

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-354/84-29 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: December 17, 1984 - January 27, 1985

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

2/8/85
Date

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

2/8/85
Date

Approved: *J. Strosnider*
J. Strosnider, Chief, Project Section 1C

2/18/85
Date

Summary: December 17, 1984 - January 27, 1985 (Report No. 50-354/84-29):

Routine onsite resident inspections of work in progress and preoperational testing programs were conducted. The inspector also made tours of the site, reviewed applicant action on previous inspection findings, reviewed the applicant's plan for transition from construction to operations, walked-down piping in selected safety systems, and examined selected raceway supports.

One violation, failure to follow procedures for control of measuring and test equipment (Detail 5) was identified.

This report period involved 171 hours of on-site inspection.

DETAILS

1. Persons Contacted

Public Service Electric and Gas Company (PSE&G)

- A. Barnabei, Principal QA Engineer
- J. Cicconi, Startup Manager
- *R. Donges, QA Engineer
- J. Fisher, QC Startup Engineer
- *A. E. Giardino, Manager, QA Engineering and Construction
- *R. Griffith, Principal Staff QA Engineer
- P. J. Kudless, Maintenance Manager
- S. LaBruna, Assistant General Manager
- *M. Metcalf, Principal Startup QA Engineer
- J. A. Nichols, Technical Engineer
- K. Petroff, Startup Engineer
- *J. M. Rucki, Maintenance Engineer
- R. S. Salvesen, General Manager, Hope Creek Operations

Bechtel Construction, Inc. (Bechtel)

- J. Cox, Principal Startup Engineer--Methods/Administration
- T. Indico, Principal Startup Engineer--Testing
- C. Jaffee, Startup Engineer
- A. Meyer, Document Control Group Leader
- *G. Moulton, Project QA Engineer
- *J. Serafin, Assistant Project Field Engineer
- R. Webster, Startup Director

*Present at Exit Meeting

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item, 81-10-02: Bechtel computerized storage maintenance program contained errors in listed inspection frequencies. The licensee extensively reviewed and has upgraded the computer program to eliminate errors. Furthermore, due to the turnover process the maintenance responsibilities have been realigned in many cases, and will continue to be shared by the licensee and the A. E. The program implemented to reflect this change in responsibility has been found to be adequate to implement the requirements. This item is resolved.

(Closed) Unresolved Item, 83-09-02: Attachment welds on the bottom of control consoles were not $\frac{1}{4}$ " flare bevel welds as specified in design drawing. The design drawing was revised to clarify the weld symbols. The welds as installed were acceptable, and were incorporated in the new drawings. This item is closed.

(Open) Unresolved Item, 84-06-03: ITT Grinnel guidance on fit-up and inspection for pipe clamps was not clear. The licensee has modified and revised design documents to clarify the requirement. However, the revised requirements still do not adequately cover an installation situation where the clamp may be in contact with only one point on a side of the pipe. An engineering analysis is needed to ascertain the validity of such installation. This item remains unresolved until additional information is provided by the licensee.

(Open) Inspector Follow Item (84-23-01): Enhancement of instrument indices and setpoint register to verify calibrations. The inspector discussed this item with the applicant to verify that he is responding appropriately. The applicant stated that he has gone through the inspection report in detail to extract all concerns related to this issue. A program to upgrade, verify, and provide traceability has been developed and is being implemented on a pilot basis for one system to verify feasibility and scope. About seven engineers are involved. The Diesel Generator system was selected for the pilot program since, as skid-mounted equipment, it has the most uncertainty in calibration data traceability; this selection is consistent with inspector observations in report 84-23. The applicant stated that, after the pilot program, the program will be refined if necessary and expanded to include all safety-related instruments, including those with previously developed instrument calibration data (ICD) cards. If any previous ICD is found to be in error, corrective action will include evaluation of the need to repeat various component and/or system tests. The inspector stated that verification of previous data is an important commitment, in that such a comprehensive program, if properly done, will satisfy NRC concerns regarding system design verification and system operating envelope during tests (reference Report 84-23, Detail 6.B, page 7). Also, the lack of control of Problem Reports (Report 84-23, Detail 6.C.3) page 11) early in the calibration program would become irrelevant to final quality and traceability. Future inspection will be done to verify the acceptability of the licensee upgraded instrument indices. This item is upgraded to an unresolved item.

