APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Report: 50-498/82-08; 50/499/82-08

Dockets: 50-498/50-499 Category A2

Licensee: Houston Lighting and 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, and Houston, Texas

Inspection Conducted: April 1982

Inspectors: for S.E. Martin 6/25/82
W. M. Hill, Resident Reactor Inspector Date
(Details Section A)

C R. Oberg 6/28/82
C. R. Oberg, Inspection Specialist Date
(Details Section B)

W. L. Hill for 6/28/82
D. P. Tomlinson, Reactor Inspector Date
Engineering Section (Details Section A)

C. J. Hale for 6/28/82
D. G. Breaux, Resident Reactor Inspector Date
(Details Section C)

Reviewed: R. D. Hubacek 6/28/82
W. G. Hubacek, STP Coordinator

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PDR ADOCK 05000498
Q PDR

Approved: W. A. Crossman — 6/28/82
W. A. Crossman, Chief — Date
Reactor Project Section B

D. M Hunnicutt, Chief — 6-28-82
Engineering Section — Date

C. J. Hale, Chief — 6/28/82
Reactor System Section — Date

Inspection Summary

Inspection Conducted During April 1982 (NRC Report: 50-498/82-08; 50-499/82-08)

Areas Inspected: Inspection of construction activities related to transfer of engineering and construction management functions from Brown & Root (B&R) to Bechtel Power Corporation (Bechtel) including: Bechtel assessment of the Quadrex Report findings; Bechtel review of existing design; site caretaking activities; ASME as-built verification; Essential Cooling Water (ECW) piping status; storage and maintenance; and status of licensee action on previous inspection findings. This inspection period involved 261 inspector-hours of inspection by four NRC inspectors.

Results: No violations or deviations were identified.

Details Section A

1. Persons Contacted

Principal Licensee Employees

*J. E. Geiger, Project QA Manager
*D. R. Keating, Project QA General Supervisor
J. W. Williams, Project Site Manager
D. Teague, Mechanical QA Specialist
T. Zwick, Mechanical QA Specialist

Bechtel Power Corporation (Bechtel)

*B. R. McCullough, Construction Manager
J. R. Downs, Deputy Manager of Construction
*L. W. Hurst, Project QA Manager
*A. W. Stenersen, Project Deputy QA Manager

Ebasco Services, Inc. (Ebasco)

*J. Crnich, Construction Manager
*E. K. Ferguson, Project Superintendent
*C. L. Hawn, Quality Program Site Manager
R. Cummings, Site QA Supervisor
*R. P. Grippardi, Site QC Supervisor
F. Miller, Senior Welding Construction Superintendent
T. Mirabilio, Welding Construction Superintendent

*Denotes those persons attending one or more of the management meetings during April 1982.

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

2. Licensee Action on Previous Inspection Findings

(Closed) Violation 81-29: Failure to Follow Procedures for Recording Vision Examinations. Discrepancies were noted when the NRC inspector compared the requirements of B&R Procedure ST-QAP-2.1 with the records of vision acuity examinations for inspection personnel. It was noted that the procedure required that 10 of the first 11 Ishihara plates observed must be read correctly. In some cases, the records indicated that 10 out of 12 to 15 plates were read correctly. All inspectors with questionable results were retested and the results were reentered into the personnel files. It was also noted that some forms indicated that corrective lenses were worn by inspectors while being examined. Other forms for the same individuals did not state that corrective lenses were worn. It was found that if a person wore contact lenses and did not inform the examiner, no notation was made to indicate this on the record form. The record forms

for eye examinations have since been revised and a "yes/no" check box added to indicate whether or not the examinee was wearing corrective lenses at the time the examination was conducted. All inspectors were questioned and a memo placed in the files of all affected personnel.

This item is closed.

(Closed) Unresolved Item 81-29: Review of Welders Qualification. While reviewing the acceptance criteria of B&R Procedure ST-QAP-9.11, the NRC inspector noted that for welds in material 3/8-inch thick or less, slag inclusions were acceptable if they were less than 1/3-inch long. The ASME Code stipulates that slag inclusions in welds within this thickness range may not exceed 1/8 inch. This was classed as an unresolved item as it was obviously a typographical error that was not corrected prior to issuing the procedure. Memo SQA-5016 was issued instructing that a temporary procedural change be made immediately. This was followed closely by a formal procedure page change on August 25, 1981. To assure that no welder qualification radiographs were erroneously evaluated, all qualification radiographs produced between the procedure issue date and the date of discovery were reevaluated to the corrected criteria. Four radiographs contained elongated indications. Three of the four indications exceeded 1/8 inch and were correctly rejected during the first evaluation. In none of these cases was a radiograph interpreted to the incorrect acceptance criteria.

