

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-498/84-08  
50-499/84-08

Dockets: 50-498 and 50-499

Construction Permit: CPPR-128  
CPPR-129

Licensee: Houston Lighting & Power Company  
P. O. Box 1700  
Houston, Texas 77001

Facility Name: South Texas Project, Units 1 and 2

Inspection At: South Texas Project, Matagorda County, Texas

Inspection Conducted: May 1 - July 31, 1984

Inspectors: *for W. Lassner* 9/10/84  
*for* D. P. Tomlinson, Senior Resident Inspector  
(pars. 1, 2, 7, 8, 9, 10, and 11) Date

*for W. Lassner* 9/10/84  
*for* D. R. Carpenter, Resident Inspector  
(pars. 1, 2, 3, 6, 8, 9, and 11) Date

*for W. Lassner* 9/10/84  
*for* D. D. Chamberlain, Senior Resident Inspector  
River Bend  
(pars. 1, 2, 4, and 5) Date

Approved:

J. Jaudon by [Signature]  
J. Jaudon, Chief, Project Section A  
Reactor Project Section 1

9/10/84  
Date

Inspection Summary

Inspection Conducted May 1 - July 31, 1984 (Report 50-498/84-08; 50-499/84-08)

Areas Inspected: Routine, announced inspection of allegations, site tours, housekeeping, in-place storage of safety-related equipment, storage of Unit 2 reactor internals, transportation and installation of Unit 2 steam generators, placement of three dome liner sections for Unit 2, and review of actions taken on previously identified items. The inspection involved 412 inspector-hours onsite by three NRC inspectors.

Results: Within the areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

- \*J. Barker, Supervising Project Engineer
- \*D. Bednarczyk, Project QA Supervisor-Civil/Structural
- J. Estella, Supervisor, Quality Systems
- J. Geiger, Manager, Quality Assurance
- \*J. Goldberg, Vice President, Nuclear Engineering and Construction
- S. Hubbard, Senior QA Specialist
- \*T. Jordan, Site QA Manager
- D. Keating, Project QA General Supervisor
- T. Logan, QC Supervisor
- \*G. Oprea, Executive Vice President
- \*J. Williams, Site Manager
- C. Wright, Project QA Supervisor-Mechanical/NDE

Other Personnel

Bechtel Power Corporation (Bechtel)

- D. Bentley, QC Inspector
- \*J. Downs, Deputy Manager of Construction
- \*L. Hurst, Project QA Manager
- R. Miller, Project QA Engineer

Ebasco, Services, Inc. (Ebasco)

- \*J. Crnich, Construction Manager
- R. Grippardi, QC Site Supervisor
- \*C. Hawn, Quality Program Site Manager
- F. Miller, Welding Construction Superintendent
- J. Thompson, Site Manager

Westinghouse Electric Company (Westinghouse)

- \*J. Baker, Site Representative
- \*A. Hogarth, Site Manager

The NRC resident inspectors also interviewed additional licensee personnel, Bechtel personnel, and other contractor personnel during this inspection.

- \*Denotes those individuals attending one or more management meetings during the inspection period.

## 2. Site Tours

During this reporting period, routine tours of the site were conducted by the NRC inspectors. In addition to the general housekeeping activities and cleanliness of the facilities, specific attention was given to areas where safety-related equipment is installed, stored, and where activities were in progress involving safety-related equipment. These areas were inspected to ensure that:

- a. Work in progress was being accomplished in accordance with approved procedures.
- b. Special precautions for protection of equipment were being implemented, where required, and additional cleanliness requirements were adhered to, where required.

The areas inspected included:

### Units 1 and 2

Reactor containment buildings, mechanical-electrical auxiliary buildings, fuel handling buildings, diesel generator buildings, and the springline area of Unit 2 reactor containment.

### Site

Reservoir, essential cooling pond, warehouses, laydown areas, welder qualification area, Pittsburg Testing Laboratory area, and heavy equipment storage area.

With regard to the above areas, the NRC inspector confirmed the following:

- a. Safety-related and storage areas were free from accumulations of trash, refuse, and debris.
- b. Work areas were clean and orderly.
- c. Tools, equipment, and material were returned to their proper storage locations when no longer in use.

