UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

"CENTRAL FILES"

April 19, 1977

In Reply Refer To:
IE:IV
Docket No. 50-498/Rpt. 77-05

Houston Lighting and Power Company
ATTN: Mr. G. W. Oprea, Jr.
Executive Vice President
Post Office Box 1700
Houston, Texas 77001

Gentlemen:

This refers to the inspection conducted by Mr. R. G. Taylor and other members of our staff during the period March 28-31, 1977, of activities authorized by NRC Construction Permit No. CPPR-128 for the South Texas Project, Unit No. 1 and to the discussion of our findings with Mr. C. A. McClure and other members of your staff at the conclusion of the inspection.

Areas examined during the inspection and our findings are discussed in the enclosed inspection report. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with personnel, and observations by the inspectors.

During the inspection, it was found that certain activities under your license appear to be in noncompliance with Appendix B to 10 CFR 50 of the NRC Regulations, "Quality Assurance Criteria for Nuclear Power Plants." The items of noncompliance and references to the pertinent requirements are identified in Section I.A. of the summary of the enclosed report.

We have also examined actions you have taken with regard to previously identified enforcement matters. The status of these items is identified in Section II of the summary of the enclosed report.

One new unresolved item is identified in Section III of the summary of the enclosed report.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within 30 days of your receipt of this notice, a written statement or explanation in reply

including: (1) corrective steps which have been taken by you, and the results acheived; (2) corrective steps which will be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If the report contains any information that you believe to be proprietary, it is necessary that you submit a written application to this office, within 20 days of the date of this letter, requesting that such information be withheld from public disclosure. The application must include a full statement of the reasons why it is claimed that the information is proprietary. The application should be prepared so that any proprietary information identified is contained in an enclosure to the application, since the application without the enclosure will also be placed in the Public Document Room. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Walrossman

for W. C. Seidle, Chief
Reactor Construction and
Engineering Support Branch

Enclosure
IE Inspection Report No. 50-498/77-05

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

IE Inspection Report No. 50-498/77-05 Docket No. 50-498

Licensee: Houston Lighting & Power Co. Category A2

Location: Bay City, Texas

Facility: South Texas Project, Unit 1

Type of Licensee: PWR-W 1250 Mwe

Type of Inspection: Routine-Unannounced

Dates of Inspection: March 28-31, 1977

Dates of Previous Inspection: March 1-4, 1977

Principal Inspector: R. G. Taylor, Reactor Inspector (Details I) 4/18/77 Date

Accompanying Inspectors: R. E. Hall, Chief, Engineering Support Section (Details III)
R. A. Hermann, Reactor Inspector (Details II)

Other Accompanying Inspectors: W. E. Vetter, Assistant to RIV Director
C. L. Heck, Co-op Student

Reviewed By: W. A. Crossman, Chief, Projects Section 4/18/77 Date

SUMMARY OF FINDINGS

I. Enforcement Action

A. Items of Noncompliance

1. Violations

None.

2. Infractions

a. Cadweld Procedure Conformance

Appendix B, 10 CFR 50, Criterion V, states in part: "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings . . . and shall be accomplished in accordance with these instructions, procedures or drawings."

Brown & Root (B&R) Construction Procedure No. A-040-KP-CCP-11, "Reinforcing Steel Mechanical Splicing (Cadwelding)," prescribes procedures for field fabrication of reinforcing bar connectors (Cadwelds). Paragraph 4.1.4 of this procedure incorporates by reference the specific Cadweld assembly procedure prescribed by Erico Products, Inc., Catalog No. RB 10M-974.

Contrary to these requirements:

(1) Sampling of production Cadwelds for Cadwelder No. 7 did not meet the frequency requirements of paragraph 3.4 of the above B&R procedure for the series 7H200 to 7H386. (Details III, Paragraph 5.)

(2) Reinforcing steel bar ends were not cleaned as prescribed by paragraph 4.2.1 of the above B&R procedure for weld 15H310. (Details III, Paragraph 4.a.)

(3) Vertical welds (B series) observed being performed by teams 5 and 7 in the Unit 1 containment structure on March 25 and 29, 1977, were not blown out by compressed air prior to Cadwelding as required by paragraph 4.2.1.1 of the above B&R procedure. (Details III, Paragraph 4.b.)

(4) Weld sleeves for horizontal Cadwelds being performed by welders 1 and 15 on March 30, 1977, were not positioned as prescribed by step 3 of the above Erico procedure for horizontal Cadwelds. (Details III, Paragraph 4.c.)