This item is closed.

3. Site Tour

Routine tours of the site were conducted by the senior resident inspector and the region-based inspectors to observe housekeeping activities; general cleanliness; protection and preservation of equipment and material; personnel access control; and plant status. Areas observed included:

a. Units 1 and 2

Reactor Containment Buildings, Mechanical-Electrical Auxiliary Buildings, Fuel Handling Buildings, and Diesel Generator Buildings.

b. Site

Reservoir, Essential Cooling Pond, and storage areas, including the warehouses, laydown areas, and the welding fabrication shop.

With regard to the above areas, the inspectors confirmed the following:

(1) Safety-related and storage areas were free from an accumulation of trash, refuse, and debris.

(2) Work areas were clean and orderly.

(3) Tools, equipment, and materials were returned to their proper storage locations when no longer in use.

No unsatisfactory conditions were identified.

4. Reinspection of AWS Welds

The AWS weld reinspection and repair program established by B&R has been modified and is now strictly a reinspection effort. Approximately 95% of the planned weld review had been accomplished by the end of this NRC inspection period with the remainder due to be completed during the first week in May. No formal documentation of the status of each weld on each drawing was planned as all repairs necessary were documented during the reinspection. The NRC will review the final results of the reinspection and monitor the repair program during subsequent inspections.

5. Vendor Fabricated Structural Steel

An unresolved item was reported in NRC Inspection Report 50-498/81-34 relative to apparent weld discrepancies noted on structural steel assemblies supplied by American Bridge. A reinspection program was initiated and all nonconforming conditions were noted on nonconformance report (NCR) forms for each assembly. Because there seemed to be some confusion on the part of the inspectors as to what acceptance standards should be used, HL&P requested a change to the Safety Analysis Report (SAR) to incorporate the requirements of the latest version of the American Welding Society (AWS) Code. Since that time the site architect-engineer functions were transferred to Bechtel. At this time it is assured that Bechtel will review all of the documentation related to this situation and will take the appropriate action to resolve discrepancies.

Of particular interest was the possible existence of short-length, shallow-depth cracks in the welds that cannot be seen by visual inspection. All of the steel assemblies were shipped to the STP site with a thin coat of primer for environmental protection during storage. The potential severity of this type of weld cracking in A-36 material will be addressed in a report generated by Batelle dealing primarily with potential defects in inaccessible welds. It is anticipated that the Batelle Report will be available for NRC review in late July or August 1982.

6. Discrepancies in Brown-Minneapolis Tanks (BMT)

Sixteen stainless steel tanks were fabricated by BMT for use in various systems in both Units 1 and 2. Two of these tanks were to be constructed and inspected in accordance with the requirements of ASME Section III for Class 2 components. The remaining 14 were to be in accordance with Class 3 requirements. Spot radiography for the Class 3 tanks and full radiography for the Class 2 tanks was performed and all welds were found to be acceptable. Approximately 18 months later, the tanks were hydrostatically tested and the Class 2 tank welds were subjected to a post-hydro liquid penetrant examination. Numerous rejectable rounded and

linear indications were noted in the welds and base material of both tanks. One of the vertical seams was reradiographed and a comparison was made with the original radiographs. The second examination revealed large and excessive porosity along with other indications that were not visible on the originals. No cracking was noted in the welds or base material. The same technique and the same radiographer were used for both inspections and the quality of both sets of film was acceptable. No explanation has been found for the failure of the first radiographs to reveal these defects. Seeking a cause for the defects, HL&P had a specimen trepanned from the Unit 2 tank and sent to Coffer Laboratories for analysis. The specimen was removed in such a manner that it contained material from two adjacent stainless steel plates and the weld joining them. The analysis report stated that both plates were SA 240, type 304 material and that the weld was made with type 308 filler material. This is the proper filler material for welding type 304 stainless steel. These conditions were noted on NCR's SM-8752 and SM-8752A. Procedures were developed for repairing the discrepant welds on both tanks. Provisions were made in this planning for the retesting of the tanks following these repairs. Negotiations are currently underway to establish responsibility for the tank welds and to decide who will accomplish the required repairs. The two affected Class 2 tanks are identified as 2N121NTF101A and 2N121NTF201A.

Tank 3R272NTF201A, a Class 3 tank also fabricated by BMT, was inadvertently over pressurized while being filled with water prior to hydrostatic testing. Visual damage and severe distortion was sustained to at least two shell plates and the tank roof. These conditions are documented on NCR SM7318A. All weld intersections below the tank's Flexcell diaphragm attachment ring have been radiographed. No unacceptable or abnormal indications were noted, indicating that the damage was confined to the upper part of the tank where all of the visible buckling is located. The proposed corrective action for this tank is to replace the top 20 inches of shell plating and the entire roof of the tank. No repairs have been initiated.

