

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

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Report No. 50-354/82-15

Docket No. 50-354

License No. CPPR-120 Priority -- Category A

Licensee: Public Service Electric and Gas Company

80 Park Plaza - 17C

Newark, New Jersey 07101

Facility Name: Hope Creek Generating Station Unit 1

Inspection At: Hancock's Bridge, New Jersey

Inspection Conducted: November 1 - December 5, 1982

Inspectors: W. H. Bateman
W. H. Bateman, Senior Resident Inspector

12/10/82
date

W. H. Bateman for
J. F. McCann, Resident Inspector (Susquehanna)

12/10/82
date

A. A. Varela
A. A. Varela, Reactor Inspector

12/16/82
date

Approved by: L. E. Tripp
L. E. Tripp, Chief, Projects Section 2A

12/16/82
date

Inspection Summary:

Unit 1 Inspection of November 1-December 5, 1982 (Report No. 50-354/82-15):

Areas Inspected: Routine unannounced safety inspection by the resident inspector (115 hours), one region based specialist inspector (42 hours), and one resident inspector assigned to the Susquehanna Steam Electric Station (30 hours) of work in progress including pipe and support installation, storage of concrete materials, concrete curing, reactor pressure vessel (RPV) internals installation, lift and set of the polar crane and reactor building dome, structural steel erection, HVAC ductwork and support installation, housekeeping, and backfill placement, compaction, and testing. The inspectors also made tours of the site, reviewed licensee and Bechtel QA audits, observed rod control practices, followed up on NCR trending activities, monitored expansion anchor bolt pullout testing, evaluated licensee action on previous inspection findings, reviewed documentation of structural steel erection activities, and discussed and observed action taken by the licensee to resolve construction deficiency reports.

Region I Form 12
(Rev. February 1982)

Inspection Summary

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Results: Violations: One (failure of QC to identify pipe support/restraint installation discrepancies during performance of inspection activities as described in paragraph 3).

DETAILS

1. Persons Contacted

Public Service Electric and Gas Company (PSE&G)

A. Barnabei, Site QA Engineer
V. J. Blenx, Construction Manager - Projects
R. Bravo, Principal Construction Engineer
A. E. Giardino, Project QA Engineer
P. Kudless, Project Construction Manager
A. Nassman, Manager, QA Engineering and Construction
G. Owen, Principal Construction Engineer

Bechtel Power Corporation (Bechtel)

A. J. Bryan, Project QC Engineer
G. Cavallo, Resident Engineer, Civil
W. Dorman, Assistant Project Field Engineer
M. Drucker, Lead Site QA Engineer
R. Hanselman, Lead Welding Engineer
M. Henry, Project Field Engineer
D. Long, Project Superintendent
R. Mackey, Resident Project Engineer
J. R. McCoy, Lead Contracts QC Engineer
G. Moulton, Project QA Engineer
J. Pfeiffer, Assistant Project Construction QC Engineer
L. Rosetta, Field Construction Manager
D. Sakers, Assistant Project Field Engineer
J. Serafin, Assistant Project Field Engineer
S. Vezendy, Lead Welding QC Engineer

General Electric Installation and Services Engineering (GEI&SE)

R. Burke, Site Project Manager
M. Hart, Site QC Supervisor
J. Plantz, Site Welding Engineer

General Electric Nuclear Energy Business Operations (GENEBO)

J. Cockroft, Site Engineer
C. Brinson, Site QA Engineer

J. Rich Steers (JRS)

J. Gagliano, Resident Engineer

2. Site Tour

Routine inspections 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. Inspection personnel were observed performing required inspections and those interviewed were knowledgeable in their work activities. Work items were examined for obvious defects or noncompliance with regulatory requirements or license conditions. Areas inspected included rod control, lifts of reactor building polar crane and dome, storage of concrete materials, concrete curing, HVAC ductwork and support installation, housekeeping, and concrete preplacement activities.

No items of noncompliance were identified.

