April 20, 2000

Mr. Harold W. Keiser
President and Chief Nuclear Officer
Nuclear Business Unit
Public Service Electric & Gas Company
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: NRC INTEGRATED INSPECTION REPORT 05000354/2000-002

Dear Mr. Keiser:

On April 1, 2000, the NRC completed an integrated inspection of your Hope Creek facility. The enclosed report presents the results of that inspection. The preliminary findings were presented to PSEG Nuclear management led by Mr. Larry Wagner in an exit meeting on April 12, 2000.

NRC inspectors examined numerous activities as they related to reactor safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspection consisted of selective review of procedures and representative records, observations of activities, and interviews with personnel. Specifically, this inspection involved five weeks of resident inspection, and two region-based inspections of security force contingency response and safety auxiliary cooling system heat exchanger performance monitoring. There were no findings identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

Sincerely,

/RA/

Glenn W. Meyer, Chief,
Projects Branch 3
Division of Reactor Projects

Enclosure: Inspection Report 05000354/2000-002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	05000354
License No:	NPF-57
Report No:	05000354/2000-002
Licensee:	Public Service Electric and Gas Company (PSEG)
Facility:	Hope Creek Nuclear Generating Station
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Dates:	February 28 - April 1, 2000
Inspectors:	Joseph G. Schoppy, Jr., Senior Resident Inspector J. Dan Orr, Resident Inspector Chris Cahill, Reactor Inspector Stephen M. Pindale, Reactor Inspector Gregory C. Smith, Sr. Physical Security Inspector
Approved By:	Glenn W. Meyer, Chief Projects Branch 3 Division of Reactor Projects

SUMMARY OF FINDINGS

Hope Creek Generating Station
NRC Integrated Inspection Report 05000354/2000-002

The report covers a five-week period of resident inspection and inspections of heat exchanger performance and safeguards by regional specialists using the guidance contained in NRC Inspection Manual Chapter 2515*. The significance of issues is indicated by their color (Green, White, Yellow, or Red) and was determined by the Significance Determination Process in draft Inspection Manual Chapter 0609 (see Attachment 1).

- **!** There were no findings.

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Report Details

SUMMARY OF PLANT STATUS

The Hope Creek plant operated at or near full power from February 28 through March 10. On March 10 operators reduced power to 60 percent for planned maintenance on hydraulic control accumulators and the C feedwater string. On March 15 operators increased reactor power to 90 percent while feedwater maintenance continued. On March 23 operators restored the plant to 100 percent power. The Hope Creek plant operated at or near full power for the remainder of the inspection period except for a planned maintenance power reduction on March 31 for A feedwater heater work.

1. REACTOR SAFETY
(Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed equipment alignment verifications on redundant equipment during system outages on the B station service water pump, the D emergency diesel generator and during an emergent equipment outage on the A station service water pump strainer. Additionally, the inspectors reviewed various corrective action notifications associated with equipment alignment issues (20021808, 20021939, 20022111, 20022384, 20022801, 2002336, and 20024392).

b. Observations and Findings

There were no findings identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors performed walkdowns of the reactor building 102' elevation (rooms 4301, 4309, 4310, and 4311). These rooms represent about 2 percent of the total core damage frequency due to fire with the potential to induce a main steam isolation valve (MSIV) closure and reactor trip. The inspectors also reviewed long-standing fire protection impairments and associated compensatory measures existing in the diesel/control auxiliary building. Additionally, the inspectors reviewed several notifications associated with fire protection issues (20021799, 20021860, 20021961, 20022232, 20023128, 20023556, 20023843, and 20024048).

b. Observations and Findings

There were no findings identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspector walked down accessible portions of safety auxiliary cooling system (SACS) and reviewed the results of the SACS heat exchanger performance inspections conducted during the March 1999 refueling outage (RFO8). This review was performed to verify that the inspections were consistent with industry standards and the results were within the range of expected heat exchanger degradation. The inspector reviewed the chemical treatment program for the SACS and the station service water (SSW) system and interviewed the system engineers to ensure that the system maintained the required heat exchanger performance. The inspector reviewed a sample of SACS and SSW system heat transfer calculations to verify that the systems' condition and operation were consistent with the design assumptions. The inspector also reviewed condition reports, notifications, and performance reviews on 10 deficiencies in the corrective action program that related to heat sink performance.

b. Observations and Findings

There were no findings identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a simulator training session and examination for one crew to assess operator performance and training effectiveness. The inspectors also reviewed notification 20023141 which involved an operator training issue.

b. Observations and Findings

There were no findings identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed all corrective action notifications initiated in December 1999 for maintenance rule screening. The inspectors further reviewed five notifications that included system engineer functional failure determinations: 20016401/A control room chiller trip, 20014203/C ECCS jockey pump high vibrations, 20015425/standby lighting inverter blown fuse, 20015628/HPCI injection valve failed to open during testing, and 20014203/A reactor recirculation pump scoop tube lockup.

b. Observations and Findings

There were no findings identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated PSEG's on-line risk management for the D emergency diesel generator (EDG), and the control of emergent work on the C EDG air compressor and the A SSW strainer. In addition, the inspectors reviewed notifications involving risk assessment and emergent work (20021819, 20021908, 20022064, 20022664, 20023078, and 20023478).

b. Observations and Findings

There were no findings identified.

