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

Report No. 50-498/78-18; 50-499/78-18

Docket No. 50-498; 50-499 Category A2

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

Facility Name: South Texas Project, Units 1 & 2

Inspection at: South Texas Project, Matagorda County, Texas

Inspection conducted: December 19-22, 1978

Inspectors: W A Crossman 1/9/79
for W. G. Hubacek, Reactor Inspector, Projects Section Date
(Paragraphs 1, 2, 3, 4, 5, 7 & 8)

W A Crossman 1/9/79
W. A. Crossman, Chief, Projects Section Date
(Paragraph 6)

Approved: W A Crossman 1/9/79
W. A. Crossman, Chief, Projects Section Date

Inspection Summary:

Inspection on December 19-22, 1978 (Report No. 50-498/78-18; 50-499/78-18)
Areas Inspected: Routine, unannounced inspection of construction activities to include review of implementing procedures related to post tensioning activities for Units 1 and 2; observation of work related to concrete placement for Unit 1; observation of housekeeping and equipment storage for Units 1 and 2; and review of previous inspection findings. The inspection involved forty-eight inspector-hours by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

*T. R. Alford, Site Manager
*F. G. White, Senior Engineer
*L. D. Wilson, Site QA Supervisor
*F. D. Asbeck, Construction Supervisor
*D. J. Long, Lead Engineer
*T. J. Jordan, Lead Engineer

Other Personnel

*J. R. Monroe, Construction Project Manager, Brown & Root (B&R)
*S. A. Rasnick, Construction Chief Engineer, B&R
*C. W. Vincent, Project QA Manager, B&R
*G. T. Warnick, QA Supervisor, B&R
T. B. Schreeder, QC Supervisor, B&R
R. C. Taylor, Construction Chief Mechanical Engineer, B&R
G. C. Cooper, Mechanical Engineer, B&R
*A. Smith, Supervisor, Construction Quality Engineering, B&R

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (50-498/78-15-2.a; 50-499/78-15-2.a): Missing Field Sketch FSQ 030. The IE inspector reviewed the B&R response to the licensee's speed letter C-047 relative to missing field sketch FSQ 030. It was determined by B&R that Cadwelds 28H31 through 28H44 were those that should have been recorded on FSQ 030; however, FSQ 030 was never initiated. B&R Civil QC has verified that the Cadwelds were satisfactory but could not verify their exact as-built locations. The approximate locations of the Cadwelds have been noted on Reactor Containment Building drawing 3-C-02-1-C-1545-4, Skt. 2 of 8, Rev. 4. Additional training in Cadwelding procedural requirements has been provided for craft and inspection personnel as well as increased surveillance of Cadwelding activities by QA/QC. This matter is considered resolved.

(Closed) Unresolved Item (50-498/78-15-3.a; 50-499/78-15-3.a): Improper Sequencing of Cadweld Numbers. The IE inspector observed that the Cadweld Material Log has been corrected and reflects the proper sequence for Cadweld numbers 36H216 through 36H222 and 36H450 through 36H453. The IE inspector also observed that, in addition to increased training of personnel and QA/QC surveillance of Cadweld activities, a comprehensive review of Cadweld records was in progress. This matter is considered resolved.

(Closed) Unresolved Item (50-498/78-15-3.m; 50-499/78-15-3.m): Unit 2 Mechanical Electrical Auxiliary Building Base Mat Dimensional Error. This matte was evaluated by the licensee and determined to be reportable in accordance with the requirements of 10 CFR 50.55(e); therefore, it is no longer considered an unresolved item. The future status of this matter will be reported in accordance with 10 CFR 50.55(e).

3. Site Tour

The IE inspectors walked through various areas of the site to observe construction activities in progress and to inspect housekeeping and equipment storage.

No items of noncompliance or deviations were identified.

4. Observations of Concrete Placement

The IE inspectors reviewed pour cards and observed work related to concrete placements ME1-S029, ME1-W004-01B and ME1-W025-12 which were placed monolithically. Mix B-1-3-11 was specified on the pour cards for these placements. Placement and consolidation techniques were observed.

No items of noncompliance or deviations were identified.

5. Storage of Permanent Plant Equipment

On December 20, 1978, the IE inspector observed storage of permanent plant equipment which was located in the Unit 1 Mechanical-Electrical Auxiliary Building (MEAB). It was noted that two charging pumps and one positive displacement pump were temporarily stored in the MEAB following their removal from the warehouse by construction personnel in preparation for installation in their permanent location in the MEAB.

The IE inspector observed that the floor of the MEAB area, where the equipment was stored, was wet from runoff of excess concrete curing water from nearby work areas. The pumps were covered with plastic sheeting which was draped over them and the heaters in the pump electrical motors were energized; however, the protection afforded by these measures against the extremely humid local environment in the MEAB storage area appeared to be marginal.

The IE inspector was informed that the licensee had issued a memorandum to B&R on December 19, 1978, directing B&R to take action to assure that adequate planning is performed to determine in-place storage requirements for equipment and that the requirements are implemented.

This matter is considered unresolved pending completion of B&R's response to the licensee memorandum and review by IE during a subsequent inspection.

6. Post-Tensioning Tendon System

The containment building post-tensioning utilizes the BBRV prestressing system supplied by the Prescon Corporation. The system is described in Section 3.8 of the Final Safety Analysis Report (FSAR).

a. System Description

The post-tensioning system will utilize horizontal (hoop) tendons and long U-tendons each of which function as two verticals and a dome tendon.

The U-tendons provide prestressing of the cylindrical portion and the dome. These tendons are continuous over the dome and provide two-way tensioning beginning at 10^{0} from the bottom of the hemispherical dome.

The horizontal tendons are continuous hoop tendons and prestress the cylindrical and dome portion of the containment. The hoop tendons are full girth, 360^{0} tendons, both ends being anchored to the same buttress and bypassing intermediate buttresses. Successive hoop tendons are anchored 120^{0} from each other. Hoop tendons begin at a point 7'9" above the top of the base mat and extend up to a point 45^{0} on the hemispherical dome.

The tendons proper are composed of 186 stress-relieved, high strength wires 1/4" in diameter. The minimum ultimate strength of the wire is 240,000 psi with a minimum yield strength of greater than or equal to 85% of the minimum ultimate strength.

No items of noncompliance or deviations were identified.

b. Applicable Codes, Standards and Specifications

The basic code used in design, fabrication and installation of the post-tensioning tendon system is Section III, Division 2 of

the ASME/ACI Code (ACI-359), "Proposed Standard Code for Concrete Reactor Vessels and Containments," 1973 including Addenda 1 through 6.

Other applicable codes and regulations include Regulatory Guide 1.103, "Post-tensioned Prestressing Systems of Concrete Reactor Vessels and Containments," Rev. 1, 10/76; Prestress Concrete Institute (PCI), "Tentative Specification for Post-tensioning Materials," PCI Journal, January-February 1971; and American Society for Testing and Materials (ASTM), E 328-72, "Stress-Relaxation Tests for Materials and Structures."

In addition to the above, applicable codes referenced in the FSAR for the materials were reviewed.

The IE inspector reviewed Revision E of Specification No. 2C239CS003, "Containment Post-tensioning System." Subsequent discussion with licensee representatives indicated that there would be revision to the Specification after evalaution of their review findings was completed. The IE inspector will review the final revision to this specification during a subsequent inspection.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. An unresolved item disclosed during the inspection is discussed in paragraph 5.

8. Exit Interview

The IE inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on December 22, 1978. The IE inspectors summarized the purpose and the scope of the inspection and the findings. A licensee representative acknowledged statements of the IE inspector concerning the unresolved item.