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

REGION IV

Report No. 50-498/79-16; 50-499/79-16

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: October 1-12, 1979

Inspector: for W. A. Crossman 12/12/79
H. S. Phillips, Resident Reactor Inspector Date

Approved: W. A. Crossman 12/12/79
W. A. Crossman, Chief, Projects Section Date

Inspection Summary:

Inspection during October 1979 (Report 50-498/79-16; 50-499/79-16)
Areas Inspected: Routine inspection by the Resident Reactor Inspector (RRI) of safety-related construction activities including the follow up on placement of containment structural concrete, Unit 2; fire prevention/protection; Essential Cooling Pond; storage of safety-related items for Units No. 1 and 2; and Diesel Generator Building foundation for Unit No. 1. The inspection involved thirty-six inspector-hours by one NRC inspector.
Results: In one of five areas inspected, one unresolved matter identified during the September inspection was upgraded to an item of noncompliance (infraction - failure to include appropriate acceptance criteria in instructions, procedures and drawings - paragraph 2).

DETAILS SECTIONS

1. Persons Contacted

Principal Licensee Employees

*D. G. Barker, Project Manager
*L. K. English, Project Site Manager
**T. J. Jordan, Lead Mechanical Engineer
**D. G. Long, Lead Civil Engineer
**W. N. Phillips, Projects QA Manger
*T. D. Stanley, Projects QA Supervisor
****G. A. Marshall, QA Senior Specialist
****J. W. Soward, QA Specialist
***L. D. Wilson, Site QA Supervisor

Brown & Root Employees

****B. Gebhardt, B&R Engineer
****R. Parrish, B&R QC Inspector (Civil)
***G. T. Warnick, Site QA Manager

Westinghouse Employees

W. Leslie, Site Manager

The RRI also interviewed other licensee and contractor personnel during the subject inspection period.

*Denotes management meeting regarding NRC policies and interface with the NRC Resident Reactor Inspector (RRI).

**Denotes personnel attending management meeting and the weekly meetings with the RRI.

***Denotes only those personnel attending the weekly meeting with the RRI.

****Denotes principal personnel contacted during inspections.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (499/79-15-1): Excessive Free Standing Water in Concrete Placement Area. The Resident Reactor Inspector (RRI) observed excessive free standing water on an existing concrete joint in the placement area of Reactor Building Containment Wall, Unit No. 1. Closer examination showed that an area (4' x 8-10') was covered with approximately ¼ to ½ inch of water. The Brown and Root Specification 2A010CS028-C, Section 3.2.8 dated April 26, 1979, states in part, "No excessive amounts of free standing water or material which would reduce the quality of the concrete shall be present in the placement or on the surface on which concrete is to be poured." The Brown and Root Procedure CCP-3, Revision 11, Section 3.3, "Prepour Inspection," paragraph 3.3.3(2) states, "Assure that all surfaces are wetted and no significant amount of free standing water remains."

The area engineer had signed off the prepour card even though a large area of trapped water covered the joint as described above. The water was subsequently removed from the joint after the RRI observed the condition and stated that the condition was questionable. The water was removed by soaking rags and squeezing them out after jetting with compressed air failed to remove the water.

The RRI considered the matter unresolved at the time because the specification and procedure used words such as "significant" and "excessive" amounts of free standing water. The RRI stated that action should be taken to revise or clarify the specification and procedure.

Subsequent contacts with several civil engineer's specialists, and the Portland Cement Association revealed that the condition described above was unacceptable. Additionally, literature such as Portland Cement Association Engineering Bulletin, "Design and Control of Concrete Mixtures," Eleventh Edition, page 58, states "Hardened concrete should be moistened thoroughly before new concrete is placed on it. Where the concrete has dried out, it may be necessary to saturate it for a day or more. No pools of water should be left on the wetted surface when the new concrete is placed." ASME III, Division 2, Subsection CB-4252, "Construction Joints," states the same.

The licensee provided the following answers to RRI based on an internal Houston Lighting and Power Company (HL&P) memo dated October 15, 1979:

> "The concrete specification currently states, 'No excessive amounts of free standing water or foreign material which would reduce the quality of the concrete shall be present in the placement. . .' which requires at each placement, concurrence between the area engineer and the Quality Control inspector before the pour may proceed. Should a conflict occur, the PSE will make the final interpretation of the specification's intent.

