U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-354/85-01

Docket No. 50-354

License No. CPPR-120 Category A

Licensee: Public Service Electric and Gas Company

80 Park Plaza

Newark, New Jersey 07101

Facility Name: Hope Creek Generating Station, Unit 1

Inspection At: Hancocks Bridge, New Jersey

Inspection Conducted: January 7 - 10, 1985

Inspectors: E. H. Gray, Lead Reactor Engineer — 2/11/85 date

H. I. Gregg, Lead Reactor Engineer — 2/25/85 date

N. J. Kortas, Reactor Engineer — 2/25/85 date

V. H. Raval, Reactor Engineer — 2/25/85 date

Approved by: J. P. Durr, Chief, Materials and Processes Section, DRS — 2/25/85 date

Inspection Summary: Inspection on January 7 - 10, 1985 (Report No. 50-354/85-01)

Areas Inspected: Routine unannounced facility inspection by four region based inspectors. The inspection scope included the RHR system in the LPCI mode, diesel generator cooling jacket heat exchanger, PSI program, reactor vessel internals and work in progress in preparation for the reactor vessel hydrostatic test. The inspection involved 117 hours on site.

Results: One violation involving static water on the tube side of a heat exchanger was identified.

DETAILS

1.0 Persons Contacted

1.1 Public Service Electric and Gas Company (PSE&G)

*A. Barnabei, Principal QAE
S. Chawaga, Principal Staff QAE
J. Kerr, Startup Engineer
*J. Cicconi, Startup Manager
*G. Connor, Ops Mgr. NCO
*R. Donges, Lead QAE
G. Duncan, Senior ISI Engineer
D. Evans, QAE
R. Faist, OSO Coordinator
*A. Giardino, Manager-QA-E&C
*R. Griffith, Principal Staff QAE
R. Inverso, RVI Proj. Const. Supervisor
G. Jaffee, PSSUG Start-up
*L. Lake, ISI Engineer
*F. C. Logan, Site Mgr.
*M. Metcalf, QASE
R. Savage, QAE

1.2 Bechtel Power Cooporation (BPC)

J. Arnold, QC Turn-Over Engineer
D. Callahan, Group Lead, Field Piping System
W. Cole, Lead Site QAE
D. Cronomiz, Lead System Field Engineer
M. Crowl, Lead Material Control
J. Dahert, Lead QC Piping Engineer
B. Dugan, Field Elect. Const. Engineer
S. Franks, Lead Field Engineer - Pipe Supports
W. Goebel, QAE
B. Groch, QA Engineer
R. Hanselman, Lead Field Welding Engineer
G. Hlebasko, System Managing Engineer
P. Hudson, System Engineer, Piping Sys 'BCB'
V. Labert, Lead Field Valve Engineer
M. May, Area Lead Field Welding Engineer
G. Moulten, Project QA Engineer
J. O'Conner, Lead Field Welding Engineer
W. Patrick, Senior Field Engineer - Pipe Supports
P. Pesscott, Field System Engineer
F. Randazzo, QC Supervising Engineer
J. Robinson, Field System Engineer
J. Serafin, Assistant Project Field Engineer
D. Shaw, Construction Supt. - Diesel Generator Area

1.3 General Electric Co. (GE)

*C. Brinson, QA Engineer
R. Burke, Project Mgr.
M. Hart, QC Mgr.
*R. McKenna, Site Manager

1.4 Southwest Research Institute (SwRI)

S. Richter, Project Manager
E. Ruescher, Technical Liaison

1.5 U.S. Nuclear Regulatory Commission

*S. Chaudhary, Senior Resident Inspector
*A. R. Blough, Senior Resident Inspector

*Denotes personnel present at exit meeting.

