) HLEP INITIATOR  ACCEPT  REJECT  AMENDED  SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
 (18) CORRESPONDENCE NUMBER \_\_\_\_\_  
 (19) HLEP INITIATOR  ACCEPT  REJECT  SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
 (20) VERIFICATION COMPLETED  ACCEPT  REJECT  SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_

4

(21) VERIFICATION ACTION IS TAKEN

\_\_\_\_\_

\_\_\_\_\_

(22) HLEP CA CLOSURE (FO:15)

Page 2 of 2

HLAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-406

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

On-going Show Cause Commitment VA(2) 19 states in part, that for bedding and backfilling of ECM System piping, DEC specifications, ESI QC Procedure, and PTL procedures are revised to incorporate the following requirement:

"Locations and sequence of various placements and correspondence in-place density test results will be documented together with summaries of the report construction methods and conditions."

Contrary to the above, during the audit, no objective evidence was provided as to:

- / a) What changes were made to the specifications and the procedures to satisfy compliance to the above quoted requirement.
- / b) What documentation was generated by ESI and PTL to ensure compliance to the show cause commitments.

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(11) CAR No. G-207

(12) REVISION 1

(13) ORGANIZATION EEC Engineering  
(14) DEF REQUIRED  YES  NO  
(15) RESPONSE DUE DATE 08-18-54  
(16) DOCUMENT VIOLATED PARA  
(17) DESCRIPTION OF CONDITION ADVERSE TO QUALITY See Block (7)

1 See continuation sheet.

(18) INITIATOR D. Jones DATE 4/9/54  
(19) SUPERVISOR/LEAD AUDITOR Thomas H. [unclear] DATE 4/17/54  
(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (112) EFFECTIVE DATE \_\_\_\_\_  
(113) CAUSE OF CONDITION

3

(114) CORRECTIVE ACTION TO PREVENT RECURRENCE

(115) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (116) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE (117) HLEP INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR DATE

AMENDED RESPONSE (118) CORRESPONDENCE NUMBER

(119) HLEP INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR DATE

(120) VERIFICATION COMPLETED  SAT  UNSAT SUPERVISOR/LEAD AUDITOR DATE

(121) VERIFICATION ACTIONS TAKEN

(122) HLEP CA CLOSURE (P/12)

4

Page 2 of 2

MILSP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-407

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CCIT)

FSAR paragraph 2.5.4.5.6.2.5 states in part, "A sufficient stockpile was maintained at all times at the site to permit sampling and verification of the material properties before it was placed. . . One sample was obtained for each 20,000 yards as the work proceeded. These samples were tested as required in the above paragraph." Above paragraphs list testing as per ASTM D2049, D422 and D2488.

Contrary to the above, no specific evidence could be produced to substantiate that relative density (ASTM D2049) is also determined from the samples from stockpiles. NCRs need to be initiated if the above stated condition has impact on previously placed backfill/fill.

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*Rev. 01-81*

**The Light Company** SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

EQ CAR No. G-408  
EQ REVISION 0

(3) ORGANIZATION PTL (4) DEF. REQUIRED REV. 2, Sec. 5.0 (5) RESPONSE DUE DATE 4-22-84  
(6) DOCUMENT VIOLATED HL&P P/MP (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY PARA 5.2.2

1 See continuation sheet

(8) INITIATOR [Signature] DATE 4/9/84  
(9) SUPERVISOR/LEAD AUDITOR [Signature] DATE 4/9/84  
(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
(13) CAUSE OF CONDITION

3 (14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

4 (17) HL&P INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
RESPONSE (18) CORRESPONDENCE NUMBER  
AMENDED RESPONSE (19) HL&P INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
(20) VERIFICATION COMPLETED SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
(21) VERIFICATION ACTIONS TAKEN

(22) HL&P QA CLOSURE # (23) \_\_\_\_\_

MILITARY OPERATIONAL REPORT CONTINUATION

DATE: 12-20-55  
BY: [Signature]

BLOCK (7) DESCRIPTION OF CONDITION OBSERVED OR MEASURED

MILP PCAP, Section 5.0, "Instructions, Procedures and Details", Revision 2, paragraph 5.2.2 states in part that "DEC is responsible for developing and implementing procedures and instructions for control of quality related activities."

Contrary to the above, no written procedure or instructions (by PTL) exist for sampling backfill material from the stockpiles.

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The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. 0-409  
(2) REVISION 1

(3) ORGANIZATION REC. DC (4) DEF. REQUIRED (5) RESPONSE DUE DATE  
(6) DOCUMENT VIOLATED H.S.P. 903P REV. 2 (6) 05-22-76  
PARA 5.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY  
The above reference states in part, . . . (REC) . . . and other contractors performing  
1 activities affecting quality are required to accomplish and document these activities  
in accordance with written procedures. . . .

Contrary to the above, MPP/QCI-4.0, Rev. 5, does not describe the process, methodology,  
and specific document requirements utilized when Category I backfill is received on-site  
Class 9 and subsequently upgraded to Class 3 prior to use. (CONT)

(8) INITIATOR Thomas H. Hill DATE 4-7-74  
(9) SUPERVISOR/LEAD AUDITOR Thomas H. Hill DATE 4-9-74

(10) REMEDIAL ACTION

2

(11) SIGNATURE DATE (12) EFFECTIVE DATE

(13) CAUSE OF CONDITION

3

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL DATE (16) EFFECTIVE DATE

APPROVED: (17) HLEP INITIATOR  ACCEPT  HOLD SUPERVISOR/LEAD AUDITOR DATE

AMENDED RESPONSE (18) CORRESPONDENCE NUMBER

(19) HLEP INITIATOR  ACCEPT  HOLD SUPERVISOR/LEAD AUDITOR DATE

(20) VERIFICATION COMPLETED  ACCEPT  HOLD SUPERVISOR/LEAD AUDITOR DATE

4

(21) VERIFICATION ACTIONS TAKEN

(22) HLEP OR CLOSURE (23) DATE

Page 2 of 2

ISMP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. C-409  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Additionally, the method of approval/release for use is not specified.

Multiple horizontal lines for text entry.



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<b>The Light Company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER QUALITY ASSURANCE CORRECTIVE ACTION REPORT		141 Cont. No. <u>7-000</u> 142 REVISION <u>8</u>
(3) ORGANIZATION REF. NO.	(4) DOCUMENT VIOLATED	(5) DEF. REQUIRED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	(6) RESPONSE DUE DATE	
	OCT-2.4/OCT-2.9	REV. 5/1	6-28-88	
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY				
1 (A) OCT-2.4, Rev. 5, paragraph 5.1.3 states in part, "The monthly plan shall provide coverage of safety related construction activities and be flexible enough to adjust to construction schedules or areas of concern. Problem areas shall have follow-up Effectiveness Inspections at increased frequencies until confidence is re-established and the deficiencies have been corrected." (CONT)				
(8) INITIATOR	Thomas H. Hill		DATE	8/19/88
(9) SUPERVISOR/LEAD AUDITOR	Thomas H. Hill		DATE	8/19/88
(10) REMEDIAL ACTION				
2				
(11) SIGNATURE				
		DATE	(12) EFFECTIVE DATE	
(13) CAUSE OF CONDITION				
3				
(14) CORRECTIVE ACTION TO PREVENT REOCCURRENCE				
4				
(15) REVIEW AND APPROVAL		DATE	(16) EFFECTIVE DATE	
INITIAL RESPONSE	(17) HLEP INITIATOR	ACCEPT REJECT	DATE	(18) SUPERVISOR/LEAD AUDITOR
ATTENDED RESPONSE	(19) CORRESPONDENCE NUMBER	DATE	(20) SUPERVISOR/LEAD AUDITOR	
(21) VERIFICATION COMPLETED	DATE	(22) SUPERVISOR/LEAD AUDITOR		
(23) VERIFICATION ACTIONS TAKEN:				
(24) HLEP QA CLOSURE (PCAS)	DATE			

Page 2 of 2

HLNPOA CORRECTIVE ACTION REPORT CONTRIBUTION

(1) CAR NO. G-410

(2) REVISION 6

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CCIT)

Contrary to (A), BEC OCE has not performed an Effectiveness Inspection pertaining to STP Category I Backfill activities since October 1982, a period of approximately 16 months.

(B) OCI-2.9, Rev. 1, paragraph 4.1 states: "Surveillances are on main reviews of the contractor's/constructor's quality practices for conformance to the applicable codes and standards for safety related construction activities at the South Texas Project."

✓ Contrary to (B), BEC OCE has not performed a surveillance of STP Category I backfill activities since the original issue of OCI-2.9 (Rev. 0) on October 21, 1983, a period of approximately five (5) months.

The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. Q-411  
(2) REVISION 5

(3) ORGANIZATION REC	(4) DEF. REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	(5) RESPONSE DUE DATE <u>02-28-75</u>
(6) DOCUMENT VIOLATED WR/OCL 4.0	REV. <u>5</u>	PARA <u>See Block (7)</u>
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY		

1 (A) Paragraph 4.1 states, "All receiving shall be performed by personnel assigned by the RS" (Receiving Supervisor).

✓ Contrary to (A), personnel are receiving Category I backfill material and they have not been assigned by the R.S. (Construction personnel are performing this function).

(8) INITIATOR <u>Thomas H. O'Brien</u>	DATE <u>4-9-74</u>
(9) SUPERVISOR/LEAD AUDITOR <u>Thomas H. O'Brien</u>	DATE <u>4-9-74</u>

(10) REMEDIAL ACTION

2

(11) SIGNATURE	DATE	(12) EFFECTIVE DATE
(13) CAUSE OF CONDITION		

3

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE
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INITIAL RESPONSE	(17) HLP INITIATOR	<input checked="" type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMEND <input type="checkbox"/> HOLD	SUPERVISOR/LEAD AUDITOR	DATE
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AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER				
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(19) HLP INITIATOR	DATE	SUPERVISOR/LEAD AUDITOR	DATE
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(20) VERIFICATION COMPLETED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	SUPERVISOR/LEAD AUDITOR	DATE
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(21) VERIFICATION ACTIONS TAKEN

(22) HLP CA CLOSURE (POA'S)	DATE
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MLAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-411

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

✓ (B) Paragraph 7.2.1 states, "Shipments that are received outside of a controlled receiving area shall be tagged with a "Hold for Receiving Inspection" tag.

Contrary to (B), BEC Receiving does not apply status indicators to incoming Category I backfill stockpiles.

✓ (C) Exhibit WPP/QCI-4.0-1A, Task No. 1.2 requires Receiving QC to perform a visual inspection for cleanliness of Category I backfill material.

Contrary to this, BEC Receiving QC is stamping this attribute "Accept" without performing the required visual inspection.

✓ (D) Paragraph 4.7 states "For [contract] procured non-safety related... material, the cognizant supplier Quality Representative of Field Procurement... shall review applicable documentation and if found acceptable, shall sign and date the PRR..."

Contrary to (D), the SQR is not signing the PRR for Category I backfill material.

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Rev. 5-25-80 1/2

The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. G-012

(2) REVISION 0

(3) ORGANIZATION	ESI Construction	(4) DEF REQUIRED YES <input type="checkbox"/> NO <input type="checkbox"/>	(5) RESPONSE DUE DATE 05-28-87
(6) DOCUMENT VIOLATED	CSP-1	REV. 3 and 10-6	See Block (7)
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY	See continuation sheet.		
(8) INITIATOR	<i>[Signature]</i>	DATE	4/9/87
(9) SUPERVISOR/LEAD AUDITOR	<i>[Signature]</i>	DATE	4/9/87
(10) REMEDIAL ACTION	1-		
(11) SIGNATURE	DATE	(12) EFFECTIVE DATE	
(13) CAUSE OF CONDITION			
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE			
(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE	
UNRECORDED RESPONSE	(17) RESP INITIATOR	REJECT <input type="checkbox"/> ACCEPT <input type="checkbox"/>	SUPERVISOR/LEAD AUDITOR DATE
ADJUDICATED RESPONSE	(18) CORRESPONDENCE NUMBER		SUPERVISOR/LEAD AUDITOR DATE
(20) VERIFICATION COMPLETED	REJECT <input type="checkbox"/> ACCEPT <input type="checkbox"/>		SUPERVISOR/LEAD AUDITOR DATE
(21) VERIFICATION ACTIONS TAKEN			
(22) RESP CA CLOSURE (VCA)	DATE		

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MLSP QA CORRECTIVE ACTION REPORT CONTINUATION(1) CAR NO. G-412(2) REVISION 1BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Attachment 4.01 of CSP-1, Rev. 3 states in part as follows:

Sequence No 3.3-"If backfill material does not have proper moisture content, it shall be conditioned by sprinkling. . ."

Sequence No 3.9-"Cohesionless backfill materials may be spread in lifts per specification 3Y069Y50043."

Sequence No 3.13-"Request compaction tests from Quality Control Inspector for each lift in accordance with paragraph 9.03 of this procedure." (QC Hold Point).

Contrary to the above, local excavations for density testing within the fill area are backfilled without QC inspection and compaction is not performed as it was for the original placement.