3. Plant Tours

During the inspection period, the inspectors toured the plant; especially, the drywell, reactor building, diesel generator enclosures, turbine building, and control room. In the course of these walk through inspections, they examined completed works, works in progress, availability of calibrated tools, presence of quality control personnel, and the general housekeeping of the plant. The inspectors especially examined pipe and equipment supports in drywell and reactor building and modification of diesel generator fuel oil system.

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 flushes and tests. Operators and supervisors were knowledgeable regarding plant status and test plans.

No violations were identified.

4. Preoperational Phase Document Control

The inspector reviewed the following procedures, and interviewed personnel to verify that the Startup program includes acceptable measures for control of test procedures:

- SAP-14, Revision 1, November 13, 1984, Preoperational Test Review Committee;
- SAP-20, Revision 4, November 19, 1984, General, Detail, and Corporate Test Procedure; and
- SAP-24, Revision 4, November 20, 1984, Preoperational Test Procedure, Format and Instructions.

The above procedures specify the responsibilities, and processes for review, approval, issuance, revision and retention of test procedures. Procedural revisions are required to be reviewed and approved at the same management level as the original procedures. Control of obsolete and superseded procedures is specified. Responsibilities are delineated for individuals and organization involved in test procedure control.

Within the scope of this review, the inspector had no further questions; no violations were identified.

5. Control of Measuring and Test Equipment (MTE) for Preoperational Testing

The inspector interviewed Startup Group personnel, toured the MTE storage/issue trailer on January 7 and 11, and reviewed the following documents:

- Startup Administrative Procedure SAP-19, Revision 4, December 3, 1984, Measuring and Test Equipment Control;
- Out of Calibration Reports (OOCRs);*
- PSSUG MTE Log Cards (i.e., usage reports);* and
- MTE Checkout Records.*

*a sampling of several documents in each category was reviewed.

The inspector determined that each item of controlled MTE has a unique serial number, a specified calibration frequency, and, when calibrated, is affixed with a calibration sticker bearing conspicuously the recalibration due date. The storage area, although slightly crowded and dusty, was acceptable. The inspector also determined that individual test procedures include requirements for recording test equipment identity and calibration date to assure that only calibrated equipment is used.

Quality Assurance Manual, Volume 4, QA Instruction (QAI) 12-1, Revision 3, 4/22/83, Calibration and Control of Measuring and Test Equipment requires that evaluations shall be made to determine validity of previous inspections and tests when MTE is found to be out of calibration. These evaluations necessitate accurate records of usage for each item of MTE. The inspector identified the following examples of noncompliance with SAP-19; these noncompliances could prevent the MTE program from maintaining a reliable history of calibrated equipment usage in support of the evaluations required by QAI 12-1.

1. SAP-19 requires that portable test equipment shall remain exclusively in the possession and control of the individual to whom issued. However, the inspector determined through interview of the Startup Test Equipment Coordinator (STEC) and MTE issue personnel that equipment is commonly transferred between workers in the field. Also, on January 11, the inspector observed the MTE issue attendant instructing a maintenance technician to borrow a precision voltmeter from an I&C technician, because none were available in the MTE trailer.
2. SAP-19 requires all MTE to be issued by the STEC. However, MTE has commonly been issued on backshifts, in absence of the STEC, through MTE trailer access provided by the operating shift. No procedural guidance is provided in this area. On January 11, the inspector observed an I&C technician returning equipment which he had neither signed-out nor provided any other notification of issuance. The technician said he had obtained the equipment on backshift.
3. SAP-19 requires that, if MTE is signed out for an extended period, MTE log cards shall be submitted weekly. The inspector checked usage records for two 1000-volt meggers and found that one of them (#1277) had been checked out for over three weeks and no MTE log cards had been submitted. Also, several pressure gages (#812, 815, 066, 654, and 655) had been signed out since October 1984, and no log cards had been submitted. For the gages, MTE personnel stated that, because the gages were signed out under a work order, weekly log cards were not required. The inspector found that this provision is not included in the procedure.

