



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION 4
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-261/84-22

Licensee: Carolina Power and Light Company
411 Fayetteville Street
Raleigh, NC 27602

Docket No.: 50-261

License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Date: June 12-15, 1984

Inspection at H. B. Robinson site near Hartsville, South Carolina

Inspector:

J. J. Blake
for W. P. Kleinsorge

6/27/84

Date Signed

Approved by:

J. J. Blake
J. J. Blake, Section Chief
Division of Reactor Safety

6/27/84

Date Signed

SUMMARY

Areas Inspected

This routine unannounced inspection involved 33 inspector-hours on site in the areas of steam generator replacement project and inspector followup items.

Results: One violation was identified - Failure to Follow Temporary Attachment Procedure. No deviations were identified.

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REPORT DETAILS

1. Persons Contacted

- *G. P. Beatty, Project Manager
- *R. E. Morgan, General Manager
- *M. J. Reid, RP Construction Manager
- *C. L. Wright, Regulatory Compliance
- *J. C. Sturdavant, Regulatory Compliance
- *E. Upchurch, Welding Engineer
- *P. Beane, NDE Specialist

Other licensee employees contacted included construction craftsmen, technicians, and office personnel.

Other Organization

M. C. Shepard, Site Supervisor, Chicago Bridge and Iron Company (CB&I)

*Attended the exit interview

2. Exit Interview

The inspection scope and findings were summarized on June 15, 1984, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below except item 261/84-22-04, which was conveyed to the licensee by the resident inspector on June 22, 1984. No dissenting comments were received from the licensee.

- (Open) Violation 261/84-22-01: "Failure to Follow Temporary Attachment Procedure" - paragraph 6b(1)(a)2
- (Open) Unresolved Item 261/84-22-02: "Visual Inspection Procedure Failure to Address All Required Attributes for Socket Welds" - paragraph 6d(1)(b)
- (Open) Inspector Followup Item 261/84-22-03: "Unavailable Calibration Documentation for Penetrameters" - paragraph 6e(3)(b)
- (Open) Unresolved Item 261/84-22-04: "Outdoor Storage of Valves" - Paragraph 5

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph nos. 5 and 6d(1)(b).

5. Independent Inspection Effort

Modification Progress

The inspector conducted a general inspection of the containment, warehouse, turbine building, fab shop, and lay down areas to observe modification progress and modification activities such as welding, material handling and control, housekeeping and storage.

With regard to the examination above, the inspector inspected four ASME Section III, N. stamped valves with no status tags on a pallet outdoors, contrary to the requirements of ANSI-N45.2.2. The inspector discussed the above with the licensee who was not able, at the time of this inspection, to determine how long the valves were stored outdoors, their status, or whether those valves were intended for a safety related application. The licensee generated NCR No. 84/191. The resident inspector informed the licensee on June 22, 1984, that pending NRC review of the NCR resolution this matter would be identified as Unresolved Item 261/84-22-04: "OutDoor Storage of Valves."

Within the areas examined no violations or deviations were identified.

6. Steam Generator Replacement Project

The inspector observed welding work activities for the steam generator replacement project as described below, to determine whether applicable code, and procedure requirements were being met. The applicable codes standards and specifications for the replacement project are listed below:

- ASME Code Section III, 1980 Edition including all Addenda through Winter of 1980 - as applicable to vessels
- ASME Code Section IX, 1980 Edition including all Addenda through Winter of 1980 - for welding requirements as applicable to the project
- ASME Code Section XI, 1977 Edition with Addenda through Summer 1978, for the establishment of the new baseline inspection requirements
- ANSI (Power Piping Code) B31.1.0, 1967 - All applicable piping work is to meet or exceed the requirements of this code
- American Institute of Steel Construction (AISC) Sixth Edition (1963) for use of all structural steel design, fabrication, and installation

- American Concrete Institute (ACI) 318-63 for use in restoring structural reinforced concrete
 - AWS D1.4 - 1979
 - H. B. Robinson Plant Operation Manual (POM)
 - H. B. Robinson Technical Specifications
 - NPCD Approved Work Procedures
 - Carolina Power and Light Company Corporation Quality Assurance Manual
 - H. B. Robinson - Unit No. 2 Steam Generator Repair Report including answers to NRC questions.
- a. Review of Quality Program

The inspector reviewed the below listed documents to ascertain whether the steam generator project had been approved by the licensee and whether adequate plans and procedures had been established to assure that the replacement project would be controlled and accomplished consistent with commitments and regulatory requirements.

