## U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-354/89-14

License NPF-57

Licensee: Public Service Electric and Gas Company P. O. Box 236 Hancocks Bridge, New Jersey 08038

Facility: Hope Creek Generating Station

Dates: June 20, 1989 - August 14, 1989

Inspectors: G. W. Meyer, Senior Resident Inspector

D. K. Allsopp, Resident Inspector

Approved:

. D. Swetland, Chief, Projects Section 2A

Inspection Summary: Inspection 50-354/89-14 on June 20, 1989 - August 14, 1989

<u>Areas Inspected</u>: Resident safety inspection of the following areas: operations, radiological controls, maintenance & surveillance testing, emergency preparedness, security, engineering/technical support, safety assessment/assurance of quality, and Licensee Event Report and open item followup.

Results: The inspectors did not identify any violations. There were three PSE&G identified, non-cited violations for improper leak rate testing of flanged piping (Section 4.3.A), a monthly surveillance test missed three times due to a computer error (Section 4.3.B), and a Technical Specification amendment implemented late (Section 4.3.C). An Executive Summary follows.

8909270192 890919 PDR ADOCK 05000354 Q PDC

#### EXECUTIVE SUMMARY

### Hope Creek Inspection Report 50-354/89-14

June 20, 1989 To August 14, 1989

Operations: A single control rod scrammed on July 10 when both trip systems actuated due to a surveillance test concurrent with a blown fuse. The operator's prompt identification of the rod scram was noteworthy. Measures were taken to ensure timely response to potential failures of the fire protection monitoring system. Periodic checking of a fire extinguisher had been overlooked.

Radiological Control: PSE&G detected a unlocked radiation door in the solid radwaste area, which administrative procedures specified to be locked. The inspectors noted good radiological performance regarding the asphalt radwaste system, the Betamax contamination detection systems, and new fuel receipt.

Maintenance/Surveillance: Non-cited violations were assigned to PSE&G identified problems regarding improper leak rate testing of flanged piping joints, a monthly surveillance test missed three times due to a computer error, and a late surveillance test due to tardy implementation of a Technical Specification amendment. An apparent failure to reinstall a cotter pin caused a HPCI valve to be inoperable. A technician's error tripped feedwater heaters in service. A technician's confusion on use of "information only" procedures during surveillance testing was corrected. New fuel receipt activities were well controlled.

Emergency Preparedness: An accountability drill was unable to account for all personnel within the 30 minute objective. Evaluation of short term corrective actions was underway.

Security: Routine inspection did not identify any noteworthy findings.

Engineering/Technical Support: A: open item was closed regarding environmental qualification of MSIV junction boxes. PSE&G revised reactor pressure setpoints to account for extended reactor coastdown operations.

Safety Assessment/Assurance of Quality: The inspectors noted four events involving lack of attention to detail. The events were of minimal technical significance but demonstrated the need for continued management attention in this area. The inspectors reviewed training for all personnel intended to increase the awareness of the importance of attention to detail.

### Details

#### SUMMARY OF OPERATIONS

The unit entered this report period (June 20 - August 14) at full power and continued power operations throughout the period.

- 2. OPERATIONS (71707, 93702)
- 2.1 Inspection Activities

The inspectors verified that the facility was operated safely and in conformance with regulatory requirements. Public Service Electric and Gas (PSE&G) Company management control was evaluated by direct observation of activities, tours of the facility, interviews and discussions with personnel, independent verification of safety system status and Limiting Conditions for Operation, and review of facility records. These inspection activities were conducted in accordance with NRC inspection procedure 71707. The inspectors performed 213 hours of normal and back shift inspection including weekend and holiday inspection on:

-	July 3,	1989	3:45	a.m.	-	5:00	a.m.
-	July 9,	1980	12:40	p.m.	-	6:40	p.m.
-	July 16,	1989	9:15	a.m.	-	3:15	a.m.
-	July 22,	1989	10:00	a.m.	-	4:00	p.m.