1R15 Operability Evaluations

.1 Extent of Condition Review

a. Inspection Scope

On February 10 maintenance technicians identified that the A SACS residual heat removal (RHR) heat exchanger outlet valve (EG -HV-2512A) failed to stroke open during testing. Control room operators open the 2512A valve to provide SACS cooling to the RHR heat exchanger during suppression pool cooling operations. The inspectors reviewed PSEG's operability determination for the 2512A valve and assessed the extent of condition review for the redundant valve (2512B) in the B SACS system.

b. Observations and Findings

There were no findings identified.

The inspectors questioned the thoroughness of the extent of condition review for the redundant valve (2512B). Engineering had determined that valve stem bearing thrust collar set screw deficiencies (one set screw was missing and the other was not engaged) caused the functional failure of the 2512A valve, but could not determine how the set screw deficiencies had occurred. Maintenance replaced the set screws and restored the 2512A valve to an operable status. The inspectors conveyed a concern to PSEG regarding the extent of problem conditions regarding the 2512B valve (identical in design to the 2512A valve), especially since the valve remained in service, operators had closed the 2512B valve (valve needs to open to perform its safety function), and maintenance prepared to work on the A SACS train. The analytical information on the 2512B valve predated the 2512A valve problem and had not been effective in determining the problem.

Operations management informed the inspectors that maintenance could not remove the 2512B valve actuator end cap to verify set screw condition without removing the B SACS train from service. Operations management stated that their plan to proceed with planned on-line maintenance, with the 2512B valve closed, represented an acceptable, very low risk. Later, engineering reviewed the results of a 2512B valve radiographic test conducted on March 3 and determined that both set screws appeared to be properly engaged. Engineering also reviewed the results of a 2512B VOTES diagnostic test conducted on March 23 and determined that the valve was operable.

.2 Operability Determinations

a. Inspection Scope

The inspectors reviewed an operability determination involving potential oil-to-freon migration and subsequent tripping of the A control room chiller. In addition, the inspectors reviewed an operability determination involving a potential rod block monitor design deficiency and an RHR pump minimum flow valve. The inspectors also reviewed all other PSEG identified safety-related equipment deficiencies during this report period and assessed the adequacy of PSEG's operability screenings.

b. Observations and Findings

There were no findings identified.

1R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed the operator work-around list, corrective action notifications, operator logs, and instrument panel status to evaluate potential impacts on the operators' ability to implement abnormal or emergency operating procedures.

b. Observations and Findings

There were no findings identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the results of post maintenance tests associated with the D emergency diesel generator partial overhaul. The inspectors also reviewed notifications concerning problems associated with post maintenance testing (20022019, 20022294, 20022678, and 20024918).

b. Observations and Findings

There were no findings identified.

1R20 Refueling and Outage Activities

.1 Outage Planning

a. Inspection Scope

The inspectors reviewed the outage risk control plan and configuration management approach.

b. Observations and Findings

There were no findings identified.

The inspectors noted that PSEG outage planning had planned to completely remove all source range monitors (SRMs) and intermediate range monitors (IRMs) concurrently, while replacing SRM and IRM dry tubes during the early phase of the outage, with a full load of irradiated fuel in the vessel. The inspectors considered the concurrent replacement of these monitors a non-conservative approach for the dry tube replacements given its effect on neutron monitoring. In addition, the inspectors contested PSEG's assumption that the complete removal of all SRMs and IRMs did not constitute a core alteration, as defined by Hope Creek's technical specifications (TS). With assistance from the NRR Project Manager and the NRR technical staff, the inspectors conveyed to PSEG that the activity, as planned, would be in violation of their technical specifications. During discussions to resolve this issue, PSEG senior management stated that the activity would not have been completed as planned. Subsequently, outage planning revised their outage plan to include a full core offload. Also, PSEG submitted a TS change request (LCR H00-03) to change the TS CORE ALTERATIONS definition to support replacement of a SRM or IRM detector.

.2 New Fuel Inspection, Handling. And Transfer

a. Inspection Scope

The inspectors observed new fuel inspections, handling and transfer to the spent fuel pool for the upcoming refuel outage in April 2000. The inspectors verified that PSEG handled new fuel in accordance with Hope Creek operating license condition 2.C.(6). The inspectors also reviewed notifications concerning the upcoming refuel outage (20021832, 20021979, 20022092, 20022826, 20023978, 20024201, and 20024453).

b. Observations and Findings

There were no findings identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions of and reviewed the results of surveillance tests associated with the E average power range monitor response time testing and a MSIV low main steam line pressure isolation channel (B21-N676C) functional test. The inspectors also reviewed notifications concerning problems encountered during surveillance testing (20021910, 20022000, 20022732, 20023050, 20023835, and 20024063).

b. Observations and Findings

There were no findings identified.