(5) On March 29, 1977, asbestos wrapping of the top of Cadweld 5BV175 was observed to be greater than prescribed by step 5 of the above Erico procedure for vertical Cadwelds. (Details III, Paragraph 4.c.)

This is considered an infraction.

b. Cadweld Inspection Failure

10 CFR 50, Appendix B, Criterion V, states in part: "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings . . . and shall be accomplished in accordance with these instructions, procedures or drawings."

Brown & Root (B&R) QC Procedure No. ST-QCP-4.2, "Cadwelding," prescribe requirements for inspection and acceptance of completed Cadwelds. Acceptance criteria from Erico Products, Inc., bulletin RBM-274 are incorporated by reference.

Contrary to these requirements, Cadweld 5BV158, which had been previously inspected and accepted by the B&R Quality Control QC Inspector, was identified by the NRC inspector as having potentially excessive voiding. Re-inspection by B&R Quality Control personnel confirmed the observation and the Cadweld was subsequently rejected by the B&R QC inspector. (Details III, Paragraph 5.)

II. Licensee Action on Previously Identified Enforcement Matters 77-04/I.A.2 Failure to Calibrate Welding Machines

It was observed that the voltmeter on various submerged arc welding machines have been calibrated. It is understood that Pittsburgh-Des Moines Steel Co. (PDM) utilized a standard, loaned to them by Brown & Root, to accomplish the calibration. It is further understood that PDM has purchased a new standard that is expected to be properly certified. The licensee has not informed RIV of the steps taken to effect corrective action but is expected to do so within the thirty day time limit required. Pending receipt of the licensee's commitment and an opportunity for the inspector to evaluate full implementation of the commitment, this matter will remain open.

III. New Unresolved Item

77-05/III. Insufficent Records of Tendon Bearing Plate Materials

The inspector identified the absence of a document necessary to establish complete materials traceability for the tendon anchor head embedded bearing plates. The inspector was assured that the document was available but could not be immediately located. Pending an opportunity to review the missing document, this matter will be considered unresolved. (Details I, Paragraph 5.)

IV. Status of Previously Reported Unresolved Items

None.

V. Design Changes

None.

VI. Unusual Occurrences

None.

VII. Other Significant Findings

A. Licensee Management Change

The inspector was informed that Mr. R. A. Frazar has been designated as the licensee's Manager of Quality Assurance effective April 1, 1977. Mr. Frazar will report to the licensee's Executive Vice President as did his predecessor, Mr. D. G. Backer, who has assumed the duties of the Manager of the Construction Division. Mr. Frazar will continue as the Project QA Manager for the South Texas Project for the next several months.

B. Investigation Report 50-498/77-03

Pittsburgh Testing Laboratory, Brown & Root and the licensee have completed the analyses of testing results of the records falsifier versus other testers performing identical work during the total period of employment. Their conclusion is that no significant differences were found to exist. The inspector reviewed the bulk and summary data utilized to support this contention and found no errors. All actions contemplated in this matter have been completed. (Details I, Paragraph 4.)

VIII. Management Interview

At the conclusion of the inspection on March 31, 1977, a meeting was held with the below listed personnel:

Houston Lighting and Power Co.

S. A. Viaclovsky, Site QA Supervisor
C. A. McClure, QA Specialist (representing R. A. Frazar, Manager of Quality Assurance)
L. D. Wilson, QA Lead Specialist
T. K. Logan, QA Senior Engineer

Brown & Root, Inc.

R. A. Sanford, Construction Chief Engineer
T. P. Gardner, Project QA Manager
T. B. Schroeder, Project QC Supervisor

Pittsburgh-Des Moines Steel Co.

J. Newmeister, Field Project Manager

The inspection findings described in the report Summary of Findings were discussed as follows:

Cadweld Procedure Conformance (77-05/I.A.2.a)

The inspector stated that he observed during the inspection that Cadwelders were not following the installation instructions. As examples of this observation the inspector stated that (a) test sampling was not correct, (b) neither the rebar nor the Cadweld sleeves were being cleaned properly, (c) the Cadweld sleeves were not properly positioned and (d) excess asbestos wrap was being used to dam the sleeves prior to casting. The inspector stated that these individual observations would be considered as examples of noncompliance to Appendix B Criterion V since they involve QC and construction procedures.