"To specify no free standing water is impractical and technically unjustified. Such restrictive requrements would only serve to further shackle construction into unnecessary delays.

"From an engineering viewpoint, limited amounts of free standing water left in a placement have no detrimental effects on the quality of the concrete.

"Even in the event a situation exists where the quantity of water is questionable, any adverse effects can be eliminated through utilization of proper construction practices.

"Construction encounters such varied situations it is impossible to define generic criteria for a maximum permissible amount of water. Therefore it is the position of B&R and HL&P engineering to allow construction (construction engineering implied) to accept or reject residual water based on their own independent engineering judgment in the assessment of each pour situation."

The RRI reviewed the answers as additional information provided and found that the licensee did not provide clarification of the terms such as "excessive amounts" or "significant amounts" of free standing water. The answer also failed to assure that instructions, procedures and drawings include appropriate quantitative or qualitative acceptance criteria.

This finding represents a noncompliance with Criterion V of 10 CFR 50, Appendix B.

3. Fire Prevention/Protection, Units 1 and 2

The Resident Reactor Inspector (RRI) observed fire prevention and protection activities in areas containing combustible materials which could lead to damage of safety-related structures, systems or components. The RRI observed prevention/protection measures to assure compliance with ANSI N45.2.2-1972, paragraph C.2.3, "Packing, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants," and ANSI N45.2.3, paragraph 3.2.3, "Housekeeping During the Construction Phase of Nuclear Power Plants," for the following:

a. non-flammable protective coverings

b. accumulation of wooden scaffolding and wooden shoring material

c. flammable packaging materials in proper containers

d. proper storage of flammable liquid

e. control of heat sources

f. fire protection/suppression equipment

g. fire drill (in process)

4. Essential Cooling Pond (ECP)

a. Description

FSAR, volume 5, paragraph 2.3.6 describes the purpose and size of the ECP. The purpose of the ECP is to provide a source of cooling water for safe plant shutdown and is used as the normal heat sink for plant auxiliaries. The ECP covers 45.6 acres @ el 25' and 40 acres @ el 17'. It is surrounded by an embankment 6050' long.

b. Status of Work

The majority of work has been completed on the ECP. However, the intake and discharge structures and placement of safety-related concrete on the southeast embankment are yet to be completed.

c. Engineering

The RRI met with project engineers assigned to the ECP area to discuss work completed and documented in the FSAR as follows:

(1) soil and foundation - investigation and geotechnical engineering design

(2) design bases - Section 9.2.5, referenced in paragraph 2.5.6

(3) ECP foundation and abutment treatment, that is, stripping top soil, removal of silty or sandy soil and replacement with clay. The FSAR specified a minimum (CH, CL) liquid limit of thirty and a minimum plasticity index of ten. The engineers stated that the tests confirmed that the materials met specified limits.

(4) Borrow material was used to control the embankment and dikes. On-site clays and sand strengths were recorded in Subsections 2.5.5.2.1 and 2.5.6.4.2.4, respectively.

(5) Embankment crest measurement was recorded as 8' above the berm and 9' above the original ground surface.

(6) Interim dike crest measurement was 12' above the berm and 13' above the ground surface.

(7) Exterior and interior embankment (dike cross sections were recorded as being built to 3 to 1 slope).

d. Observation of Work

The RRI observed that several work activities were in progress as follows:

(1) Borrow Material

Borrow material was being hauled in to spread on the bottom of the ECP. Test results to assure desired properties were stated to be at Pittburgh Testing Laboratory. Engineers assigned to this area stated that materials met specified limits.

(2) Concrete

Safety-related concrete was being placed on the Toe Block on Embankment (location: right side station 25 + 85 to 22 + 86). Pour No. TB-ERT-25+92 was being placed on October 9, 1979. The following was observed to be satisfactory:

(a) proper mix specified/delivered (B-1-3-11) per design drawing No. OY-0103-4

(b) mixing time/revolutions

(c) temperature control

(d) testing at placement (slump, air, temperature)

(e) adequate crew

(f) rebar clean, forms tight

(g) proper placement and vibration

(h) TNMEC Cure 68-191 was specified. (RRI did not verify application since placement was not complete.)

(i) B&R inspector had performed preplacement inspection and was at scene of placement. Crew supervisors were also present.