<u>No.</u>	<u>Title</u>
CB&I-MT-11X, Rev 1	"Magnetic Particle Examination Procedure, Continuous Yoke, Dry, Visible Particles" - Class 1
CBI-MT-10X, Rev 1	"Magnetic Particle Examination Procedure, Continuous Prod, Dry, Visible particles " - Class 1
CBI-MT-9X, Rev 1	"Magnetic Particle Examination Procedure, Continuous Prod/Yoke, Dry, Visible Particles" - Class 1
CBI-MT-1N, Rev 0	"Magnetic Particle Examination Procedure, Continuous Yoke, Dry, Visible Particles" - B31.1
CBI-PT-14X, Rev 2	"Liquid Penetrant Examination Procedure, Color Contrast, Solvent Removable, Wet Developer " - Class 1
CBI-RT-1X, Rev 1	"Radiographic Examination Procedure for Welds" - Class 1
CBI-RT-9X, Rev 2	"Radiographic Examination Procedure for Piping Welds" - B31.1
CBI-NRP-1, Rev 9	"Nuclear Records Procedure"

<u>No.</u>	<u>Title</u>
CBI-GR-IN, Rev 1	"General Repair Procedure for Welds and HAZ" - Class 1 and B31.1
CBI-GR-2N, Rev 1	"General Repair Procedure for Cast Material" - Class 1
CBI-GR-3N, Rev 1	"General Repair Procedure for Upper and Lower Assembly and Piping" - Class 1
CBI-GWPS-SMAWX, Rev 2	"General Welding Procedure Specification for the Shielded, Metal Arc Process"
CP&L-NDEP-101, Rev 4	"Radiographic Examination"
CP&L-NDEP-201, Rev 3	"Liquid Penetrant Examination (Visible Dye, Solvent Removable)"
NDEP-603, Rev 2	"Visual Examination of Welds (HBR)"
HOPE -	Film Processor Manual for Model 118
CP&L-WP-500, Rev 8	"General Welding Procedure"
CI-4651-CHP-007, Rev 2	"Lower Girth Weld and Cladding Replacement Post Weld Heat Treatment Procedure"
CI-4651-CHP-006, Rev 1	"Upper Girth Joint Extended Zone Post Weld Heat Treat"

b. Welding - Piping (55050B)

(1) Preheat and Post Weld Heat Treatment

(a) Post Weld Heat Treatment (PWHT)

- 1 The inspector reviewed the CP&L and Cooperheat, Inc. (CI) programs for PWHT to determine whether procedures were available; had a system capable of meeting the heating and cooling rates, metal temperature, temperature uniformity and control limits were specified and consistent with the applicable codes; procedure covered both local and furnace heating if used; and furnace atmosphere controlled if used.

- 2 The inspector, by direct observation and record review, examined the below listed PWHT operations to determine whether components were instrumented; sufficient thermocouples were used; PWHT temperature and holding time specified were adhered to, and consistent with applicable codes; procedures were available for intermediate in-process stress relief if applicable; temperature control was exercised for the entire temperature cycle; and measures were taken to avoid sensitization if applicable.

Welds Examined

- A - Generator Lower Girth Weld
- B - Generator Upper and Lower Girth Welds
- C - Generator Upper Girth Weld

With regard to the examination above the inspector noted, on "C" steam generator upper girth weld, the removal sites for the temporarily attached thermocouples, had no marking after removal and prior to the required surface examination. The above is contrary to ASME B and PV Code Section III subsection NB, paragraph NB-4231.2(e), CB&I - procedure CUP -1X Revision 2, "Plate Cleanup Procedure," paragraph 3.4, and Cooperheat Procedure 4651-CHP-006, Rev. 1, "Upper Girth Joint Extended Zone Post Weld Heat Treat", paragraph 4.4 all of which require temporary attachments to be marked prior to removal such that the marking will remain, after removal, to identify the removal sites for the required surface examination. Therefore, the individual who removed the temporary attached thermocouples, failed to mark or adequately mark the removal sites prior to their removal, failed to follow procedure. Failure to follow procedure for activities affecting quality is in violation of 10 CFR 50, Appendix B, Criterion V. This violation will be identified 261/84-22-01: "Failure to Follow Temporary Attachment Procedure."

- 3 The inspector examined the cumulative stress relief records for the below listed welds to determine whether total time-at-temperature was consistent with the applicable code and welding procedure specifications.

Welds Examined

- A - Generator Lower Girth Weld
- C - Generator Upper Girth Weld

(2) Examination of Welds

The inspector visually examined completed and accepted welds as described below to determine whether applicable code and procedure requirements were being met.

