April 22, 2002

Mr. Harold W. Keiser
Chief Nuclear Officer and President
PSEG Nuclear LLC - N09
P. O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK NUCLEAR GENERATING STATION - NRC INSPECTION REPORT 50-354/02-02

Dear Mr. Keiser:

On March 30, 2002, the NRC completed an inspection of your Hope Creek facility. The enclosed report documents the inspection findings which were discussed on April 3, with Mr. Lon Waldinger and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection involved seven weeks of resident inspection and a region-based biennial heat sink performance review.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green). Both of these issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these non-cited violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at the Hope Creek facility.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and your ability to respond to terrorist attacks with the

capabilities of the current design basis threat (DBT). On February 25, 2002, the NRC issued an Order to all nuclear power plant licensees, requiring them to take certain additional interim compensatory measures to address the generalized high-level threat environment. With the issuance of the Order, we will evaluate PSEG Nuclear's compliance with these interim requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

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

Enclosure: Inspection Report 50-354/02-02
Attachment: Supplemental Information

Docket No. 50-354
License No. NPF-57

cc w/encl: E. Simpson, Senior Vice President and Chief Administrative Officer
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-354
License No:	NPF-57
Report No:	50-354/02-02
Licensee:	PSEG Nuclear LLC
Facility:	Hope Creek Nuclear Generating Station
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Dates:	February 10 - March 30, 2002
Inspectors:	J. G. Schoppy, Jr., Senior Resident Inspector C. G. Cahill, PE, Resident Inspector F. J. Arner, Reactor Inspector R. S. Barkley, PE, Senior Project Engineer
Approved By:	Glenn W. Meyer, Chief Projects Branch 3 Division of Reactor Projects

Summary of Findings

IR 05000354-02-02, on 2/10 - 3/30/02, Public Service Electric Gas Nuclear LLC, Hope Creek Generating Station, Heat Sink Performance, Surveillance Testing.

The inspection was performed by resident inspectors, a regional reactor inspector, and a regional project inspector. This inspection identified two Green findings, both of which were non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, *Significance Determination Process* (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/reactors/operating/oversight.html. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation for ineffective corrective actions for malfunctions regarding standby SW pump performance due to intake silt accumulation, in that poor standby pump performance in a 2001 incident recurred in 2002.

  The safety significance of this finding was very low, because the redundant SW pump in the affected loop remained operable and capable of performing its safety function, given considerable operator action. (Section 1R07.1)

- Green. The inspectors identified a non-cited violation for PSEG Nuclear's failure to incorporate a change in the Technical Specification (TS) minimum river level requirement into SW pump inservice testing (IST) procedures.

  The safety significance of this finding was very low because the level measured during the test was above the TS required minimum limit and the control room operators recorded river level every two hours. (Section 1R22.1)

B. Licensee Identified Violations

The inspectors reviewed two violations of very low significance which were identified by PSEG Nuclear. PSEG Nuclear's corrective actions, taken or planned, appeared reasonable. These violations are listed in Section 40A7 of this report.

Report Details

SUMMARY OF PLANT STATUS

The Hope Creek plant operated continuously at or near full power for the duration of the inspection period except for (1) a planned power reduction to 70 percent on February 10 for control rod scram time testing and a control rod pattern adjustment, (2) a planned power reduction to 70 percent on February 17 for turbine valve testing and a control rod pattern adjustment, (3) an emergent power reduction to 90 percent on March 4 in response to an offgas pretreatment radiation alarm (see Section 1R14.1), (4) a planned power reduction to 60 percent on March 17 for turbine valve testing and power suppression testing (see Section 1R14.2), and (5) a planned power reduction to 84.5 percent power on March 27 for a control rod pattern adjustment.

1. REACTOR SAFETY
Initiating Events, Mitigating Systems, and Barrier Integrity [REACTOR - R]

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed two notifications involving equipment problems related to adverse weather preparations (20091126 and 20091936).

