

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-498/83-16
50-499/83-16

Dockets: 50-498; 50-499

Construction Permits: CPPR-128
CPPR-129

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

Facility Name: South Texas Project (STP), Units 1 and 2

Inspection At: South Texas Project, Matagorda County, Texas

Inspection Conducted: September 6-8, 1983

Inspector: J. R. Boardman 9/20/83
J. R. Boardman, Reactor Inspector
Reactor Project Section B Date

Approved: W. A. Crossman 9/21/83
W. A. Crossman, Chief
Reactor Project Section B Date

Inspection Summary

Inspection Conducted September 6-8, 1983 (Report 50-498/83-16; 50-499/83-16)

Areas Inspected: Routine, unannounced inspection of construction activities including licensee actions on 10 CFR 50.55(e) report of breakdown in the quality program for the procurement cycle of purchased material. The inspection involved 16 inspector-hours onsite by one NRC inspector.

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

DETAILS

1. Persons Contacted

Principal Licensee Employees

- *D. G. Barker, Project Manager
- *T. J. Jordan, Project Quality Assurance (QA) Manager
- *S. M. Dew, Engineering Manager
- *L. J. Klement, Supervising Engineer, Licensing
- *P. R. Wilson, QA Engineer
- *J. G. White, Engineering

Bechtel Power Corporation (Bechtel)

- *B. L. Lex, Project Manager,
- *R. L. Rogers, Project Engineering Manager,
- *S. T. Cozzens, Project Engineering,
- *K. R. Dotterer, Project QA Engineer,
- *F. Lopez, Assistant Project Engineer

*Indicates attendance at exit interview held September 8, 1983. The NRC inspector also contacted other licensee and contractor personnel.

2. Breakdown in the Quality Program for the Procurement Cycle of Purchased Material

a. Description of Deficiency

On January 4, 1980, HL&P submitted a report in accordance with 10 CFR 50.55(e) to the Director of Region IV describing a breakdown in the B&R quality assurance vendor surveillance program in which the program failed to detect inadequate documentation records of welder certification at a Category I steel supplier's facility. As a result of this deficiency, B&R initiated a vendor control program (VCP) to study the effectiveness of prior vendor coordination and surveillance activities. The VCP reviewed several purchase orders (PO), engineering and purchasing interfaces, quality inspections, vendor documentation and records, material release at vendors, site receiving inspections. The findings of these reviews identified nine generic areas of concern with the quality programs related to the overall procurement cycle of purchased materials and equipment for STP. On June 13, 1980, HL&P in accordance with 10 CFR 50.55(e), notified the NRC of a potentially reportable deficiency regarding the findings of the VCP. On June 3, 1983, HL&P submitted their final report on this item.

b. Followup Inspection

The NRC inspector began the followup inspection to review actions taken by the licensee on this potential construction deficiency.

(1) Failure to Identify Applicable Supplier Procedures Audited

The NRC inspector first reviewed the documentation package for Bostrom-Bergen Metal Products, the Category I steel supplier (PO 35-1197-6008) whose quality assurance deficiencies initiated the reviews that resulted in this generic review of the entire B&R vendor quality program. The NRC inspector reviewed the actions or reviews performed by B&R, NUS Corporation (NUS), Bechtel, and HL&P.

An action of major significance in the review program of B&R, NUS, Bechtel, and HL&P, were the audits done by NUS (1) of each supplier's quality assurance program and (2) of each supplier's implementation of his quality assurance program. These audits were conducted in June 1981. Both reports for the supplier reviewed are worded in the present tense indicating an audit of procedures and implementation in effect in June 1981. Such an audit does not reflect the in-place supplier quality assurance program in 1977-1979 when supplier actions were accomplished in providing material or services to STP, and during which time the B&R vendor control program has been identified as deficient, necessitating this review by the licensee.

The licensee and Bechtel could not address this concern, nor produce documentation that NUS reviewed all procedures and implementation, including applicable revisions, which were used by suppliers during the accomplishment of work for STP, not procedures in effect 2 to 4 years afterwards.

The findings and conclusions reached by B&R, NUS, Bechtel, and HL&P did not appear to the NRC inspector to represent an organization having the problems originally identified.

Without the audit by NUS of the appropriate procedures actually used to establish final product quality, the overall vendor quality review progress by B&R, NUS, Bechtel, and HL&P provides little assurance of the quality of material and services provided to STP.

