

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

Region I

Report No. 50-354/81-14
50-355/81-14
Docket No. 50-354
50-355
License No. CPPR-120 Priority -- Category A
CPPR-121

Licensee: Public Service Electric and Gas Company

80 Park Plaza - 17C

Newark, New Jersey 07101

Facility Name: Hope Creek Generating Station, Units 1 and 2

Inspection at: Hancocks Bridge, New Jersey

Inspection conducted: September 1 - October 4, 1981

Inspectors: W. H. Bateman 10/9/81
W. H. Bateman, Senior Resident Inspector date signed

date signed

date signed

Approved by: E. G. Greenman 10/14/81
E. G. Greenman, Chief, Reactor Projects date signed
Section 2A

Inspection Summary:

Unit 1 Inspection of September 1 - October 4, 1981 (Report No. 50-354/81-14):

Areas Inspected: Routine unannounced inspection by the resident inspector (48 hours) of work in progress including structural steel installation, pipe and hanger installation, equipment and material storage, reactor pressure vessel (RPV) internals installation, HVAC duct installation, service water intake structure excavation, and concrete preplacement, placement, and post-placement activities. The inspector also made tours of the site, reviewed licensee action on previous inspection findings, evaluated licensee action on a construction deficiency report, and reviewed the HVAC contractor's quality assurance manual.

Results: Of the thirteen areas inspected, no items of noncompliance were identified in twelve areas and one item of noncompliance was identified in one area. (Failure to add filler metal while gas tungsten arc welding flow blockage plugs into the core support plate as discussed in paragraph 3.)

Unit 2 Inspection of September 1 - October 4, 1981 (Report No. 50-355/81-14):

Areas Inspected: Routine unannounced inspection by the resident inspector (43 hours) of work in progress including containment erection, torus pipe installation, storage of equipment and materials, receipt inspection of lower biological shield, excavation of service water intake structure, and concrete preplacement, placement, and post-placement activities. The inspector also made tours of the site, reviewed licensee action on previous inspection findings, and evaluated licensee action on a construction deficiency report.

Results: Noncompliances - None.

DETAILS

1. Persons Contacted

Public Service Electric and Gas Company (PSE&G)

A. Barnabei, Site QA Engineer
R. Bravo, Principal Construction Engineer
A. E. Giardino, Project QA Engineer
P. Kudless, Project Construction Manager

Bechtel Power Corporation (Bechtel)

A. J. Bryan, Assistant Project QC Engineer
W. Dorman, Assistant Project Field Engineer
M. A. Drucker, Lead QA Engineer
C. Colletto, Assistant Lead QCE - Civil
R. Hanks, Project QC Engineer
M. Henry, Project Field Engineer
R. McCoy, Lead QCE Contracts
K. Mills, Lead QCE Mechanical
G. Moulton, Project QA Engineer
D. Sakers, Assistant Project QC Engineer
S. Vezendy, Lead Welding QC Engineer

General Electric Installation and Services Engineering (GEI&SE)

G. Barberi, Site QC Supervisor
D. Burke, Site Project Manager

General Electric Nuclear Energy Division (GENED)

J. Cockroft, Site Engineer

J. Rich Steers

T. Heath, Project Superintendent
M. Russell, Site QC Supervisor

2. Site Tour

Routine tours of the site were made to observe the status of work and construction activities in progress. The inspector noted the presence of and interviewed QC and construction personnel. Work items were examined for obvious defects or noncompliance with regulatory requirements or licensee conditions. Areas observed included:

Unit 1: Structural steel installation, pipe and hanger installation, equipment and material storage, HVAC duct installation, and concrete preplacement, placement, and post-placement activities.

Unit 2: Torus pipe installation, equipment and material storage, and concrete preplacement, placement, and post-placement activities.

No items of noncompliance were identified.

3. Reactor Vessel Internals - Observation of Work and Work Activities - Unit 1

A. During this inspection report period the inspector observed the following activities:

1. Control of cleanliness of and access into the reactor pressure vessel.
2. Tack welding consummable inserts to recirc nozzle thermal sleeves in preparation for connecting the jet pump inlet risers.
3. Preparation of the shroud for attachment of the backing bar needed to weld the shroud to the shroud support ledge.

These three activities were performed in accordance with requirements.