### 2.2 Inspection Findings and Significant Plant Events

On July 10, Hope Creek experienced a single control rod scram during A. a functional test of channel B of the reactor protection system (RPS). Unbeknownst to the operators, a blown fuse existed on the RPS channel A scram solenoid at the hydraulic control unit (HCU) for control rod 46-31 prior to performing RPS testing. When the RPS channel B solenoid was tripped by the functional test, both scram solenoids for rod 46-31 were de-energized and the rod fully inserted. The control room operator immediately detected the inserted rod and correctly reduced reactor power by reducing secirculation flow. After reactor engineering evaluated the core conditions and verified no core thermal limits had been exceeded, the control rod was returned to its previous full out position. The root cause of this single rod scram is the lack of indication of a blown scram solenoid control power fuse. Long term corrective action included reviewing installation of hardware to monitor the status of all scram solenoid fuses. The operator's prompt identification of the inserted rod was noteworthy, as there is no annunciation associated with this condition. (LER 89-014)

- Β. On July 30, the control room fire protection (FP) monitoring system became inoperable due to a failure of drive B of the process computer. Although drive A is a redundant backup to drive B. it has been out of service for over two years awaiting parts and service. The station instituted local monitoring of all class one fire protection systems on a prioritized basis as outlined in their procedures. A continuous fire watch was posted at all local panels within one hour with the exception of four panels. These panels were posted within one hour and thirty five minutes after the drive B failure. Due to the difficulties associated with obtaining parts and service for the current processor, a replacement is currently scheduled for implementation in 1990. The Fire Protection (FP) Department has implemented compensatory measures to insure the hour time limit can be met as an interim measure. These compensatory measures include expedited management notification and fire watch call-up procedures. The fire protection program is not covered under Technical Specifications. However, failure to post all local class one fire panels constitutes a plant procedure violation. This violation is not being cited because the criteria specified in section V.G. of the enforcement nolicy were met (NCV 89-14-01).
- C. The inspector noted a fire extinguisher in the turbine building which had not been periodically checked by FP personnel. The fire extinguisher was permanently mounted outside the elevator motor room and was not on the FP list of permanent fire extinguishers. FP supervision agreed that this fire extinguisher should be added to the listing of permanent fire extinouishers and periodically checked. Fire extinguishers are routinely inspected by NRC inspectors, and this oversight appeared to be isolated as this was the first permanently mounted extinguisher that was not on the FP inspection list. However, this particular fire extinguisher had been randomly inspected in the past by FP, and the inspector concluded that its lack of periodic checking should have been identified and corrected by FP personnel. As such, it represented an attention to detail error. Attention to detail errors are further discussed in Section 8.

### RADIOLOGICAL CONTROLS (71707)

## 3.1 Inspection Activities

PSE&G's compliance with the radiological protection program was verified on a periodic basis. These inspection activities were conducted in accordance with NRC inspection procedure 71707.

### 3.2 Inspection Findings and Review of Events

- Α. During a July 24 shiftly inspection of locked radiation doors, a Radiation Protection (RP) Department technician found a high radiation door in the radwaste area with the door handle locked; however, the door was ajar. The door was promptly closed and checked to be locked. The dose rates in the room did not exceed radiation levels (1000 mr/hr) at which Technical Specifications would have required the door to be locked. PSE&G reviewed radiation dose records of individuals to confirm that no personnel had received unexplained radiation dose due to the door being unlocked. A PSE&G evaluation could not establish who was responsible for the error, but determined the personnel who had been involved during the applicable activities in the room. As corrective action, all departments will be trained including a special session to those individuals who entered the room after the last shiftly verification. RP policy will also be revised to upgrade accountability when issuing keys to high radiation areas. The inspector concluded that these corrective actions were acceptable and appropriate. Nevertheless, the failure to correctly secure the radiation door represented a lack of attention to detail. Attention to detail errors are further discussed in Section 8.
- B. Hove Creek has successfully processed four radwaste shipments utilizing the asphalt extruder system. The shipments were checked for water content at the burial site with none detected. Hope Creek is one of relatively few utilities to process their own solid radwaste including powdex and resin beads.
- C. The inspector accompanied a radiation protection technician during his rounds and observed calibration and source checks of Betamax automated frisking devices. The Betamaxes located in the refueling floor were calibrated to reduced minimum detectable activities and reduced count times. These Betamaxes also had shielding installed to reduce background radiation levels to improve sensitivity. The expenditure of time and resources to improve the efficient, effective detection of contamination are in keeping with ALARA and are commendable. The technician was knowledgeable and performed his duties in a conscientious manner.
- D. The inspectors evaluated the radiological aspects of new fuel receipt and inspection activities as effective and acceptable.
- MAINTENANCE/SURVEILLANCE TESTING (62703, 61726)
- 4.1 Maintenance Inspection Activity