For example, in an approximate 4 foot by 2 foot excavation for density test, No. EL-A72-2-1557, and an approximate 2 foot by 2 foot excavation for test No. EL-A72-2-1555, backfilling was accomplished with a lift that exceeded 2 feet in its deepest portion. Additionally, the material was placed in approximately 3 inches of standing water, and was compacted without the addition of water. (NOTE: These holes were excavated beyond testing depth to control water seepage).

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**The Light Company** SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(13) CAR No. G-413  
(23) REVISION 0

(21) ORGANIZATION EST DC	(14) DEF REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	(16) RESPONSE DUE DATE 4-29-88
(18) DOCUMENT VIOLATED WSPM Section OA-111-11	REV. <u>3</u>	PARA <u>3.1</u>
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY		
1 See continuation sheets.		
(8) INITIATOR <i>[Signature]</i>	DATE <u>4/9/84</u>	
(9) SUPERVISOR/LEAD AUDITOR <i>Thomas H. [Signature]</i>	DATE <u>4/21/84</u>	
(10) REMEDIAL ACTION		
2		
(11) SIGNATURE	DATE	(12) EFFECTIVE DATE
(13) CAUSE OF CONDITION		
3		
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE		
(15) REVIEW AND APPROVAL	DATE	(17) EFFECTIVE DATE
INITIATOR RESPONSE	(17) HNSP INITIATOR <input checked="" type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> SUPERVISOR/LEAD AUDITOR
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER	DATE
(19) HNSP INITIATOR	<input checked="" type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	SUPERVISOR/LEAD AUDITOR
(20) VERIFICATION COMPLETED	<input type="checkbox"/> OK <input type="checkbox"/> NOT OK	DATE
4 (21) VERIFICATION ACTION IS TAKEN		
(22) HNSP CA CLOSURE (P/AM)	DATE	

Page 2 of 2

MLAP CA CORRECTIVE ACTION REPORT CONTINUATION01 CAR NO. G-41302 REVISION 0BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

ESI MOAPIH, Section CA-III-11, paragraph 3.1 states in part, "Inspection documents shall be prepared based upon the quality requirements contained in purchase orders, specifications, . . ."

Contrary to the above, ESI OCP-10.10, "Soils Inspection," Rev. 1, does not contain the following requirements of BEC Specification 37069Y50043, "Structural Excavation and Backfill," Rev. 8:

- 1) The gradation and distribution of materials in the compacted areas shall be such that backfill or fill is not segregated. (Paragraph 7.8.1)
- 2) Fill surfaces shall be constructed so that water will readily drain off at all times. (Paragraph 7.8.5)
- 3) Compaction will not be allowed within 300 feet of an area where in-situ density tests are being performed in granular materials. (Paragraph 4.1.4)
- 4) If concrete mats and basement walls have been waterproofed, the backfilling shall be performed so that the protective waterproofing material is not damaged. (Paragraph 7.9.1)



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MLSP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-413  
(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

5) Backfill adjacent to structures or over portions of foundations shall be placed and compacted symmetrically and uniformly by the Constructor in a manner to prevent eccentric loading, or unbalanced pressure upon or against the structures. (Paragraph 7.9.7)

The condition is not limited to above quoted requirements and ESI needs to review the specification and procedure to ensure that all specification requirements are either directly incorporated into the procedure or included by making reference to the specification.

In the event previously placed backfill/fill is impacted due to non-compliance to the above quoted requirements, MCR(s) need to be initiated.

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The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(13) CAR No. 2-17  
(12) REVISION 6

(3) ORGANIZATION <b>ESI</b>	(14) DEF. REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	(15) RESPONSE DUE DATE <u>04-24-84</u>
(4) DOCUMENT VIOLATED <u>NCP 10.10/1Y069Y50043</u>	REV. <u>1/8</u>	PARA <u>5.3.3.1(b)/7.5</u>
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY <u>Inspection 1Y069Y50043, Rev. 8, Paragraph 7.5 states, "The natural soil subgrade for Category I structures is subject to foundation verification and geologic mapping by the Engineer before the constructor can place concrete or backfill."</u>		
1 <u>NCP 10.10 Rev. 1, paragraph 5.3.3.1(b) states, "Where natural subgrade is encountered, the Pachtal Foundation Verification Engineer shall indicate his acceptance in the remarks section of Attachment M (Backfill) Inspection Report."</u>		
(8) INITIATOR <u>The use of Backfill</u>	DATE <u>4-7-84</u>	
(9) SUPERVISOR/LEAD AUDITOR <u>William W. P. [unclear]</u>	DATE <u>4-7-84</u>	
(10) REMEDIAL ACTION		
2		
(11) SIGNATURE		
DATE		(12) EFFECTIVE DATE
(13) CAUSE OF CONDITION		
3 (14) CORRECTIVE ACTION TO PREVENT REURRENCE		
(15) REVIEW AND APPROVAL		
DATE		(16) EFFECTIVE DATE
UNFINISHED RESPONSE	(17) RESP. INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT <input type="checkbox"/> AMENDED
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER	SUPERVISOR/LEAD AUDITOR DATE
(19) VERIFICATION COMPLETED	(20) RESP. INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT <input type="checkbox"/> AMENDED
(21) VERIFICATION ACTIONS TAKEN	SUPERVISOR/LEAD AUDITOR	DATE
(22) REPORT CLOSURE (FORM)	DATE	

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NSAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-414

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to the above, no objective evidence could be provided that the BEC Foundation Verification Engineer has mapped or accepted natural substrate which is encountered during construction of safety-related duct banks and manholes.

Examples: Manhole 53-C

Ductbank 134 (south of manhole 155)

Manhole 57

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DATE 4-3-74 ✓ 19

The Light Company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. R-115  
(2) REVISION 0

(3) ORGANIZATION	ESI	(4) DEF REQUIRED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	(5) RESPONSE DUE DATE	4-3-74
(6) DOCUMENT VIOLATED	See Block (7)	REV	See Block (7)	PARA	See Block (7)
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY	See continuation sheet.				
(8) INITIATOR	<i>William H. ...</i>	DATE	4-3-74		
(9) SUPERVISOR/LEAD AUDITOR	<i>...</i>	DATE	4-3-74		
(10) REMEDIAL ACTION					
(11) SIGNATURE		DATE	(12) EFFECTIVE DATE		
(13) CAUSE OF CONDITION					
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE					
(15) REVIEW AND APPROVAL		DATE	(16) EFFECTIVE DATE		
ORIGINAL RESPONSE	(17) HESIP INITIATOR	<input checked="" type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(18) SUPERVISOR/LEAD AUDITOR	DATE	
AMENDED RESPONSE	(19) CORRESPONDENCE NUMBER		(20) SUPERVISOR/LEAD AUDITOR	DATE	
(21) VERIFICATION COMPLETED	(22) HESIP INITIATOR	<input checked="" type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(23) SUPERVISOR/LEAD AUDITOR	DATE	
(24) VERIFICATION ACTIONS TAKEN					
(25) HESIP OR CLOSURE (PCAV)	DATE				

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Page 2 of 3

MLAP QA CORRECTIVE ACTION REPORT CONTINUATION(1) CAR NO. G-415(2) REVISION 0BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

FSAR Section 2.5.4.5.6.2.5, 2nd paragraph states in part, "The inspectors considered possible variations in density with depth in determining the test locations. The tests are selected such that a series of consecutive tests will give representative density information for all depth intervals within the lifts."

Specification 3Y069Y50043, Rev. 8, paragraph 4.1.2.2 states in part, . . . "The Constructor shall consider variations in density with depth depending on lift thickness, placement and compaction methods, and shall distribute the test depths to obtain the true condition of the backfill."

Specification 3Y069Y50043, Rev. 8 (Section 4.1.3.1, "30-inch ECM Pipes"), paragraph 4.1.3.1.3 states in part, ". . . The test shall be located immediately adjacent to the pipe at an elevation of 7-inches below the invert. . ."

OCP-10.10, Rev. 1, PCR 7, paragraph 5.3.1.1 states, "Frequency of testing shall be as described in Bechtel Specification 3Y059Y50043." OCP-10.10, Rev. 1, PCR 7, paragraph 5.3.1.2 states, "Location of test shall be as described in Bechtel Specification 3Y069Y50043."

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MLAP QA CORRECTIVE ACTION REPORT CONTRIBUTION(1) CAR NO. Q-415(2) REVISION 1BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to the above listed requirements:

1) QCP-10.10, Rev. 1, does not provide criteria on density variation with depth to enable OC to determine the correct location for testing.

2) There is no objective evidence that backfill installed by ESI has been tested at the required depths, in general. In particular, there is no objective evidence that tests below 30-inch Ø ECW pipes are taken at a depth of 7-inches below the invert. QCP-10.10, Rev. 1, does not require test depths to be recorded.

NOTE: A) The field test elevation selection process does not give representative density information for all depth intervals within the lift.

B) PTL Procedure CC-ST-1 provides for recording test depth, but ESI OC is not providing test depth information to PTL for subsequent reporting on the PTL test form.

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SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER

**The Light Company**

QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. G-416  
(2) REVISION 1

(3) ORGANIZATION Pittsburgh Testing Laboratory (4) DEF. REQUIRED NO (5) RESPONSE DUE DATE 4-20-57  
(6) DOCUMENT VIOLATED See Block (7) (7) REV. See Block (7) (8) P.A.A. See Block (7)

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1 PTL procedure QC-LT-1, Revision 35, Section 12.2, states, "Appendix I contains a listing of standard written test methods which shall be employed in conducting the specified tests."  
Among other methods, Appendix I references ASTM D422-63 (of which D 421 is an integral part) and D 2049-69. (CONTINUED)

(8) INITIATOR H. Wilson DATE 4/9/57  
(9) SUPERVISOR/LEAD AUDITOR Thomas E. ... DATE 4/9/57

(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
(13) CAUSE OF CONDITION \_\_\_\_\_

3 (14) CORRECTIVE ACTION TO PREVENT RECURRENCE \_\_\_\_\_

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

4 (17) RESPONSE (17) RESP. INITIATOR  ACCEPT  REJECT  NO RESPONSE SUPERVISOR/LEAD AUDITOR DATE  
ADJUDICATED RESPONSE (18) CORRESPONDENCE NUMBER (18) RESP. INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR DATE  
(19) VERIFICATION COMPLETED  SAT  UNSAT SUPERVISOR/LEAD AUDITOR DATE  
(20) VERIFICATION ACTIONS TAKEN \_\_\_\_\_

(21) HELP OR CLOSURE (PCAS) \_\_\_\_\_ DATE \_\_\_\_\_

2-5

MILSPQA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-416  
(2) REVISION 6

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

PTL procedure QC-ST-1, Revision 2B, Section 11.1 states in part, "The following test method standards shall be used to perform the tests specified. . . (1) ASTM D-1556-64-(69). . ."

a) ASTM D422-63 requires preparation of the test sample for mechanical analysis per ASTM D 421. ASTM requires air drying of sample received from field (Section 2.1), then quartering (Section 3.1), then separating on a No. 10 sieve (Section 4.1), then washing the material retained on the No. 10 sieve free of all fine material and drying (Section 4.2), then sieving on the No. 4 sieve (Section 4.2).

b) ASTM D422-63, Section 5.1 requires ". . . sieving until not more than one mass percent of the residue on a sieve passes that sieve during one minute of sieving. When mechanical sieving is used, test the thoroughness of sieving by using the hand method of sieving. . ."

c) ASTM D422-63, Section 10.1 requires washing of material passing the No. 10 sieve through a No. 200 sieve.

d) ASTM D422-63, Section 17.1.3.2 requires reporting the hardness of the material tested.



Page 3 of 5

## MILP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CONT NO. G-416  
 (2) REVISION 4

## BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

e) ASTM D1555-68, Section 3 requires determination of the volume of the jar and attachment for determination of bulk density. Note 4 allows determination of " . . . bulk density in other containers of known volume that dimensionally approximate the largest test hole that will be dug. . . If this procedure is followed, it shall be determined that the resulting bulk density equals that given by the jar determination.

f) ASTM D2019-69, Section 4.1 requires determination of the volume of the mold by direct measurement, and checking by filling with water.

g) ASTM D2049-69, Section 4.1.3 requires obtain an initial dial reading, which will remain constant for a particular measure and surcharge base plate combination, by placing the calibration bar across the diameter of the mold across the guide bracket axis.

h) ASTM D2049-69, Section 4.1.3 requires match marks be used so the measuremen on the top of the base plate can be made in the same relative position for each maximum density determination.

i) ASTM D2019-69, Section 6.1.2 states, for material placed with a funnel, " . . . spread of the excess soil level with the top by making one continuous pass with the steel straightedge."

Page 4 of 5

MLSP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. C-416  
(2) REVISION 6

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to a) above, PTL quarters, then oven dries the sample, does not separate on a No. 10 sieve, and does not wash the material retained. With regard to b) above, PTL uses a mechanical sieving device. Although laboratory personnel are familiar with the length of time for sieving, this time has not been documented, and there is no objective evidence that samples are sieved for the same length of time. Further, the thoroughness of sieving is not checked.

Contrary to c) above, PTL determines the amount of material finer than a No. 200 sieve by dry sieving only.