Cadweld Inspection Failure (77-05/I.A.2.b.)

The inspector stated that he had identified a Cadweld that appeared to have excess void in the filler metal. The Cadweld had been accepted by Brown & Root QC, but upon performance of a reinspection requested by the inspector, the Cadweld was rejected for excessive voids. The Brown and Root original QC Inspector apparently failed to follow the QC procedure relating to measurement of voids which is in noncompliance to Appendix B, Criterion V.

Failure to Calibrate Welding Machines (77-04/I.A.2.)

The inspector stated that it appeared that prompt action had been taken to calibrate the submerged arc machine voltmeters. The inspector stated that since a formal licensee commitment had not yet been received, the matter could not be fully evaluated and would remain open.

Insufficient Records (77-05/III.)

The inspector stated that a necessary supplier furnished document to establish materials traceability for the tendon bearing plates was not immediately available, but that he had been assured it was in the mail. This would be considered an unresolved matter pending an opportunity to review the document during a future inspection.

PTL Records Falsification (77-03)

The inspector stated that he had reviewed the PTL generated data relative to this matter and has concluded that no further action is necessary.

The licensee acknowledged his understanding of the inspection finding, but had no additional questions and made no comments.

DETAILS I

Principal Inspector: R. G. Taylor
R. G. Taylor, Reactor Inspector, Projects Section

Reviewed By: W. A. Crossman
W. A. Crossman, Chief, Projects Section

1. Persons Contacted

Houston Lighting & Power Company, (HL&P)

S. A. Viaclovsky, Site QA Supervisor
T. K. Logan, QA Senior Engineer

2. Status of Project

The sixth containment liner ring has been erected and was being welded during the inspection. The first ten foot concrete lift for the containment wall was completed on March 24, 1977, and was being cured during the inspection. The first of over twenty major placements of concrete in the foundation of the electrical-mechanical building was completed on March 28, 1977. The inspector was informed that nearly 3000 people are now employed on the job site with about 60% devoted to earthwork involved in constructing the main cooling lake.

3. Scope of Inspection

The purpose of this area of the inspection was to evaluate the resolution of the problem created by a person falsifying test records[1/] and examine records pertaining to the bearing plate of the tendon trumpet assembly.

4. Records Falsification

Pittsburgh Test Laboratory (PTL), by letter to Brown & Root, dated March 17, 1977, presented a statistical analysis of test data based upon a comparison of the work of the records falsifier versus the work of other PTL personnel and the work of the aggregate and concrete supplier. The PTL technique consisted of averaging the data from all of tests performed from March 1976 through January 1977, relating to aggregate gradation. In addition to the average value, a coefficient of variation for each party involved in each test was developed. The average test values and the coefficient of variation for each different test performed by the records falsifier and other testing personnel reveal no significant

1/ Investigation Report 50-498/77-03.

differences. The inspector spot checked the considerable amount of bulk data against the summary and found no discrepancies. The inspector's review of the data revealed that the falsifier had performed only about 37% of the total of 1637 gradation tests. The balance of the tests clearly indicate that the aggregates met the quality standards. The investigation[1/] is now considered complete.

5. Review of Records For Tendon Bearing Plates

Ten trumpet assemblies were randomly selected for review. Five were embedded in the Unit 1 stressing gallery ceiling and five were in storage awaiting installation. Each trumpet has a number assigned to it by the supplier and is steel stamped into the bearing plate. The bearing plate is also steel stamped with a code number traceable to a mill materials certification report. The assembly number is unique to each unit, while the heat code appears many times over. The requirements for the plates are generally established in ASME Section III, Division 2, paragraph CC-2430. The project specification 2C239CS003-D, "Containment Post-Tensioning System," requires that the plates be manufactured from steel meeting the requirements of ASTM A-633, Grade E. Six of assembly bearing plates were traceable to records indicating manufacture from two different heats, both of which had chemical and physical properties in accordance with ASTM A-633. Four assemblies could not be traced due the absence of a document which correlates assembly numbers to heat code numbers to actual mill test reports. A licensee representative checked with the supplier and was informed that the necessary document would be placed in the mail. Pending receipt and review of the missing document and the applicable mill test reports, this item is considered unresolved.

1/ Investigation Report 50-498/77-03.