The repair of these BMT tanks will be monitored by the NRC during subsequent inspections.

7. ASME As-Built Verification

The physical inspection, walkdown of systems and recording of as-built conditions has been completed for all ASME piping. At the close of this reporting period, a total of 465 document packages had been compiled. Seventeen had not yet been reviewed by B&R and, therefore, were considered to be incomplete. Two hundred thirty-two packages had been compiled, reviewed, and forwarded to the record vault for filing and storage. Two hundred sixteen packages had been completed by both Bechtel and B&R but not forwarded as they lacked the review and signature of the authorized nuclear inspector (ANI) prior to being turned over to the records vault. Many of these packages have been reviewed by several NRC inspectors and these have been identified in previous inspection reports with no discrepancies noted.

The as-built verificiation program for all ASME welds other than piping welds has just been initiated. This program is tentatively scheduled for completion in July 1982. The NRC will monitor this verification and review a sample of the record packages during subsequent inspections.

8. Essential Cooling Water (ECW) Piping Status

The NRC inspector toured the Site Welder Qualification Center and observed two welders practicing on samples of the ECW aluminum-bronze piping. Ebasco has not yet developed and issued procedures for any of the planned welding activities, therefore, no qualifications are yet available for these welders and all welds produced are for familiarization purposes. It is anticipated by Ebasco that all required procedures will be issued and welders qualified prior to the resumption of welding of the ECW system on August 15, 1982. The NRC will review the welding-related procedures as they become available and will monitor the future qualification of welders.

9. Storage and Maintenance

The inspectors observed activities in several warehouses and other designated storage areas with particular attention paid to the following:

- Classification and location of specific equipment in various storage areas that were segregated and classified as levels A through D to provide appropriate storage and environmental control for various types of equipment.
- Temperature and humidity were being measured and recorded to confirm that ambient conditions were being controlled, as appropriate.
- Storage areas were not being used to store food, drink, or salt.
- An active program was in effect to control rodents and small animals.
- Racks, crates, and cribbing were carrying the fill weight without component distortion.
- All items were labeled and stored in a manner that allows access for inspection.
- Fire protection systems and equipment were available for use.
- Sufficient dunnage was available to protect materials and components in storage.
- Canvas or plastic covering was available for weather protection, as required.
- Protective covers and seals were properly attached.
- Personnel access to the storage locations was adequately controlled.

During a tour of warehouse "E" on April 28, the NRC inspector observed that the wood storage container for a Low Head Safety Injection Pump (S/N 51703 N/B 422) had been damaged. There was no visible damage to the pump; however, only three of the four horizontal ribs were providing support for the pump.

A hold tag, attached to the pump, was assigned NCR BN-00007. The NCR required engineering assessment to determine if any pump damage occurred. The NRC inspector had no questions relating to the NCR.

Following a discussion with maintenance personnel and review of maintenance records, the NRC inspector determined that maintenance personnel had inspected the pump approximately 1 week earlier. It was observed that the storage/shipping crate was damaged but there was no damage to the pump. No comments were entered on the maintenance record. The maintenance procedures require monthly inspection of the storage area and verification of equipment integrity. Inspection of the crate was not specifically required by the maintenance inspection procedure. The NRC inspector discussed this matter with a responsible licensee employee and questioned if the maintenance program was providing adequate inspection. The licensee representative said the matter would be investigated.

This matter is unresolved pending further review of the licensee maintenance program (8208-01).

10. Site Transition

The inspector reviewed the following Bechtel transition procedures for as-built verification of site safety-related equipment, components, or materials:

Procedure No. 3 As-Built Verification of Site Fabricated Piping Spools/ Supports and Installed Piping Systems

Procedure No. 4 As-Built Verification of Site Safety-Related Civil/ Structural Activities Including Nuclear Coatings and Fire-Proofing During the Transition Phase

Procedure No. 5 As-built Verification of Safety-Related Installed NSSS Components, Rotating/Stationary Mechanical/Nuclear Equipment During the Transition Phase

Procedure No. 6 As-built Verification of Site Installed Safety-Related Electrical Equipment, Cable, Trays, Conduit, Electrical Control Cabinets and Enclosures, Duct Banks, and Instrumentation During the Transition Phase

In general, the procedures listed above required the following steps:

a. Obtain the latest copy of the design, architectual, or general arrangement drawing (work package).

b. Conduct a visual walkdown and verification. Each drawing is highlighted to indicate the status of items actually checked. All items found incomplete, unacceptable, or conflicting with requirements shall be indicated on the "as-built" drawing. Each drawing shall be signed and dated by the responsible QC engineer.

c. Conduct a document review and mark the document status on an exhibit included in each procedure.

d. The original as-built verification documentation will be maintained by Bechtel QC until a procedure/method of filing the documentation in the vault is approved.