Contrary to d) above, PTL forms "Report of Particle Size Analysis", Form No. ST-3, and "Report of Sieve Analysis", Form No. ST-A, have no provision for recording this information.

Contrary to e) above, PTL determines bulk densities in a 0.1 cubic foot mold. has not determined the bulk density using the ASTM prescribed method, and has not compared the results of their method of determination to ensure that it equals the far method.

5 5

HLAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. Q-416

(2) REVISION 6

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to f) above, PTL instruction sheet IS-CAL-22, Rev. 0, 03/03/82, requires determination of mold volume by the water filling method only.

Contrary to g) above, PTL zeros the gage on the base plate for each of the six measurements, then raises the gage stem by hand, and slides the end of the calibration bar in along the periphery of the mold, steadying the bar by hand as the reading is taken.

Contrary to h) above, PTL uses no match marks, so the base plate measurements are made in different locations each time the maximum density is determined.

Contrary to i) above, PTL adds material by hand to the surface of the soil-filled mold, after screeding.

0037940

11/3/82

*Asst. S.E. Wilson*

**The Light Company** SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. 6-417  
(2) REVISION 1

(3) ORGANIZATION BEC Engineering END 4 49	(4) DEF REQUIRED YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	(5) RESPONSE DUE DATE REV. 4/1/83 4,49-16	(6) PARA 8.2
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(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1 The above reference states in part, "Revisions to specifications shall be made by revision, FCR/FCN, SCN or Addendum. . ."

Contrary to the above, the BEC Contracts Manager instructed PTL, in correspondence #ST-Y5-00-00182, dated 2/2/83, "to change the frequency of tests requested in the reference correspondence" (ST-Y5-00-000173, dated 01/26/83).

(8) INITIATOR <i>Y. Wilson</i>	DATE 2-9-83
(9) SUPERVISOR/LEAD AUDITOR <i>Y. Wilson</i>	DATE 2-9-83

(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

3

(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE
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(17) HELP INITIATOR	ACCEPT <input type="checkbox"/> REJECT <input checked="" type="checkbox"/>	(18) SUPERVISOR/LEAD AUDITOR	DATE
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(19) CORRESPONDENCE NUMBER	(20) HELP INITIATOR	ACCEPT <input type="checkbox"/> REJECT <input checked="" type="checkbox"/>	SUPERVISOR/LEAD AUDITOR	DATE
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(21) VERIFICATION COMPLETED	ACCEPT <input type="checkbox"/> REJECT <input checked="" type="checkbox"/>	SUPERVISOR/LEAD AUDITOR	DATE
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4 (22) VERIFICATION ACTIONS TAKEN

(23) HELP QA CLOSURE (DATE) \_\_\_\_\_ DATE \_\_\_\_\_

0037940-1393

2017 Rev. 001 ✓16

<b>the Light company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER QUALITY ASSURANCE CORRECTIVE ACTION REPORT		(11) CAR No. <u>0-277</u>	
(3) ORGANIZATION <u>BEC</u>		(14) DEF REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	(15) RESPONSE DUE DATE <u>05-15-94</u>		
(4) DOCUMENT VIOLATED <u>Specification 2Y060750-4</u>		REV. <u>3</u>	(16) PARAS. OF 2, 3 AND 7 OF 6-371-1		
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY					
1 <u>See continuation sheet.</u>					
(8) INITIATOR <u>[Signature]</u>					
(9) SUPERVISOR/LEAD AUDITOR <u>[Signature]</u>			DATE <u>4/10/84</u>	DATE <u>6/10/84</u>	
(10) REMEDIAL ACTION					
2					
(11) SIGNATURE _____ DATE _____ (12) EFFECTIVE DATE _____					
(13) CAUSE OF CONDITION					
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE					
3					
(15) REVIEW AND APPROVAL _____ DATE _____ (16) EFFECTIVE DATE _____					
(17) INITIAL RESPONSE		(17) HLRP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(17) SUPERVISOR/LEAD AUDITOR	DATE
AMENDED RESPONSE		(18) CORRESPONDENCE NUMBER	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	SUPERVISOR/LEAD AUDITOR	DATE
(20) VERIFICATION COMPLETED		<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	SUPERVISOR/LEAD AUDITOR	DATE
4 (21) VERIFICATION ACTIONS TAKEN					
(22) HLRP OR CLOSURE (PCAM) _____ DATE _____					

2 2

ML&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. C-419

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

1) Specification ZY060Y5044, Rev. 3, paragraph 4.0A.2.b states in part,  
 "Compaction control criteria shall be controlled by the soil type and  
 referenced specification and developed in accordance with ASTM D558,  
 ASTM D698, ASTM D1557, ASTM D2049 or BOR E-25-63, as applicable, and  
 approved by the Construction Manager."

2) Form G-321-E, "Engineering Document Requirements", requires submittal  
 of compaction control criteria prior to use.

Contrary to the above, no objective evidence could be provided for  
 compliance to the above quoted requirements.

HOUSTON LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

Order 548-981 V

QUALITY ASSURANCE  
DEFICIENCY NOTICE

FORM NO. MA

7 ORGANIZATION BEC OC	8 DATE ISSUED 04/04/87	9 DATE DUE 04/24/87
10 DOCUMENT VIOLATED WPP/OCI-4.0	11 DIVISION 5	12 AREA Appendix I B1, Entry 47

1 DESCRIPTION OF DEFICIENCY

The above states, "Enter Material Receiving Report Number.  
Contrary to this RIP #2015 listed NBR #B-2015 instead of the proper NBR #B-6472.

13 INITIATOR Thomas H. Campbell	14 DATE 4-9-87
15 REVIEW & APPROVAL Thomas H. Campbell	16 DATE 4-9-87
17 PERSON CONTACTED R. W. Miller	18 POSITION BEC Site PDR
	19 DATE 4-2-84

2 REMEDIAL ACTION

20 SIGNATURE	21 DATE	22 EFFECTIVITY DATE
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23 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT DATE	24 SUPERVISOR APPROVAL	DATE
	<input type="checkbox"/> UNSAT		

25 VERIFICATION PERFORMED BY	DATE	<input type="checkbox"/> SAT	CAR NO.
		<input type="checkbox"/> UNSAT	

26 MAJORSURE - INITIATOR	DATE	27 REVIEW & APPROVAL	DATE
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28 CC LIST

HOLSTEN LIGHTING & POWER model 508-001 ✓  
 SOUTH TEXAS PROJECT ELECTRIC GENERATING PLANT  
 QUALITY ASSURANCE  
 DEFICIENCY NOTICE

107 NO 165

1 ORGANIZATION PTL	DATE ISSUED 4-10-84	DATE DUE 4-24-84
2 DOCUMENT VIOLATED QC-LT-1	REVISIONS 35	PARA. 12.3

3 DESCRIPTION OF DEFICIENCY

1 The above reference states in part, "When standard written test methods do not exist for the test activities. . . PTL shall prepare written instruction sheets which shall be identified in Appendix I and attached to this procedure. . . IS-S10-S049-69, paragraph II.1 states, "Vibratory table shall be calibrated in accordance with IS-S-15A-VTC."

Contrary to the above, relative density table calibrations have been performed according to IS-P11-75 Rev. 0, which replaced IS-S-15A-VTC.

4 INITIATOR <i>[Signature]</i>	DATE 4/9/84
5 REVIEWER'S APPROVAL <i>[Signature]</i>	DATE 4/11/84
6 PERSON CONTACTED R. J. Miller / L. E. Toth	POSITION CEP PDNE / PTL S. J. M. M. M.
	DATE 4-2-84

7 REMEDIAL ACTION:

2

8 SIGNATURE	DATE	10 EFFECTIVITY DATE
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9 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT DATE	11 SUPERVISOR APPROVAL	DATE
	<input type="checkbox"/> UNSAT		

12 VERIFICATION PERFORMED BY	DATE	<input type="checkbox"/> SAT	CAR NO.
		<input type="checkbox"/> UNSAT	

13 QA CLOSURE - INITIATOR	DATE	11 REVIEWER APPROVAL	DATE
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14 CC LIST



HOUSTON LIGHTING & POWER  
10/17/84

LAST SUPPLY ✓

QUALITY ASSURANCE  
DEFICIENCY NOTICE

10/17/84 106

1 ORGANIZATION PTL	2 DATE ISSUED 08-18-84	3 DATE DUE 11-24-84
4 DOCUMENT VIOLATED QC-DC-1	5 PARAGRAPH 11	6 PARAGRAPH 7.10.2&7.10.3

8 DESCRIPTION OF DEFICIENCY  
Paragraph 7.10.2 states in part, "The retest report shall reference the original report to provide traceability. . .". Paragraph 7.10.3 states in part, "All retest reports shall indicate the date of the retest(s) and shall be filed with the original report."  
Contrary to the above, while retests are clearly identified, and reference the original test by test number, they do not reference the original test reports, nor are they filed with the original reports.

9 INITIATOR <i>[Signature]</i>	10 DATE 4/1/84
11 REVIEWER - APPROVAL <i>Thomas H. [Signature]</i>	12 DATE 4/9/84
13 PERSON CONTACTED Raj Miller / L E T. [Signature]	14 POSITION EE - PACE / ITC Site Rep.
	15 DATE 4-2-84

12 REMEDIAL ACTION:

13 SIGNATURE	14 DATE	15 EFFECTIVITY DATE
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16 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT	DATE	17 SUPERVISOR APPROVAL	DATE
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18 VERIFICATION PERSONNEL BY DATE	<input type="checkbox"/> SAT	CAR NO.
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19 MA CLOSURE - INITIATOR	DATE	16. NUMBER OF DEFICIENCIES	DATE
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20 COMMENT



HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE

DEFICIENCY NOTICE

1 ORGANIZATION BEC Engineering		2 DATE ISSUED 04-10-99	3 DATE DUE 08-24-99
4 DOCUMENT VIOLATED Specification ZY060T5044		5 SECTION 3	6 PARA. 4.08
7 DESCRIPTION OF DEFICIENCY Paragraph 4.08 states, "The frequency of testing shall be as directed by the constructor and the Construction Manager." Contrary to the above, no objective evidence could be provided to substantiate that the testing frequencies are directed by both the constructor and the Construction Manager.			
9 INITIATOR <i>[Signature]</i>		10 DATE 4/9/99	
11 REVIEW & APPROVAL <i>Thomas R. McQuinn</i>		12 DATE 4/9/99	
13 PERSON CONTACTED R. W. Miller / R. Schumann		14 POSITION REP. C. L. PROG. / <i>[Signature]</i>	15 DATE 4-2-99
16 REMEDIAL ACTION			
17 SIGNATURE		18 DATE	19 EFFECTIVITY DATE
20 RESPONSE ACCEPTANCE - INITIATOR <input type="checkbox"/> SAT DATE <input type="checkbox"/> UNSAT		21 SUPERVISOR APPROVAL DATE	
22 VERIFICATION PERFORMED BY DATE <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT		23 CAR NO.	
24 QA SUBJECTS - INITIATOR DATE		25 DATE	
26 CC LIST			

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426

HOUSTON LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATIONS

Audit Sub-unit

QUALITY ASSURANCE  
DEFICIENCY NOTICE

137170 169

1 ORGANIZATION: PTL  
DATE ISSUED: 04-18-84  
DATE DUE: 04-30-84

2 DOCUMENT VIOLATED: QC-CAL-3/15-CAL-19  
SECTION: 18/0  
PARA: 3.1, 3.2

3 DESCRIPTION OF DEFICIENCY:  
The above reference states in part, "Place 200 pounds or less of sand in a suitable container. Hand mix thoroughly. . . Obtain a representative sample." The procedure does not adequately describe how the sand from different bags is thoroughly blended to ensure that the sample taken for testing is representative of bulk density throughout the container, and that zones of material of different bulk density do not result (which would introduce an error in density calculations). Conversations with PTL personnel indicated there was not uniform agreement as to how the sand was actually being blended.