B. GENED Field Disposition Instruction (FDI) No. 19/79450, "Core Support Plugging" requires that stainless steel plugs be welded into the flow bypass holes in the stainless steel core support plate to limit reactor core bypass flow. Bypass flow restriction is necessary to prevent flow induced vibration of in-core monitors which have caused fuel channel wear in operating reactors.

Accomplishment of FDI No. 19/79450 required fillet welding the plugs into the core support plate using the gas tungsten arc welding (GTAW) process and a stainless steel filler metal. The inspector observed this activity and noted that one of the requirements of GEI&SE's "General Welding Procedure (HCSE 1 - 7, Rev. 1) was not met. In particular core plate plug weld joints 40-09-180 (bottom) and 40-09-270 (bottom) as called for on GEI&SE Traveler No. HCl-4-T-M1, Rev. 0, were remelted without the addition of filler metal. Paragraph 5.18.3.6 of the General Welding Procedure states, that for GTAW: "Filler metal addition shall be applied to all welds unless otherwise approved."

The failure to add filler metal while gas tungsten arc welding the flow blockage plugs into the core support plate is an item of noncompliance. (354/81-14-01)

Before the end of the inspection report period the following corrective action was taken:

1. The plug welding was stopped when the inspector identified the problem.
2. Training sessions were held with all GEI&SE welders at which time the welding engineer stressed the importance of adding filler metal when welding using the GTAW process.

3. A comprehensive training program was initiated by GEI&SE to inform all their welders of the requirements and limitations specified in the General Welding Procedure.
4. Administrative action was taken to ensure that welders hired in the future will receive training on the General Welding Procedure.

Based on this corrective action, the inspector had no further questions and no additional response is required.

4. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (354/81-10-03; 355/81-10-02): Failure to sign Maintenance Action Cards to document performance of maintenance inspections. The inspector verified the following corrective actions were taken:

1. All Maintenance Action Cards were signed in accordance with procedure requirements when maintenance activity was completed.
2. A training session was held with involved Quality Control Engineers stressing the importance of performing to the requirements of the Maintenance Program.

The inspector had no further questions.

(Closed) Unresolved Item (355/81-10-03): Deterioration of dunnage supporting the stored Unit 2 reactor pressure vessel (RPV). The licensee placed new dunnage adjacent to the old dunnage and added a requirement to the Maintenance Program to perform a monthly inspection of the dunnage for deterioration. The inspector had no further questions.

5. Review of Nonroutine Events Reported by the Licensee

By letter dated May 26, 1981, the licensee reported a potential significant deficiency in accordance with the requirements of 10 CFR 50.55(e) involving concrete embedment of embeds with potentially defective welds purchased from ACME Steel Engineering Co. By letter dated August 10, 1981, the licensee withdrew this potentially reportable item based on results of destructive tests and engineering calculations.

The inspector reviewed results of investigations by Bechtel Field Engineering and QC and the test results of the destructive tests performed at Lehigh University. Key points follow:

1. Bechtel Field Engineering conducted a 100% visual examination of the welds on 134 embeds and noted 69 that varied from specification criteria and should have been rejected by ACME.

2. All ACME embeds were affected by the weld defects.
3. Only a small amount of the total weld length per embed (approximately 1%) exhibited defects.
4. Approximately 50% of embeds examined contained unacceptable weld defects based on AWS D1.1 criteria.
5. Defects consisted of undersize fillet welds, undercut, roll-over, and surface and subsurface porosity.
6. Visual and radiographic examination of selected embeds isolated worst case conditions for destructive testing.
7. Destructive tests on the worst case embeds identified in 6 above evaluated the effects of porosity only.
8. The results of the destructive tests demonstrated that embeds with porous welds exceeded design loading requirements.
9. Analytical evaluation of the other weld defects indicated the design margin was sufficient to accommodate the slight reduction in embed capacity.
10. Inspection of embeds by other suppliers disclosed similar but not as extensive weld defects. Because the defects were not as serious as the ACME defects, resolution of the ACME problem resolved any problems with embeds by other suppliers.