3

The inspectors observed selected maintenance accivities on safety-related equipment to ascertain that these activities were conducted in accordance with approved procedures, Technical Specifications, and appropriate industry codes and standards. These inspections were conducted in accordance with NRC inspection procedure 62703.

Portions of the following activities were observed by the inspector:

Work Order	Procedure	Description
890717083	NA	Repair of D Emergency Diesel Generator fuel line leak
890601592	RE-FR.ZZ-004	Refueling activities

The maintenance activities inspected were effective with respect to meeting the safety objectives of the maintenance program.

## 4.2 Surveillance Testing Inspection Activity

The inspectors performed detailed technical procedure reviews, witnessed in-progress surveillance testing, and reviewed completed surveillance packages. The inspectors verified that the surveillance tests were performed in accordance with Technical Specifications, approved procedures, and NRC regulations. These inspection activities were conducted in accordance with NRC inspection procedure 61726.

The following surveillance tests were reviewed, with portions witnessed by the inspector:

- IC-FT.BC-006 Functional test of Division 2 residual heat removal pump discharge flow
- IC-FT.BB-037 Functional test of high drywell pressure channel
- IC-CC.SP-025 Channel calibration of liquid radiation waste discharge line monitor
- IC-FT.GU-DD1 Functional test of the filtration, recirculation and ventilation system flow rate channel
- IC-CC.BE-015 Channel calibration of D core spray pump start delay
- IC-FT.SP-031 Functional test of reactor building and refuel floor exhaust process radiation monitor

The surveillance testing activities inspected were effective with respect to meeting the safety objectives of the surveillance testing program.

### 4.3 Inspection Findings

A. On June 29, PSE&G concluded that the vacuum relief sections of the High Pressure Coolant Injection (HPCI) and Reactor Coolant Isolation Croling (RCIC) Systems that are adjacent to the torus had been incorrespondent of the torus had been incorrespondent leak testing. Specifically, these sections include vacuum relief valves which have bolted flanges and require Type B leak testing to confirm that no leakage occurs at the flanged joint at design pressure. Because the flanged section had been incorrectly categorized, prior tests had been performed at operating pressure. When properly leak tested on June 29 within nine hours of the determination, the flanged sections passed.

Licensee corrective actions included initiating a change to the Final Safety Analysis Report (FSAR), including the correct leak testing requirements in the Inservice Test Manual, and revising leak testing procedures. The inspector concluded that the lack of proper leak rate testing of HPCI and RCIC vacuum relief flanged joints represented a licensee identified violation and would not be cited because the criteria specified in Section V.A of the Enforcement Policy were met. (NCV 354/89-14-02) (LER 89-13)

B. On July 15, an I&C supervisor determined that a monthly Technical Specification (TS) surveillance test had been last performed on March 15, 1989, and that three subsequent monthly tests had been missed. The surveillance test functionally checks a temperature switch associated with the HPCI isolation for steam leaks. The test was immediately performed, and the switch functioned properly. PSE&G determined that a mainframe computer malfunction had occurred on March 16, while the information for this test was being updated. This malfunction had introduced errors in the test's computer record, thus preventing proper scheduling and tracking of the test.