Some areas requiring additional attention relative to housekeeping and cleanliness were pointed out to the licensee. Specifically, these areas were:

- a. Unit 1 Control Room. This area was the first major Zone IV area in the power block. This level was established when control panel installation was started. Even though the area was clearly posted "Zone IV" - "No tobacco use - No eating," on inspection tours during

the first several weeks, the NRC inspector found debris. These observations were reported to HL&P and immediate action was taken to enforce the posted areas. This area has been acceptable during recent tours.

- b. Unit 2 Upper and Lower Cable Spreading Rooms. These areas were found with excess construction debris and lunch trash. The areas are now maintained in an acceptable condition.
- c. Unit 2 Reactor Vessel Cavity. Prior to installation of the Unit 2 reactor vessel the cavity area was found to be littered with lunch trash. It was immediately cleared and has been maintained in an acceptable condition.

These areas were attended to promptly and the NRC inspectors had no further questions concerning site tours or housekeeping activities.

### 3. Licensee Actions on Previous Inspection Findings

(Closed) Violation (498/499-8404-01) Control of Nonconforming Material. Procedure WPP/QCI 5.0, "Nonconforming Material, Parts, and Components," Revision 9, was inadequate in that it did not provide for reinspection of material returned to the warehouse. This was evidenced by Nonconformance Report (NCR) HM 00254, where nonconforming weld filler material was returned to Bechtel's controlled storage area from Ebasco's weld issue stations. The NCR was brought to Houston Lighting and Power Company's (HL&P) attention by the NRC inspector and appropriate inspections were immediately performed. There was no adverse impact on safety as a result of this particular NCR, HM 00254. However, the procedure that allowed this sequence of events was inadequate. The Site Standard for Nonconformance Reporting has been revised to incorporate language that will require the initiator to determine if the nonconforming condition impacts similar bulk materials in Bechtel's controlled storage areas. Ebasco will, upon validation of the NCR, notify Bechtel of the nonconforming condition and Bechtel will quarantine the suspect bulk material. The evaluation/inspection will be documented on a Field Inspection Report (FIR) and be made a part of the original NCR.

The NRC inspector has reviewed procedure, WPP.QCI 5.0, and it is adequate to prevent recurrence.

This violation is closed.

(Closed) Unresolved Item (498/499-8311-04) Procurement. This unresolved item dealt with purchase orders (PO) that did not reference or include the Bechtel piping material specification (PO 14926-BF-1065). Appended to the purchase order were two attachments; Attachment A contained material requirements such as the following:

- a. Conformance with ASME Boiler and Pressure Vessel Code
- b. Certification of Conformance to the procurement document
- c. Source inspection
- d. Certified material test reports
- e. Condition of the material

Attachment B provided for the identification and marking of the material. Attachments A and B to the PO are summary documents derived from various engineering specification requirements. These summary sheets are used to incorporate technical and quality requirements into the PO. When the summary sheets are used to denote the technical and quality requirements in the PO, the specification is not required.

The subject attachments are reviewed by Resident Project Engineering as verification that the technical and quality requirements imposed are adequate for the specific commodities. The attachments are also reviewed by QA to assure that minimum project quality requirements and document requirements have been met. The practice of using summary sheets to list the applicable requirements is in compliance with Bechtel's WPP/QCI 10.0, "Field Material Requisition Preparation and Approval," Revision 8. The NRC inspector has reviewed WPP/QCI, Revision 8, and has determined that it provides adequate direction for completion of POs, including specification requirements.

This unresolved item is closed.

4. Storage/Maintenance of Safety-Related Equipment

This area of inspection was reviewed to determine program requirements and effectiveness of storage and maintenance of safety-related equipment, both in the warehouse and installed. The NRC inspector reviewed the Bechtel program for storage and maintenance of equipment prior to installation and the Ebasco program for storage and maintenance of installed equipment. At the time of Bechtel's release to Ebasco for installation, Bechtel is responsible for providing the storage and maintenance requirements to Ebasco. Selected warehouse areas were examined and stored equipment was selected for review of maintenance requirements and records. The types of equipment selected were electrical panels, transformers, motor operated valves, batteries, motors, pumps, etc. During the review of the Residual Heat Removal (RHR) pumps storage/storage requirements, it was noted that controversy existed between the Westinghouse site specific maintenance manual requirements and the RHR pump operation and maintenance manual requirements. The controversies were:

- a. The RHR pump operation and maintenance manual required that the pumps be covered with porous bags of corrosion inhibitor inside the covering (site specific maintenance manual had no such requirement).
- b. The RHR pump operation and maintenance manual required storage in an indoor environment where the ambient temperature of the pump does not fall below 60°F (site specific maintenance manual specifies Level B storage which indicates temperature limits of 40-140°F).

