

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION IV

Report No. 50-498/80-17; 50-499/80-17

Docket No. 50-498; 50-499

Category A2

Licensee: Houston Lighting and Power Company
Post Office Box 1700
Houston, Texas 77001

Facility Name: South Texas Project, Units 1 and 2

Inspection at: South Texas Project, Matagorda County, Texas

Inspection Conducted: June 23-26, 1980

Inspectors:

R. E. Hall
R. E. Hall, Chief, Engineering Support Section

Date

R. I. Tapia
R. I. Tapia, Reactor Inspector, Engineering Support
Section

7/16/80
Date

R. K. Chaudhary
R. K. Chaudhary, Reactor Inspector, Engineering Support
Section, Region I

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Date

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R. B. Landsman, Reactor Inspector, Engineering Support
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Date

Approved:

W. A. Crossman
W. A. Crossman, Chief, Projects Section

7/16/80
Date

R. E. Hall
R. E. Hall, Chief, Engineering Support Section

7/16/80
Date

Inspection Summary:

Inspection on June 23-26, 1980 (Report No. 50-498/80-17; 50-499/80-17)

Areas Inspected: Special, announced follow-up inspection of construction activities including observation of work and review of records pertaining to the NRC Inspection Report No. 50-498/79-19; 50-499/79-19 findings related to earthwork. The inspection involved one hundred and eight inspector-hours by four NRC inspectors.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

- *R. A. Frazar, Manager, Quality Assurance
- *L. D. Wilson, Project Supervisor, Mechanical/NDE
- *T. J. Jordan, Supervisor, Quality Systems
- *T. K. Logan, Lead Engineer, Quality Assurance
- R. A. Raymond, Lead Engineer, Geotechnical
- R. R. Hernandez, Lead Engineer, Structural

Other Personnel

- C. S. Hedges, Project Manager, Woodward-Clyde Consultants
- R. J. Woodward, Vice-President, Woodward-Clyde Consultants
- N. L. Worth, Project Manager, Shannon & Wilson
- T. E. Kirkland, Engineer, Shannon & Wilson
- *J. L. Hawks, Engineering Project Manager, Brown & Root
- C. B. Pettersson, Lead Discipline Engineer, Brown & Root
- *S. T. Garland, Project Geotechnical Engineer, Brown & Root
- *G. Martin, Assistant Project Manager, Brown & Root
- *C. Vincent, Project Management Staff, Brown & Root

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

*Denotes attendance at the exit interview.

2. Follow Up on Items of Noncompliance

During this inspection, corrective actions described in Houston Lighting and Power Company (HL&P) letter to the NRC, dated May 23, 1980, were inspected. The letter was in response to the items of noncompliance related to the Category I structural backfill resulting from special investigation as reported in IE Investigation Report 50-498/79-19; 50-499/79-19. These items were identified as Infraction Numbers 2, 3, 4, 5, 16, and 17 in Appendix A to the NRC letter to HL&P dated April 30, 1980. In the discussion below, the track numbers from IE Investigation Report 50-498/79-19; 50-499/79-19 are indicated.

(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.

(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.

(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.

(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.

(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.

(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.

3. Follow Up on Unresolved Items

During this inspection, licensee actions being taken to resolve the following Unresolved Items (UI) from IE Investigation Report 50-498/79-19; 50-499/79-19 were inspected.

UI 79-19-19	Test Fill Programs
UI 79-19-20	Compaction Under Structures
UI 79-19-23	Test Fill Program
UI 79-19-25	Uniformity of Placed Backfill
UI 79-19-26	Liquefaction Potential
UI 79-19-29	Shift in Max/Min Relative Densities

UI 79-19-29

Engineering Analysis of Blow Counts

UI 79-19-30

Low Density In-Place Backfill

Due to the inter-relationships between these items and the Show Cause Order (Item Number 2) transmitted to HL&P by NRC letter dated April 30, 1980, these items will all remain unresolved. They will be further inspected as a part of the inspection follow up to the Show Cause Order.

4. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of non-compliance, or deviations. An unresolved item disclosed during this inspection is discussed in paragraph 3.

5. Exit Interview

The IE inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on June 26, 1980. The IE inspectors summarized the purpose and the scope of the inspection and the findings. The IE inspectors also discussed the possible merits of specifying tolerances on critical variables in site procedures (e.g., tolerances on hammer weights identified in ASTM D-1586), and the potential for preliminary wet maximum relative density measurements affecting the previous calculations of in-place relative density for the Category I backfill. A licensee representative acknowledged statements of the IE inspectors.