2.0 Licensee Action on Previous Inspection Findings

(Closed) Unreso'ved Item (354/84-25-01) Independent verification of weld joint identification marking. (SwRI) Nuclear Projects Operating Procedure IX-FE-103-2, Rev. 2, was modified to state that verification of weld identification marking will be independent of the marking operation. SwRI QA and PSE&G QA performed a joint audit of the welds marked prior to the procedure modification, determining that these markings were accurate. The inspector reviewed the above audit and examined a random sample selection of the welds for proper identification and zero reference location. There were no significant findings in the audits performed or in the inspector observations.

This item is closed.

(Open) Unresolved Item (354/84-15-02) Close proximity welds on line 1-BJ-14-DBB-003B. The welds identified as No. 5 and No. 6 on PSI figure B-45, Rev. 1, on line 1-BJ-14-DBB-003B have been replaced by two other welds in the PSI/ISI program. However, this item remains open pending completion of an evaluation by the licensee of the actual piping configuration with regard to its acceptability for extended use.

3.0 Residual Heat Removal System - Low Pressure Coolant Injection (LPCI) Mode

The scope of inspection in this section covered the large bore piping, large bore pipe supports and mechanical components installation.

The installation and QC inspection of the above listed items are performed by the Bechtel Power Corporation's (BPC's) construction organization with onsite QA surveillances and audits performed by BPC and the licensee in addition to their corporate audits, as applicable.

The inspector verified the location and quality of the RHR system - LPCI mode piping, specific welds of piping, specific mechanical equipment, specific pipe supports, and selected pipe thickness measurements.

The inspector performed a walk-down inspection for the above system from the discharge side of "LOOP-A" RHR pump to the reactor nozzle. The inspection consisted of a review of the design commitments in the FSAR and comparison with the output design specifications and drawings to verify that they were consistent. Various design parameters were selected such as the pressure and temperature ratings, flow rates, materials and component dimensions. These values were compared with the nameplate data, procurement specifications and vendor supplied documents.

In addition, the accessible RHR subsystems were physically examined to verify that they conformed to the installation drawings, flow diagrams, and field specifications. The examinations involved verification of selected attributes on the installation drawings for the pipe supports and associated welds. Where possible, the relative locations of the piping and supports were verified by tape measurements. The subsystem, piping isometrics, pipe supports and components that were examined are listed in Table 3.1.

During the RHR subsystem walk-down inspection, the major equipment listed in Table 3.2 was selected for review of the nameplate data, procurement specifications and design basis information. The inspector measured the BC system line piping (GBB Class) and weld material thickness with an ultrasonic thickness gage. These measurements were made at seventeen locations near Elevations 60', 81', 95' and 106'. The pipe material and welds exceeded the nominal and minimum required pipe wall requirements.

The inspector reviewed NCR No. 5615 and its disposition applicable to valve 1-P-BC-V105 for the arc strikes on the valve body. The inspector determined that the performed valve repair was acceptable due to proper sign-off by the involved persons including the ANI and QA/QC personnel, and determined that it conformed with the defined work steps.

The inspector determined that the installed equipment meets the associated documents, design, and FSAR requirements.

No violations were identified.

TABLE 3.1

RHR SYSTEM - LPCI MODE, LOOP "A"

WALKDOWN INSPECTION

ISO NO.	FAB ISO NO.	LINE SYSTEM	SUPPORT NO.	EQUIPMENT	FINDINGS
1-B-BC03 (P&IC No. M-51-1, SH. 2of2)	1-P-BC-017 1-P-BC-018	From outlet to RHR Pump AP20 2 to Inlet of Penetration P-6C	1-P-BC-075-H20 1-P-BC-063-H33 1-P-BC-063-H35 1-P-BC-063-H37 1-P-BC-063-H39 1-P-BC-063-H41 1-P-BC-063-H56	BC-V105, 18" Check VLV; BC-V106, 18" Gate VLV; BC-V538, 18" M.O. Buttfy VLV;BC-V113, 12" M.O. Gate	Support 1-P-BC-075-H20 was shimmed under 3 of 4 lugs. However, support installation conforms to BPC drawing P-0586 No violations identified.
1-P-B-C-02 (P&ID No.M--51-1, SH.2 of 2)	1-P-BC-033	From Penetration P-6C to reactor nozzle 17C	None	BC-V114, 12" M.O. Test check VLV;	None
1-P-BC-04 CP&ID No.M--51-1, SH.2 of 2)	-	Suction from torus to pump AP--202	1-P-BC-087-H03 1-P-BC-087-H04 1-P-BC-087-H05	None	None