3. Safety Related Pipe Support and Restraint Systems

The inspectors reviewed the licensee's QA program and Bechtel's QC inspection program involving pipe support and restraint installation. The licensee's QA audit requirements for the hanger program were reviewed to ensure:

- adequate audit scope and frequency
- adequate and technically correct specific audit criteria
- proper recording and reporting of audit findings
- prompt and adequate resolution of audit findings
- properly trained and experienced auditors

It was determined that hanger and restraint system QA audits are conducted annually. PSE&G audit number H-233, conducted August 1981, was reviewed with respect to the above requirements with no unacceptable conditions noted.

The completed hanger and restraint installations listed below were inspected for agreement with the detail drawings. They had been inspected and accepted by Bechtel QC to the requirements of Bechtel QCI P-2.10, Pipe Hanger, Support, Restraint and Shock Suppressor Installation, Fabrication, and Rework - Initial. Discrepancies identified by NRC inspection are as indicated.

<u>Drawing No.</u>	<u>Remarks</u>
1-P-BC-066-H01(Q), Rev. 4 (Variable Support)	None
1-P-BC-044-H07(Q), Rev. 1 (Vertical Restraint)	None
1-P-BC-075-H01(Q), Rev. 0 (Variable Support)	None
1-P-EG-155-H02(Q), Rev. 0 (North-South Restraint)	Weld shrinkage, most likely caused by welding oversize fillet welds (5/16" required but up to 1" actual), resulted in distortion of restraint members
1-P-BE-047-H02(Q), Rev. 3 (Vertical and Lateral Restraint)	No cope on reinforcing "I" beam section as required in Detail 1
1-P-BC-046-H05(Q), Rev. 4 (Lateral restraint)	Based on the angle of the diagonal member, a partial penetration weld should have been specified and used. Contrary to project requirements, a fillet weld was specified and used
1-P-EG-155-H01(Q), Rev. 2 (Variable Support)	Variable support is incapable of adjustment, therefore, not properly installed

The inspectors reviewed the completed QCIR's for deficient hangers and determined that the deficiencies for the last three supports on the list had not been identified by QC during their inspection activities. It appeared that, regarding the failure to use a partial penetration weld, the error was, in part, caused by an erroneous weld symbol on the design drawing that called for a fillet weld. However, based on site requirements that address welding of skewed "T"-joints (Bechtel Dwg. P-0596(Q), Rev. 2), this joint should not have been fillet welded.

Because the erroneous weld symbol on the hanger drawing contributed to the weld problem, it is apparent that steps must be taken to ensure this will not happen in the future.

The failure of QC inspection to identify these deficiencies as part of QCI-P-2.10 inspection activities is contrary to Criterion X of Appendix B of 10 CFR50 and is an item of noncompliance. (354/82-15-01) Prior to the end of this inspection report period, the licensee had partially completed their investigation into the above discrepancies and determined that the failure to cope a piece of steel and the incorrect installation of the variable support such that it was not capable of adjustment were isolated cases.

The distortion of restraint members caused by weld shrinkage most likely resulting from oversized welds, was evaluated by Bechtel project engineering. In this case it was determined not to be a problem. However, it was stated that oversized welds would not in all cases be acceptable. To ensure project engineering evaluation of oversized welds, QC is revising QCI-P-2.10 to require that all welds oversized by greater than 1/8" be evaluated by Bechtel field welding engineering and that the field welding engineer's evaluation be documented on the QCIR for the support. Field welding engineering will consult with project engineering, as appropriate, to determine the acceptability of oversized welds.

