

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-354/85-19 Docket 50-354 License CPPR-120

Licensee: Public Service Electric and Gas Company

Facility: Hope Creek Generating Station

Inspection at: Hancock's Bridge, New Jersey

Conducted: April 15 - May 27, 1985

Inspectors: *AR Blough*
A. R. Blough, Senior Resident Inspector

6/10/85
Date

SK Chaudhary
for S. K. Chaudhary, Senior Resident Inspector

6/10/85
Date

J. Lyash
for J. Lyash, Reactor Engineer

6/10/85
Date

D. Vito
for D. Vito, Emergency Preparedness Specialist

6/10/85
Date

J. Hawxhurst
for J. Hawxhurst, Emergency Preparedness Specialist

6/10/85
Date

Approved: *J. Strosnider*
J. Strosnider, Chief, Projects Section 1B
Projects Branch No. 1
Division of Reactor Projects

6/10/85
Date

Summary:

April 15 - May 27, 1985 (Report No. 50-354/85-19): A routine onsite resident inspection (232 hours) of work in progress and preoperational testing was conducted. The inspector also made tours of the site; reviewed licensee action on previous inspection findings, IE Bulletins, IE Circulars, and TMI Action Plan Items; and reviewed Technical Specifications. Also two Emergency Planning (EP) specialists reviewed EP program development status. (24 hours).

No violations were noted.

DETAILS1. Persons ContactedPublic Service Electric and Gas Company

C. Adams, Emergency Preparedness Planning
 *A. Barnabei, Principal QA Engineer
 *J. Carter, Startup Manager
 N. Champion, QA Engineer
 G. Daves, Senior Engineer, Operations
 J. Hagan, Operating Engineer
 *A. E. Giardino, Manager, QA Engineering and Construction
 *R. Griffith, Principal Staff Engineer
 *P. Kudless, Maintenance Manager
 S. LaBruna, Assistant General Manager
 *E. Logan, Site Manager
 D. McCloskey, Emergency Preparedness Manager
 M. Metcalf, Principal Startup QA Engineer
 P. Moeller, Nuclear Site Protection Manager
 J. A. Nichols, Technical Engineer
 J. M. Rucki, Maintenance Engineer
 R. S. Salvesen, General Manager, Hope Creek Operations

Bechtel

W. Cole, Lead Site QA Engineer
 W. Goebel, QA Engineer
 C. Jaffee, Startup Engineer
 D. Long, Field Construction Manager
 W. Maurer, Construction Manager
 G. Moulton, Construction Manager
 R. Webster, Startup Director

2. Previous Inspection Item Update

(Closed) Unresolved Item (84-29-02), the effect of thermometer calibration on battery test. The inspector reviewed the results of the preoperational test (PJ-1), interviewed the test engineer, and reviewed the results of the thermometer calibrations subsequent to the test. Although not all thermometers were cross-referenced to particular cells, the test engineer did record the thermometer number for the highest-reading cell of each battery. Post-test calibrations were acceptable (i.e., within tolerance) for the associated thermometers. In one case, the thermometer was within 0.2°F; and, in the other, it was reading about 1°F high, which is conservative. The inspector had no further questions.