TABLE 3.2

EQUIPMENT FOR DESIGN DATA REVIEW

Equipment	Identification No.	Data
BC - V105, 18" Check Valve	E6161 - 22 - 3	P.O. No. P-301(Q); ASME III, Class 2, ASME III, Class 2, Anchor Darling Valve; 720 PSIG @100 F; 18" - 300 lb Check;
BC - V106, 18" Gate Valve	E6161 - 8 - 4	P.O. No. P-301 (Q); ASME III, Class 2, Anchor Darling Valve; 720 PSIG @100 F; 18" - 300 lb Gate;
BC - V538, 18" Butterfly (HV-048A)	BF 248762	P.O. No. J-605 (Q); ASME III, Class 2, Fisher Controls Valve; 720 PSIG@ 100F (172 PSIG@ 320F);
BC - V113, 12" MOV (HV-F017A)	E6162 - 50-1	P.O. No. P-302(Q); ASME III, Class 1, Anchor Darling Valve; 2230 PSIG@ 100F (2163 PSIG@ 575F); 12" - 900 lb Gate Valve;
BC-V114, 12" MO Check Valve (HV-F041A)	3-14053	P.O. No. NSSS-40348; ASME III, Class Class 1, Atwood Merrill Valve; 1500 PSIG @ 500 F (1930 PSIG@ 100F, Cold); 12" - 900 lb testable check;

4.0 SDG Jacket Water Heat Exchanger Internal Inspection

Removal of the heat exchanger cover flange for examination of tubes and tube sheet was scheduled for the Standby Diesel Generator (SDG) jacket water heat exchanger. This was part of the independent inspection effort to verify the internal condition of the Seismic Category I, ASME Code Section III, Class 3 safety related equipment in accordance with the in-plant storage requirements as required per 10 CFR 50, Appendix B, Criterion XIII. However, licensee stated that they did not have any specific procedures for internal preventive maintenance including internal inspection requirements for the involved SDG heat exchanger.

Upon opening the tube-side of the heat exchanger the inspector observed the following:

1) Seven inch (7") of static water level, submerging the bottom two rows of the tubes with a heavy corrosion level on the tube sheet and surrounding channel area of the heat exchanger.

2) A medium level of corrosion between 7 inch and 17 1/2 inch from the bottom of the equipment indicating that 13 tube rows, were under submergence during storage at one point in time.

3) A moderate corrosion level was noted over the remainder of tube rows indicating a moisture environment inside the equipment.

The inspector examined several tubes by borescope to verify the internal condition of the tubes. However all tubes were wet such that no effective assessment of tube damage was possible due to the water condition remaining in place from in-place storage.

The failure to provide an appropriate storage environment for the safety related equipment is contrary to 10 CFR 50, Appendix B, Criterion XIII, and a violation (50-354/85-01).

5.0 Preservice Inspection (PSI) Program

Program areas inspected and reviewed included responsibility of personnel, recording criterion, evaluation of indications and acceptance of NDE results.

The inspector questioned available personnel on their understanding of assigned responsibilities and limits as outlined in the PSI program. Examination records reviewed by the inspector were within the recording criterion as outlined in the applicable SwRI operating procedures.

The PSI Program allows for NDE rejectable indications to be reported on Customer Notification Forms (CNF's). CNF's are tracked in a closed loop system which includes two separate log books. Field Construction Orders (FCO's) effecting the PSI/ISI Program are also traced in a closed-loop system interconnected with the CNF loop.