Corrective actions included review of all surveillance test computer records (no other errors found), instructions to computer personnel to alert computer users when a mainframe computer problem occurs, and a new periodic tracking report that can determine such errors. The inspector concluded that the missed surveillance tests represented a licensee identified violation and would not be cited because the criteria specified in Section V.A of the Enforcement Policy were met. (NCV 354/89-14-03) (LER 89-15)

C. On July 25, PSE&G determined that a surveillance test (ST), previously performed monthly, was overdue by ten days on its revised weekly frequency. The ST involved the channel functional test of the manual scram channel, and its frequency had been recently changed by Technical

Specification (TS) Amendment 26. TS Amendment 20 was implemented on June 29, 1989, and relaxed the frequency of numerous Sis, as well as, increasing the frequency of the manual scram ST. Since the amendment was effective upon receipt and the station had not completed all associated procedure revisions, PSE&G determined it would continue to perform the affected STs at the previous frequency. However, the manual scram ST frequency was not revised from monthly to weekly.

There was minimal safety significance from this oversight; however, it indicated a weakness in the integrated control of the license amendment implementation process. Corrective action included ensuring future license amendment requests allow for sufficient implementation time, and tightening the procedure associated with implementing approved amendments. The inspector concluded that the lack of surveillance testing at the increased frequency represented a licensee identified violation and would not be cited because the criteria specified in Section V.A of the Enforcement Policy were met. (NCV 354/89-14-04)

On August 4, the High Pressure Coolant Injection (HPCI) System was D. declared inoperable when the stram supply isolation valve would not open. Due to inoperability of the valve operator torque switch, the valve had been jammed into its shut seat when last operated. The torque switch became inoperable when the torque switch adjustment plate slid off the torque shaft. The torque switch adjustment plate is normally secured to the shaft by a cotter pin. However, it appeared that the plate had beer removed from the valve, and the cotter pin had not been reinstalled. As corrective action, steps for removal of the plate will be included in appropriate procedures and will require an independent verification of cotter pin installation. The steam isolation valve could be positioned manually at all times. The incorrect installation of the cotter pin is not being cited because the criteria specified in section V.G. of the enforcement policy were met (NCV 354/89-14-05).

The failure to correctly install the cotter pin is another example of an attention to detail error. Attention to detail errors are further discussed in Section 8.

E. On August 2, an instrument and controls (I&C) technician's error resulted in a trip of the 1B and 2B feedwater heaters. While attempting to perform calibrations on the 3B, 4B, and 5B feedwater heaters (which were out of service for maintenance), the I&C technician removed the wrong electrical card and tripped the 1B and 2B feedwater heaters (which were in service). A contributing factor

. .

to this personnel error was the very similar identification numbers on the two electrical cards (two digits were transposed). The control room operators responded correctly. The 1B and 2B feedwater isolation existed for approximately two minutes during which reactor feed pump suction pressure dropped from 500 to 450 psig and reactor level dropped from 35 to 33 inches. After two minutes, the electrical card was replaced, the feedwater heater trip reset, and the feedwater heater alignment restored.

Corrective action included individual technician counseling. Although the safety significance of this event was minimal, this was another attention to detail error. Attention to detail errors are further discussed in Section 8.

- F. While observing the liquid radiation waste monitor calibration, the inspector noted that the calibration procedure being utilized was properly stamped as "working copy", but an "information only" copy of another procedure referenced in the calibration procedure was being used. This "information only" procedure had been correctly copied from a "working copy" procedure but had been erroneously stamped "information only". Shortly afterward, a controls supervisor noted the "information only" copy of the procedure and promptly corrected the situation. Technician training on the mandatory use of "working copy" procedures to satisfy Technical Specification required survei lance testing has been accomplished. The inspector concluded that this corrective action was acceptable and appropriate.
- G. The inspector observed new fuel receipt activities including removal from the wooden shipping crates, removal from the metal shipping casks, inspection, placement in the new fuel vault and placement in the spent fuel pool. The activities were well controlled and personnel involved were know edgeable of their duties.

#### EMERGENCY PREPAREDNESS (71707)

. .