- (a) The below listed welds were examined relative to the following: location, length, size and shape; weld surface finish and appearance (including inside diameter of pipe welds when accessible); transitions between different wall thicknesses; weld reinforcement -- height and appearance; joint configuration of permanent attachments and structural supports; removal of temporary attachments; arc strikes and weld spatter; finish-grinding or machining of weld surface -- surface finish and absence of wall thinning; surface defects -- cracks, laps, and lack of penetration, lack of fusion, porosity, slag, oxide film and undercut exceeding prescribed limits.

<u>Weld No.</u>	<u>System</u>
HBR-2-RC-122	Reactor Coolant
2-HBR-SGR-3151	Steam Generator Blowdown
2-HBR-SGR-3152	Steam Generator Blowdown

- (b) Quality records for the above welds were examined relative to the following: records covering visual and dimensional inspections indicate that the specified inspections were completed; the records reflect adequate quality; history records were adequate.
- (c) The inspector verified that approved procedures are available for the nondestructive examination of welds when required by applicable code and/or contact requirements.

c. Welding - Structures (55100B)

(1) Welding Procedure Specification

The following Welding Procedure Specification (WPS) was selected for review and comparison with the ASME Code:

<u>WPS</u>	<u>PQR</u>
615A1, Rev 1	129

The above WPS and its supporting Procedure Qualification Records (PQRs) was reviewed to ascertain whether essential, supplementary and/or nonessential variables including thermal treatment were consistent with code requirements; whether the WPS was properly qualified and its supporting PQR was accurate and retrievable;

whether all required mechanical tests had been performed and the results met the minimum requirements; whether the PQR had been reviewed and certified by appropriate personnel and; whether any revisions and/or changes to nonessential variables were noted. WPSs are qualified in accordance with AWS D1.4.

d. Visual Examination (57050B)

(1) Procedure Review

The inspector reviewed CP&L Procedure NDEP-603 and WP-500 to ascertain whether they had been reviewed and approved in accordance with the licensee's established QA procedures. The above procedures were reviewed for technical adequacy and conformance with ASME, Section V, Article 9 and other licensee commitments/requirements in the below listed areas: specified method; application; how visual examination is to be performed; type of surface condition available; method or tool for surface preparation; whether direct or remote viewing is used; special illumination, instruments, or equipment to be used, sequence of performing examination, data to be tabulated; acceptance criteria; and report.

- (a) With regard to the above the inspector noted the following: The acceptance criteria in WP-500 are not consistent with USAS B31.1-1967 the inspector discussed the above with the licensee, who stated that WP-500 is used as a guide when B31.1 is specified. Inspections are made directly to B31.1. WP-500 is used for areas not covered by B31.1.
- (b) With regard to the above inspection the inspector noted that USAS B31.1 paragraph 127.4.4 require that the final surface of socket welded joints be visually inspected for cracks. CP&L-NDEP-603 Rev. 2, Attachment A paragraph 4.0 excludes socket welded joints from visual inspection for cracks on the final external surface. CP&L-NDEP-603 does not require any visual inspection of the inside surface of slip on flanges. USAS B31.1 Fig. 127.4.4B requires visual inspection of the inside diameter fillet weld for slip on flanges for weld size. The inspector discussed the above with the licensee and stated that pending NRC review of the above for safety significance this matter would be identified as unresolved item 261/84-22-02: "Visual Inspection Procedure Failure to Address All Required Attributes for Socket Welds."

(2) Work Observation

The inspector, by direct observation and record review, reinspected/reviewed the visual examinations indicated below to determine whether the inspection procedure clearly specified required tests; the procedure was available; required tools were

available; test attributes were consistent with the procedures; defects were evaluated in accordance with the procedure; correct acceptance criteria were used; and results were reported in the prescribed manner.

CP&L

<u>Weld No.</u>	<u>System</u>
HBR-2-389-FW-689	Makeup Water Treatment
HBR-2-389-FW-690	Makeup Water Treatment
HBR-2-389-FW-691	Makeup Water Treatment
HBR-2-389-FW-692	Makeup Water Treatment
HBR-2-389-FW-693	Makeup Water Treatment
HBR-2-389-FW-694	Makeup Water Treatment
HBR-2-389-FW-695	Makeup Water Treatment
HBR-2-389-FW-696	Makeup Water Treatment

(3) Record Review

- (a) The inspector reviewed the qualification documentation for the below listed examiners in the following areas: employer's name, person certified, activity qualified to perform, effectiveness period of certification, signature of employer's designated representative, basis used for certification and annual visual acuity, color vision examination.