In reference to the above procedures, the NRC inspector reviewed the following drawings:

1-C-4112-2	MEAB #1, wall section and elevation
1-C-4020	MEAB #1, floor plan
1-C-4023	MEAB #1, floor plan
1-C-4018-4	MEAB #1, floor plan 29 feet 0 inches
1-S-1532-7	RCB #1, SGRCP vertical and lateral support
2-S-1503-4	RCB #2, internal steel framing, elev. 19 feet 0 inches
2-S-1502-2	RCB #2, internal steel framing, elev. (-) 2 feet 0 inches
1-S-1504-5	RCB #1, internal steel, elev. 19 feet 0 inches
1-S-1503-5	RCB #1, internal steel, elev. 19 feet 0 inches
1-S-1501-5	RCB #1, internal steel, elev. (-) 2 feet 0 inches
1-S-1502-5	RCB #1, internal steel, elev. (-) 2 feet 0 inches
1-C-5001-5	DGB #1, floor, elev. 25 feet 0 inches
1-C-5002-1	DGB #1, slab, elev. 55 feet
1-C-5004-2	DGB #1, roof plan
1-C-5005-5	DGB #1, section and detail (wall)
1-C-5006-6	DGB #1, section and detail (wall)
*1-S-4082-3	MEAB #1, frame plan, elev. 72 feet, 24 feet, and 76 inches
2-S-1501-2	RCB #2, internal steel frame, elev. (-) 2 feet 0 inches
2-S-1532	RCB #2, NSSS columns

*Each drawing was marked with a color code (hi-lite) to indicate the status such as the following for a frame plan 1-S-4082-3:

Green	missing or incomplete
Blue	beam erected
Yellow	documents in the QA vault for acceptance
Red	incomplete connection; partially welded or partially bolted

Based on review of the above procedures and documents, the NRC inspector considered the transition program for verification of the as-built condition of the plant to be adequate. Although this transition program will receive continuing review by the NRC, the NRC inspector had no further questions relative to the activities described herein.

11. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. One unresolved item identified during this inspeciton is discussed in paragraph 9.

12. Exit Interview

At periodic intervals during the course of this inspection, meetings were held with senior facility management to discuss inspection scope and findings.

Details Section B

1. Persons Contacted

Houston Lighting and Power Company (HL&P)

J. White, Special Coordinator, Engineering
J. Molleda, Supervising Engineer

Bechtel Power Corporation (Bechtel)

J. Gormly, Project Manager for Licensing
R. Scott, Licensing Engineer (EN 619 Coordinator)
J. Quinnelly, Project Quality Engineer, STP

2. Status of HL&P and Bechtel Review of the Quadrex Report

During the period of April 13-15, 1982, the licensee representatives identified in paragraph 1 above, were visited by the Region IV Quadrex Review Coordinator in order to determine the status of the resolution of the Quadrex Report items. The following documents were reviewed in their relationship to the Quadrex Report:

- HL&P STP Administrative Guidelines for the Review of Draft Final Reports, Transition Phase (Rev. 1, April 2, 1982)

- Bechtel letter ST-YB-HL-0408 MOC 82-290 of March 26, 1982, Quadrex Issues (Working Document)

The final resolution of Quadrex items will be documented in appropriate engineering work packages. As of the date of the inspection, no work packages containing Quadrex issues had received a final review and approval by HL&P. Bechtel had assigned an engineer to coordinate compliance work package EN-619. This document will track each Quadrex finding and identify the final resolution.

The Bechtel working document, identified above, listed work packages that are affected by Quadrex findings. This is a preliminary list and it is expected that the contents will be changed as detailed review of the work packages continues. Specific work assignments were given in this document.

The NRC inspector also discussed the status of the review of Volume II and III Quadrex "Questions." These "Questions" and the B&R answers formed the basis for the Quadrex Findings in Volume I of the report. In some cases, recommendations are contained in the assessments made by Quadrex that have not been brought forward to Volume I. HL&P and Bechtel had indicated that Volumes II and III will be reviewed, but only as background material for the Volume I findings. After some additional discussion, HL&P indicated that Volumes II and III would be reviewed for "significant recommendations" not referenced in Volume I. The recommendations would be acted upon if

the Bechtel reviewer determines that they are of major importance and should be resolved. HL&P does not plan on "second guessing" Quadrex Corporation management by increasing the number of findings without justification.