3. I.E. Bulletin Followup

- 3.1 (Closed) IE Bulletin 79-08, "Nuclear Accident at TMI." Subsequent to this bulletin, the TMI Action Plan (TAP), NUREG-0737, was issued. Followup of IEB 79-08 is specified under TAP Items II.K.1.5,.10,.22, and .23. Therefore, this bulletin is closed administratively to avoid redundancy of NRC followup effort.
- 3.2 (Closed) IE Bulletin 79-15 (79-BU-15), "Deep Draft Pump Deficiencies." This bulletin required collection of deep draft pump design information and operational data for NRC review. The inspector verified that the applicant had gathered the required data. Deep draft pump operability was reviewed by NRC(NRR) during the Pump and Valve Operability Review Team (PVORT) audit May 6-10, 1985. One open item was identified regarding Service Water pump cyclone separator blockage. This item requires licensee analysis of (1) the cause of failure, (2) the pump design, and (3) the adequacy of instrumentation. The results of NRC (NRR) review will be published in a SER supplement. Any subsequent NRC Region I followup considered necessary to augment the review would be specifically requested by the NRR Licensing Project Manager at that time. Therefore, this bulletin is closed.
- 3.3 (Closed) IE Bulletin 84-02, Failure of GE HFA Relays. The applicant's review indicated that upgraded, Century Series relays (which use a "Tefzel" coil spool) had been provided for all safety-related applications, except for four relays associated with ECCS logic. These were replaced with Century Series relays under a GE FDI. The inspector observed the relays in-plant and verified that the Century Series relays have been installed. He also verified that the older model relays, whose nylon or Lexon coil spool often crack in use, are included on the applicant's index of potentially defective equipment (IPDE).
- 3.4 (Open) IE Bulletin 79-24 (79-BU-24), "Freezing of Lines in Cold Weather." The applicant's response to this item addressed only the design of process piping. The inspector stated that this item would remain open pending a more comprehensive description to the inspector of freeze protection measures, including: (1) protection of sampling and instrument lines, if necessary; and (2) measures to ensure/verify that freeze protection measures (such as insulation, heat tracing, intake screen de-icers and fire hydrant shutoff/drain valves) remain functional throughout plant life.

4.0 IE Circular Followup

- 4.1 (Closed) IE Circular 77-08 (77-CI-08), "Failure of Feedwater Sample Probe. For this plant the design was changed to preclude this failure. After reviewing the design specification (J-556) and drawing (J-5107), the inspector had no further questions.

- 4.2 (Closed) IE Circular 77-10 (77-CI-10), "Vacuum in Radwaste Tanks." This item was superseded by IE Bulletin 80-05, which will be inspected.
- 4.3 (Closed) IE Circular 78-14, "HPCI Turbine Reversing Chamber Hold Down Bolting." The turbine was returned to GE and reworked per FDI 29/79450, August 3, 1977. The inspector reviewed the completed FDI, dated September 12, 1980.
- 4.4 For the following circulars, the inspector reviewed the licensee analyses and planned actions and found them acceptable. Implementing procedures are not yet approved, however. The circulars therefore remain open.
- (Open) IE Circular 78-13 (78-CI-13), "Service Water Pumps;" and
 - (Open) IE Circular 81-12 (81-CI-12), "Testing of Protective Systems."

5. TMI Action Plan (TAP)

The inspector reviewed the following TAP items to verify that the applicant is implementing adequate measures to meet his commitments.

- 5.1 (Open) TAP I.C.2--Shift Relief and Turnover Procedures. The applicant has included appropriate shift turnover procedures and checklists in procedure OP-AP-ZZ-107, Revision 1, February 1, 1985. FSAR Section 1.10 also commits to a system to evaluate effectiveness of shift relief and turnover. This system is not yet developed. Therefore, this item remains open.
- 5.2 (Closed) TAP Item I.C.4--Control Room Access. This item is appropriately addressed in applicant procedures for conduct of operations, including SA-AP-002(Q), Revision 1, January 11, 1985, "Station Organization and Operating Practices," and OP-AP-ZZ-002(Q), Revision 0, February 1, 1985, "Conduct of Operations."
- 5.3 (Closed) TAP Item I.C.7 NSSS Vendor Review of Procedures. This item applies to emergency procedures, (EOPs), low-power tests, and power ascension procedures. Because EOPs are based on guidelines developed by the NSSS vendor and BWR Owners Group, the NRC:NRR staff does not require further vendor review of EOPs (reference SER paragraph 13.5.2.3). Regarding low-power and power ascension test procedures, administrative procedure SA-AP-ZZ-001(Q) requires review by the appropriate vendor operations manager. The inspector discussed the review process with the power ascension director and verified that the two procedures approved thus far have been reviewed by the vendor.