CP&L

<u>Examiner</u>	<u>Level/Method</u>
WAS	II-VT

- (b) The inspector reviewed the below listed visual examination reports for compliance with procedure record requirements.

CP&L

<u>Weld No.</u>	<u>System</u>
HBR-2-389-FW-689	Makeup Water Treatment
HBR-2-389-FW-690	Makeup Water Treatment
HBR-2-389-FW-691	Makeup Water Treatment
HBR-2-389-FW-692	Makeup Water Treatment
HBR-2-389-FW-693	Makeup Water Treatment
HBR-2-389-FW-694	Makeup Water Treatment
HBR-2-389-FW-695	Makeup Water Treatment
HBR-2-389-FW-696	Makeup Water Treatment

- (c) The inspector independently verified the visual inspection results using the licensee's/contractor's procedure for the below listed reports.

<u>Weld No.</u>	<u>CP&L</u> <u>System</u>
HBR-2-RC-122	Reactor Coolant
2HBR-SGB-3151	Steam Generator Blowdown
2HBR-SGB-3152	Steam Generator Blowdown

e. Liquid Penetrant Examination (57060B)

(1) Procedure Review

The inspector reviewed CP&L Procedure NDEP-201 and CB&I Procedure PT-14X to ascertain whether they had been reviewed and approved in accordance with the licensee's established QA procedures. The above procedures were reviewed for technical adequacy and conformance with ASME, Section V, Article 6 and other licensee commitments/requirements in the below listed areas: specified method; penetrant materials identified; penetrant materials analyzed for sulfur; penetrant materials analyzed for total halogens; acceptable pre-examination surface; drying time; method of penetrant application; surface temperature; solvent removal/water washable; dry surface prior to developing; type of developing; examination technique; and evaluation technique.

(2) Work Observation

The inspector observed the liquid penetrant examination of weld joint indicated below: to determine whether procedure clearly specified the applicable test; procedure was available; sequencing and timing of examination in accordance with applicable code/and contract; materials available and properly identified; examiner identification; location and extent of examination clearly defined; and procedure compliance in the following areas: surface preparation; penetrant type; application method; penetration time; surface temperature; penetrant removal; drying; developed type and application; and developing time; evaluation in accordance with procedure and with correct acceptance criteria; and surfaces cleaned at conclusion of examination.

<u>Weld No.</u>	<u>CP&L</u> <u>System</u>
2HBR-SGR-709 R-1	Steam Generator Blowdown

(3) Record Review

- (a) The inspector reviewed the qualification documentation for the below listed examiner in the following areas: employer's name; person certified; activity qualified to perform; effective period of certification; signature of employer's designated representatives; basis used for certification; and annual visual acuity; color vision examination.

CP&L

<u>Examiner</u>	<u>Level/Method</u>
WST	II - PT

- (b) The inspector reviewed the below listed liquid penetrant examination report for compliance with procedure record requirements.

CP&L

<u>Weld No.</u>	<u>System</u>
2-HBR-SGR-709 R1	Steam Generator Building

- (c) The inspector reviewed the "certification of containment content" for the below listed liquid penetrant materials to determine whether the analysis for halogen and sulfur is consistent with applicable requirements.

<u>Type</u>	<u>Batch No.</u>
Developer	84B024
Cleaner	84B019
Penetrant	83M072

d. Magnetic Particle Examination (57070B)

(1) Procedure Review

The inspector reviewed CB&I Procedure Nos. MT-11X, MT-10X, MT-9X and MT-1N to ascertain whether they had been reviewed and approved in accordance with the licensee's established QA procedures. The above procedures were reviewed for technical adequacy and for conformance with ASME Section V, Article 7 and other licensee commitments/requirements in the below listed areas: examination method; surface preparation; contrast of dry powder particle color with background and surface temperature; suspension medium and surface temperature for wet particles; viewing conditions; examination overlap and directions; pole or prod spacing; current or lifting power (yoke); and acceptance criteria.

(2) Work Observation

The inspector observed the magnetic particle examinations indicated below: to determine whether the procedure clearly specified applicable test; procedure was available; equipment materials available and identified; sequences and timing of examination in accordance with applicable code/and contract; examiner identification; location and extent of examination; clearly defined; and procedure compliance in the following areas: type and color of particles; surface preparation; surface temperature; technique and coverage; prod condition/usage, magnetizing current; prod or pole spacing; yoke lifting power; and demagnetization; indications properly evaluated and reported.

Weld

"C" Steam Dome to Lower Assembly (In Part)
Feedwater Elbow to Pipe 'A' (Traveler 17A)

(3) Record Review

- (a) The inspector reviewed the qualification documentation for the below listed examiner in the following areas: employers' name; person certified; activity qualified to perform; effectiveness period of certifications; signature of Employer's designated representative; basis used for certification; and annual visual acuity, color vision examination.