The Bechtel program requires the lead storage/maintenance engineer (LS/ME) to research/review vendor manuals for storage and maintenance requirements and the Westinghouse site specific maintenance manual requires that unique controversies with vendor manual requirements be resolved by Westinghouse NSD onsite representative. There was no evidence that the unique controversies between the vendor manual and the site specific instructions had been identified and/or resolved by the Westinghouse NSD job-site representative. A review of the RHR pump storage location revealed that the pumps were not covered and, although buckets of desiccant were placed next to the pumps, there was no evidence that depleted desiccant had been replaced as required. Subsequent discussions with licensee and Westinghouse personnel revealed that Westinghouse engineering does not believe the use of corrosion inhibitor is critical to the proper storage of these pumps. Also, the lower temperature limit is 40°F compared to 60°F appears not to be a major concern. However, although these identified unique controversies with vendor manual requirements may have been resolved, it is not apparent to the NRC inspector that all unique controversies have been identified and once identified that they could be resolved by Westinghouse NSD onsite representation. This matter is considered to be an unresolved item (8408-01), and this area will be reviewed during a future inspection.

The NRC inspector toured areas of the plant and selected installed equipment for review of maintenance records to document maintenance performed by Ebasco. The types of equipment selected were electrical switchgear, electrical panels, pumps, motors, motor operated valves, etc. The review of storage/maintenance records against established requirements revealed no violations or deviations.

#### 5. Class 1E Cable Receipt and Storage

This area of inspection was reviewed to evaluate the Bechtel program/program effectiveness for Class 1E Electrical Cable Receipt and Storage. The NRC inspector toured cable storage areas, examined selected cable reels, and reviewed selected receipt inspection documentation. It was noted during the tour of cable storage areas that the covers over certain reels had begun to deteriorate from exposure to the elements. This was discussed with Bechtel personnel, and it was noted that this condition had been identified during QC surveillance activities, and an

on-going program had been initiated to replace reel covers as required. The review of receipt documentation was inconclusive in that it was not always clear to the NRC inspector what documentation was required to meet applicable specification requirements. Specifically, a review of receiving inspection documentation for cable received from the Okonite Company for cable reels CB-712507 and CC-712015 revealed inconsistencies with the amount of physical test report data included in the package. Also, the physical test report sheets were not easily identifiable to the cable reel tested. A review of Specification 3E-189ES022-D for control cables revealed a requirement for certified evidence that the requirements of IEEE-383 are met and, although a certified test report was provided, it was not clear to the NRC inspector that this constituted proper certified evidence. The aforementioned concerns will be reviewed further during future inspections (Open Item 8408-02).

No violations or deviations were identified in this area of inspection.

6. Storage of Unit 2 Reactor Internals

Unit 2 reactor internals are stored in a locked and fenced Kelly building in a lay down area. The NRC inspector made a storage inspection and found puddles of water on the tarpaulin covering internals, numerous wasp nests inside the Kelly building, and unidentified material stored inside the Kelly building. HL&P QA and construction management were informed. The water was immediately cleaned up and roof repairs made. The inside area of the building was cleaned and all material stored within the Kelly building was properly identified. Westinghouse site representatives inspected the reactor internals and determined no damage had occurred. This will be an area of future inspections.

7. Review of Nonconformance Reports

The NRC inspector reviewed NCRs BN-0016 and CM-00327. These were selected for review because each was related to the setting of the Unit 2 reactor vessel. These NCRs indicated the following conditions and dispositions:

- a. NCR CM-00327 - After inserting one reactor support shoe guide pin into the vessel support approximately 1", it became galled. The threaded guide pin could not be inserted further or withdrawn. While attempting to loosen the guide pin with a chain wrench, the unthreaded portion of the pin became gouged. The original disposition stated that the guide pin should be reworked after removal and prior to reinstallation. Removal operations, however, required that the pin be destroyed. A replacement pin was acquired by Westinghouse from another facility and this NCR was closed and NCR BN-00106 was initiated.