DETAILS II

Accompanying Inspector: R. A. Hermann
R. A. Hermann, Reactor Inspector
Engineering Support Section

C. L. Heck
C. L. Heck, Engineering Aide
Engineering Support Section

Reviewed by: for R. E. Hall, Chief, Engineering Support Section

1. Persons Contacted

a. Houston Lighting and Power (HL&P)

S. A. Viaclovsky, Site QA Supervisor
L. D. Wilson, Lead QA Specialist

b. Brown & Root, Inc. (B&R)

T. B. Schreeder, QA/QC Supervisor

c. Pittsburgh-Des Moines Steel Co. (PDM)

J. Newmeister, Field Project Manager
T. Foley, Site QA Manager
B. Thomsen, Field Engineer
W. Chadwick, QA Inspector
R. Barker, Field Project Engineer

2. Scope of Inspection

The scope of the inspection included the observation of work and review of records with regard to the installation, erection, and welding of the Unit No. 1 containment liner.

3. Containment Steel Structures

a. Observation of Work

The installation, erection and welding of rings 4, 5 and 6 on the Unit No. 1 containment were inspected and found con-

sistent with the requirements of B&R Specification 2C269SS006-E, which invokes draft ASME B&PV Code, Section III, Division 2.

The fit-up and submerged arc welding (SAW) of the portion between vertical seams 76 and 83 of the seam joining rings 5 to 6 were observed while work was in progress. Although the SAW of the seam was being performed per WPS-73-127 which was qualified in accordance with the ASME B&PV Code, Section IX requirements, the inspector observed the root pass contained rejectable linear discontinuities. The discontinuities were identified for corrective action by the licensee and contractor QA personnel before successive welding was performed. The inspector reviewed the following radiographs (RT) which were prepared per PDM Procedure CRT-04, Revision 8:

Circumferential Seam - 3 to 4	Spot RT's-43,44,45 Tracers-43 and 45 100% of 45 - Sampled 5 originals and 5 repairs
Circumferential Seam - 4 to 5	Spot RT's of entire seam and tracers

The quality and interpretation of the radiographs appeared consistent with the draft ASME B&PV Code, Section III, Division 2 requirements. A considerable portion of the SAW performed on the above referenced seams contained discontinuities identified as lack of fusion and required subsequent repair. The inspector discussed the observations stated above with the PDM Field Project Manager who stated that technical assistance had been requested to help alleviate the difficulties associated with the automated welding.

The shielded metal arc welding (SMAW) of vertical seam 378 was inspected and found consistent with WPS-67-61 which invokes the requirements of the applicable draft ASME B&PV Code. The qualifications of three welders were reviewed and found consistent with the requirements of the ASME B&PV Code, Section IX.

Pressure decay testing of leak chase systems 168, 111, 78 and 169 was inspected and found consistent with PDM Procedure CLT-01, Revision D, which incorporates the requirements of Regulatory Guide 1.19.

The containment liner dimensional tolerances were inspected to determine if the requirements of the draft version of ASME Section III, Division 2, were satisfied. Brown & Root Specification 2C269SS006-E, "Steel Liner Work for Reactor Containment Structures," defines the tolerances established by the above stated code requirements and requires a written procedure to implement the dimensional requirements. The procedure being

utilized for the dimensional measurements was formulated as an attachment to a PDM letter to T. P. Gardner (B&R), dated January 6, 1977. Field notes were reviewed to determine if the allowed 3/4" maximum deviation from a vertical 10 foot straight edge placed between circumferential welds connecting liner plates had been exceeded. From the field notes for rings No. 2, 3 and 5, approximately 10 measurements were sampled for each ring. A random check to determine if the gap across the vertical welds were within the specified tolerances of the B&R specification described above was performed.

b. Review of Records

The material test reports, vendor manufacturing and inspector records, and receiving inspection reports for three (3) liner segments and one penetration assembly provided to the requirements of B&R Specification 2C269SS006-E, which invokes the draft ASME B&PV Code, Section III, Division 2, were inspected and found consistent with the requirements. The material test results are included in Table 1.

Ten (10) PDM Corrective Action Requests (15501-15511) were reviewed and found to be legible, handled in a timely manner and contained dispostion of the problem stated.

No discrepancies were noted in this part of the inspection.