4 INITIATOR: [Signature]  
DATE: 4/10/84

5 REVIEW & APPROVAL: Thomas K. [Signature]  
DATE: 4/14/84

6 PERSON CONTACTED: R.W. Miller / L.P. [Signature]  
POSITION: asst. POPE/ [Signature]  
DATE: 4-2-84

7 REMEDIAL ACTION:  
[Empty box for remedial action]

8 SIGNATURE: [Signature] DATE: [Date] EFFECTIVE DATE: [Date]

9 RESPONSE ACCEPTANCE-INITIATOR:  SAT DATE: [Date] SUPERVISOR APPROVAL:  SAT DATE: [Date]

10 VERIFICATION PERFORMED BY: [Name] DATE: [Date]  SAT EAR NO.: [Number]  UNSAT

11 QA CLOSURE - INITIATOR: [Name] DATE: [Date] SUPERVISOR APPROVAL: [Name] DATE: [Date]

12 CC LIST:  
[Empty box for CC list]

INSPECTION LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
QUALITY ASSURANCE  
DEFICIENCY NOTICE

Order 505-001

FORM NO. 170

1 ORGANIZATION ESI OC	3 DATE ISSUED 01-18-84	2 DATE DUE 04-24-84
4 DOCUMENT VIOLATED M&P P&AP	5 REVISION 2	7 PARA. Section 10.3
8 DESCRIPTION OF DEFICIENCY Section 10.3 requires that the inspection procedures shall provide for recording the results of the inspection operation.  Contrary to the above, the inspections conducted listed in paragraph 5.1.3 and 5.1.4 of QCP-10.10, "Soils Inspection", are not required to be recorded. These inspections have been recorded on appropriate forms, but the procedure does not provide requirements.		
9 INITIATOR <i>[Signature]</i>	DATE 4/9/84	
10 REVIEW & APPROVAL <i>Thomas H. [Signature]</i>	DATE 4/17/84	
11 PERSON CONTACTED R. G. Smith / S.R. [Signature]	POSITION ESI [Signature] / S. [Signature]	DATE 4-2-84

12 REMEDIAL ACTION

13 SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ 14 EFFECTIVITY DATE \_\_\_\_\_

15 RESPONSE ACCEPTANCE-INITIATOR  SAT DATE \_\_\_\_\_ 16 SUPERVISOR APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_  
 UNSAT

17 VERIFICATION PERFORMED BY DATE \_\_\_\_\_  SAT CAR NO. \_\_\_\_\_  
 UNSAT

18 QA CLOSURE - INITIATOR \_\_\_\_\_ DATE \_\_\_\_\_ REVIEW & APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_

19 CC LIST

### NONCONFORMANCE REPORT

SOUTH TEXAS PROJECT FIELD NO. <u>04</u> CONTRACTOR <u>DAVID N/A</u> DATE <u>04/14</u> CITY <u>N/A</u> STATE <u>N/A</u> COUNTY <u>N/A</u> ZIP <u>78403</u> PROJECT NO. <u>8</u> DRAWING NO. <u>N/A</u>	NEW ITEM DESCRIPTION <u>AA Category E P.S.C. II</u> CONTRACTOR/SUPPLIER <u>FINANCO</u> DATE NO. <u>N/A</u>	PROJECT NO. <u>ECW-1</u> DATE <u>11/20/08</u> TIME <u>08:00 AM</u> BY <u>[Signature]</u> TITLE <u>[Signature]</u>	PAGES <u>1</u> DRAWINGS <u>1</u> COMMENTS <u>ECW-1</u>
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17. DESCRIPTION LIST THE PIECES, DIMENSIONS, PRESENT CONDITION 1. <u>Penetration, CSP-1, For 3rd Fl. 4.14 Sq. ft.</u> 2. <u>2.9 sq. ft. "Concrete" block</u> 3. <u>Concrete may be saved in lifts per Spec. Sec. 5.9.1.2</u> 4. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 5. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 6. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 7. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 8. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 9. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 10. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 11. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 12. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 13. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 14. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 15. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 16. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 17. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 18. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 19. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 20. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 21. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 22. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 23. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 24. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 25. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 26. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 27. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 28. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 29. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 30. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 31. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 32. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 33. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 34. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 35. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 36. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 37. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 38. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 39. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 40. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 41. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 42. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 43. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 44. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 45. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 46. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 47. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 48. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 49. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 50. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 51. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 52. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 53. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 54. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 55. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 56. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 57. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 58. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 59. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 60. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 61. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 62. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 63. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 64. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 65. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 66. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 67. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 68. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 69. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 70. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 71. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 72. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 73. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 74. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 75. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 76. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 77. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 78. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 79. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 80. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 81. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 82. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 83. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 84. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 85. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 86. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 87. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 88. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 89. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 90. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 91. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 92. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 93. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 94. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 95. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 96. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 97. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 98. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 99. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u> 100. <u>Concrete shall be placed in lifts per Spec. Sec. 5.9.1.2.1</u>	18. VALUED BY <u>[Signature]</u> DATE <u>04/14/08</u> TITLE <u>[Signature]</u> COMPANY <u>[Signature]</u>
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19. DISPOSITION <input type="checkbox"/> PARTIAL DISPOSITION <input type="checkbox"/> FINAL DISPOSITION	20. DISPOSITION BY NAME <u>[Signature]</u> DATE <u>04/14/08</u> TITLE <u>[Signature]</u> COMPANY <u>[Signature]</u>
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21. CONDITIONAL RELEASE <input type="checkbox"/> YES <input type="checkbox"/> NO DATE _____	22. ACCEPTANCE BY (OWNER/REPAIR/REJECT COMPLETE) NAME _____ DATE _____ TITLE _____ COMPANY _____	23. ACCEPTANCE BY (OWNER/REPAIR/REJECT COMPLETE) NAME _____ DATE _____ TITLE _____ COMPANY _____
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24. APPROVALS SUPERVISOR _____ DATE _____ PROJECT MANAGER _____ DATE _____ PROJECT ENGINEER _____ DATE _____ PROJECT SUPERVISOR _____ DATE _____	25. APPROVALS PROJECT MANAGER _____ DATE _____ PROJECT ENGINEER _____ DATE _____ PROJECT SUPERVISOR _____ DATE _____	26. APPROVALS PROJECT SUPERVISOR _____ DATE _____ PROJECT ENGINEER _____ DATE _____ PROJECT MANAGER _____ DATE _____
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27. APPROVALS PROJECT MANAGER _____ DATE _____ PROJECT ENGINEER _____ DATE _____ PROJECT SUPERVISOR _____ DATE _____	28. APPROVALS PROJECT SUPERVISOR _____ DATE _____ PROJECT ENGINEER _____ DATE _____ PROJECT MANAGER _____ DATE _____	29. APPROVALS PROJECT ENGINEER _____ DATE _____ PROJECT SUPERVISOR _____ DATE _____ PROJECT MANAGER _____ DATE _____
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# The Light company

Houston Lighting &amp; Power P.O. Box 1700 Houston, Texas 77001 (713) 236-0211

505-401

April 10, 1984  
ST-HS-YQ-00763  
File No.: Q18.6

Mr. L. W. Hurst  
Project QA Manager  
Bechtel Energy Corporation  
P. O. Box 15  
Bay City, Texas 77414

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
DEFICIENCY DOCUMENTS (CARs, DNs AND CONCERNS)  
IDENTIFIED IN THE ML&P SUPPLEMENTAL AUDIT ON  
BACKFILL OPERATIONS

Dear Mr. Hurst:

Attached are the CARs, Deficiency Notices and Concerns from the ML&P Supplemental Audit on Backfill operations. These deficiencies were discussed with responsible personnel during the site exit meeting held April 2, 1984, and with management personnel in Houston on April 3, 1984, as follows:

Personnel at site exit on 4-2-84

E. W. Miller	BEC QA PQAE
G. C. Gunkel	BEC QCE
M. J. Futrell	BEC SEO
T. H. Hitchman	BEC Contracts
L. Yao	BEC Geotech
R. G. Peck	ESI QA
L. B. Triplett	PTL

Personnel at Houston exit on 4-3-84

K. R. Dotterer	BEC PQAE
G. B. Jones	BEC APN
D. M. Malligan	BEC V.P.-Program Mgr.
R. L. Rogers	BEC Proj. Engr. Mgr.
J. L. Hurley	BEC Proj. Engr.
L. Yao	BEC Geotech
R. Talmage	BEC Geotech

The results from that audit indicate several weaknesses in the current methods:

1. Inadequate discipline by Bechtel in ensuring that FSAR commitments are totally and accurately translated to design documents, procedures and work practices.
2. Inadequate Bechtel QA/QC monitoring coverage.
3. Inadequate construction/inspection procedure preparation by Elbasco, and
4. Laxity on the part of Pittsburgh Testing Laboratory in performing their activities in strict compliance with the testing standards.



## Houston Lighting &amp; Power Company

Mr. L. M. Hurst  
ST-HS-YQ-00761  
Page 2

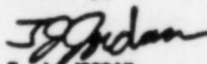
Bechtel has been previously requested in our meeting of April 3, 1984 to:

1. Immediately evaluate the impact on ongoing work.
2. Immediately evaluate the impact of the deficiencies on past work, and
3. Immediately assess the evaluation methods used to ensure technical/quality commitments are adequately tracked and translated through design documents to procedures and into actual work practices.

Bechtel's response to the documents attached is required by 04-24-84, and should address the generic issues listed in this letter, as well as the specific deficiencies cited.

Please submit your response(s) to me by 04-24-84, and transmit a copy of the response(s) to Mr. J. W. Estelle on the same date.

Sincerely,

  
T. J. JORDAN  
Project QA Manager  
South Texas Project

TJJ:lb  
Attachment

cc: J. E. Seiger  
D. G. Barker  
R. J. Maroni  
S. H. Dow  
J. W. Williams  
I. P. Morrow  
D. R. Keating  
J. W. Estelle  
D. F. Bednarczyk  
P. W. Ratter  
T. H. McShiff  
B. S. Norris  
D. T. Krishna (RPC)  
B. L. Lax (BEC)  
R. W. Miller (BEC)  
K. R. Dotterer (BEC)  
B. R. McCullough (BEC)  
STP RPS (2)  
Site Library

Houston Lighting & Power Company

Mr. L. M. Harst  
ST-HS-YQ-00761  
Page 3

ATTACHMENTS:

ML&P CARs: G-403, G-404, G-405, G-406, G-407, G-408, G-409, G-410,  
G-411, G-412, G-413, G-414, G-415, G-416, G-417, G-418,  
all Revision-0

DEFICIENCY NOTICES: 164, 165, 166, 167, 168, 169 and 170

CONCERNS: 1, 2, 3, 4, 5, 6, 7 & 8

0037940-136037

Houston Lighting & Power Company

Mr. L. M. Hurst  
ST-MS-YQ-00761  
Page 4

- bcc: G. W. Oprea, Jr.  
J. W. Goldberg  
C. G. Robertson  
T. E. Logan  
E. W. Jennings  
C. L. Grover  
D. G. Long  
C. L. Hawn (ESI) (Deficiency Documents only)  
H. G. Peck (ESI) (Deficiency Documents only)  
L. B. Triplett (PTL) (Deficiency Documents only)

Act 505-001

(1) ORGANIZATION <b>The Light company</b> BEC Engineering		(14) DEF REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO		(16) RESPONSE DUE DATE 4/9/84	
(2) DOCUMENT VIOLATED See continuation sheet		(15) REV. <input type="checkbox"/> SEE CONTINUATION SHEET		(17) P.A.A.A. <input type="checkbox"/> SEE CONTINUATION SHEET	
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY See continuation sheet.					
(8) INITIATOR <i>Delvarez</i> DATE 4/9/84					
(9) SUPERVISOR/LEAD AUDITOR <i>Thomas A. "T" ...</i> DATE 4/7/84					
(10) REMEDIAL ACTION					
(11) SIGNATURE _____ DATE _____ (12) EFFECTIVE DATE _____					
(13) CAUSE OF CONDITION					
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE					
(15) REVIEW AND APPROVAL _____ DATE _____ (16) EFFECTIVE DATE _____					
ORIGINAL RESPONSE (17) H&P INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> AMENDED RESPONSE	<input type="checkbox"/> REJECT <input type="checkbox"/> RESPONSE		SUPERVISOR/LEAD AUDITOR DATE	
AMENDED RESPONSE (18) CORRESPONDENCE NUMBER	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT		SUPERVISOR/LEAD AUDITOR DATE		
(20) VERIFICATION COMPLETED	<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT		SUPERVISOR/LEAD AUDITOR DATE		
(21) VERIFICATION ACTIONS TAKEN					
(22) H&P QA CLOSURE (POAM) _____ DATE _____					

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NLSP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-403  
(2) REVISION 1

BLOCK (6) DOCUMENT VIOLATED (CONT)

EDP-4.49, "Project Specifications", Rev. 4

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Paragraph 2.3 of EDP-4.49 states in part, "Personnel preparing specifications shall review the requirements to ensure applicable requirements are addressed.

- b. Applicable codes, standards, and regulatory requirements.
- f. Project Quality Program Requirements."

QAPD, Rev. 5, Part A, Table 1 (Also PQAP, Rev. 3, Table 2.2) state in part that the qualifications of Inspection, Examination and Testing personnel conform to ANSI M5.2.6-1973 and R.G. 1.58 (Rev. 0, 8/73) as modified by positions C.5, C.6, C.7, C.8, and C.10 of Rev. 1.

However, to the contrary, BEC Specification 3Y060Y5044, "Field and Laboratory Testing of Earthwork Construction" (also PTL Procedure QC-PQ-2) only invokes ANSI M5.2.6-1973 and does not commit conformance to R.G. 1.58 (Rev. 0, 8/73) as modified by positions C.5, C.6, C.7, C.8, and C.10 of Rev. 1.

HLBP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. 403

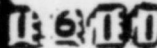
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

NOTE: Regulatory Guide positions impose stringent requirements at least in two areas as compared to ANSI M45.2.6-1973:

- a) Type of experience
- b) Requiring documented objective evidence (i.e., procedures and record of written test) in the event capability demonstration is the criteria for personnel certification.