Cornerstone: Emergency Preparedness [EP]

1EP1 Drill, Exercise, and Actual Events

a. Inspection Scope

The inspectors observed portions of a Hope Creek emergency preparedness drill from the control room simulator and the emergency operating facility on March 8, 2000. In particular, the inspectors assessed the timeliness and correctness of emergency classifications, notifications and protection action recommendations.

b. Observations and Findings

There were no findings identified.

3. SAFEGUARDS

Physical Protection [PP]

PP3 Response to Contingency Events

a. Inspection Scope

The inspectors reviewed the contingency response strategy, procedures, training and target set analysis. The protected area perimeter intrusion detection and alarm assessment systems were evaluated for vulnerabilities. Testing of the intrusion detection system was conducted in 10 locations. Seven table top exercises with security supervisors and response team members were conducted, and eight response team members demonstrated tactical firing at the onsite firing range with contingency weapons. Drill critiques for prior contingency response drills were also reviewed.

b. Observations and Findings

There were no findings identified.

4. OTHER ACTIVITIES [OA]

4OA1 Identification and Resolution of Problems

Inspection findings in previous sections of this report also had implications regarding PSEG's identification, evaluation, and resolution of problems, as follows:

a. Section 1R15.1 - The review of the extent of problem conditions for the 2512B valve was limited and not thorough. Though the valve was eventually determined to be free of the problem, this demonstrated weak problem evaluation.

b. Section 1R20.1 - Outage planning developed a non-conservative approach for the dry tube replacements which could have resulted in a violation of Hope Creek technical specifications, if completed as planned. This demonstrated weak problem identification.

In addition, engineering did not effectively use the corrective action system to resolve a deficiency (notification 20010406) affecting several RHR pump minimum flow valves, which months later was still unresolved and addressed in notifications 20022208, 20024029, and 20025813. This demonstrated weak problem resolution.

Additional items associated with PSEG's corrective action program were reviewed without findings and are listed in Sections 1R04, 1RO5, 1RO7, 1R11, 1R12, 1R13, 1R15.3, 1R16, 1R19, 1R20.2 and 1R22 of this report.

4OA4 Other

(Open/Closed) LER 354/2000-001-00: failure to meet technical specification (TS) surveillance requirement to verify vital bus load shedding during a loss of power (LOP) and a loss of power/loss of coolant accident (LOP/LOCA). This LER discussed a PSEG procedure error that allowed a non-vital load to not be verified load shed during LOP and LOP/LOCA surveillance testing as required by TS 4.8.1. The non-vital load was the B radwaste supply fan. The inspectors verified that no other loads on any of the four vital busses were also affected by procedure errors. The inspectors agreed with the safety consequence described in the LER and determined that the missed TS surveillance requirement had no impact on the D emergency diesel generator or its associated 4KV bus and any other supplied loads. This violation of TS 4.8.1 was determined to be of low significance by the Significance Determination Process because the D EDG and its supplied loads were fully capable of performing their intended function during a LOP or LOP/LOCA event. This violation is in the licensee's corrective action program as notification 20016909. The missed TS surveillance constitutes a violation of minor significance and is not subject to formal enforcement action in accordance with Section IV of the NRC's Enforcement Policy .

4OA5 Management Meetings

a. Exit Meeting Summary

On April 12, 2000, the inspectors presented their overall findings to members of PSEG management led by Mr. Larry Wagner. PSEG management acknowledged the findings presented and did not contest any of the inspectors' conclusions. Additionally, they stated that none of the information reviewed by the inspectors was considered proprietary.

ITEMS OPENED AND CLOSED

Opened/Closed

05000354/2000-001-00	LER	Failure to meet technical specification surveillance requirement to verify vital bus load shedding during a loss of power and a loss of power/loss of coolant accident. (Section 4OA4)

LIST OF ACRONYMS USED

CCDP	Conditional Core Damage Probability
CR	Condition Report
EDG	Emergency Diesel Generator
IRMs	Intermediate Range Monitors
LOCA	Loss of Coolant Accident
LOP	Loss of Power
MPM	Motor Power Monitor
MSIV	Main Steam Isolation Valve
NRC	Nuclear Regulatory Commission
PDR	Public Document Room
PR	Performance Reviews
PSEG	Public Service Electric and Gas
RFO	Refueling Outage
RHR	Residual Heat Removal
SACS	Safety Auxiliary Cooling System
SRMs	Source Range Monitors
SROs	Senior Reactor Operators
SSW	Station Service Water
TS	Technical Specifications

ATTACHMENT 1

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
! Initiating Events	! Occupational	! Physical Protection
! Mitigating Systems	! Public	
! Barrier Integrity		
! Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.