The program depends on various levels of qualified personnel to analyze ultrasonic conditions and indications. Evaluation of examination and test results is the responsibility of the owner (refer to the applicable 1977 ASME B&PV Code, Section XI).

PSE&G has interpreted from Quality Assurance Manual, QAI7-14, that the PSE&G QA - Engineering & Construction Verification Stamp signifies the acceptance of the examination records, results and evaluations.

No violations were identified.

6.0 Radiography

The radiographs for FW2, 1-P-BC-017 completed in September 1982 and the radiographs for the following current work were reviewed for conformance to the radiographic procedure and ASME code requirements.

FW7, 1-P-GS-007
FW54C-1, 1-P-BH-002
FW54, 1P-KP-201

No violations were identified.

7.0 Reactor Pressure Vessel (RPV) AND RPV Internals (RPVI).

The inspector observed work in progress and reviewed records of completed work for the RPV and RPVI.

Work in progress included removal of the RPV head and certain RPVI components to permit completion of work steps in preparation for the system pressure testing.

The traveler and procedure HCI-16-P-0, Rev. 3, dated 12/7/84, for rigging to remove the RPV head and steam dryer were reviewed. The lift removing the steam dryer was observed. The inspector noted the presence of and involvement by both PSE&G QA and Bechtel QC in work planning and work activity. The travelers controlling the work were prepared by GE and reviewed and signed by GE QC. The travelers involved were current with the work status and were available at the work location along with referenced procedures.

No violations were identified.

Prior to QC inspection, the presence of rust-corrosion was noted in the threads of several RPV upper flange stud holes. The NRC inspector requested for examination or review the stud hole thread gage and the applicable QC inspection procedure with thread acceptance criteria. The

specific thread gage and QC procedure/criteria were not available at the site. Subsequent to the exit meeting, the NRC inspector was advised that the thread condition has been documented on an FDDR with GE initiating steps to evaluate the condition. This is an unresolved item pending review of the thread inspection criteria and action taken in thread evaluation and disposition. (50-354/85-01-02)

Records for installation of the following were reviewed against the basic 197R628 drawing series requirements.

Control rod drive housing to stub tube welding.
Control rod drive lower housing to extension (Shop Weld)
Jet pump top piece bolting.
Control rod drive alignment control during welding
Incore guide tube stabilizers.
Incore clamps.

The records as sampled were found to be complete and descriptive of the work steps and inspections performed.

No violations were identified.

8.0 QA/QC Activities

8.1 PSE&G/Bechtel QA/QC Interface

The inspector reviewed the PSE&G and Bechtel QA/QC interface related to activities associated with the RHR "A" Pump discharge, (designated as "BC" system discharge piping). Specific PSE&G QA Surveillances and Audits and Bechtel QA Audits reviewed by the inspector were :

-- PSE&G QA File S-B-6 Surveillance/ASME Pipe Welding - Surveillances of 7/15/83, 7/14/83, 4/24/83 and 4/19/ 83

-- PSE&G QA File S-B-2 Surveillance/ASME Pipe Supports - Surveillances of 2/10/84, 11/7/83 and 12/30/81

-- PSE&G QA Audits H-388 Weld Filler Material/ Pipe Welding - performed 9/13 - 18/84 and 12/4 - 12/ 84

-- Bechtel QA Audit 24.1 Large Piping and Valve Inprocess Control - performed 4th quarter 1984

-- Bechtel QA Audit 24.4 Pipe Support Inprocess Control - performed 1st quarter 1984

The inspector verified that QA findings were clearly identified, responses were timely, and corrective actions were taken to prevent the recurrence of discrepant findings.