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed equipment alignment verifications on redundant equipment during a planned C residual heat removal (RHR) system outage and a B emergency diesel generator (EDG) outage. The inspectors reviewed the technical specifications and performed plant walkdowns, in-field tagging verifications (WCD 4039576 and WCD 4039576), and main control room tours to verify that the planned outages did not adversely affect the redundant emergency core cooling systems (ECCS) and electrical power sources. In particular, the inspectors performed walkdowns of the following equipment and areas:

- A, B, C, and D EDGs
- A, B, and D RHR pump rooms
- A and B RHR heat exchanger rooms
- 4160 V vital switchgear rooms and 480V vital motor control centers
- ECCS pump rooms

The inspectors also reviewed the following documents:

- *Residual Heat Removal System Operation* (HC.OP-SO.BC-0001)
- *Emergency Diesel Generator BG400 Operability Test* - Monthly (HC.OP-ST.KJ-0002)
- *Power Distribution Lineup - Weekly* (HC.OP-ST.ZZ-0001)
- Overhead annunciator alarm response procedure for window A2-F5*, Computer PT in Alarm, A2426 River Level* (HC.OP-AR.ZZ-0002)

The inspectors also verified that C RHR and the B EDG were restored to an operable condition after the planned maintenance was complete. Additionally, the inspectors reviewed various corrective action notifications associated with equipment alignment deficiencies (20091176, 20091659, 20091666, 20091942, 20092272, 20092421, 20092488, 20092814, 20093028, and 20093648).

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors performed walkdowns of potentially affected risk significant areas in the diesel/control building prior to and during an infrequently performed transfer of 1200 gallons of EDG lube oil. The inspectors also performed walkdowns of electrical switchgear rooms and electrical access areas on elevation 130' of the diesel/control building. Plant walkdowns included observations of combustible material control, fire detection and suppression equipment availability, and compensatory measures. The inspectors performed fire protection inspections due to the potential to impact mitigating systems in these areas. The inspectors reviewed Hope Creek's Individual Plant Examination for External Events for risk insights concerning these areas. Additionally, the inspectors reviewed several notifications associated with fire protection deficiencies (20091057, 20091173, 20091241, 20091490, 20092042, 20092144, 20093009, 20093247, and 20093603).

The inspectors reviewed the following documents:

- *Actions for Inoperable Fire Protection - Hope Creek Station* (HC.FP-AP.ZZ-0004)
- *Hope Creek Room 5315 Oil Fire Drill Critique* (2002-S1-D1-2)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

On March 2 operators implemented flood protection actions in response to a high river level condition and high winds. The inspectors evaluated flood protection measures to determine whether flood vulnerabilities existed and to assess the physical and material condition of flood barriers. The inspectors reviewed the Hope Creek Updated Final Safety Analysis Report (UFSAR) and plant procedures to verify that PSEG Nuclear's flooding mitigation plans and installed equipment were consistent with TS 3.7.3 requirements, design bases, and risk analysis assumptions. The inspectors reviewed several notifications associated with flood protection barriers or processes (20090941, 20091223, 20092455, 20093011, and 20093742).

The inspectors also reviewed the following documents:

- *HCGS Event Classification Guide*
- *Acts of Nature* (HC.OP-AB.ZZ-0139)
- *Surveillance Log - Control Room* (HC.OP-DL.ZZ-0026 Attachment 1a)
- Overhead annunciator alarm response procedure for window A2-F5*, Computer PT in Alarm, A2426 River Level* (HC.OP-AR.ZZ-0002)

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

.1 Service Water Silt Accumulation

a. Inspection Scope

The inspectors reviewed an incident (notification 20091651) in which the A SW traveling screen tripped and the C SW pump had to be put in service, including the operator's initial response to the condition, and evaluated previous corrective actions to ensure that any common cause heat sink performance problems, with the potential to increase risk, were identified and addressed. The inspectors reviewed safety auxiliaries cooling system (SACS) heat exchanger performance monitoring data for the period January 2001 through February 2002, SW silt survey results and trending, and corrective action issues associated with SW grassing and silting (20055614, 20057573, 20059201, 20062808, 20066565, 20088739, and 20090345).

The inspectors also reviewed the following documents:

- *Validating SSWS Flow Through SACS HXs* (HC.OP-FT.EA-0001)
- *Hope Creek Service Water – EA and Traveling Screens & Backwash – EP System Health Report*, for the period 8/01/01 to 11/30/01
- *Safety and Turbine Building Auxiliaries Cooling System – EG System Health Report*, for the period 8/01/01 to 11/30/01

- *NRC Information Notice No. 86-96: Heat Exchanger Fouling Can Cause Inadequate Operability of Service Water Systems*
- *Service Water Intake Silt Survey and Silt Removal* (HC.MD-PM.EA-0002), dated 11/28/00, 4/10/01, 5/17/01, 1/7/02, and 2/25/02
- *Service Water System Operation (HC.OP-SO.EA-0001)*
- *Configuration Baseline Documentation for Station Service Water System* (DE-CB.EA-EP-0052)
- *Service Water System Malfunction* (HC.OP-AB.ZZ-0122)

b. Findings

The inspectors identified a non-cited violation for ineffective corrective actions for malfunctions regarding standby SW pump performance due to intake silt accumulation, in that poor standby pump performance in a 2001 incident recurred in 2002. The safety significance of this finding was very low, because the redundant SW pump in the affected loop remained operable and capable of performing its safety function, given considerable operator action.