4. Review of Nonroutine Events Reported by the Licensee

- A. On July 2, 1982, the licensee reported a potential significant construction deficiency in accordance with the requirements of 10CFR50.55(e) involving potential deleterious effects that could be caused by the corrosion inhibitor used in the emergency diesel generator cooling system on the solder used to stake nuts on thermostatic valve override assemblies by Robertshaw. By letter dated 9/15/82, the licensee reported that their evaluation had determined this issue to be reportable and stated the corrective action would be to provide swaged locking on the adjustment nut. In NRC Inspection Report 82-13 it was reported that cotter pins would be used in lieu of staking to secure the nuts. During this inspection report period, the inspector witnessed replacement of the lower over-run assembly in one of four Robertshaw Model 1285 5" temperature control valves. The replacement of the assembly was controlled by adherence to Robertshaw's procedure entitled, "Procedure for Replacing Lower Over-Run Assembly in Robertshaw Model 5" and 6" Temperature Control Valves." The inspector observed the presence of QC and field engineering personnel documenting and controlling the replacement activities. The replacement assemblies used a cotter pin and castellated nut in place of solder and a standard hex nut. The inspector reviewed the following two QCIR's that documented replacement activities:

-- QCIR No. 1 BG-400-RW-1.00

-- QCIR No. 1 DG-400-RW-1.00

No questions resulted from the inspector's activities, therefore, this item is considered closed. (354/82-00-04)

- B. On September 17, 1982, the licensee reported a potential significant construction deficiency in accordance with the requirements of 10 CFR 50.55(e) involving damage to cable tray support strut in the form of local deformation and tearing of the channel lips in the area where the cable tray hold-down bolts were installed. By telephone call on October 15, 1982, the licensee withdrew this item as potentially reportable based on the results of testing performed by Bechtel on deformed strut.

The inspector reviewed the Bechtel report which included a technical evaluation performed by Bechtel's M and QS department. The key points in the report were:

- The deformation of the strut channel lips resulted from overtightening the hold-down clips used to fasten the cable tray to its support.
- The strut deformation was in no way detrimental to the design intent of the strut. This was concluded based on the outcome of seven different physical tests simulating worst case conditions.
- Had the observed deformations gone undetected, they would not have adversely affected safe operation of the plant.

Based on the results of the technical report as supported by physical test results, the inspector agrees with the above key points and concurs with the licensee that this item is not reportable per the requirements of 10CFR50.55(e). (354/82-00-05)

- C. On September 17, 1982, the licensee reported a potential significant construction deficiency in accordance with the requirements of 10 CFR50.55(e) involving intrusion of cement grout of unknown quantity into the air gap between the free standing containment drywell and the exterior concrete shield wall. During this inspection report period,

the inspectors observed in process activities prescribed by Special Work Plan/Procedure SWP/P-C-6687. The initial steps of this procedure required tunneling through approximately six feet of grout in four locations. The four locations were determined by a review of the grout intrusion map. The excavation by hand operated chisels started November 15 and was observed to meet the instructions/precautions of Excavation Permit XC-1102. This item will remain open pending satisfactory resolution of air gap grout blockage and restoration of the excavated shield wall. (354/82-00-06)

5. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (354/82-04-02): Questionable HVAC installation and QC practices by W-H. This unresolved item raised two questions:

- (1) Was lack of full thread engagement of bolts into nuts acceptable?
- (2) Why was not QC involved in torquing of the ductwork support bolting?

The question of lack of full thread engagement was addressed in NRC Inspection Report 82-09. During this inspection report period, the question of lack of W-H QC involvement in torquing of ductwork support bolting was addressed. In particular Bechtel QC torqued a minimum of 10% of the bolted connections employed in each ductwork support that was installed by W-H prior to the time Bechtel assumed onsite QC responsibilities. The inspector verified this activity had been accomplished by reviewing, on a sample basis, QC inspection records and the application of torque paint on bolts. The inspector had no further questions and considers this unresolved item closed.

(Closed) Noncompliance (354/82-05-01): Failure of W-H to maintain an inspection status of ductwork support expansion anchor bolt (EAB) torquing activities. Bechtel QC verified the torque of all accessible EAB's installed by W-H prior to the time Bechtel assumed onsite QC responsibilities. Four EAB's were not accessible. The results of the torque verification activities demonstrated that all of the EAB's were correctly installed. Based on the lack of problems with accessible EAB's that were checked, the four that were not accessible for checking were considered acceptable. The inspector verified the accomplishment of this activity by reviewing, on a sample basis, the QC inspection records and the torque paint applied to the EAB's. The inspector had no further questions and considers this item closed.