CB&IExaminerLevel/Method

TAC

II - MT

e. Radiography (57090B)

(1) Procedure Review

The inspector reviewed CP&L Procedure No. NDEP-101 and CB&I Procedure No. RT-1X to ascertain whether they had been reviewed and approved in accordance with the licensee's established QA procedures. The above procedures were reviewed for technical adequacy and for conformance with USAS B31.1-1967 and ASME Section V, Article 2 and other licensee commitments/requirements in the below listed areas:

- Material and weld surface condition requirements; types of material; material thickness range; type of radiation source, effective focal spot or effective source, size, x-ray equipment voltage rating and equipment manufacturer, as applicable; film brand or type and number of films in cassette; minimum source to film distance; blocking or masking technique, if used; type and thickness of intensifying screens and filters; exposure conditions for procedure qualification, if applicable; radiographic film processing requirements; quality of radiographs - limits on mechanical, chemical or other blemishes, loss of detail or false indications; film density limits for single and composite viewing; use of densitometers for assuring compliance with film density requirements; system to radiograph identification; use of location markers; records for showing film and source location with reference to the part being radiographed; use of intensifying screens; methods of reducing and testing for backscatter; description of or reference to the welding procedure; material type and thickness restrictions for isotope radiography; geometrical unsharpness limitations; selection and use of penetrameters including penetrometer design; selection of essential hole; penetrometer thickness including special requirements for single and double wall viewing; penetrometer placement including special requirements for single and double wall viewing; number of penetrameters and shims under penetrameters; radiographic technique requirements for double wall viewing; qualification of radiographic procedure; requirements for evaluation and disposition of radiographs; and records requirements.

(2) Work Observation

The inspector observed the radiographic examinations indicated below: to determine whether the procedure clearly specified applicable test; procedure was available; sequencing and timing of examination in accordance with applicable code/and contract; examiner identification; location and extent of examination clearly defined; equipment and materials at the work station and properly identified; procedure compliance in the following areas: types of material; material thickness range; type of radiation source, effective focal spot or effective source size, X-ray equipment voltage rating and equipment manufacturer, as applicable; film brand or type and number of films in cassette; minimum source to film distance; blocking masking technique, if used; type and thickness of intensifying screens and filters; exposure conditions for procedure qualifications, if applicable; radiographic film processing requirements; quality of radiographs - limits on mechanical, chemical or other blemishes, such as fogging, process marks, scratches, finger marks, loss of detail or false indications; film density limits for single and composite

viewing; use of densitometers for assuring compliance with film density requirements; system of radiograph identification; use of location markers; records of showing film and source location with reference to the part being radiographed; use of intensifying screens; methods of reducing and testing for backscatter; description of or reference to the welding procedure; material type and thickness restrictions for isotope radiography; geometrical unsharpness limitations; selection and use of penetrameters including: penetrameter design; selection of essential hole; penetrameter thickness including special requirements for single and double wall viewing; number of penetrameters; shims under penetrameters; radiographic technique requirements for double wall viewing; and evaluation and disposition of radiographs records requirements.

CP&L

Welder Qualification Test Assembly RT-25
Feedwater Elbow to Pipe A (Traveler 17A)

(3) Record Review

- (a) The inspector reviewed the qualification documentation for the below listed examiners in the following area: employer's name; person certified; activity qualified to perform; effectiveness period of certification; signature of Employer's designated representative; basis used for certification; and annual visual acuity, color vision examination

CP&L

EXAMINER
GLC

LEVEL/METHOD
IIL/RT

CB&I

RWA

II/RT

- (b) The inspector requested the certification and calibration records for the below listed material and equipment to determine whether the documents are complete, retrievable, and accurate.

Equipment

Penetrameter	CP&L-H-8	#10
Penetrameter	CP&L-H-4	#10

With regard to the inspection above, the penetrometer calibration documentation was not available at the time of this inspection. The licensee indicated that the above documentation would be made available for a future inspection. The inspector stated that the above matter would be identified as inspector followup item 261/84-22-03: "Unavailable Calibration Documentation for Penetrameters"

No violations or deviations were identified except as noted in paragraph 6b(1)(a)2.

7. Inspector Followup Items

(Closed) Inspector Followup Item 261/84-20-02: "Unavailable MT Examiner Qualification Record"

The licensee made the MT Examiner Qualification records in question available to the inspector. The inspector has no further questions in this area. This matter is considered closed.