- 5.4 (Closed) TAP Item I.C.8--Pilot Monitoring of Selected EOPs for NTOL Plants. The SER (NUREG-1048) states that NRC (NRR) has chosen not to monitor Hope Creek EOPs, since the EOPs are based on BWR Owners Group Guidelines. Instead, NRR will review in detail the Hope Creek plant-specific Procedures Generation Package (Tap Item I.C.1). A sampling of EOPs is reviewed by NRC Region I as part of the routine preoperational phase inspection program. Therefore, no additional inspection is needed for TAP Item I.C.8.
- 5.5 (Closed) TAP Item II.K.1.23, Reactor Vessel Water Level Indication. This item required providing, for NRC staff review, descriptions of reactor water level indications and their uses. The required information was provided in sections 1.10 and 5.1 of the FSAR and reviewed by NRC:NRR. The inspector has no further questions on this item. An associated item, II.F.2, involves the adequacy of instrumentation to detect inadequate core cooling and is still open.
- 5.6 (Closed) TAP Item II.K.3.3--Reporting of Failure of Safety Relief Valve to Close. Administrative Procedure SA-AP-ZZ-006(Q), Revision 0, February 19, 1985, requires notification of NRC Operations Center within one hour of declaring Emergency Class as specified in the Emergency Plan. Emergency Plan Table 5.1 classifies failure of a relief valve to close as an Unusual Event. Also, draft Technical Specifications 6.9 requires an annual report of all challenges to safety relief valves.
- 5.7 (Closed) TAP Item II.K.3.17--Report of ECCS System Outages. This item required reporting of ECCS outage history so that NRC could evaluate Technical Specification-allowed outage times. Although Hope Creek has no operating history, the applicant has committed to report future ECCS problems as required by the LER system. The SER accepted this commitment. Administrative Procedure SA-AP-ZZ-006(Q) requires shift personnel to report equipment malfunctions via Incident Reports. Incident Reports are screened and evaluated for reportability and for trends.

6. Preoperational Phase Activities

- 6.1 The inspector toured the control room on regular and backshifts. He interviewed operations personnel regarding testing scheduled or in progress, reviewed logs and night orders, and observed alignment and indications of systems undergoing tests. Operators and supervisors were knowledgeable regarding plant status and test plans. The inspector toured areas of the plant, including drywell, reactor building, and the control building. He checked on tests and operations in progress, observed equipment and housekeeping conditions, and interviewed personnel involved in ongoing activities.

During a plant tour on May 7, the inspector noticed a Core Spray Loop 'A' pipe hanger which was tagged as "complete" but was disconnected at one end. The inspector determined that rework of the hanger had been properly authorized and was being tracked via Hanger Rework/Removal Card #4960, dated 4/17/85.

During a plant tour on May 22, the inspector checked portions of a Diesel Generator safety tag out. Where fuse removal was specified, the tags had been placed on the removed fuses, which were stored in the bottom of the associated cabinet--there was no tag on or near the location of circuit interruption. The inspector discussed with the applicant the potential for the circuit to be reenergized prematurely by installation of a different set of fuses. The applicant stated that practices and procedures would be changed to implement tagging of the actual circuit location.

6.2 Preoperational Test Observations

During April 22-26, the inspector observed portions of the following tests:

- BB-2, Revision 0, "Reactor Recirculation System;" and
- BB-4, Revision 0, "Reactor Pressure Vessel Internals Vibration Test."

The inspector interviewed shift personnel, test personnel, and supervisors; observed testing; and independently checked indicators and calculations to verify the following:

- shift and test personnel were knowledgeable regarding test requirements and status;
- the procedure was followed;
- test exceptions were documented;
- on-the-spot changes were properly controlled; and
- required data was being collected.

The inspector made the following findings:

- A. Reactor core flow as calculated from control room instrumentation, appeared to be slightly below the value specified in the procedure. Oscillations in jet pump flow indicators (typical at all BWRs with jet pumps) made

precise flow calculation difficult. The inspector discussed this with NSSS vendor engineers, who then checked flow, using the output signal from the square root converter in the flow measurement system to give a more precise reading, and verified that it was within specification.