On February 16 a shear pin on the A SW traveling screen sheared, necessitating stopping the A SW pump and starting the C SW pump, the standby pump in the A SW loop. However, after a few minutes the C SW pump strainer experienced a high differential pressure condition. Operators entered their abnormal operating procedure for SW trouble, and manually manipulated SW controls and valves for approximately 45 minutes in order to maintain the A SW loop operable.

The inspectors determined that PSEG Nuclear had not implemented effective measures to ensure that the standby SW pump and traveling screens would perform properly under emergent SW pump start conditions. On February 24, 2001, a standby SW pump exhibited marginal performance when called upon under emergent conditions, a very similar situation to the February 16, 2002, event. In this 2001 incident PSEG Nuclear had initiated a notification of the lowest level, and subsequent evaluations had not determined any corrective actions other than existing approaches.

The evaluations addressed SW intake silt accumulation, which had apparently contributed to the sluggish performance of the SW pump in February 2001, but the only action to address this was continued monitoring of silt accumulation. While the SW system has river temperature, silt, and debris conditions which vary considerably over the year, the inspectors concluded that the recurrence of marginal standby SW pump performance in February 2002 demonstrated an ineffective evaluation of the previous incident. In addition, the inspectors identified weaknesses in performance engineering's silt accumulation survey trending and a lack of engineering rigor in their evaluation of several related corrective action notifications (20055614, 20057573, and 20059201).

If left uncorrected, the failure to ensure proper standby SW pump performance could result in a more significant safety concern, in this case the loss of function of a SW loop, a risk significant malfunction. The safety significance of this finding was very low, because the redundant SW pump in the affected loop, in February 2001 and February 2002, remained operable and capable of performing its safety function, given considerable operator action.

10 CFR 50, Appendix B, Criterion XVI, *Corrective Actions,* requires that measures shall be established to assure that conditions adverse to quality, such as deficiencies and malfunctions are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, PSEG Nuclear did not determine the cause of the marginal standby SW pump performance on February 24, 2001, and did not implement corrective actions to prevent recurrence, in that a very similar incident occurred on February 16, 2002. However, because the violation is of very low significance (Green) and PSEG Nuclear entered the deficiency into their corrective action system (notification 20091651), this finding is being treated as a non-cited violation, consistent with Section VI.A of the Enforcement Policy, issued May 1, 2000 (65FR25368). **(NCV 50-354/02-02-01)**

.2 Heat Sink Performance Biennial Review

a. Inspection Scope

PSEG Nuclear's methods (inspection, cleaning, maintenance, and performance monitoring) used to ensure heat removal capabilities for the 1A2E-201 and 1B2E-201 SACS heat exchangers were reviewed and compared to the commitments made in response to Generic Letter 89-13, *Service Water System Problems Affecting Safety-Related Equipment*. The inspector verified that periodic SW side pressure drop readings for the selected SACS heat exchangers had been recorded in order to monitor for potential macro-fouling conditions. The inspector compared the surveillance test data to the acceptance test criteria, which had been developed in engineering calculations. The inspector also reviewed these criteria to ensure that the minimum design bases assumptions were technically justified. The inspector reviewed the eddy current test methodology and results to verify that the number of plugged SACS heat exchanger tubes was bounded by assumptions in the engineering analyses.

The inspector reviewed the design fouling factor assumptions for the reactor core isolation cooling (RCIC) unit coolers and the engineering analyses of minimum calculated SACS flowrate to the unit coolers. This review was performed to verify that the minimum calculated SACS flowrate, in conjunction with the heat transfer capability of the unit coolers, supported the minimum heat transfer rates assumed for the RCIC area during accident and transient conditions. Preventive maintenance procedures were reviewed to ensure activities existed for cleaning of the RCIC unit coolers to ensure the fouling factors assumed in engineering analyses were reasonable.