No items of noncompliance or deviations were identified.

5. Foundations, Unit 1

The RRI observed the completed work where the Diesel Generator (DG) will be located. The seal slab and a protective six inch slab had been poured. A Brown & Root inspector and a trade superintendent were reviewing the Diesel Generator (DG) layout 1C-5000-1, Revision 3, Drawing 3-D-05. The RRI reviewed the drawing to determine where the DG will be located. Rebar and embeds will be placed during the next several months after which a foundation will be poured. The foundation is to be located on backfill which requires testing/ compaction.

No items of noncompliance or deviations were identified.

6. Storage of Safety Related Items

The RRI observed the storage and/or maintenance of the following items:

Units	Description of System	No. of Items	Comments
	Safety-related Restraints	6	
1	1428-28/24/03/16/59; CC1111-SH03		Stored inside on dunnage
	Safety-related Components		
1	Steam Generators	4	Stored per PPM-0233
1	Accumulators	3	Nitrogen purge maintenance and stored in place
2	Accumulators		Nitrogen purge. Stored outside.
1	RHR Heat Exchanger	1	stored per procedure
1	Heat Exchanger Component Cooling Water	1	Stored per PPM 1899-6
1	RCDT Heat Exchanger	1	Per PPM-0295-9
	Reactor Vessel		
1	Vessel	1	Stored in place w/o dessicant per Westinghouse direction
2	Vessel	1	stored outside with exterior protected and dessicant on inside

Units	Description of System	No. of Items	Comments
1	Head	1	stored inside
2	Head	1	stored outside on dunnage per PPM-0110-3
1 & 2	Upper Tie Plate, 5940A02 Lower Internals, SN39127 Upper Internals, 45862	2 2	stored outside per procedure
1	Component Cooling Water Piping: 1303-WA 1428-WA3	2 1	Stored inside MEAB on dunnage or position to be welded
2	Essential Cooling Water Piping: Laydown area	6	Stored in area on dunnage
1	Reactor Pressure Coolant Boundary Piping (Spool pieces that join to inlet/ outlet nozzles	8	Inside containment in place

The RRI noted that the dessicant indicator in Unit 1 vessel showed that the dessicant was expended. Further, the Westinghouse Site Representative stated that the dessicant had been removed and the opening resealed when the vessel was set inside containment. The RRI questioned the need for dessicant during storage outside while dessicant was not required while stored (interim) inside. The reason given for the different requirement was the fact that long term storage requires dessicant while short term/interim storage does not.

The removal of the nitrogen purge on the secondary side of the steam generators was similar to the matter discussed above. In this case nitrogen was removed prior to setting the steam generators inside containment. The RRI questioned the need for interim storage requirements regarding the inside of the secondary side of the steam generators. The Westinghouse Representative stated there was a need for the inert gas purge for long term storage but not for short term storage.

The RRI reviewed ANSI N45.2.2, Westinghouse (WEC) Equipment Manuals and WEC/STP site criteria. No requirement for dessicant was found.

Therefore, the RRI had no further question regarding the storage of the vessel and steam generators.

No items of noncompliance or deviation were identified.

7. Management Meeting

The RRI inspector met with management from the Houston office. The following topics were discussed by the RRI:

- NRC interface with site personnel
- Lines of communication, that is, telephone, daily contacts and weekly meetings
- Government regulation prohibiting apparent conflict of interest
- Enforcement per Manual Chapter 0800 and the Resident Inspector's interpretation of 0800 as relates to the Resident Inspection Program
- RRI reports to be made monthly and interim reports to be made if item of noncompliance is identified early in the month
- Office hours are to be flexible in order to perform backshift work, however, core hours were given

The RRI met with licensee representatives weekly to discuss findings. The licensee requested that such meetings be held each Friday. Subsequently, the request was changed to Thursday at 9:00 a.m. because the site presently works four ten hour days and most personnel are not on site on Friday.

No meetings were held during the period October 15-30 because the RRI was not on site during this period. The RRI did meet with licensee personnel on October 31, to discuss unresolved matters identified in the month of September.

The RRI told the licensee's site representative that Unresolved Matter (50-499/79-15-1) would be upgraded to an item of noncompliance based on additional information obtained. This is discussed in paragraph 2 of this report. The licensee acknowledged the finding.