- B. Although individual on-the-spot (OTS) changes were handled properly, the large number of changes made the procedure harder to follow and would complicate the applicant's test results review process. A similar situation had been identified relative to vendor testing of diesel generators (reference inspection report 85-11). The applicant acknowledged the comments and stated he is attempting to write procedures that will need less OTS changes. In the case of diesel generators, the remaining vendor test procedures and the preoperational test procedures are being revised to incorporate lessons learned from the first vendor test.

6.3 Preoperational Test Procedure (PTP) Review

The PTP listed below was reviewed for technical and administrative adequacy and for verification that testing is planned to adequately satisfy regulatory guidance and licensee commitments. It was also reviewed to verify licensee review and approval, proper format, test objectives, prerequisites, initial conditions, test data recording requirements, acceptance criteria, and system return to normal.

-- BH-1, Revision 0, April 19, 1985, Standby Liquid Control System.

No unacceptable conditions were identified.

6.4 Technical Specification Reviews

In the course of other inspection activities, the inspector checked selected draft Technical Specifications (TS) for consistency with design documents and the FSAR. The inspector found the following areas unclear:

- A. The maximum closure times for some containment isolation valves listed in TS 4.6 are not consistent with FSAR Table 6.2.16. A note to Table 6.2.16, added during an amendment, states that the values are design best closure times, not maximum allowables--if this is true, it indicates that most valves (where FSAR times do match the TS) have no design margin. In view of the confusion the inspector stated that he would need to see the technical

basis for TS closure times of the isolation valves. The applicant stated that this item was under review, having previously been identified by his operations department and his startup group.

- B. A note on several ECCS system P&IDs regarding operation of root valves connected to non-Q instrument piping (see inspection report 85-14, Detail 7.1), does not correlate clearly to TS definitions or operability requirements for primary containment. The applicant agreed to review this item and provide his position.

Pending applicant resolution and inspector review, the above two items are collectively considered an unresolved item (85-19-01).

During the above reviews, the inspector noted that Hope Creek Operations has an extensive TS review in progress and is identifying other areas needing clarification. The effort should be helpful in avoiding major TS problems and improving TS clarity. The NRC operational readiness inspection program includes additional comparisons of a sampling of TS to the as-built plant.

7. Construction

7.1 Plant Tour

The inspectors periodically toured the plant and performed walk-through inspections during this inspection period. In the walk-through inspections, special emphasis was placed in the areas of drywell, reactor building, torus/wetwell, and diesel generator enclosures. These inspections were carried-out to assess the acceptability of finished work, housekeeping practices in the work area, and the work in progress. The inspectors also verified the availability of approved procedures, current design and construction information, craft supervision, and quality control personnel in the work area. The completed works were examined to verify their conformance to approved project procedures, specifications, approved design drawing, and acceptable workmanship. The works in progress were reviewed for proper tools, equipment, work procedure, and knowledge and understanding of craftsmen regarding the quality of the job they were performing.

The inspectors especially observed the paint touch-up operations in the torus area after the ECCS system flushes. They interviewed craft supervisors and QC personnel, checked ventilation, observed installed temperature/humidity indicators, and verified the calibration of these indicators.

No violations were identified.

7.2 Training and Indoctrination of Craftsmen

The inspectors reviewed procedures, and held discussions with cognizant licensee personnel to determine the adequacy of the training and indoctrination program for craft and supervisory personnel. In addition to the above the inspectors interview many craftsmen and the members of supervision and construction management to discuss different elements of the program in order to ascertain the effectiveness of the same. Through these inspections and interviews, the inspectors also assessed supervisory personnel's familiarity with the currently approved project procedures; the practices of disseminating approved changes to and new requirements of design and/or construction; revision of design drawings and/or specifications; and the training of personnel in the changed and/or revised requirements. The inspectors reviewed following procedures:

- Bechtel Procedure, WP/P-18, Rev. 0; "Orientation and Training Program"; and
- Bechtel Procedure, SWP/P-18, Rev. 13, "Orientation, Training and Indoctrination"

Based on the above review and discussions the inspectors determined that for the craftsmen:

- A. The craftmanship training for different crafts are controlled by their respective unions.
- B. The site/project specific requirements are covered by the formalized indoctrination program at the time of hiring.
- C. The changes to and/or revision of project and design requirements are covered in the weekly tool box meeting.
- D. The effectiveness of union's craft training, project indoctrination, and tool box meetings are judged by the supervisors through the job performance of each individual in his/her assigned job. Some of the indicators used for this purpose are NCR trending program, field engineering inspection, QCIRs, supervisor/foremen's observations, and licensee's CARs.