- b. NCR BN-00106 - The replacement guide pin provided by Westinghouse, as mentioned above, was received onsite without having the procedurally required documentation reviews performed by Bechtel and HL&P QC. The disposition stated that Westinghouse would expedite the applicable required documentation and that Bechtel would track and verify that the HL&P review and document approval was accomplished. The same day that this NCR was issued a conditional release for the support pin was generated to facilitate the installation of the reactor vessel. Because of the pin's unique identification and retrievability, Ebasco, Bechtel, and the authorized nuclear inspector concurred.

The actions taken as a result of these NCRs were monitored by the NRC inspector. These actions and the dispositions were deemed to be adequate and the NRC inspector had no further questions relative to these dispositions or the conditional release.

#### 8. Placement of Unit 2 Major Components

The Unit 2 reactor vessel was successfully transported from the laydown storage area to the Reactor Containment Building. It was rigged into position, insulation was installed, and a preliminary set was achieved. The NRC inspector witnessed the transportation, rigging, and installation of the reactor vessel and noted that no major difficulties were encountered. The transporting and uprighting cradle had to be partially disassembled during the polar crane lift due to minor interference. This was a deviation from the original rigging plan but was performed in accordance with an immediate procedural change.

The four steam generators were also transported from the laydown storage area to the Reactor Containment Building. Each was successfully rigged, uprighted, lifted into its correct position in the building, and temporarily secured. The NRC inspector witnessed all phases of the first and fourth steam generator placements. Each was accomplished in accordance with approved procedures and the support documentation for this work appeared to be adequate.

The final three sections of Unit 2 Reactor Containment Building dome were lifted into place and the welding of these sections is currently in progress. These lifts were also performed in accordance with approved procedures and the lifts were monitored by the NRC inspector. Welding activities, performed by Pittsburg-Des Moines Steel (PDM), will be inspected and will be documented in a subsequent inspection report.

No violations or deviations were noted during this portion of the inspection.

9. NRC Inspector Follow-Up of Allegation

Two separate allegations were received by the NRC dealing with the primary and secondary shield wall placements at about the 67' level of Unit 2. Following discussions between the licensee's management and Region IV, the constructor placed a stop work order for all construction activities related to the primary and secondary shield walls of Unit 2. HL&P (licensee), Bechtel (architect-engineer), and Ebasco (constructor) investigated the allegations and the potential impact of these allegations on safety and construction. The NRC resident inspector monitored these investigations and commenced an independent inspection of the work on the shield walls.

The first allegation involved the improper fit-up of reinforcing steel (rebar) prior to cadwelding. The licensee and the constructor were notified of this allegation and a 100% visual inspection of all cadwelds in the area of this placement was performed. Although no visual evidence of improper bar spacing was noted, three cadwelds were found with marginally acceptable slag inclusions in the tap hole area.

These three cadwelds were removed and replaced with four new cadwelds. Two of the cadwelds removed involved "tail pieces" that extended into the next concrete placement and required only a single cadweld replacement. The third cadweld was to be totally incorporated into the current placement. This was removed along with adjacent lengths of the rebar and new rebar was installed utilizing two cadwelds. Visual inspection of the four replacement cadwelds indicated that all were acceptable. The cadweld identified by the allegor as having excessive end-gap inside the sleeve was located and positively identified. This cadweld was included in a sample of cadwelds selected for end gap verification to be performed by radiography. The sample was made up of 15% of the total number of cadwelds in this replacement and were of similar configuration and orientation. The configuration was unusual because both of the ends being joined contained bends so close to the cadweld that they prevented the achievement of the proper end gap. This and other bars surrounded a block-out in the shield wall. The radiography sample consisted of 22 cadwelds out of approximately 57 to be included in this concrete placement. The radiographs of the cadwelds were reviewed solely for end-gap verification and not for voids or other conditions. This inspection revealed that the joint originally identified by the allegor was the only one that exhibited excessive gap within the sleeve. The NRC inspector contacted the allegor and informed him of the actions taken and the results of the investigation. He stated that he was satisfied and had no further questions.