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Rev. 1-28-81

<b>The Light company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER		FR CAR No. <u>G-404</u>
		QUALITY ASSURANCE CORRECTIVE ACTION REPORT		CR REVISION <u>1</u>
(3) ORGANIZATION	BEC Engineering & QA	(4) DEF REQUIRED	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	(5) RESPONSE DUE DATE
(6) DOCUMENT VIOLATED	See Block (7)	REV	See Block (7)	PARA See Block (7)
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY				
1 See continuation sheet.				
(8) INITIATOR	<i>D. J. Jones</i>	DATE	4/9/84	
(9) SUPERVISOR/LEAD AUDITOR	<i>Thomas H. Hill</i>	DATE	2/17/84	
(10) REMEDIAL ACTION				
2				
(11) SIGNATURE		DATE	(12) EFFECTIVE DATE	
(13) CAUSE OF CONDITION				
3				
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE				
(15) REVIEW AND APPROVAL		DATE	(16) EFFECTIVE DATE	
ORIGINAL RESPONSE	(17) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMENDED RESPONSE	SUPERVISOR/LEAD AUDITOR
	(18) CORRESPONDENCE NUMBER			DATE
AMENDED RESPONSE	(19) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT		SUPERVISOR/LEAD AUDITOR
		<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT		DATE
(20) VERIFICATION COMPLETED				
4				
(21) VERIFICATION ACTIONS TAKEN				
(22) HLEP QA CLOSURE (POAK)				
DATE				

HELP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-464  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

1) FSAR paragraph 2.5.4.5.6.2.4 states in part, "Whenever fill or backfill was placed during a work shift, at least one field test was conducted during the shift and a sample for laboratory relative density testing was obtained, provided that the compaction was completed in some area."

Contrary to the above, BEC Specification 3Y069Y50043, Rev. 8, requires:

- a) One test per eight hour work day and,
- b) Does not require sampling for laboratory relative density testing.

2) FSAR paragraph 2.5.4.5.6.2.5 states in part, "For subgrade preparations, a minimum of three additional in-place tests had to be performed within each tested area."

Contrary to the above, BEC earthwork specifications do not contain the above quoted requirements for subgrade preparation.

NOTE: BEC response must address the impact of the above deficiencies on the fill/backfill placed to date and initiate MCR(s) accordingly.



*Ind. 205-0013*

**The Light company** SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. *G-405*  
(2) REVISION *1*

(3) ORGANIZATION: *REC* (4) DEF REQUIRED:  YES  NO (5) RESPONSE DUE DATE: *10-20-20*

(6) DOCUMENT VIOLATED: *See Block (7)* REV. *See Block (7)* PARA *See Block (7)*

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

**1** *See continuation sheet*

(8) INITIATOR: *[Signature]* DATE: *1/7/04*

(9) SUPERVISOR/LEAD AUDITOR: *Thomas H. H. Hail* DATE: *2/19/04*

(10) REMEDIAL ACTION

**2**

(11) SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_ (12) EFFECTIVE DATE: \_\_\_\_\_

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

**3**

(15) REVIEW AND APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_ (16) EFFECTIVE DATE: \_\_\_\_\_

ORIGINAL RESPONSE (17) HLEP INITIATOR: \_\_\_\_\_  ACCEPT  AMENDED SUPERVISOR/LEAD AUDITOR: \_\_\_\_\_ DATE: \_\_\_\_\_  
 REJECT  RESPONSE

AMENDED RESPONSE (18) CORRESPONDENCE NUMBER: \_\_\_\_\_

(19) HLEP INITIATOR: \_\_\_\_\_  ACCEPT  SUPERVISOR/LEAD AUDITOR: \_\_\_\_\_ DATE: \_\_\_\_\_  
 REJECT  SAT  UNSAT

(20) VERIFICATION COMPLETED: \_\_\_\_\_ SUPERVISOR/LEAD AUDITOR: \_\_\_\_\_ DATE: \_\_\_\_\_

**4** (21) VERIFICATION ACTIONS TAKEN

(22) HLEP QA CLOSURE (POAM): \_\_\_\_\_ DATE: \_\_\_\_\_

Page 2 of 2MLBP OR CORRECTIVE ACTION REPORT CONTINUATION(1) CAR NO. G-405  
(2) REVISION 0BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

FSAR Paragraph 2.5.4:5.6.2.5 states in part, "All testing was done in general accordance with ASTM Standards. Exceptions or clarifications to ASTM are noted hereunder for each test type.

1) j. Field density using the Sand-Cone Method-ASTM D1556-64 (1968).

NOTE: Two bulk density tests were run as a minimum for each new bag. Additional tests must be run if results deviated more than one percent. Standard sand had 100 percent passing the No. 10 sieve and none passing the No. 200 sieve.

Contrary to the above, the two quoted commitments (stringent requirements) are not incorporated into PTL Procedures/Instructions.

2) d. ASTM D422-63, Grain size-sieve and hydrometer.

Contrary to the above, PTL procedure QC-LT-1, Rev. 35 takes exception to ASTM D422 in that, the hydrometer portion of the test is not required to be performed for Category I structural backfill.

ARCT 505-001

14-002 07/83 SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER

**The Light company** (1) CAR No. G-406  
QUALITY ASSURANCE CORRECTIVE ACTION REPORT (2) REVISION 1

(3) ORGANIZATION EPC Engineering & CA	(4) DEF REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	(5) RESPONSE DUE DATE 27-28-84
(6) DOCUMENT VIOLATED On-going Short Circuit Commitment	REV. VA(2) HB	PARA. N/A
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY		

1 See continuation sheet

(8) INITIATOR <i>[Signature]</i>	DATE 4/9/84
(9) SUPERVISOR/LEAD AUDITOR Thomas H. (H) [Signature]	DATE 6/9/84

(10) REMEDIAL ACTION

2

(11) SIGNATURE	DATE	(12) EFFECTIVE DATE
(13) CAUSE OF CONDITION		

3

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE
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ORIGINAL RESPONSE	(17) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT <input type="checkbox"/> AMENDED RESPONSE	SUPERVISOR/LEAD AUDITOR	DATE
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER			
	(19) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	SUPERVISOR/LEAD AUDITOR	DATE

4

(20) VERIFICATION COMPLETED

(21) VERIFICATION ACTIONS TAKEN

(22) HLEP QA CLOSURE (FOAM) DATE

Page 2 of 2

HLBP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-406

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

On-going Show Cause Commitment VA(2) MB states in part, that for bedding and backfilling of ECM System piping, BEC specifications, ESI QC Procedure, and PTL procedures are revised to incorporate the following requirement:

"Locations and sequence of various placements and correspondence in-place density test results will be documented together with summaries of the report construction methods and conditions."

Contrary to the above, during the audit, no objective evidence was provided as to:

a) What changes were made to the specifications and the procedures to satisfy compliance to the above quoted requirement.

b) What documentation was generated by ESI and PTL to ensure compliance to the show cause commitments.

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Andiz Sas-001

<b>The Light company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER		(11) CAR No. <u>G-407</u>
		QUALITY ASSURANCE CORRECTIVE ACTION REPORT		(12) REVISION <u>1</u>
(3) ORGANIZATION HLC Engineering	(4) DEF REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	(5) RESPONSE DUE DATE 4-9-84		
(6) DOCUMENT VIOLATED PSA	REV. <u>36</u>	PARA <u>See Block (7)</u>		
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY				
1 See continuation sheet.				
(8) INITIATOR <i>[Signature]</i>	DATE <u>4/9/84</u>			
(9) SUPERVISOR/LEAD AUDITOR <i>Thomas H. McV...</i>	DATE <u>4/9/84</u>			
(10) REMEDIAL ACTION				
2				
(11) SIGNATURE	DATE	(12) EFFECTIVE DATE		
(13) CAUSE OF CONDITION				
3				
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE				
(15) REVIEW AND APPROVAL				
		DATE	(16) EFFECTIVE DATE	
ORIGINAL RESPONSE	(17) HLSF INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(18) CORRESPONDENCE NUMBER	SUPERVISOR/LEAD AUDITOR DATE
AMENDED RESPONSE	(19) HLSF INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(20) VERIFICATION COMPLETED	SUPERVISOR/LEAD AUDITOR DATE
		<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT		
4 (21) VERIFICATION ACTIONS TAKEN				
(22) HLSF QA CLOSURE (FOAMS)				
				DATE

HLSP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-407  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

FSAR paragraph 2.5.4.5.G.2.5 states in part, "A sufficient stockpile was maintained at all times at the site to permit sampling and verification of the material properties before it was placed. . . One sample was obtained for each 20,000 yards as the work proceeded. These samples were tested as required in the above paragraph." Above paragraphs list testing as per ASTM D2049, D422 and D2486.

Contrary to the above, no specific evidence could be produced to substantiate that relative density (ASTM D2049) is also determined from the samples from stockpiles. NCRs need to be initiated if the above stated condition has impact on previously placed backfill/fill.

Audit 205-901

**The Light company** SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. G-408  
(2) REVISION 0

(3) ORGANIZATION PTI (4) DEF REQUIRED  YES  NO (5) RESPONSE DUE DATE 04-29-84  
(6) DOCUMENT VIOLATED HLAP POAP REV. 2, Sec. 5.0 (7) PARS 5.2.2  
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1 See continuation sheet

(8) INITIATOR [Signature] DATE 4/9/84  
(9) SUPERVISOR/LEAD AUDITOR Thomas H. [Signature] DATE 4/9/84  
(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
(13) CAUSE OF CONDITION \_\_\_\_\_

3 (14) CORRECTIVE ACTION TO PREVENT RECURRENCE \_\_\_\_\_

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE (17) HLAP INITIATOR  ACCEPT  REJECT  AMEND OR  NO RESPONSE SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
(18) CORRESPONDENCE NUMBER \_\_\_\_\_  
AMENDED RESPONSE (19) HLAP INITIATOR  ACCEPT  REJECT  AMEND OR  NO RESPONSE SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_  
(20) VERIFICATION COMPLETED SUPERVISOR/LEAD AUDITOR \_\_\_\_\_ DATE \_\_\_\_\_

4 (21) VERIFICATION ACTIONS TAKEN \_\_\_\_\_  
(22) HLAP QA CLOSURE (POAM) \_\_\_\_\_ DATE \_\_\_\_\_

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-408  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

HL&P PQAP, Section 5.0, "Instructions, Procedures and Drawings", Revision 2, paragraph 5.2.2 states in part that "BEC is responsible for developing and implementing procedures and instructions for control of quality related activities.

Contrary to the above, no written procedure or instructions (by PTL) exist for sampling backfill material from the stockpiles.



Audit 505-401

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# The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(1) CAR No. Q-409  
(2) REVISION 1

(3) ORGANIZATION REC OF (4) DEF REQUIRED  YES  NO (5) RESPONSE DUE DATE 4-9-84  
(6) DOCUMENT VIOLATED HEAP ROAD REV. 2 PARA 5.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY  
The above reference states in part, "... (BEC) ... and other contractors performing activities affecting quality are required to accomplish and document these activities in accordance with written procedures. . . ."

1

Contrary to the above, MPP/QCI-4.0, Rev. 5, does not describe the process, methodology, and specific document requirements utilized w/ Category I backfill is received on-site Class 9 and subsequently upgraded to Class 3 prior to use. (CONT)

(8) INITIATOR Thomas H McNeill DATE 4-9-84  
(9) SUPERVISOR/LEAD AUDITOR Thomas H McNeill DATE 4-9-84

(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_

(13) CAUSE OF CONDITION

3

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE (17) HELP INITIATOR  ACCEPT  DAMAGED  REJECT  RESPONSE SUPERVISOR/LEAD AUDITOR DATE

AMENDED RESPONSE (18) CORRESPONDENCE NUMBER (19) HELP INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR DATE

(20) VERIFICATION COMPLETED  SAT  UNSAT SUPERVISOR/LEAD AUDITOR DATE

4

(21) VERIFICATION ACTIONS TAKEN

(22) HELP QA CLOSURE (FOAM) \_\_\_\_\_ DATE \_\_\_\_\_

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MLP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. 0-409

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Additionally, the method of approval/release for use is not specified.

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A-61 509-401

<b>The Light company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER QUALITY ASSURANCE CORRECTIVE ACTION REPORT		(1) CAR No. <u>G-810</u> (2) REVISION <u>8</u>
(3) ORGANIZATION REF. OF (4) DOCUMENT VIOLATED OCT-2.4/OCT-2.9 (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY	(14) DEF. REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO REV. 5/1	(6) RESPONSE DUE DATE 04-24-84 (5.1.3/4.1)		
<b>1</b> (A) OCT-2.4, Rev. 5, paragraph 5.1.3 states in part, "The monthly plan shall provide coverage of safety related construction activities and be flexible enough to adjust to construction schedules or areas of concern. Problem areas shall have follow-up Effectiveness Inspections at increased frequencies until confidence is re-established and the deficiencies have been corrected." (CONT)				
(8) INITIATOR <i>Thomas H. (M) Kraft</i>		DATE 4/9/84		
(9) SUPERVISOR/LEAD AUDITOR <i>Thomas H. (M) Kraft</i>		DATE 4/9/84		
<b>2</b> (10) REMEDIAL ACTION				
(11) SIGNATURE		DATE	(12) EFFECTIVE DATE	
(13) CAUSE OF CONDITION				
<b>3</b> (14) CORRECTIVE ACTION TO PREVENT REURRENCE				
(15) REVIEW AND APPROVAL		DATE	(16) EFFECTIVE DATE	
ORIGINAL RESPONSE	(17) H&P INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMENDED RESPONSE	SUPERVISOR/LEAD AUDITOR
(18) CORRESPONDENCE NUMBER				
AMENDED RESPONSE	(17) H&P INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	SUPERVISOR/LEAD AUDITOR	
(20) VERIFICATION COMPLETED				
<b>4</b> (21) VERIFICATION ACTIONS TAKEN				
(22) H&P QA CLOSURE (POAM)				DATE

HILBP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-410

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to (A), BEC QCE has not performed an Effectiveness Inspection pertaining to STP Category I Backfill activities since October 1982, a period of approximately 16 months.