For supervisory, engineering, and non-manual personnel, the inspectors determined the following:

- A. There is a structured classroom training for the supervisory and other non-manual personnel. Although the classes are billed as safety training, the actual content covers all kinds of technical and administrative topics of current interest.

- B. These training sessions are coordinated by Bechtel's on-site training department.
- C. Additional technical training sessions are organized by Lead Superintendents and department managers on the as-needed basis to cover specific areas of interest and importance.
- D. The effectiveness and the need for training is determined by similar indicators as used for craft training, e.g., NCR trending program, CAR trending program, field engineering inspection program, new and/or changing job requirement, changes to an/or revision of approved design and construction requirements.
- E. In addition to the above the management review of the job performance of individuals are also taken into consideration to assess the effectiveness of the training.
- F. Craft supervisors are made aware of changes in procedures or requirements at regular meetings. Although sufficient time is not available at these meetings for detailed review, this documentation is readily available for review by appropriate supervisors as necessary.

The inspectors further determined that the licensee and the A/E provide adequate opportunities and facilities to keep the supervisory and engineering personnel on-site apprised of changing requirements and upgrade in their skill for the jobs to which an individual is assigned.

No violations were identified.

7.3 Changes to Test Pressure in Safety Related HVAC System

The inspectors reviewed documentation and discussed the matter with licensee and A/E engineers to determine the adequacy and technical validity of the changes. The inspector reviewed pertinent specification and HVAC system drawings.

Based on the review of documents, discussions with cognizant engineers, and direct observation the inspector determined that the decrease in test pressure was technically valid. This is also a followup on an allegation we should expand on the validity of the reduction in test pressure. The current test pressure complies with the requirements of applicable standard (SMACMA High Pressure Duct Standards) for system tests for operability.

No violations or safety concerns were identified

8. Emergency Preparedness

Two emergency preparedness inspectors from Region I met with the PSE&G Emergency Preparedness personnel on May 16 and 17, 1985 to discuss the Hope Creek Generating Station Radiological Emergency Plan/Procedures and upcoming Emergency Plan Implementation Appraisal, which is currently scheduled for August 12-16, 1985.

The inspectors noted that the review of the HCGS Emergency Plan is near completion and the final evaluation is scheduled to be included in a forthcoming supplement to the HCGS Safety Evaluation Report. It was noted that HCGS emergency plan implementing procedures (EPIPs) will be submitted on June 1, 1985. Classroom and practical training on the EPIPs is scheduled to be completed by July 22, 1985 for all personnel except one of the two groups of operators in license training; followed by drills and practice exercises. The second operator licensee training group will begin EP classroom and practice training immediately following the first operator licensing group.

The Emergency Response Facilities (EPFs), scheduled in the HCGS SER to be complete on June 1, 1985, six months prior to the proposed issuance of the operating license, are behind schedule. The inspectors discussed certain milestones with licensee personnel to facilitate an August 12, 1985 EPIA inspection. The milestones include completion of: the physical facilities (TSC and OSC) with furniture (July 1, 1985); status boards, lockers and general equipment (mid-July '85); and the interim emergency response telecommunication system (mid-July '85).

The licensee will provide a letter to NRC/RI addressing the status of Emergency Preparedness at the HCGS on July 15, 1985, one month prior to the appraisal date.

9. Unresolved Item

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 6.4.

10. Exit Interview

The inspectors met with applicant and contractor personnel periodically and at the end of the inspection report period to summarize the scope and findings of their inspection activities.

Based on Region I review and discussions with the licensee, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.