8.2 QA/QC Documentation

The inspector reviewed documentation of several valves observed during his walkdown of the RHR "A" Pump discharge piping. The document files reviewed by the inspector were -

-- Anchor Darling 18" - 300 #Gate Valve with 6:1 Bevel Gear Operator and 16" Dia Hwhl., Rating 720 psi @100°F, Ser. No. E-6161-8-4, Valve V 106

-- Anchor Darling 18" - 300# Swing Check Valve, Rating 720 psi @ 100°F, Ser. No. E-6161-22-3, Valve V105

-- Rockwell International 1" - 3622-24-F316L-T1 Globe Valve, Class 1500, Rating 1450 psi @800°F, Cust. Order #10855-P-303A-Q-AC Bechtel item 5.2, Valve Ser. NO. BJ-177.

The inspector verified that the documentation was complete and included; material certifications, body wall thickness measurements, weld material certifications test data, and ASME NPV-1 forms.

8.3 QC Construction Documentation

The inspector reviewed numerous Quality Control Inspection Reports (QCIRs) for the "BC" piping and equipment. The QCIRs included -

-- Field Welds - QCIRs-1-P-BC-03-31-P-1.10 for FW-3 on Fab. ISO 1-P-BC-017; 1-P-BC-03-21-P-1.10 for FW-17 on Fab. ISO 1-P-BC-018

-- Pipe Support - QCIRs-1-P-BC-03-30A-P-2.10 for 1-P-BC-063-H37 (Q) support; 1-P-BC-03-10A-P-2.10 for 1-P-BC-063-H41 (Q) support

-- Pipe Spool-QCIRs-1-P-BC-03-21-P-1.10 for 1-P-BC-063-S06 spool; 1-P-BC-03-22-P-1.1.0 for 1-P-BC-063-S08 spool

-- Equipment - QCIRs - P-301-R-25550 for valve BC-V105; P-302-R-47951 for valve BC-113; P-301-R-44102 for valve BC-106,

The inspector determined that the QCIRs satisfactorily addressed each work step and that work implementation was performed in accordance with HCGS QA program requirements.

The inspector reviewed the qualification of welders P77, P11, P25, P26 and PBH who were noted to have performed butt joint welding on the BC line. Qualifiction records were readily available and complete.

8.4 Conclusion

For each of the QA/QC areas described in this paragraph, the inspector determined that there was an effective program and interface with the work activities.

No violations were identified

9.0 Design Document Review

The inspector reviewed the P&ID, System ISOs, Fab ISOs and specifications to verify the revision correctness and mutual agreements for the involved engineering information for "Loop A" LPCI system. The inspector identified a discrepancy for "Loop - A" Valve F017A (BC-V113) as follows:

1) Drawing 1-P-B-C-03, R.16 shows F017B
2) Drawing 1-P-BC-03, R.15 shows F017A
3) Drawing 1-P-BC-018, R.9 thru R.12, show F015A
4) Drawing 1-P-BC-018, R.8 shows F017A
5) P&ID M-51-1, Sh.2 of 2, R.10 shows F017A

The BPC engineers stated that P&ID M-51-1 sh.2 of 2, R.10 reflects the correct valve number and inconsistencies of drawings 1-P-BC-03 and 1-P-BC-018 were generated due to the drafting errors. The BPC initiated a FCR No. P-12258, dated October 12, 1984 to revise drawing 1-P-BC-03 and an internal document, dated January 3, 1985 to revise drawing 1-P-BC-018 to identify the involved valve as F017A.

The inspector verified the cable "Termination Installation Cards" for the involved valve and concurred that the location of termination was for valve F017A. The inspector concluded that above discrepancy was satisfactorily resolved.

No violations were identified.

10. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable, violations or deviations. An unresolved item is discussed in paragraph 7.

11. Exit Meetings

The inspectors met with licensee representatives, listed in paragraph 1, at the conclusion of the inspection to summarize the scope and findings of the inspection. At no time during this inspection was written material provided to the licensee by the inspectors; however, the proprietary reference ISO drawings listed in Table 3.1 of this report will be returned, along with field notes thereon, to the licensee in accordance with the document receipt dated 1/10/85 after issuance of this inspection report.