(B) QCI-2.9, Rev. 1, paragraph 4.1 states, "Surveillances are on going reviews of the contractor's/constructor's quality practices for conformance to the applicable codes and standards for safety related construction activities at the South Texas Project."

Contrary to (B), BEC QCE has not performed a surveillance of STP Category I backfill activities since the original issue of QCI-2.9 (Rev. 0) on October 21, 1983, a period of approximately five (5) months.

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SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
 HOUSTON LIGHTING & POWER  
**The Light company**  
 QUALITY ASSURANCE  
 CORRECTIVE ACTION REPORT

(10) CAR No. G-411  
 (11) REVISION 1

(1) ORGANIZATION REC  
 (2) DOCUMENT VIOLATED  
 (3) DEF REQUIRED  
 (4) RESPONSE DUE DATE  
 (5) REV. 5  
 (6) PARA see Block (7)

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY  
 1 (A) Paragraph 4.3 states, "All receiving shall be performed by personnel assigned by the RS" (Receiving Supervisor).

Contrary to (A), personnel are receiving Category I backfill material and they have not been assigned by the R.S. (Construction personnel are performing this function).

(8) INITIATOR Thomas H. McNeill DATE 4-9-89  
 (9) SUPERVISOR/LEAD AUDITOR Thomas H. McNeill DATE 4-9-89

(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
 (13) CAUSE OF CONDITION \_\_\_\_\_

3

(14) CORRECTIVE ACTION TO PREVENT REURRENCE \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE (17) HLEP INITIATOR  ACCEPT  AMENDED SUPERVISOR/LEAD AUDITOR DATE  
 REJECT  RESPONSE

AMENDED RESPONSE (18) CORRESPONDENCE NUMBER  
 (19) HLEP INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR DATE  
 SAT  UNSAT

4

(20) VERIFICATION COMPLETED SUPERVISOR/LEAD AUDITOR DATE

(21) VERIFICATION ACTIONS TAKEN \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(22) HLEP QA CLOSURE (FOAM) \_\_\_\_\_ DATE \_\_\_\_\_

HLAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-411  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

(B) Paragraph 7.2.1 states, "Shipments that are received outside of a controlled receiving area shall be tagged with a "Hold for Receiving Inspection" tag.

Contrary to (B), BEC Receiving does not apply status indicators to incoming Category I backfill stockpiles.

(C) Exhibit MPP/QCI-4.0-1A, Task No. 1.2 requires Receiving QC to perform a visual inspection for cleanliness of Category I backfill material.

Contrary to this, BEC Receiving QC is stamping this attribute "Accept" without performing the required visual inspection.

(D) Paragraph 4.7 states "For Bechtel procured non-safety related... material, the cognizant supplier Quality Representative of Field Procurement... shall review applicable documentation and if found acceptable, shall sign and date the MQR..."

Contrary to (D), the SQR is not signing the MQR for Category I backfill material.

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The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
INDUSTRIAL LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(11) CAR No. G-812  
(12) REVISION 0

(3) ORGANIZATION ESI Construction (4) DEF REQUIRED  YES  NO (6) RESPONSE DUE DATE NOV-22-84  
(8) DOCUMENT VIOLATED CSP-1 REV. 3 and ICP-6 (7) See Block (7)

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1

See continuation sheet.

(9) INITIATOR [Signature] DATE 4/9/84

(2) SUPERVISOR/LEAD AUDITOR [Signature] DATE 4/9/84

(10) REMEDIAL ACTION

2

(11) SIGNATURE DATE (12) EFFECTIVE DATE

(13) CAUSE OF CONDITION

3

(14) CORRECTIVE ACTION TO PREVENT REURRENCE

(15) REVIEW AND APPROVAL DATE (16) EFFECTIVE DATE

ORIGINAL RESPONSE (17) HLEP INITIATOR  ACCEPT  REJECT  AMENDED RESPONSE SUPERVISOR/LEAD AUDITOR DATE

(18) CORRESPONDENCE NUMBER

AMENDED RESPONSE (18) HLEP INITIATOR  ACCEPT  REJECT SUPERVISOR/LEAD AUDITOR DATE

(20) VERIFICATION COMPLETED  SAT  UNSAT SUPERVISOR/LEAD AUDITOR DATE

4

(21) VERIFICATION ACTIONS TAKEN

(22) HLEP QA CLOSURE (POAM) DATE

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## MILP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-412(2) REVISION 1

## BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Attachment 4.01 of CSP-1, Rev. 3 states in part as follows:

Sequence No 3.3-"If backfill material does not have proper moisture content, it shall be conditioned by sprinkling. . ."

Sequence No 3.9-"Cohesionless backfill materials may be spread in lifts per specification 3Y069YS0043."

Sequence No 3.13-"Request compaction tests from Quality Control Inspector for each lift in accordance with paragraph 9.03 of this procedure." (QC Hold Point).

Contrary to the above, local excavations for density testing within the fill area are backfilled without QC inspection and compaction is not performed as it was for the original placement.

For example, in an approximate 4 foot by 2 foot excavation for density test, No. EL-A72-2-1587, and an approximate 2 foot by 2 foot excavation for test No. E1-A72-2-1586, backfilling was accomplished with a lift that exceeded 2 feet in its deepest portion. Additionally, the material was placed in approximately 3 inches of standing water, and was compacted without the addition of water. (NOTE: These holes were excavated beyond testing depth to control water seepage).

PDA-884 (1/88)



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SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER

**The Light company** (1) CAR No. G-413  
QUALITY ASSURANCE (2) REVISION 1  
CORRECTIVE ACTION REPORT

(3) ORGANIZATION ESI DC (4) DEF REQUIRED  YES  NO (5) RESPONSE DUE DATE REV. 29-88

(6) DOCUMENT VIOLATED MOBPH Section 04-111-11 REV. 3 PARA 3.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1 See continuation sheets.

(8) INITIATOR [Signature] DATE 4/9/84

(9) SUPERVISOR/LEAD AUDITOR Thomas M. McPhee DATE 4/9/84

(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_

(13) CAUSE OF CONDITION \_\_\_\_\_

3

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE \_\_\_\_\_

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_

ORIGINAL RESPONSE	(17) HEMP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMENDED RESPONSE	SUPERVISOR/LEAD AUDITOR	DAYS
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER				
	(19) HEMP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT		SUPERVISOR/LEAD AUDITOR	DATE

(20) VERIFICATION COMPLETED  SAT  UNSAT SUPERVISOR/LEAD AUDITOR DATE

4 (21) VERIFICATION ACTIONS TAKEN \_\_\_\_\_

(22) HEMP OR CLOSURE (NCR#) \_\_\_\_\_ DATE \_\_\_\_\_

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HLBP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-413

(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

ESI HQAPH, Section QA-III-11, paragraph 3.1 states in part, "Inspection documents shall be prepared based upon the quality requirements contained in purchase orders, specifications. . ."

Contrary to the above, ESI QCP-10.10, "Soils Inspection," Rev. 1, does not contain the following requirements of BEC Specification 3Y069YS0043, "Structural Excavation and Backfill," Rev. 8:

1) The gradation and distribution of materials in the compacted areas shall be such that backfill or fill is not segregated. (Paragraph 7.8.1)

2) Fill surfaces shall be constructed so that water will readily drain off at all times. (Paragraph 7.8.5)

3) Compaction will not be allowed within 300 feet of an area where in-situ density tests are being performed in granular materials. (Paragraph 4.1.4)

4) If concrete mats and basement walls have been waterproofed, the backfilling shall be performed so that the protective waterproofing material is not damaged. (Paragraph 7.9.3)

MLP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-413  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

5) Backfill adjacent to structures or over portions of foundations shall be placed and compacted symmetrically and uniformly by the Constructor in a manner to prevent eccentric loading or unbalanced pressure upon or against the structures. (Paragraph 7.9.7)

The condition is not limited to above quoted requirements and ESI needs to review the specification and procedure to ensure that all specification requirements are either directly incorporated into the procedure or included by making reference to the specification.

In the event previously placed backfill/fill is impacted due to non-compliance to the above quoted requirements, NCR(s) need to be initiated.

**The Light company**

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

(10) CAR No. *G-44*  
(11) REVISION *0*

(3) ORGANIZATION	ESI	(4) DEF REQUIRED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	(6) RESPONSE DUE DATE	25-25-84
(4) DOCUMENT VIOLATED	OCP 10.10/3Y069Y50043	REV.	1/8	(5) RESPONSE DATE	3.3.3.1(b)/7.5
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY Specification 3Y069Y50043, Rev. 8, Paragraph 7.5 states, "The natural soil subgrade for Category I structures is subject to foundation verification and geologic mapping by the Engineer before the constructor can place concrete or backfill." OCP-10.10, Rev. 1, paragraph 5.3.3.1(b) states, "Where natural subgrade is encountered, the Recharl Foundation Verification Engineer shall indicate his acceptance in the remarks section of Attachment H" (Backfill Inspection Report).					
(8) INITIATOR	Thomas H. [unclear]	DATE	4-9-84		
(9) SUPERVISOR/LEAD AUDITOR	Thomas H. [unclear]	DATE	8-9-84		
(10) REMEDIAL ACTION					
(11) SIGNATURE	DATE	(12) EFFECTIVE DATE			
(13) CAUSE OF CONDITION					
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE					
(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE			
ORIGINAL RESPONSE	(17) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> AMENDED <input type="checkbox"/> RESPONSE	SUPERVISOR/LEAD AUDITOR	DATE
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER	(19) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	SUPERVISOR/LEAD AUDITOR	DATE
(20) VERIFICATION COMPLETED	<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	SUPERVISOR/LEAD AUDITOR	DATE		
(21) VERIFICATION ACTIONS TAKEN					
(22) HLEP QA CLOSURE (POAM)	DATE				

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MAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-414  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to the above, no objective evidence could be provided that the SEC Foundation Verification Engineer has mapped or accepted natural subgrade which is encountered during construction of safety-related duct banks and manholes.

Examples: Manhole 53-C

Ductbank 134 (south of manhole 155)

Manhole 57

QA-943 (8/7/82)

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
HOUSTON LIGHTING & POWER  
QUALITY ASSURANCE  
CORRECTIVE ACTION REPORT

REVISED 5-8-91 19

The Light company

(1) CAR No. 6-025  
(2) REVISION 0

(3) ORGANIZATION ESI (4) DEF REQUIRED  YES  NO (5) RESPONSE DUE DATE 4-9-84  
(6) DOCUMENT VIOLATED See Block (7) (7) REV. See Block (7) (8) PARA. See Block (7)  
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1

See continuation sheet.

(9) INITIATOR MICHAEL A. Knipe DATE 4-9-84  
(10) SUPERVISOR/LEAD INITIATOR Thomas E. Smith DATE 4-9-84  
(10) REMEDIAL ACTION

2

(11) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ (12) EFFECTIVE DATE \_\_\_\_\_  
(13) CAUSE OF CONDITION

3

(14) CORRECTIVE ACTION TO PREVENT REURRENCE

4

(15) REVIEW AND APPROVAL \_\_\_\_\_ DATE \_\_\_\_\_ (16) EFFECTIVE DATE \_\_\_\_\_  
ORIGINAL RESPONSE (17) HMLP INITIATOR  ACCEPT  REJECT  AMENDED RESPONSE SUPERVISOR/LEAD AUDITOR DATE  
(18) CORRESPONDENCE NUMBER  
AMENDED RESPONSE (19) HMLP INITIATOR  ACCEPT  REJECT  SAT  UNSAT SUPERVISOR/LEAD AUDITOR DATE  
(20) VERIFICATION COMPLETED  
(21) VERIFICATION ACTIONS TAKEN  
(22) HMLP QA CLOSURE (PGAM) \_\_\_\_\_ DATE \_\_\_\_\_

Page 2 of 3HLBP QA CORRECTIVE ACTION REPORT CONTINUATION(1) CAR NO. G-415(2) REVISION 1BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

FSAR Section 2.5.4.5.6.2.5, 2nd paragraph states in part, "The inspectors considered possible variations in density with depth in determining the test locations. The tests are selected such that a series of consecutive tests will give representative density information for all depth intervals within the lifts."

Specification 3Y069Y50043, Rev. 8, paragraph 4.1.2.2 states in part. . .

"The Constructor shall consider variations in density with depth depending on lift thickness, placement and compaction methods, and shall distribute the test depths to obtain the true condition of the backfill."