This item is closed.

The second allegation involved the welding of undeformed steel round stock (slick bar) to deformed reinforcing steel (rebar). Welding or tack welding on rebar is forbidden as the high heat concentrations can create a "notch effect" which will greatly reduce the strength of the bar. The allegation stated a specific area where unauthorized welding had been performed and a cursory inspection revealed that the allegation was correct. A 100% visual inspection of all rebar in this area was initiated but no further evidence of welding or tack welding to the rebar was found. The section of rebar where the welding had been performed was removed and a new piece of rebar was cadwelded into place. Only one cadweld was necessary as this was a "tail piece" that would extend beyond the concrete placement in question. All of the Ebasco ironworkers and their supervisors were reinstructed on the prohibition of welding to rebar and the reasons for this prohibition. The alleger was contacted by the NRC inspector and informed of the investigation results and the actions taken by the licensee and the constructor. The alleger stated that he was satisfied and that he had no further concerns.

This item is closed.

(Closed) Allegation Follow-up. A series of questions were received by Region IV concerning the current validity of commitments made as a result of the Show Cause Order. The questions were specifically related to the differences in pay and status between QA/QC personnel and the craftsmen working in the construction trades.

The NRC inspector was able to ascertain that the basic pay bracket for QC inspectors is higher than the pay bracket of the highest paid craft onsite. It was found, however, that an electrician or pipefitter in the upper part of his pay bracket could earn more than a QC inspector in the lower portion of his pay bracket. In the supervisory and management positions, company automobiles are provided to individuals in certain pay brackets whether they are employed in a construction or quality function. The allocation of automobiles is based solely on an individuals pay bracket and not on his occupation. A detailed response to each of the specific questions was mailed to the concerned individual by Region IV.

This item is closed.

(Closed) Allegation Follow-up. In the licensing hearings for Palo Verde, it was stated by a witness that unqualified Brown and Root personnel were hired by Bechtel and sent to the Palo Verde Nuclear Construction Site as quality control inspectors. After a few months of "walking around the site" these people were allegedly returned to the South Texas Project (STP) and put to work as fully qualified and certified quality control inspectors.

Interviews with Bechtel project quality control engineers at STP and Palo Verde indicated that this did not occur. Bechtel did hire five electrical engineers from the onsite Brown and Root work force and temporarily assigned them to work at Palo Verde. Three of these are currently at Palo Verde and two have resigned from Bechtel. There is no indication that Bechtel hired anyone from the Brown and Root work force, sent them to Palo Verde, and then returned them to the STP. The NRC senior resident inspector concluded that no further action is required.

This allegation was independently investigated by HL&P QA/QC personnel who also reached the conclusion that there was no merit to the allegation.

This item is closed.

In addition to the actions taken on allegations and items of concern received directly by the resident inspector or the Region IV office, the NRC inspector has randomly monitored the investigations conducted by Ebasco and HL&P. The record packages of six investigations performed by HL&P were reviewed and found to be adequate. Each investigation appears to have been conducted in a well organized and thorough manner by personnel cognizant in the subject area of each allegation. The findings of each investigation were evaluated to determine whether or not there were generic implications or if any other areas could be affected. Following these reviews the NRC inspector had no further questions relative to the investigations performed by HL&P QA/QC. There are several other allegations currently being pursued by HL&P and activities associated with these will be monitored and documented in future inspection reports.

The NRC inspector has been verbally notified of several allegations received by Ebasco and has been given informal status reports on each by the Ebasco quality program site manager. The results of these allegation investigations will be reviewed and evaluated by the NRC inspector when they are finalized and the findings are documented by Ebasco.

10. Unresolved Item

An unresolved item is a matter about which more information is required in order to determine whether it is an acceptable item, a violation, or a deviation. One resolved item is discussed in paragraph 4 of this report.

11. Exit Interviews

Exit interviews were held periodically with licensee management personnel during the course of this inspection. Those attending one or more of the meetings are denoted in paragraph 1. At these meetings, the scope and findings of the inspection were presented.