It is anticipated that EN 619 will be ready for NRC review on or about July 19, 1982.

Details Section C

1. Persons Contacted:

J. L. Hurley, Assistant Project Engineering Manager, Bechtel
H. Friend, Project Manger, Bechtel
K. R. Dotterer, Project QA Engineer, Bechtel
J. McBride, Quality Engineer, Bechtel
L. Rogers, Project Engineering Manager, Bechtel
L. Quinnelly, Quality Engineer, Bechtel
C. C. Smith, Records Manager, Bechtel
B. Robertson, Purchasing Manager, Bechtel
W. Melton, Project Engineering Coordinator, Bechtel
D. Krisha, Project QA Manager, Bechtel
S. Coffear, Project Quality Engineer, Bechtel
B. L. Lex, Project Manager, Bechtel
J. L. Blau, Supervisory Project Engineer, HL&P
S. M. Dew, Manager Engineering, HL&P
T. J. Jordan, Project QA Supervisor, HL&P
J. M. LeBlanc, Records Manager, HL&P

2. Details

This section of the report details NRC activities with respect to surveillance/inspection of the Bechtel/Brown & Root (B&R) transition process. To assess the overall transition program and to keep track of exact status of the Bechtel review and assessment of the existing B&R engineering design and associated data, a NRC Region IV inspector was placed on a full time basis at the A/E facility (Bechtel Houston). For background information on transition activities prior to this report, refer to the details section of previous monthly reports.

Phase A of the Bechtel/B&R transition process is the review and assessment of the South Texas Project design. This task has been broken down in to discretely defined systems which are defined as work packages. As the initial Bechtel review and assessment of a certain work package is completed, a draft final report is sent to HL&P for their review and comment. HL&P's comments are then incorporated into the generation of the work package final reports. When all of the final reports have been completed for the designated work packages, Phase A of the transition will be completed. The following draft final reports have been sent to HL&P for review and comment:

*EE-200	*EE-208	EJ-314	EJ-318	EJ-315
*EE-215	EJ-300	EJ-361	EA-003	EJ-352
*EE-202	*EN-610	EA-002	EM-615	EJ-366
EE-210	*EJ-364	EE-205	EC-110	EC-155
*EJ-316	*EN-609	EN-605	EJ-351	EC-142
*EJ-310	EE-220	EE-206	EJ-369	EE-219

*EE-209	EJ-313	EC-174	EJ-360	EC-165
*EA-007	EE-214	EM-506	EM-511	EM-455
*EM-557	EJ-362	EJ-303	EC-150	
EN-608	EJ-306	EN-606	EC-151	
*EN-612	EM-558	EA-006	EM-410	

*Final report sent to HL&P.

The present status of design documentation transmitted by B&R and received by Bechtel is as follows:

B&R Subpackages

	Total Scheduled	Scheduled To Date	Received
Engineering	872	775	710
Procurement	1567	1497	1058

Bechtel Supplier Quality along with Quality Engineering are reviewing all transmitted Vendor Control Program (VCP) documentation that was generated by B&R. This review will generate a list of action items that will need to be addressed. In conjunction with this activity, engineering will generate a list of action items that are identified in the engineering work package final reports.

On March 26, 1982, Bechtel completed a comprehensive listing of all the Quadrex Report findings and the related engineering work packages that will address these findings.

3. Findings

Transfer of purchase order responsibility from B&R to Bechtel occurs when Bechtel receives all the procurement information necessary to commercially assess the purchase order. The inspector observed that there were a few examples where a responsibility change had been initiated without Bechtel receiving adequate procurement documentation. These transfers were rescinded by Bechtel and will be reinstated as soon as the proper documentation is received from B&R.

During a review of some of the most recent work package draft final reports the NRC inspector observed a reference to B&R Design Assurance Group review documentation in Bechtel's assessment of the B&R design verification. The B&R Design Assurance Group was not established to perform verification activities. Bechtel Quality Engineering held an informational training session to assure that all design disciplines understood this point.

In the previous monthly report, the NRC inspector reported the latest status of the HL&P generated Corrective Action Report (CAR) HG-035. There has still been no response by B&R as of this date. Houston Lighting and

Power has decided to forward this CAR along with 11 others to Bechtel Quality Assurance for follow up.

From the review of Bechtel procedures relating to the South Texas Project Transition activities, the NRC inspector found that the procedures adequately reflected the transition phase of design responsiblity from B&R to Bechtel. Transitional activities are being properly implemented in accordance with Bechtel procedural commitments.