(Closed) Noncompliance (354/82-07-03): Failure to obtain an excavation permit prior to drilling an EAB hole to a depth equal to or greater than 6". Bechtel issued Rev. 6 to SWP/P-C-4, Installation of Expansion Type Concrete Anchors, that requires use of "a mechanism on all drills to limit and/or gauge the depth of holes drilled" for EAB's. Additionally, Bechtel imposed the requirements of this procedure on all subcontractors installing EAB's in safety related walls. Also, Bechtel QC and field engineering performed a review of all walls where expansion anchor bolts were used for panel wall connectors and stair supports and determined that there was no potential for damage either to embedded pipe or conduit. The inspector had no further questions and considers this item closed.

(Closed) Noncompliance (354/82-11-01): Failure to follow step-off pad procedures at the point of RPV entry. GEI&SE implemented step-off pad procedures at the point of RPV entry. A craftsman is stationed full-time at the entry area to enforce the procedures. The inspector witnessed the step-off pad procedures being implemented on several different occasions. The inspector had no further questions and considers this item closed.

6. Structural Steel Erection and Welding For Unit Cooler Supports - Observation of Work and Record Review

Inspection was performed of completed structural steel supports for one unit cooler and another incomplete unit was inspected for punch listed items remaining. Documentary evidence was reviewed in the final approved QC records for unit cooler No. AVH-210 and in-process records were reviewed and discussed with responsible engineers for unit cooler No. AVH-211. (No construction activity was on-going during this inspection.) The inspector evaluated and determined from the above observations that safety related steel supports for major equipment outside the containment are constructed in accordance with NRC requirements and SAR commitments to industry codes and standards.

Specific QC records reviewed included QC inspection report No. C085-4-C-2.10. This inspection report was observed to provide inspection verification and sign-off for the details of construction in accordance with criteria required by the specifications and referenced drawings. Inspection of the completed structural work included observation of AWS D1.1-75 structural welds. The details of welded joints were observed to meet the configurations and details given on the drawings. The supplementary welding report and QC inspection sign-off for weld and welder identification, weld procedure qualification, base material and filler metal identification, and in-process and final inspection of each weld appear to satisfy criteria identified in the specifications, drawings, and the code.

Audits were reviewed of structural steel erection and welding. Licensee audit no.'s H-170, H-171, H-187, H-195, H-204, H-218 and H-249 cover the period from February, 1980 through April, 1982. Bechtel audit no.'s 18.6-5 through 18.6-8 were performed June, 1980 through June, 1982. Structural steel bolting and welding of supports for the unit coolers was underway during the above audit periods. These audits fulfilled the requirements of 10CFR50 Appendix B and were observed to be effective in requiring corrective actions for deficiencies and disposition of NCR's. They verified through examination of objective evidence and physical inspections that activities associated with erection of structural steel were accomplished in accordance with applicable requirements.

No violations were identified.

7. Structural Backfill Work Activities - Observed for Service Water Pipes

The inspector observed the following particular aspects of the Service Water Pipe backfill in the zone within the sheet pile trench east of the service water intake structure (SWIS) from elevation 70' at the SWIS to about elevation 85' easterly 200 feet:

- adequacy of drawings, specifications and availability of implementing QC procedures
- control of groundwater below ground surface and large rock removal from backfill
- craft supervision in spreading of loose fill, vibro-machine and hand-operated compaction
- QC activities involving daily/shift advance in placement, spreading, compaction and soil testing.

The inspector also reviewed the following:

- test equipment calibration status
- Bechtel surveillance of test activities
- personnel qualifications, adequacy of reports, and disposition of nonconforming conditions with responsible QC and field engineering personnel.

No violations were identified.

8. Exit Interview

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