Specification 3Y069Y50043, Rev. 8 (Section 4.1.3.1, "30-inch ECM Pipes"),

paragraph 4.1.3.1.3 states in part, ". . .The test shall be located immediately adjacent to the pipe at an elevation of 7-inches below the invert. . ."

OCP-10.10, Rev. 1, PCR 7, paragraph 5.3.1.1 states, "Frequency of testing shall

be as described in Bechtel Specification 3Y069Y50043." OCP-10.10, Rev. 1, PCR 7,

paragraph 5.3.1.2 states, "Location of test shall be as described in Bechtel

Specification 3Y069Y50043."

Page 3 of 3

SLMP QA CORRECTIVE ACTION REPORT CONTINUATION(1) CAR NO. G-415(2) REVISION 1BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to the above listed requirements:

1) QCP-10.10, Rev. 1, does not provide criteria on density variation with depth to enable QC to determine the correct location for testing.

2) There is no objective evidence that backfill installed by ESI has been tested at the required depths, in general. In particular, there is no objective evidence that tests below 30-inch Ø ECW pipes are taken at a depth of 7-inches below the invert. QCP-10.10, Rev. 1, does not require test depths to be recorded.

NOTE: A) The field test elevation selection process does not give representative density information for all depth intervals within the lift.

B) PTL Procedure QC-ST-1 provides for recording test depth, but ESI QC is not providing test depth information to PTL for subsequent reporting on the PTL test form.



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Audit 545-001

<b>The Light company</b>		SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER		(11) CAR No. <u>G-416</u>	
		QUALITY ASSURANCE CORRECTIVE ACTION REPORT		(12) REVISION <u>1</u>	
(3) ORGANIZATION Pittsburgh Testing Laboratory	(5) DEF. REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	(6) RESPONSE DUE DATE <u>05-25-88</u>			
(4) DOCUMENT VIOLATED See Block (7)	REV. See Block (7)	PARA See Block (7)			
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY					
1 PTL procedure QC-LT-1, Revision 35, Section 12.2, states, "Appendix I contains a listing of standard written test methods which shall be employed in conducting the specified tests." Among other methods, Appendix I references ASTM D422-63 (of which D 421 is an integral part) and D 2049-69. (CONTINUED)					
(8) INITIATOR <i>[Signature]</i>	DATE <u>4/9/84</u>				
(9) SUPERVISOR/LEAD AUDITOR <i>Thomas U. [Signature]</i>	DATE <u>4/9/84</u>				
(10) REMEDIAL ACTION					
2					
(11) SIGNATURE		DATE	(12) EFFECTIVE DATE		
(13) CAUSE OF CONDITION					
3 (14) CORRECTIVE ACTION TO PREVENT REURRENCE					
(15) REVIEW AND APPROVAL					
ORIGINAL RESPONSE	(17) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	<input type="checkbox"/> CORRECTIVE ACTION <input type="checkbox"/> RESPONSE	SUPERVISOR/LEAD AUDITOR	DATE
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER			SUPERVISOR/LEAD AUDITOR	DATE
(20) VERIFICATION COMPLETED	(19) HLEP INITIATOR	<input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT		SUPERVISOR/LEAD AUDITOR	DATE
4 (21) VERIFICATION ACTIONS TAKEN					
(22) HLEP QA CLOSURE (POAM)					
DATE					

Page 2 of 5

MLBP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-416  
(2) REVISION 1

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

PTL procedure OC-ST-1, Revision 28, Section 11.1 states in part, "The following test method standards shall be used to perform the tests specified. . . (1) ASTM D-1556-64-(68). . ."

a) ASTM D422-63 requires preparation of the test sample for mechanical analysis per ASTM D 421. ASTM requires air drying of sample received from field (Section 3.1), then quartering (Section 3.1), then separating on a No. 10 sieve (Section 4.1), then washing the material retained on the No. 10 sieve free of all fine material and drying (Section 4.2), then sieving on the No. 4 sieve (Section 4.2).

b) ASTM D422-63, Section 5.1 requires ". . . sieving until not more than one mass percent of the residue on a sieve passes that sieve during one minute of sieving. When mechanical sieving is used, test the thoroughness of sieving by using the hand method of sieving. . ."

c) ASTM D422-63, Section 10.1 requires washing of material passing the No. 10 sieve through a No. 200 sieve.

d) ASTM D422-63, Section 17.1.3.2 requires reporting the hardness of the material tested.

0037940-13639

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MLBP QA CORRECTIVE ACTION REPORT CONTINUATION(1) CAR NO. C-416(2) REVISION 1BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

e) ASTM D1556-64, Section 3 requires determination of the volume of the jar and attachment for determination of bulk density. Note 4 allows determination of " . . . bulk density in other containers of known volume that dimensionally approximate the largest test hole that will be dug. . . If this procedure is followed, it shall be determined that the resulting bulk density equals that given by the jar determination.

f) ASTM D2049-69, Section 4.1 requires determination of the volume of the mold by direct measurement, and checking by filling with water.

g) ASTM D2049-69, Section 4.1.3 requires obtaining an initial dial reading, which will remain constant for a particular measure and surcharge base plate combination, by placing the calibration bar across the diameter of the mold across the guide bracket axis.

h) ASTM D2049-69, Section 4.1.3 requires match marks be used so the measurement to the top of the base plate can be made in the same relative position for each maximum density determination.

i) ASTM D2049-69, Section 6.1.2 states, for material placed with a funnel, . . . " . . . screen of the excess soil level with the top by making one continuous pass with the steel straightedge."

FORM-204 (7/1/69)

0037940-136430

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## NLRP QA CORRECTIVE ACTION REPORT CONTINUATION

FD CAR NO. C-416CR REVISION 0BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to a) above, PTL quarters, then oven dries the sample, does not separate on a No. 10 sieve, and does not wash the material retained. With regard to b) above, PTL uses a mechanical sieving device. Although laboratory personnel are familiar with the length of time for sieving, this time has not been documented, and there is no objective evidence that samples are sieved for the same length of time. Further, the thoroughness of sieving is not checked.

Contrary to c) above, PTL determines the amount of material finer than a No. 200 sieve by dry sieving only.

Contrary to d) above, PTL forms "Report of Particle Size Analysis", Form No. ST-3, and "Report of Sieve Analysis", Form No. ST-8, have no provision for recording this information.

Contrary to e) above, PTL determines bulk densities in a 0.1 cubic foot mold, has not determined the bulk density using the ASTM prescribed method, and has not compared the results of their method of determination to ensure that it equals the jar method.

Page 5 of 5

## H&amp;P QA CORRECTIVE ACTION REPORT CONFIRMATION

(1) CAR NO. Q-416(2) REVISION 0

## BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

Contrary to f) above, PTL instruction sheet IS-CAL-22, Rev. 0, 03/03/82, requires determination of mold volume by the water filling method only.

Contrary to g) above, PTL zeros the gage on the base plate for each of the six measurements, then raises the gage stem by hand, and slides the end of the calibration bar in along the periphery of the mold, steadying the bar by hand as the reading is taken.

Contrary to h) above, PTL uses no notch marks, so the base plate measurements are made in different locations each time the maximum density is determined.

Contrary to i) above, PTL adds material by hand to the surface of the soil-filled mold, after screeding.

*Auth: S&S 101*

<b>The Light company</b> SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER QUALITY ASSURANCE CORRECTIVE ACTION REPORT		(11) CAR No. <u>G-417</u> (12) REVISION <u>1</u>
(3) ORGANIZATION BEC Engineering	(4) DEF REQUIRED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	(5) RESPONSE DUE DATE REV - 20 - FY FARA 8.2
(6) DOCUMENT VIOLATED EOP 4.3	REV. 4/1CN 4.49-16	
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY		
<b>1</b> The above reference states in part, "Revisions to specifications shall be made by revision, FCR/FCH, SCR or Addendum. . ."		
Contrary to the above, the BEC Contracts Manager instructed PTL, in correspondence PST-Y5-00-00182, dated 2/2/83, "to change the frequency of tests requested in the reference correspondence" (ST-Y5-00-000173, dated 01/26/83).		
(8) INITIATOR <i>Thomas H. McQuinn</i>	DATE 2-9-83	
(9) SUPERVISOR/LEAD AUDITOR <i>Thomas H. McQuinn</i>	DATE 2-9-83	
(10) REMEDIAL ACTION		
<b>2</b>		
(11) SIGNATURE	DATE	(12) EFFECTIVE DATE
(13) CAUSE OF CONDITION		
<b>3</b>		
(14) CORRECTIVE ACTION TO PREVENT RECURRENCE		
<b>4</b>		
(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE
ORIGINAL RESPONSE	(17) HEMP INITIATOR <input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(18) SUPERVISOR/LEAD AUDITOR <input type="checkbox"/> AMENDED RESPONSE
AMENDED RESPONSE	(19) HEMP INITIATOR <input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT	(20) SUPERVISOR/LEAD AUDITOR <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT
(21) VERIFICATION COMPLETED		DATE
(22) HEMP OR CLOSURE (FOAM)		
DATE		

Audit Ser. no. 16

<b>The Light company</b> SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION HOUSTON LIGHTING & POWER QUALITY ASSURANCE CORRECTIVE ACTION REPORT		TO CAR No. <u>G-418</u> CD REVISION <u>d</u>
(3) ORGANIZATION REC	(4) DEF REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO	(6) RESPONSE DUE DATE <u>12-31-77</u>
(8) DOCUMENT VIOLATED Specification 2Y060YS044	REV. <u>3</u>	SARA 4.04 2 b and FORM E-321-E
(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY See continuation sheet.		
(9) INITIATOR <i>[Signature]</i>	DATE <u>4/10/84</u>	
(5) SUPERVISOR/LEAD AUDITOR <i>Thomas H. [Signature]</i>	DATE <u>4/10/84</u>	
(10) REMEDIAL ACTION		
(11) SIGNATURE	DATE	(12) EFFECTIVE DATE
(13) CAUSE OF CONDITION		
(14) CORRECTIVE ACTION TO PREVENT REURRENCE		
(15) REVIEW AND APPROVAL	DATE	(16) EFFECTIVE DATE
ORIGINAL RESPONSE	(17) HLEP INITIATOR <input type="checkbox"/> ACCEPT <input type="checkbox"/> AMENDED <input type="checkbox"/> REJECT <input type="checkbox"/> RESPONSE	SUPERVISOR/LEAD AUDITOR DATE
AMENDED RESPONSE	(18) CORRESPONDENCE NUMBER	
	(19) HLEP INITIATOR <input type="checkbox"/> ACCEPT <input type="checkbox"/> REJECT <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	SUPERVISOR/LEAD AUDITOR DATE
(20) VERIFICATION COMPLETED		SUPERVISOR/LEAD AUDITOR DATE
(21) VERIFICATION ACTIONS TAKEN		
(22) HLEP QA CLOSURE (POAM)		DATE

2

3

4

HLAP QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-419

(2) REVISION #

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY (CONT)

1) Specification 2Y060Y5044, Rev. 3, paragraph 4.0A.2.b states in part,  
 "Compaction control criteria shall be controlled by the soil type and  
 referenced specification and developed in accordance with ASTM D558,  
 ASTM D698, ASTM D1557, ASTM D2049 or BOR E-25-63, as applicable, and  
 approved by the Construction Manager."

2) Form 6-321-E, "Engineering Document Requirements", requires submittal  
 of compaction control criteria prior to use.

Contrary to the above, no objective evidence could be provided for  
 compliance to the above quoted requirements.



HOUSTON LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
QUALITY ASSURANCE  
DEFICIENCY NOTICE

Model SPP-001

FORM NO. 164

1 ORGANIZATION BEC OC	3 DATE ISSUED 04/24/84	4 DATE DUE 05/24/84
5 DOCUMENT VIOLATED MPP/OCI-4.0	6 REVISION 5	7 AREA Appendix I B1 - Entry #7

8 DESCRIPTION OF DEFICIENCY

The above states, "Enter Material Receiving Report Number.  
Contrary to this RIP #2015 listed MPR #B-2015 instead of the proper MPR #B-6472.

9 INITIATOR Thomas H. Miller	DATE 4-9-84
10 REVIEW & APPROVAL Thomas H. Miller	DATE 4-9-84
11 PERSON CONTACTED R. W. Miller	POSITION BEC Site POAE
	DATE 4-2-84

12 REMEDIAL ACTION

13 SIGNATURE	DATE	14 EFFECTIVITY DATE
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15 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT DATE	16 SUPERVISOR APPROVAL	DATE
	<input type="checkbox"/> UNSAT		

17 VERIFICATION PERFORMED BY	DATE	<input type="checkbox"/> SAT	CAR NO.
		<input type="checkbox"/> UNSAT	

18 QA CLOSURE - INITIATOR	DATE	REVIEW & APPROVAL	DATE
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19 CC LIST

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HOUSTON LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
QUALITY ASSURANCE  
DEFICIENCY NOTICE

FORM NO. 165

1 ORGANIZATION <b>PTL</b>	3 DATE ISSUED <b>04-10-84</b>	4 DATE DUE <b>04-28-84</b>
5 DOCUMENT VIOLATED <b>QC-LT-1</b>	6 REVISION <b>35</b>	7 PARA. <b>12.3</b>

8 DESCRIPTION OF DEFICIENCY

1 The above reference states in part, "When standard written test methods do not exist for the test activities. . . PTL shall prepare written instruction sheets which shall be identified in Appendix I and attached to this procedure. . ."  
IS-S10-S049-69, paragraph II.1 states, "Vibratory table shall be calibrated in accordance with IS-S-15A-VTC."