Pending retrieval of quality assurance documentation by the licensee confirming, for all suppliers audited by NUS, that the correct procedures and revisions were audited, this will remain an unresolved item. (8316-01)

(2) Failure to Identify Required Standards; Possible Nonconforming Installation

During the NRC inspector's analysis of documentation of the B&R, NUS, Bechtel, and HL&P review of the Category I steel supplier discussed above, the NRC inspector also noted the following apparent deficiency:

- ° NUS showed that bolted connections were not addressed in the basic B&R specification (3A010SS026-F) invoked on the supplier, and that reference should be made to the American Institute of Steel Construction (AISC) specification for bolted connections for proper procedures and controls for assuring the adequacy of structural joints.
- ° B&R closed out this item stating that permanent bolted connections would no longer be made by this supplier, that "previous permanent bolted connections were made using 'Turn of the Nut' method per AISC" (there was no documentation available substantiating this), and in most (if not all) cases, existing bolted connection could be checked. Bechtel concurred in this B&R close-out.
- ° HL&P QA had the following comment on this item:
"Since there was no acceptance criteria specified, and the bolting material is accessible, perhaps a spot check of a few of the torques should be performed."
No action had been taken on this comment.
- ° The licensee has committed in his QA program, Revision 3, to ANSI N45.2.5-1974 "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants." ANSI N45.2.5-1974 covers tightening of high strength bolting and contains such requirements, as documentation of inspections, verification of the bolting crews before beginning tightening operations, calibration of hand torque wrenches used for inspection, and qualification of personnel performing inspections.
- ° ANSI N45.2.5-1974 was not invoked on this supplier, though actions covered by this standard were identified by NUS. No reviewing organization (B&R, Bechtel, or HL&P) identified this noncompliance. If the NRC inspector had not identified this deficiency, apparently nonconforming safety related structural steel joints would have remained installed at STP.

- ° This will remain an unresolved item (8316-02) pending retrieval by HL&P of all supplier documentation related to these apparently nonconforming installations, and retrieval by HL&P of all documentation relating to the failure to involve ANSI N45.2.9-1974 on suppliers.

In addition, the NRC inspector could find no requirement imposed in PO 35-1197-6008 to prevent supplier reuse of galvanized A325 bolts. This will remain an unresolved item (8316-03) pending further review by the NRC inspector.

(3) Additional Failure to Identify Required Standards, Possible Nonconforming Installations, Apparent Design Drawing Error, and Apparent Failure to Include Subtier Specification Compliance in the Vendor Review Program

The NRC inspector reviewed the documentation package for Pittsburgh-Des Moines Steel Company, another Category I steel supplier, PO 35-1197-0011 which included the polar crane bracket and rail installation.

The NRC inspector not only discovered that ANSI N45.2.5-1974 was not invoked on the supplier (a fact not identified by NUS, B&R, Bechtel, or HL&P), but that the AISC bolting specification apparently was not invoked.

Licensee personnel informed the NRC inspector that B&R Drawing 1-S-1006, "Steel, Reactor Containment Building, Shell Crane Girder Plan Sect Details Unit 1," was directly invoked, that Note 2 of this drawing references B&R Drawing 0-S-0001 for general notes, and that the general notes on Drawing 0-S-0001 include (by reference) the AISC specification.

Since the licensee vendor QA review program did not appear to have reviewed and verified such subtier requirements, this area is considered an unresolved item (8316-04) and will be reviewed further during a subsequent inspection.

For installations on PO 35-1197-0011, the NRC inspector discovered two types of high strength bolts (Specifications ASTM A490 and A449) which B&R drawings identified as being tightened by turn-of-the-nut method, and, hence, should be governed by ANSI N.45.2.5-1974.

Licensee personnel told the NRC inspector that the ASTM A490 bolts in this application were loaded in shear and should not have been tightened since they were installed in slotted holes to allow for thermal expansion. Tightening of the nuts as specified would restrict thermal expansion

and induce stresses. This B&R drawing had been reviewed and approved by Bechtel, and issued for construction on October 4, 1982 (Bechtel Drawing 2C26-9-S-1025-0). If the question of tightening of high strength bolts had not been raised by the NRC inspector, there would have been an unacceptable installation, based on an incorrect design drawing.

This will remain an unresolved item (8316-05) pending determination by the NRC inspector of the status of installed material, and a review of Bechtel procedures and documentation that are involved in the issuance of Drawing 2C26-9-S-1025-0 containing the design error.

(The failure to invoke ANSI N45.2.9-1974 on PO 35-1197-0011 will be covered under Unresolved Item 8316-01; reuse of A490 bolts will be covered under Unresolved Item 8316-03.)

The tightening of the installed A449 bolts will remain an unresolved item (8316-06), pending licensee retrieval of quality assurance documentation for this installation.

3. 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. Six unresolved items are discussed in paragraph 2 of this report.

4. Exit Interview

An exit interview was conducted September 8, 1983, with those licensee personnel denoted in paragraph 1 of this report. At this meeting, the scope of the inspection and the findings were summarized.