4. SAP-19 requires personnel to update MTE log cards daily for equipment in their possession and to submit the log card upon return of equipment. The STEC maintains a usage record via the log cards or a computer record. The inspector found that no log cards or computer record was on file for usage of gage Nos. 066, 654 and 655 during October 4-10, 1984. Also, the inspector observed on January 11, one technician returning equipment without a log card (he told the MTE trailer attendant he would provide the card later), and two persons filling out the cards from memory upon return.
5. SAP-19 requires the STEC to assure calibration of MTE on schedule. Fixed MTE may remain in a fixed location for the duration of a test if it remains in calibration. However, numerous gages (including 066, 654, 655, 812, and 815) were not calibrated on schedule and were allowed to remain in fixed locations beyond the calibration due dates. These exceptions to SAP-19 were apparently permitted based on verbal statement from Test Engineers that the gages were not used in critical applications (i.e., for measurements used as test acceptance criteria). The inspector disagreed with this philosophy and stated that good engineering practice can dictate use of calibrated instruments in other applications, such as monitoring a system to maintain its parameters within specified limits during testing.

10 CFR 50, Appendix B, Criterion XII requires measures to assure that measuring and test devices used in activities affecting quality are properly controlled. The above-listed failures to control MTE in accordance with procedures are a Violation (354/84-29-01).

The above findings were presented to the applicant at a preliminary exit interview on January 11. On January 22, the applicant stated that he had revised his procedures (SAP-19) extensively, retrained personnel and increased surveillance on MTE procedural adherence. These measures were not evaluated or verified by the inspector during the inspection.

6. Preoperation Test Observations

6.1 Class IE Battery Testing

The inspector reviewed the test package; interviewed QC personnel, the test engineer; and test technicians; and observed portions of the following preoperational test:

-- PJ-1, Revision 1, 250 VDC Class IE Power System;

The portions observed involved service testing and recharge testing on battery 10D421 on January 16. Persons involved in the test appeared

knowledgable regarding their responsibilities. The Test Engineer had good control over the test. The inspector verified that data was being recorded properly and that test equipment used was being documented and was within its calibration cycle. In this regard, the inspector noted that twenty-one thermometers were being used to record cell temperatures. Although the serial numbers of thermometers were being documented, they were not being indexed to the particular cell used. The inspector stated that any failure to record MTE usage as precisely as possible could limit the ability to evaluate the consequences of MTE found out of tolerance at its next calibration. (See further discussion below). During the service test, test personnel noticed a deviation from expected results, in that during the first minute battery load cycled between about 650 and 900 amps, whereas a constant rate of 759 amps was specified. The Test Engineer, who believed the "hunting" was due to the limitations of the test device, documented this item as a test exception as required. By procedure, test exceptions are all evaluated during the test review process.

The inspector reviewed portions of the test package involving battery 8-hour rated discharge for batteries 10D421 and 10D431. The test of battery 10D421 had resulted in a calculated capacity of 100.1 percent of the minimum. The inspector checked the calculation and reviewed the data. The inspector noted that the highest recorded battery temperature is a factor in the calculation. Each 1°F error in temperature affects the capacity calculation by about 0.4 percent. The test engineer stated that he believed the procedure was conservative because it specified the highest battery temperature, whereas, on an engineering basis, use of average temperature would be appropriate. The inspector stated that, pending the formal review of PORC of these test results, both (1) the practice of not recording the specific cell of a thermometer's use and (2) the overall acceptability of the 10D421 8-hour discharge capacity test are considered unresolved (84-29-02).