TABLE 1 - MATERIAL ST DATA SUMMARY

Ident. number	Heat number	Tensile Properties: Yield ksi	UTS ksi	% elong. (over 8")	Chemistry: C	Mn	P	S	Si	Impact Properties: Charpy V-notch at 0°F ft. lbs	%shear	lat.exp.(mils)
Liner Plates												
1673	801W10590	46.6	62.8	29	.11	.55	.013	.016	.20	----------NA----------		
1682	801W10590	45.4	61.0	28	.11	.55	.013	.016	.20	----------NA----------		
2201	899W20001	35.3	49.7	34	.05	.32	.007	.018	.20	----------NA----------		
Requirement-SA285: gd.A		24min	45-65	27min	.17	.90	.035	.045	--1/	----------NA----------		
Penetration Assembly												
Plate												
61RR1	801T22930	53.4	72.6	26%2/	.14	1.10	.008	.023	.27	104avg	99avg	85avg
Required-SA516: gd.60		30.0	60-80	25%2/	.23	.85-1.2	.035	.04	.15-.30	15avg(min)3/	--	--
Sleeve												
2236	45067	---	---	---	.13	1.23	.012	.022	.25	127avg	97avg	85a
Required-SA333: gd.6		---	---	---	.30	0.29-1064/	.048	.058	.10min	20avg(min)	--	--

1/ Chem. values are max. allowable unless otherwise denoted
2/ Over 2 inches
3/ Required test temperature is 20°F or less
4/ For each reduction of 0.01 percent carbon below 0.30 percent, an increase of 0.05 percent manganese above 1.06 percent is permitted up to a max. of 1.35 percent manganese.

DETAILS III

Accompanying Inspector: R. E. Hall, Chief, Engineering Support Section

Reviewed by: W. A. Crossman, Chief, Projects Section

1. Persons Contacted

Houston Lighting and Power Co. (HL&P)

S. A. Viaclovsky, Site QA Supervisor
T. K. Logan, QA Engineer
D. G. Long, QA Engineer
M. M. Johnson, QA Engineer
T. Jordan, QA Engineer

Brown & Root (B&R)

G. Wilson, Quality Control
J. F. Ellis, Quality Control
J. W. Pettit, Supervisor-Cadwelding

2. Scope of Inspection

The scope of this portion of the inspection included observation of work and review of records concerning Cadwelding of reinforcing steel.

3. Document and Procedure Review

The following documentation was reviewed for conformance with commitments contained in Section 3.8 of the South Texas Project (STP) Preliminary Safety Analysis Report (PSAR) and references contained therein:

STP Specification 2A010CS028-D, "Concrete Construction," dated 3/25/76

STP Specification 2A010CS002-F, "Reinforcing Steel," dated 10/28/75

B&R Construction Procedure A-040-KP-CCP-11, "Reinforcing Steel Mechanical Splicing (Cadwelding)," dated 8/18/76

B&R Construction Procedure A-040-KP-CCP-11, "Reinforcing Steel Mechanical Splicing (Cadwelding)," dated 8/18/76

B&R Quality Control Procedure ST-QCP-4.2, "Cadwelding"

HL&P Quality Assurance Procedure SQAP-ST-C4

No discrepancies were noted during this portion of the inspection.

4. Observation of Work Activities

Cadwelding operations and related inspection activities were observed for welders designated 1, 5, 7 and 15 on March 28, 29 and 30, 1977, for conformance with the procedural controls identified in paragraph 3 above. During this portion of the inspection, the following cases were noted where work activities were not accomplished in accordance with requirements and therefore are in noncompliance to Criterion V of Appendix B:

a. Paragraph 4.2.1 of B&R Construction Procedure A-040-KP-CCP-11 specifies that each reinforcing steel bar (rebar) end will be cleaned of rust, scale, etc., a distance of two inches beyond the area covered by the Cadweld sleeve by either power brushing, sandblasting or hand brushing to clean metal. During observation of Cadwelder No. 15, it was observed that he was preparing to cast Cadweld No. 15H310 without having cleaned the bar ends. Additional rebar splices were also partially completed (Cadweld sleeves installed and positioned) without having the rebar ends cleaned. Subsequent to observation of this problem, splice 15H310 was disassembled at the request of B&R QC and the rebar cleaned prior to Cadwelding. Subsequently, follow-on splices previously noted were disassembled and cleaned prior to Cadwelding.

b. Paragraph 4.2.1.1 of B&R Construction Procedure A-040-KP-CCP-11 specifies that B series Cadweld splices (installed vertically) must be cleaned and have sediment blown out by compressed air prior to Cadwelding. Observation of work activities in the Unit 1 containment revealed that each B series sleeve was being sandblasted to remove rust, scale, etc.; however, the open end of the sleeve was not covered to protect the cleaned sleeve until it was Cadwelded. Accordingly, sand and rust were observed in several sleeves awaiting Cadwelding. During observations of Cadwelders 5 and 7 during the period March 28-30, 1977, no instances were noted where the Cadweld sleeves were blown out with compressed air prior to Cadwelding.

c. Erico procedures for Cadwelding are specified in Erico Products Publication RB10M-974. This procedure is incorporated by reference in B&R Construction Procedure A-040-KP-CCP-11 (paragraph 4.1.4).

