

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-354/84-09

Docket No. 50-354

License No. CPPR-120

Priority -

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: June 11-15, 1984

Inspectors:	<u>A. Finkel</u>	<u>7/9/84</u>
	A. Finkel, Lead Reactor Engineer	date
	<u>U. Cheh</u>	<u>7/9/84</u>
	U. Cheh, Reactor Engineer	date
	<u>Leonard S. Cheung</u>	<u>7/9/84</u>
	L. Cheung, Reactor Engineer	date
	<u>A. J. Hodson</u>	<u>7/9/84</u>
	J. Hodson, Reactor Engineer	date
Approved by:	<u>C. J. Anderson</u>	<u>7/19/84</u>
	C. J. Anderson, Chief, Plant Systems Section, EPB, DETP	date

Inspection Summary: June 11-15, 1984 (Inspector Report No. 50-354/84-09)

Areas Inspected: Routine, unannounced inspection by four region based inspectors of work observation and document review of activities related to previously identified items, electrical cables, and termination, HVAC, and related QA/QC activities. The inspection involved 140 hours of direct inspection time on site.

Results: No violations were identified.

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## DETAILS

### 1.0 Persons Contacted

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

- \*A. Barnabei, Principal Quality Assurance Engineer
- \*C. Churchman, Site Engineering Manager
- \*R. Dorges, Lead Quality Assurance Engineer
- \*A. Giardino, Manager, Quality Assurance
- \*R. Griffith, Principal Staff Quality Assurance Engineer
- \*A. Smith, Site Manager

#### 1.2 Bechtel Power Corporation (BPC)

- \*A. Bryan, Quality Control Engineer
- \*W. Cole, Lead Site Quality Assurance Engineer
- \*W. Goebei, Quality Assurance Engineer
- \*N. Griffin, Project Field Engineer
- \*D. Long, Field Engineer
- \*G. Moulton, Project Quality Assurance Engineer

#### 1.3 U. S. Nuclear Regulatory Commission

- \*W. Bateman, Senior Resident Engineer

\*Denotes personnel present at exit meeting.

Other licensee personnel were contacted throughout the inspection period during the review of data and inspection of hardware installations.

### 2.0 Facility Tour

The inspector observed work activities in progress, completed work and plant status in several areas during a general inspection of the site. The inspector examined work items for obvious defects of noncompliance with NRC requirements or licensee commitments. Particular note was taken regarding the presence of quality control inspectors and indications of quality control activities through visual evidence such as inspection records, material identifications, nonconformance and acceptance tags. In addition, the inspector interviewed craft and supervisory personnel encountered in the work area.

No violations were identified.

### 3.0 Previously Identified Inspection Findings

(Closed) Unresolved Item 84-01-02 pertaining to the electrical craft using the internal wiring harness of equipment as tie points for the field installed harness and in many cases field harnesses not being tied or anchored to the equipment.

Engineering Specification E-1408 drawing 1000, SWP/P-E-18 and quality control inspection plan E5.0 have been changed to reflect the following criteria:

- Maximum cable/conduit bending
- Method for supporting field installed cables in electrical equipment.

A sampling of the field cabling installed in electrical equipment indicates that the construction program has identified the above cabling problem and taken action as required.

This item is considered closed.

(Closed) Unresolved item 83-09-01 pertaining to the receipt of procurement documentation not in conformance to site specification 10855-J-200(Q) Appendix B documentation criteria. The licensee has added additional instructions to the "Engineering and Quality Verification Document Requirements" form of specification 10855-J-200 so that the inspector is aware of and knowledgeable as to what he is required to accept. In the receiving of technical data, such as equipment qualification data, the receiving inspector signature only means that he received a report and not that the report is acceptable.

The inspector reviewed the results of Licensee's audit report H-296 which addresses many of the inspectors concerns identified in NRC inspection report No. 50-354/83-09-01. The responses to the audit finding have resulted in personnel retraining and documentation changes.

This item is considered closed.

(Closed) Construction Deficiency Report No. 82-00-07 pertaining to a design modification to provide a flow diverter for the recirculation system which will only allow 25% of the flow into the annulus as compared with the 50% assumed in January, 1979.

The inspector verified the installation of the flow diverter design (elevation 128' 8½" drywell area) with the installation drawings. At the time of the inspection the installation was approximately 90% complete. Quality control inspection was in progress and no non-conformance reports (NCR's) had been identified by the licensee's inspectors as of the time of this inspection.