6.2 Safety Auxiliaries Cooling System (SACS) Pump Test

The inspector observed portions of a coupled run-in of the 'B' SACS pump, performed in Test Package EG -00-29, in accordance with the following General Test Procedures (GTP's):

- GTP-9, Revision 2, Rotating Equipment Functional Checkout; and
- GTP-17, Revision 2, Vibration Analysis.

The inspector interviewed the QC inspector, test engineers, data-takers, electricians, and operator involved. He observed rotation checks measurements of bearing temperatures, winding temperatures, strainer differential pressure, and motor current. The inspector checked MTE in use for evidence of valid calibration.

Within the scope of these test observations, no violations were identified.

7. Training and Certification of Test Personnel

The inspector reviewed the program for certification of Startup Group personnel. He reviewed the certification procedures, interviewed persons administering the program, and reviewed a sampling of certification files for Level II and Level III test personnel. The applicant stated that he is currently revising his procedure SAP-15, Personnel Certification. The inspector noted that the revised procedure provides somewhat more stringent experience requirements for Level II certification. The applicant stated that he has recently reviewed personnel records to verify that all certified Level II's meet the new requirements. Within the sampling of Level II and III certifications reviewed by the inspector, all personnel appeared to significantly exceed the minimum requirements.

In reviewing medical qualifications the inspector had two findings:

- (1) Vision requirements include normal color vision and ability to read J-1 letters on a standard Jaeger test chart for near vision. Some medical report forms did not specifically indicate that the above tests had been completed satisfactorily. The applicant investigated this item and obtained written certification from his medical department that the vision tests are included on each exam and deficiencies, if any, are recorded on the report forms. The inspector had no further questions on this matter.
- (2) The inspector found that one individual had exceeded one year since his last vision exam. The inspector checked about 50 others and found none overdue. The applicant then checked all records and found no other overdue. The individual was promptly retested and passed his vision exam. The inspector noted that the applicant routinely reviews certification status and follows up on vision re-examinations. Thus, the one overdue exam is considered an isolated case.

In reviewing resumes provided by Bechtel, the inspector noted many individuals certified as "Bachelor of Science equivalent." The inspector requested to see the Bechtel procedures providing definition and criteria for this certification. As of the end of this inspection, the applicant was attempting to obtain the procedures. These will be reviewed in a future inspection.

8. Transition Planning

The inspector reviewed provisions for transition from construction, through the preoperational phase, to operations. The applicant had developed a planning document, Hope Creek Transition Plan (January 1984), which provides a schedule and guidance for transferring functions, personnel, and documents between organizations in support of the transition. An Assistant General Manager, Hope Creek Operations, has responsibility for monitoring the transition, and resolving difficulties. A Steering Committee also monitors the process and reports periodically to the Senior Vice President. The inspector interviewed two members of the Steering Committee. The applicant stated that the plan is being revised to reflect organizational changes and to provide more detail where needed.

Within the scope of this review, no unacceptable conditions were identified.

9. Walkdown Inspection of Standby Liquid Control System and Core Spray System, to Compare the "As-installed" System Configuration to Design Documents

The inspectors examined the "as-installed" configuration of both systems, and compared the same to the design requirements specified in approved design documents. The systems Piping and Instrumentation Diagrams (PID's) and Isometric Drawings (ISO's) were used to trace the system, and to identify equipments, supports, piping spools, and field welds in the installed locations. In-place storage and maintenance of system components was also reviewed.