Based on the acceptable results of investigations into the effects of the weld defects on the capability of the ACME embeds to withstand design loading, the inspector agrees with the licensee that this issue is not reportable for the Hope Creek Project and considers the item closed.
(354/81-00-02; 355/81-00-02)

6. Safety Related Structures - Unit 2 Lower Biological Shield

The inspector performed an inspection of the Unit 2 lower biological shield (bioshield) fabricated by PX Engineering. Bechtel design drawings including C-0955-0, Rev. 9 were used to determine the fabrication requirements. The purpose of this inspection was to verify that corrective action taken by the licensee to improve shop inspection and record keeping at PX (as a result of problems with the Unit 1 bioshield) was effective.

The following details were inspected:

1. Fillet weld size, shape, and location
2. Location of stiffeners
3. Workmanship

4. Location of penetrations
5. Material conformance
6. Welds for weld defects

Bechtel QC performed a similar inspection of the bioshield prior to the NRC inspection and identified their findings on NCR No. 1305. The NRC inspection also identified defects noted on NCR 1305 which included a mislocated stiffener, undersized welds, and excessive gaps between the penetrations and the inner and outer shells.

The inspector questioned Bechtel QC personnel regarding the status of the NDE records of the bioshield welds. He was informed that the records were complete.

The results of this inspection indicated that some improvement took place at PX. The licensee has, however, taken additional measures to further improve PX's performance. These measures include additional inspections of PX by the licensee and Bechtel, instruction of supplier quality personnel in the use of fillet weld measuring gauges, and overall improvements in the Bechtel generic Supplier Quality Program as applied to Hope Creek. (354/81-07-01; 355/81-07-01)

No items of noncompliance were identified.

7. Containment Erection - Observation of Work and Work Activities - Unit 2

Erection activity has increased to support a November 1981 test of the containment structural integrity.

The inspector observed various activities associated with erection of the drywell, torus, vent lines, vent header, and safety relief valve discharge lines. The quality of shop welds and field welds as judged by a visual inspection were in accordance with ASME Code Requirements. Preheat requirements were implemented as required as verified by the use of temperature indicating crayons. The installation of the safety relief valve discharge lines, which resulted in a cold pull problem in Unit 1, was in accordance with drawing requirements. Control of weld filler metal was observed to be satisfactory.

No items of noncompliance were identified.

8. Foundations - Observation of Work and Work Activities - Units 1 and 2

The inspector observed excavation of the sediment above the Vincentown geologic formation in preparation for placement of concrete to form the base mat of the Service Water Intake structure. Sediment removal was nearly complete with inspection of the Vincentown planned for early November.

J. Rich Steers (Steers) is the subcontractor responsible for the excavation and tremie placement of approximately 16,000 cubic yards of concrete that forms the intake structure base mat. The inspector discussed the planning for the placement with both the Steers QC supervisor and project superintendent. Planning calls for starting the placement in mid-November and continuing the placement to completion without interruption. Design concrete mixes were tested and erection and qualification of the batch plant was in process. Plans for around the clock QC coverage were discussed along with provisions for backup in case of equipment breakdown.

The inspector reviewed the initial stages of planning. No unacceptable conditions were identified.

9. Heating, Ventilating, and Air-Conditioning-Review of QA Manual and Implementing Procedures

Hope Creek's heating, ventilating, and air-conditioning (HVAC) work is being performed by a joint venture of two companies - Williard, Inc. and Hirsch, Arkin, Pineherst, Inc. (HAP). HAP's QA manual and implementing QC procedures form the basis of the HVAC QA program. The joint venture is called W-H Constructors.

The inspector reviewed the following manual and procedures to ensure that the QA program was aligned with the eighteen criteria of Appendix B to 10 CFR 50:

- HAP QA Manual, Rev. 0
- HAP Quality Control Procedures (Each with their own revision.)
- Various W-H Constructors Work Procedures, e.g., Cleaning and Coating Procedure
- W-H Constructors Welding Procedures - Section II (AWS D1.1 welding by SMAW process)
- W-H Constructors Welding Procedures - Section III (GMAW of austenitic stainless steel)
- W-H Constructors Expansion Anchor Bolt Installation Procedures, Rev. 0
- Various Seismic Duct Construction Standards

The QA Manual is arranged in a format similar to Appendix B 10 CFR 50 in that each of the eighteen criteria is addressed. The QC implementing procedures present the step-by-step methods of implementation of the QA manual.

No items of noncompliance were identified.

10. Exit Interview

The inspector met with licensee and contractor personnel at periodic intervals during this inspection report period. At these times the inspector summarized the scope and findings of his inspection activities. The licensee acknowledged the inspection findings.