Erico procedure step 3 for horizontal welds specifies the splice sleeves must be "lifted" completely to allow more filler metal clearance above than below the bar. During observations of Cadwelders No. 1 and 15 on March 30, 1977, it was noted that the sleeve was not being lifted completely; but rather it was being positioned in a near concentric position or below center on Cadwelds observed.

Erico procedure step 5 for vertical weld states, "Place a single wrap of packing loosely around the bar on top of sleeves . . . ." Erico inspection guidance (step 2) states in part, "When making vertical splices, it is important that the proper length packing be used at both the top and bottom of the sleeve." The guidance further specifies 1 1/4 wraps at the top to permit air escape during casting to assure proper fill. While observing Cadweld 5BV175, it was noted that about 2 1/2 wraps of asbestos material were placed at the top end of the Cadweld sleeve. It was noted that after casting, this Cadweld failed inspection for inadequate fill.

5. Records Review

Certification records for Cadwelders 1, 5, 7, 14 and 15 were reviewed to assure that they had been qualified for the activities they were observed performing. No discrepancies were noted relative to qualification requirements contained in PSAR, Section 3.8 which commits to Regulatory Guide 1.10, "Mechanical (Cadweld) Splices in Reinforcing Bars of Category 1 Contrete Structure." Qualification requirements were consistent with RG 1.10 in B&R Construction Quality Control procedures. No discrepancies were noted in this area.

Records of in-process tensile testing of representative production and sister splices were reviewed relative to Regulatory Guide 1.10 and commitments of the PSAR. One instance was noted wherein only one of the two required production splices was tested in the sequence 7H200 to 7H386. Requirements contained in STP Specification 2A010CS028-D, "Concrete Construction," and B&R Quality Control Procedure ST-QCP-4.2, "Cadwelding," were found consistent with PSAR commitments. Failure to perform production program sampling on the prescribed frequency has been identified as an example of failure to follow prescribed procedures and is considered an additional example of the situation described in paragraph 4 above.

6. Quality Control

Observation of activities of B&R Quality Control personnel were observed in the following areas:

a. Tensile testing of rebar/Cadweld samples selected as a portion of the process qualification program.

b. Inspection activities of B&R Quality Control Inspections relative to B&R Procedure ST-QCP-4.2., "Cadwelding."

During this portion of the inspection, a field check of completed Cadwelds revealed one, 5BV158, which appeared to have inadequate fill (excessive void area). Review of B&R QC records indicated that this weld had been inspected by a B&R QC Engineer, prior to, during and following its casting on March 28, 1977. The weld records indicated acceptance of the Cadweld, visual marking had been placed on the Cadweld sleeve indicating its acceptance. Reinspection by B&R QC at the request of the HL&P QA Engineer accompanying the NRC inspector resulted in rejection of the Cadweld for inadequate fill. This was identified as an apparent item of noncompliance since provisions of B&R QC Procedure ST-QCP-4.2 contained in paragraph 5.5.1 regarding acceptability had not been satisfied. Paragraph 5.5.1(e) specifies criteria for acceptability of voids, and requires a determination of void area for identified voids and references Erico Products Bulletin RBM-274 for the methods of determining acceptability. No record to substantiate acceptability of the apparent void was included with the field acceptance records. This item was identified as an apparent item of noncompliance for failure to follow prescribed inspection procedures.

During this observation, it was noted that field observations by the B&R QC inspector were being only partially recorded during the observation of work activities; and that formal QC records were being prepared subsequently based on the field notations. Even though no formal requirement could be identified, the NRC inspector voiced concern that transposition of records from field drafts, based in part on memory and records of others, offered the potential for errors.

7. HL&P Audit Records

Records of audits performed by HL&P QA personnel, required by STP QA Procedure SQAP-ST-C4, were reviewed for the year preceding the inspection. No discrepancies were noted during this portion of the inspection.