To verify the design installation criteria of the flow diverter installation the inspector reviewed the following documentations.

- Memo dated 11-29-82 to RC Haynes, Region I Administrator from T. J. Martin, PES&G VP
- FSAR 6B-1, Hope Creek Generating Station
- Bechtel Project QC Control Instructions C-2.10 Revision 13 10-26-83, Structural Steel Erection

-- Drawing No. C-0949-1 Revision 6 titled Primary Containment Biological Shield Flow Diverter and Radiation Shielding at Recirculation Outlet Penetration

This item is closed.

#### 4.0 Separation Criteria - Regulatory Guide 1.75 Physical Independence of Electrical Systems

The licensee has defined their conformance to R.G. 1.75 in their Final Safety Analysis Report (FSAR) Page 7.1-16 Amendment 5. The criteria of R.G. 1.75 and IEEE 384 states that internal separation distance between redundant Class 1E equipment and wiring internal to the equipment can be established by analysis based on tests performed to determine the flame retardant characteristics of the wiring, etc. used in the design configuration.

Bechtel's drawing No. E-1408-0 Revision 2 Sheet 3.6 paragraph C states in part, "The General Electric installed wiring inside the NMS cabinets is exempt from 6 inch separation requirement".

The justification for the licensee to exempt the 6" inch separation criteria on the General Electric NMS cabinets has been placed on the NRC agenda and will be addressed as part of the questions associated with the compliance criteria of RG 1.75 and IEEE 384 for this license.

This item is considered unresolved pending NRC review of the position the licensee has taken on this subject. (354/84-09-01)

#### 5.0 Installation of Electrical Equipment

5.1 The inspector observed work in progress, partially completed work and completed work pertaining to cable installations, terminations and electrical equipment installations, so as to determine whether the requirements of applicable specifications, work procedures and instructions have been met in the areas of installation and modifications.

##### 5.1 Electrical Installation Document Review

The inspector reviewed the following documents relative to cable installation and termination.

- a) FSAR Chapters 1.8 and 8.1
- b) Bechtel Spec E-1408-0 Rev. 11, Wire and Cable - notes and details.
- c) Bechtel Design Criteria 10855-D4.18, Rev. 4, separation of Class 1E Equipment and Circuits.
- d) Bechtel Design Criteria 10855-D4.9, Rev. 4, The Raceway System.

- e) Bechtel Work Procedure SWP/P-E-18, Rev. 3, Termination Installation
- f) Bechtel Work Procedure SWP/P-E-17, Revision 5, Cable Installation

## 5.2 Cable Installations and Terminations

- 5.2.1 During the inspection, the inspector randomly selected the terminations of two safety related multi conductor cables, the installation of a safety related 2-conductor control cable and a safety-related triplex power cable, and witnessed the licensee's quality control inspectors performing their inspections. The inspector reviewed the licensee's inspection criteria and quality control inspection records (QCIR), and verified that the QCIR were signed by the licensee's inspectors.

No violations were identified.

- 5.2.2 The inspector randomly selected several vertical cable tray installations in each color coded channel and examined whether the cables were properly secured with cable ties. It was identified that several cables were not tied within 5-foot intervals (as required by the installation procedure). Similar problem had been identified by the resident inspector in Inspection Report 354/84-05. This appears to be a generic problem. The resident inspector will follow this item in his monthly inspection program.

## 6.0 Quality Assurance Documentation

### 6.1 QA Audit

The licensee did not indicate in FSAR Chapter 17 how frequent the QA audit was to be performed at the site. The inspector reviewed the licensee's audit schedule which indicated that the audits are performed yearly. The following audit reports in the electrical installation area were selected for review:

<u>Report No.</u>	<u>Type of Installation</u>	<u>Audit Period</u>	<u>Status</u>	<u>Response Due</u>	<u>Response Date</u>
H-319	Electrical Equipment	4/2/84- 5/2/84	Complete	7/2/84	Pending
H-285	"	3/21/83- 3/30/84	"	Not Required (no deficiency)	-
H-297	Cable Tray & Conduit	6/6/83- 6/23/83	"	"	-
H-329	"	In process	Incomplete	-	-

The licensee's QA audit was based on their procedure QAI 18-1 and their audit check lists.