The inspector determined that the "as-installed" system configuration reflected the approved design documents and design changes. The components, pipe spools, and supports, welds and other miscellaneous equipment were readily identified, and were easily traceable to the applicable PID's and/or ISO's. In one case, however, two valves in the core spray system were found to have the same valve number (V024). When this discrepancy was brought to licensee's attention, it was readily determined that the actual number should have been V024 and V025 respectively, and the mislabeling was corrected. The inspectors considered this an isolated instance of misidentification, for no other similar example was identified in all the systems examined by the inspectors.

The inspectors also verified that proper storage and maintenance practices were in effect in that the core spray pumps A, B, C, and D were supplied with individual heaters, and the heaters were in use.

No violation was identified.

10. Visual Examination of Pipe Spools

The inspectors examined two completed pipe supports in the drywell. The supports were selected randomly, one in the Main Steam system (H-2), and one in the Residual Heat Removal system (H-2). The support in the main steam system was located at elevation 105', azimuth 345°, and the one in the residual heat removal system was at elevation 133', azimuth 30°. These supports were inspected for their conformance to the design drawing, material traceability, and general workmanship of fabrication and installation.

The inspectors noted that support H-2 in the main steam system had one bolt out of four missing, and the other three were not adequately tightened. The inspectors reviewed the applicable drawing, 1-KL-035-H02 and determined that the installation of the support was not complete. The support had not been inspected and accepted by quality control.

The support in the RHR system appeared to be not in conformance with the design drawing. The inspectors reviewed the applicable design drawings, 1-P-BC-014-H02(Q) and FCR-H-009 and compared the design with the "as-built" conditions of the support. The inspectors determined that one of the hanger rods did not meet the installation requirement. The tolerance of installation for these rods, as specified in Specification P-410 is the greater of 3% or $\frac{1}{2}$ " from vertical. The actual installation exceeded this limit by approximately 1". However, the inspectors also noted that the support had not been inspected and accepted by QC; therefore, it was technically still under construction.

No violations were identified.

11. Visual Examination of Raceway Supports

The inspector visually examined a selected sample of conduit hangers, and reviewed the documentation associated with these hangers. The sample specifically comprised of the hangers listed on Nonconformance Reports (NCRs) 4957 and 5094. The hangers and associated documents were examined to determine if the hangers were designed, installed, and accepted per the project requirements; the nonconformances were dispositioned properly and disposition was technically adequate; and the workmanship of the installation was acceptable. The inspector reviewed the following documents:

- Bechtel NCRs, 4957; 5094
- Weldrod Maintenance logs
- IOM Cy to L. Smith dated 10/18/84
- Raceway Hanger Installation Cards, and FSKs
- RHIC

	<u>FSKs</u>
C-110; C-368	R-2702
C-111; C-065	R-2802
C-240; C-068	
C-326; C-069	
C-327; C-087	
C-102; C-088	
C-104; C-090	
C-127; C-099	
C-141; C-309	
C-203; C-311	
C-365; C-330	
C-366; C-367	
- Raceway Support Inspection Cards for Hanger Nos.
 - C-259; C-353
 - C-266; C-354
 - C-320; C-271
 - C-321; C-272
 - C-323; C-281
 - C-351; C-288
 - C-352; C-289
 - C-308
- Visual examination of workmanship of Hanger Nos.
 - C-351; C-352; C-259; C-281
 - C-323; C-353; C-266; C-272
 - C-321; C-345; C-288; C-271

Based on the above reviews of documents and examination of the installed raceway supports, the inspector determined that the hangers were designed and erected per applicable project procedures. The nonconformances were properly identified, and technically valid and adequate dispositions were implemented. The workmanship of installed supports was of acceptable quality.

No violations were identified.

12. Unresolved Items

Unresolved items are matters about which more information is required to ascertain whether they are acceptable items, items of noncompliance, or deviations. An unresolved item disclosed during the inspection is discussed in paragraph 6.

13. Exit Interview

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

Based on NRC Region I review of this report and discussions held with licensee representatives on January 25, 1985, it was determined that this report does not contain information subject to 10 CFR 2.790 instructions.