The inspector reviewed EDG jacket water heat exchanger modeling analyses against the heat exchanger specification sheets. This included calculations related to minimum

allowable SACS flowrate to the coolers. Additionally, a tube plugging calculation was reviewed against the most recent eddy current test results for the D EDG jacket water cooler (1D-E-405) to ensure that operability assumptions in the calculation were consistent with the actual condition of the heat exchanger.

With regard to the ultimate heat sink, the inspector verified that testing had been established to ensure that SW flow to nonsafety loads was automatically isolated during accident conditions. The inspector walked down portions of the intake structure along with the SACS, RCIC and EDG jacket water heat exchangers to assess their material condition. In addition, the inspector reviewed several notifications and preventive maintenance work orders associated with heat exchanger performance monitoring (20043781, 20049930, 20052661, 20070876, 20094576, 30025213, 30025634, and 30057412).

The inspector also reviewed the following documents:

- *Validating SSWS Flow Through SACS HXs* (HC.OP-FT.EA-0001)
- *Integrated Emergency Diesel Generator 1CG400 Test - 18 Months* (HC.OP-ST.KJ-0007)
- *HVAC Cooling/Heating Unit and Coil Inspection and Cleaning* (HC.MD-GP.ZZ-0020)
- *ProtoPower HX (*calculation *96-005)*
- *Max Plugged Tubes for EDG Coolers* (calculation H-1-EG-MEE-1555)
- *Evaluation to Determine Maximum Ambient Temp for EACS* Rooms (calculation H-1-GR-MEE-1279)
- *STACS Operation* (calculation EG-46)
- *STACS Required Flow and Heat Loads* (calculation EG-0020)
- *Dynamic Hydraulic Model of Station Service Water System* (calculation EA-0001)
- *STACS Proto HX Models* (calculation EG-0044)
- *A SACS Lower Heat Exchanger RF010 Eddy Current Inspection*
- B SACS Lower Heat Exchanger RF009 Eddy Current Inspection
- *A Upper SACS RF010 H-1-EG-MEE-1569 Eddy Current Inspection*
- *1D Diesel Jacket Water HX Eddy Current Inspection*
- *PSEG Nuclear LLC Balance of Plant Heat Exchanger Program*
- *SACS Heat Exchanger Specification Sheets*
- *EDG Jacket Water Cooling Heat Exchanger Data Sheet*

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed all corrective action notifications initiated between November 16, 2001, and December 31, 2001, for maintenance rule screening. The inspectors further reviewed four notifications that included system engineer functional failure determinations (20084365, 20084608, 20085811, and 20086941) and four preventable system functional failure (PSFF) evaluations (70020322, 70021379, 70021745, and 70021790). The inspectors also reviewed the PSEG Nuclear (a)(1) system goals database and the PSFF database.

To assess PSEG Nuclear's implementation of 10 CFR 50.65 *Maintenance Rule* requirements, the inspectors reviewed the following documents:

- SE.MR.HC.02, *System Function Level Maintenance Rule VS Risk Reference*
- NRC Regulatory Guide 1.160, *Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*, Revision 2
- NUMARC 93-01, *Industry Guideline For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*, Revision 2
- Salem & Hope Creek Expert Panel Meeting Minutes HCEP 02-003

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated on-line risk management for the following configurations: (1) the planned outage of the B EDG and transfer of 1200 gallons of lube oil in the EDG/control building; (2) the concurrent planned maintenance on A1 SACS heat exchanger and the extended outage of the SW emergency makeup valves to the B SACS loop; and (3) the concurrent unplanned outage of the C SW pump and the B standby liquid control system. The inspectors reviewed maintenance risk evaluations, work schedules, recent corrective action notifications, and control room logs to verify that other concurrent planned and emergent maintenance or surveillance activities did not adversely affect the plant risk already incurred with the out of service components. The inspectors also used PSEG Nuclear's on-line risk monitor (Equipment Out Of Service workstation) to evaluate the risk associated with the plant configuration and to assess PSEG Nuclear's risk management. In addition, the inspectors reviewed other notifications involving risk assessment and emergent work (20091495, 20091651, 20091979, 20092040, 20092208, 20092401, 20092308, 20092419, and 20093043).