On July 21, PSE&G conducted an annual accountability drill of onsite personnel. The drill involved approximately 450 people that were to have been accurately accounted for within 30 minutes. However, accountability required 45 minutes to perform due to the large number of personnel which must be accounted for manually. Contributing to the accountability time was an error in the implementation of a new accountability technique. PSE&G also did not meet the 30 minute accountability period last year and intends to implement an automated accountability system that will integrate computerized inputs from each accountability station. This automated accountability scheduled to be operational in 1991. PSE&G is evaluating the problem to identify an acceptable interim strategy.

### 6. SECURITY (71707)

. .

PSE&G's compliance with the security program was verified on a periodic basis, including the adequacy of staffing, entry control, alarm stations, and physical boundaries. There were no noteworthy findings in this area.

### 7. ENGINEERING/TECHNICAL SUPPORT (92700)

- A. (Closed) Unresolved Item (354/87-05-02); Environmental qualification (EQ) of main steam isolation valve (MSIV) junction boxes. The inspector had noted that the MSIV junction boxes were not sealed. PSE&G stated that the electrical control wiring to the MSIVs had been modified to stillize Raychem splices instead of sealed junction boxes. Accordingly, the condition of the junction boxes did not adversely affect the qualification of the controls. When the junction boxes were accessible, the inspector reviewed the condition of the splices on the outboard MSIV controls and found them to be acceptable. The item is closed.
- Β. On August 4, Hope Creek raised the pressure regulator setpoint of the Electro-hydraulic Control (EHC) System, thereby increasing the steam pressure in the reactor and gaining approximately seven megawatts electric. The increased pressure setpoint allows reactor steam dome pressure to be increased back to 100% power values during the coastdown period when the reactor can only achieve powers less than 90%. PSE&G had reviewed the effects of the increased pressure setpoint including transient analyses, turbine inlet pressure and turbine first stage pressure and concluded that these effects were acceptable. The inspectors reviewed the PSE&G safety evaluation and affected procedures for impact on end-of-cycle recirculation pump trip, rod sequence control system, and other reactor protection system interactions. The inspectors concluded that the reactor pressure setpoints could be increased with no reduction in safety of the plant. The inspectors discussed the change with NRC licensing personnel, who did not identify any problems.

### 8. SAFETY ASSESSMENT/QUALITY VERIFICATION

During this inspection period four events involving lack of attention to detail were noted. These events included an unlocked high radiation door (Section 3.2.A), an inadvertent trip of 1B/2B feedwater heaters (Section 4.3.C), an apparent failure to reinstall a HPCI valve cotter pin (Section 4.3.C), and a fire extinguisher not included in the periodic inspection program (Section 2.2.D). Although these events had minor safety significance taken in isolation, collectively they indicate the need for continued management involvement in the attention to detail area. The inspectors attended a training session on attention to detail, which included a video tape presentation. The inspectors judged the training to be a worthwhile attempt to convey the importance of attention to detail to all personnel. The effectiveness of this training and other efforts in this area will be judged based on the reduction of attention to detail errors.

# 9. LICENSEE EVENT REPORT (LER) AND OPEN ITEM FOLLOWUP (92700)

A. PSE&G submitted the following event reports and periodic reports, which were reviewed for accuracy and the adequacy of the evaluation.

Monthly Operating Reports for June 1989 and July 1989

- LER 89-13 Inadequate leak testing of flanged joints in HPCI and RCIC piping; discussed in Section 4.3.A of this report.
- LER 89-14 Blown scram solenoid fuse results in single rod scram: discussed in section 2.2.A of this report.
- LER 89-15 Missed surveillance test due to computer scheduling error; discussed in Section 4.3.B.
- B. The following previous inspection item was followed up during this inspection and is tabulated below for cross reference purposes.

Closed 87-05-02 Section 8.A

#### 10. EXIT INTERVIEW (30703)

\* \* \* \* \*

The inspectors met with Mr. J. Hagan and other PSE&G 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 PSE&G, it was determined that this report does not contain information subject to 10 CFR 2 restrictions.