No violations were identified.

## 6.2 QA Surveillance

The inspector reviewed one of the licensee's recent Corrective Active Request (CAR No. HCS-121) which identified several deficiencies in the area of cable installations. The deficiencies were corrected and this CAR was closed on May 15, 1984. The corrective action was adequate and completed in a timely manner.

## 6.3 Nonconformance Report (NCR)

The inspector randomly selected 6 NCR's in the areas of cable installation and termination. These were reviewed for:

- adequacy of engineering disposition
- the timeliness of the corrective action and
- that they were signed by the authorized personnel.

No violations were identified in these areas.

## 7. Heating, Ventilation and Air Conditioning System (HVAC)

7.1 The inspector performed an inspection of installed equipment, audited the nonconformance report (NCR) and field change notice/field change request (FCN/FCR) system, reviewed several quality assurance audits performed by the licensee on the HVAC contractor, Willard Hirsch, and Bechtel, and discussed Regulatory Guide 1.75 HVAC commitments related to redundant battery rooms with the licensee.

### 7.1.1 Review of NCR's, FCN's and FCR's

#### 7.1.1.1 Review of NCR's

The inspector reviewed the following general procedures for the handling of NCR's and the following specific NCR's related to HVAC. The specific NCR's were reviewed for timeliness, adherence to procedure, and engineering.

#### Procedures

- Construction Quality Control Manual (CQCM) - Section IV - Control of Nonconforming Items - Rev. 0 - dated 10/1/75
- Project Quality Control Instruction - Supplement to Section IV of the CQCM for the Hope Creek Project - AQCI-IV-I Rev. 3 dated 3/7/83.

Specific NCR's

- WH-626
- WH-628
- WH-632
- WH-630
- WH-676
- WH-670
- WH-662
- WH-671

No violations were identified.

## 7.1.1.2 Review of FCCN's and FCR's

The inspector reviewed the following general procedures for the handling of FCN's/FCR's and several recent FCN's/FCR's related to safety-related HVAC. The FCN's/FCR's were reviewed for adherence to procedure and good engineering practice.

Procedure

- Field Change Request/Field Change Notice - SWP/P-5 - Rev. 17
- Technical Specification for HVAC Ductwork and Equipment Installation - 10855 - M-735(Q) - Rev. 7
- Technical Specification for Drywell Ductwork Installation - 10855 - M-735B(Q) Rev. 3

No violations were identified.

## 7.1.2 HVAC Installation

During inspection of the HVAC installation, the inspector reviewed the installed equipment and ductwork for obvious deficiencies and cleanliness problems. The following areas were inspected on a walkdown of the HVAC systems.

- Reactor building
- Auxiliary building
- Control room
- Intake structure

No violations were identified.

## 7.1.3 Quality Assurance (QA) Audits

The inspector reviewed a recent QA audit No. H-324 performed by PSE&G on the HVAC constructor, Williard-Hirsch, and Bechtel QA/QC. The inspector also surveyed several other HVAC audits performed within the past one and one-half years.

The inspector did not find any unacceptable conditions.

#### 7.1.4 Battery Room HVAC - Regulatory Guide 1.75

A review of sub-section 1.8.1.75 of the FSAR revealed that the licensee's stated position for a particular HVAC system appeared to be contrary to the recommendations of Reg. Guide 1.75 Position C.15 of the Reg. Guide states that redundant Class 1E batteries shall be located in separate safety class structures and be served by independent ventilation systems. Contrary to this recommendation the licensee's design of the HVAC system for the 250-V Class 1E batteries (electrical divisions A and B) located at elevation 163 feet of the auxiliary building utilizes a common exhaust system with redundant fans but not redundant ductwork.

The inspector reviewed the various design drawings and verified that the installation is per the licensee's stated position.

The justification for the licensee's stated position has been placed on the NRC Agenda and will be addressed as part of the questions associated with the compliance criteria of RG 1.75 for this licensee.

### 8.0 Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain if they are violations or deviations. An unresolved item is discussed in paragraph 4.0.

### 9.0 Exit Meeting

The inspector met with licensee and contractor representatives (denoted in paragraph 1) at the conclusion of the inspection on June 15, 1984. The inspector summarized the scope and findings of the inspection as described in this report.

At no time during this inspection was written material provided to the licensee by the inspector.