Contrary to the above, relative density table calibrations have been performed according to IS-CAL-35, Rev. 0, which replaced IS-S-15A-VTC.

9 INITIATOR <i>[Signature]</i>	DATE <b>4/9/84</b>
10 REVIEWER'S APPROVAL <i>Thomas H. Christoff</i>	DATE <b>4/19/84</b>
11 PERSON CONTACTED <b>RJ Miller / L. B. Triplett</b>	POSITION <b>EEC RONE / PTL Site Mgr</b>
	DATE <b>4-2-84</b>

12 REMEDIAL ACTION

2

13 SIGNATURE	DATE	14 EFFECTIVITY DATE
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15 RESPONSE ACCEPTANCE - INITIATOR <input checked="" type="checkbox"/> SAT DATE <input type="checkbox"/> UNSAT	16 SUPERVISOR APPROVAL DATE
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17 VERIFICATION PERFORMED BY DATE <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	CAR NO.
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18 QA CLOSURE - INITIATOR	DATE	REVIEW & APPROVAL	DATE
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19 CC LIST

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HOUSTON LIGHTING & POWER Audit Sub 001  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
QUALITY ASSURANCE IDN NO. 106  
DEFICIENCY NOTICE

1 ORGANIZATION PTL	3 DATE ISSUED 09-10-88	4 DATE DUE 09-24-88
2 DOCUMENT VIOLATED QC-DC-1	5 REVISION 11	6 PARA. 7.10.2&7.10.3
7 DESCRIPTION OF DEFICIENCY Paragraph 7.10.2 states in part, "The retest report shall reference the original report to provide traceability. . .". Paragraph 7.10.3 states in part, "All retest reports shall indicate the date of the retest(s) and shall be filed with the original report."  Contrary to the above, while retests are clearly identified, and reference the original test by test number, they do not reference the original test reports, nor are they filed with the original reports.		
8 INITIATOR <i>[Signature]</i>	DATE 4/9/84	
9 REVIEW & APPROVAL <i>Thomas H. McLaughlin</i>	DATE 4/9/84	
10 PERSON CONTACTED R.W. Miller / L.E. Triplett	11 POSITION EE: POAE / ITL Site Mgr.	DATE 4-2-84

12 REMEDIAL ACTION

13 SIGNATURE	DATE	14 EFFECTIVITY DATE
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15 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT	DATE	<input type="checkbox"/> UNSAT	16 SUPERVISOR APPROVAL	DATE
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17 VERIFICATION PERFORMED BY DATE	<input type="checkbox"/> SAT	DATE	<input type="checkbox"/> UNSAT	CAR NO.
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18 QA CLOSURE - INITIATOR	DATE	REVIEW & APPROVAL	DATE
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19 CC LIST

Audit 505-901

**HOUSTON LIGHTING & POWER**  
**SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION**

**QUALITY ASSURANCE**  
**DEFICIENCY NOTICE**

FORM NO. 167

1 ORGANIZATION PTL	10 DATE ISSUED 08-18-84	11 DATE DUE 08-24-84
5 DOCUMENT VIOLATED QC-LT-1	7 REVISION 35	8 PARA. 12.2

6 DESCRIPTION OF DEFICIENCY  
 IS-510-52049-69 of the above references ASTM D2049-69 as the standard for determining relative density of cohesionless soils. Paragraph 9.1.1 of ASTM D2049-69 requires reporting of the "method used for determining minimum density (scoop or funnel). . ."

Contrary to the above, PTL Form No. ST-6, Rev. 4, 9/30/82 has no provision for reporting the method used for determining minimum density. (Note: PTL FCR #103, 1/26/84 addresses this).

9 INITIATOR <i>[Signature]</i>	DATE 4/6/84
10 REVIEWER APPROVAL <i>Thomas H. McP...</i>	DATE 4/9/84
11 PERSON CONTACTED R.W. Milne / L.B. Platt	POSITION SR. PDR/DR - S.L. Mgr
	DATE 4-2-84

12 REMEDIAL ACTION

: : :

13 SIGNATURE	DATE	14 EFFECTIVITY DATE
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15 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	DATE	16 SUPERVISOR APPROVAL	DATE
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17 VERIFICATION PERFORMED BY DATE	<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	CAR NO.
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18 QA CLOSURE - INITIATOR	DATE	REVIEW & APPROVAL	DATE
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19 CC LIST

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HOUSTON LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
QUALITY ASSURANCE  
DEFICIENCY NOTICE

And 7505-001

100 NO. 168

1 ORGANIZATION  
BEC Engineering

3 DATE ISSUED  
04-10-88

4 DATE DUE  
08-24-88

5 DOCUMENT VIOLATED  
Specification ZYD60YS044

6 REVISION  
3

7 PARA.  
4.08

8 DESCRIPTION OF DEFICIENCY  
Paragraph 4.08 states, "The frequency of testing shall be as directed by the constructor and the Construction Manager."  
Contrary to the above, no objective evidence could be provided to substantiate that the testing frequencies are directed by both the constructor and the Construction Manager.

9 INITIATOR  
*D. Jones* DATE  
4/9/88

10 REVIEW & APPROVAL  
*Thomas R. McQuinn* DATE  
4/9/88

11 PERSON CONTACTED  
*R. W. Miller / R. Schuman* POSITION  
*PER. C. to PDE / Lead* DATE  
*4-2-88*

12 REMEDIAL ACTION

13 SIGNATURE DATE 14 EFFECTIVITY DATE

15 RESPONSE ACCEPTANCE--INITIATOR  SAT DATE  UNSAT 16 SUPERVISOR APPROVAL DATE

17 VERIFICATION PERFORMED BY DATE  SAT CAR NO.  UNSAT

18 QA CLOSURE - INITIATOR DATE REVIEW & APPROVAL DATE

19 CC LIST

HOUSTON LIGHTING & POWER  
 SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
 QUALITY ASSURANCE  
 DEFICIENCY NOTICE

Audit 505-01

FORM NO. 148

1 ORGANIZATION PTL		3 DATE ISSUED 04-10-84	2 DATE DUE 04-31-84
5 DOCUMENT VIOLATED OC-CAL-3/IS-CAL-19		4 REVISION 10/8	1 PARA. 3.1, 3.2
6 DESCRIPTION OF DEFICIENCY The above reference states in part, "Place 200 pounds or less of sand in a suitable container. Hand mix thoroughly. . . Obtain a representative sample." The procedure does not adequately describe how the sand from different bags is thoroughly blended to ensure that the sample taken for testing is representative of bulk density throughout the container, and that zones of material of different bulk density do not result (which would introduce an error in density calculations). Conversations with PTL personnel indicated there was not uniform agreement as to how the sand was actually being blended.			
8 INITIATOR <i>[Signature]</i>		DATE 4/9/84	
10 REVIEW & APPROVAL <i>Thomas K. McNeil</i>		DATE 4/9/84	
11 PERSON CONTACTED RW Millay / L B Triplett		POSITION Asst POAE/PTL S. M. M.	DATE 4-2-84
12 REMEDIAL ACTION			
13 SIGNATURE		DATE	14 EFFECTIVITY DATE
16 RESPONSE ACCEPTANCE - INITIATOR <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT		DATE	15 SUPERVISOR APPROVAL DATE
17 VERIFICATION PERFORMED BY DATE		<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	CAR NO.
18 QA CLOSURE - INITIATOR		DATE	REVIEW & APPROVAL DATE
19 CC LIST			

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HOUSTON LIGHTING & POWER  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
QUALITY ASSURANCE  
DEFICIENCY NOTICE

FORM NO. 170

7 ORGANIZATION ESI GC	8 DATE ISSUED 04-18-84	9 DATE SOL 04-27-84
10 DOCUMENT VIOLATED H&P PQAP	11 REVISION 2	12 PAR. Section 10.3

**13 DESCRIPTION OF DEFICIENCY**  
Section 10.3 requires that the inspection procedures shall provide for recording the results of the inspection operation.

Contrary to the above, the inspections conducted listed in paragraph 5.1.3 and 5.1.4 of OCP-10.10, "Soils Inspection", are not required to be recorded. These inspections have been recorded on appropriate forms, but the procedure does not provide requirements.

14 INITIATOR <i>[Signature]</i>	DATE 4/1/84
15 REVIEW & APPROVAL <i>Thomas H. McBriff</i>	DATE 4/17/84
16 PERSON CONTACTED R.G. Reel / S.R. Dana	POSITION ESI Office Sup / ESI LDC
	DATE 4/2/84

**17 REMEDIAL ACTION**

18 SIGNATURE	DATE	19 EFFECTIVITY DATE
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20 RESPONSE ACCEPTANCE - INITIATOR	<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	DATE	21 SUPERVISOR APPROVAL	DATE
22 VERIFICATION PERFORMED BY	DATE	<input type="checkbox"/> SAT <input type="checkbox"/> UNSAT	DATE	23 CAR NO.

24 EA CLOSURE - INITIATOR	DATE	25 REVIEW & APPROVAL	DATE
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**26 OE LIST**

PQA-000 03/83

STP CATEGORY I BACKFILL ACTIVITIESAUDIT 508-401CONCERNS:

- 1) No methodology has been devised to date to correct erroneous documentation (i.e., Logs, Inspection Reports, test reports) or to cross-reference the accurate recalculations which were addressed by SEC CAR F-302.
- 2) It is unclear how ESI QC determines which Category I backfill material source type is encountered (i.e., TH2, III, Parker Bros., etc.) at the required subgrade elevation during excavation to enable QC to accept the material as subgrade prior to subsequent backfilling or concreting operations.
- 3) The control criteria (i.e., Relative Density Max/Min) is not consistent for all test fill programs. The sampling requirements and data application for Relative Density determinations is prescribed differently in ESI QC Procedure QCP-10.10 for "The Correlation Test Fill" (no requirements), "The Macker vibratory plate compactor qualification program" (one R.D. taken on the top lift after application of eight one-way passes), and the "Test Fill for Qualification of various hand operator compactors" (running average of the last five maximum/minimum Relative Densities). Where "the average of the last five Max/Min Relative Densities" is mentioned it is unclear if this refers to production averages, or to what source material. Additionally, it is unclear why no requirements have been included in the "Correlation



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Test Fill<sup>®</sup> procedure for control criteria, R.O. sampling, or application of R.O. Max/Min results.

- 4) Bechtel Specification 37069Y50043, Revision 8, paragraph 7.8.12 states in part, "... For the final lift of a backfill operation, density tests shall be performed within two inches of the surface elevation ..."

FSAR paragraph 2.5.4.5.6.2.3 states in part, "The top lifts to be located immediately below foundations are tested at depths between 6" and 12", regardless of lift thickness."

While it appears the current specification exceeds FSAR requirements for surface density tests, the specification conflicts with the description in the FSAR.

- 5) Inspection/verifications indicated in ESI QC Procedure QCP-18.18, Sections 5.2 and 5.3 are recorded on the Daily Backfill Inspection Report under "generic" checkpoints (i.e., Excavation, Compaction, etc.). Each "generic" checkpoint includes only one acceptance for several specific attributes. From the backfill Inspection Report, it cannot be determined that each specific attribute contained in the procedures has in-fact been verified.

AUDIT 505-401Page 3 of 4

- 6) There is no traceability of acceptance tests to shipments of Category I backfill material other than the date of the test and the time (am or pm). As a result, it is not possible to determine if PTL is meeting the minimum test frequency (each 500 yards) prescribed in Specification 3Y069Y50C43.

Additionally, this same concern applies to the bulk density determination performed on density sand for sand cone (in-place density) tests. It is not possible to determine if all bags of Ottawa sand received in a shipment have been tested.

- 7) Review and approval of PTL generated FCRs (to PTL procedures) by BEC appears to take an excessive amount of time which could impact on-going activities. FCRs containing changes which are minor in nature and do not require extensive study or review have not been responded to by BEC for over one month. The following are examples: PTL FCR No. 097 (submitted to BEC 01/26/84), PTL FCR No. 098 (submitted to BEC 01/31/84), PTL FCR No. 103 (submitted to BEC 02/16/84), and PTL FCR No. 099 (submitted to BEC 01/31/84 - This FCR adds requirements to test for weight of rebar, a test requested to be performed as directed by BEC.
- 8) PTL Procedure QC-AD-1, "Quality Assurance Program Addendum", is not referenced or addressed in other PTL implementing procedures. This procedure "modifies requirements in PTL Quality Control Procedures."

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Audit 505-401

Page 4 of 6

One of five PTL personnel questioned, as to the purpose and scope of AD-1, knew this procedure was an addendum to other PTL procedures utilized for STP. It is noted that PTL Manuals reviewed at the site testing laboratory contained hand written changes to the affected sections. This is an additional, non-proceduralized undertaking initiated by PTL and therefore, other manual holders do not have similar instructions to denote changes in this manner.

*William H. Phil / Jr. / 4/10/04  
Audit Team Leader*