To assess PSEG Nuclear's risk management, the inspectors reviewed the following documents:

- SE.MR.HC.02, *System Function Level Maintenance Rule VS Risk Reference*
- HCGS PSA Risk Evaluation Forms for Work Week Nos. 58 - 64
- SH.OP-AP.ZZ-108, *On-Line Risk Assessment*
- NRC Regulatory Guide 1.182, *Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants*
- Section 11, *Assessment of Risk Resulting from Performance of Maintenance Activities,* dated February 11, 2000, of NUMARC 93-01, *Industry Guideline For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

.1 Potential Fuel Pin Cladding Defect

a. Inspection Scope

The inspectors evaluated operator actions in response to an emergent condition related to a potential fuel pin cladding defect. At 4:00 p.m. on March 4, the offgas pretreatment radiation monitors alarmed at 10 mr/hr. The offgas pretreatment radiation monitors are designed to detect increasing radiation levels including those resulting from fuel cladding deficiencies. The control room supervisor promptly directed a power reduction to reduce offgas pretreatment radiation levels below the alarm setpoint. The peak offgas level during the event was approximately 3800 uCi/sec. The design and licensing basis steady state offgas level, assuming a 1 percent fuel cladding defect, is 330,00 uCi/sec at 100 percent rated thermal power.

The inspectors reviewed the operations logs, applicable abnormal operating procedures, the associated Hope Creek Transient Assessment Response Plan (TARP) report, and corrective action notifications (20080350, 20081613, 20092994, 20093043, 20093046, 20093311, and 20093755).

The inspectors reviewed the following documents:

- *HCGS Event Classification Guide*
- *Off Gas System - High Radiation* (HC.OP-AB.ZZ-0127)
- *Radiation Monitoring* System Alarm Response - RM11 (HC.OP-AR.SP-0001)
- *Off Gas System Malfunctions* (HC.OP-AB.ZZ-0128)
- Daily Chemistry Shift Summary Reports
- *Loose Parts Monitoring System Operation* (HC.OP-SO.SC-0001)
- *Gamma Spectroscopy Analysis Using CAS* (NC.CH-RC.ZZ-2525)
- *Fuel Integrity Program* (NC.NA-AP.ZZ-0071)
- *Hope Creek Generating Station Core Operating Limits Report* (NFS-0181)

- *TARP Report: Elevated Offgas Pre-Treatment Radiation Monitor Levels Potential Fuel Pin Cladding Challenge*; dated March 4, 2002
- *Elevated Offgas Pre-Treatment Radiation Monitor Levels Technical Issues Report*; dated March 5, 2002

b. Findings

No findings of significance were identified.

.2 Power Suppression Testing

a. Inspection Scope

On March 17 operators reduced reactor power to 60 percent for power suppression testing. The purpose of the testing was to determine the location of the failed fuel within the reactor so that the power of that bundle could be reduced to minimize further fuel damage and fission product escape. The inspectors observed operators' preparations for the testing, the pre-test briefing, portions of the power reduction, and the conduct of operators and engineers associated with the testing.

The inspectors reviewed the following documents:

- *Power Suppression Testing* (HC.RE-RA.ZZ-0007)
- *Conduct of Infrequently Performed Tests or Evolutions* (NC.NA-AP.ZZ-0084)
- *Off Gas System - High Radiation* (HC.OP-AB.ZZ-0127)
- *SORC Power Suppression Testing Results, Hope Creek 3/21/2002*
- *Review of Core Management Strategy After Suppression of Suspected Failed Fuel Assembly* (NFS 02-49)

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability determinations for non-conforming conditions associated with main turbine master trip solenoid valve A (70023201) and a drywell hotspot above the UFSAR maximum (70023178). The inspectors also reviewed all other PSEG Nuclear identified safety-related equipment deficiencies during this report period and assessed the adequacy of the operability screenings.

The inspectors reviewed the following document:

- *Main Turbine Functional Test - Weekly* (HC.OP-FT.AC-0001)

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

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

The inspectors also reviewed the following documents:

- Condition Resolution Operability Determination Notebook
- Inoperable Instrument/Alarm/Indicators/Lamps/Device Log
- Inoperable Computer Point Log
- Hope Creek Operator Workarounds List
- Hope Creek Operator Concerns List

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the post maintenance testing (PMT) data for (1) the C RHR pump motor replacement (work order 60015966), (2) the C RHR pump minimum flow valve (BC-HV-F007C) limitorque actuator work (work order 60012422), (3) D SW pump maintenance (work order 60023173), (4) B EDG lube oil replacement (work order 60026071), and (5) motor driven fire pump emergent work to verify that the PMTs were adequate for the scope of maintenance performed. The inspectors discussed IST requirements with the PSEG Nuclear IST program manager. The inspectors also reviewed notifications concerning problems associated with PMTs (20091624, 20091720, 20092254, 20092756, 20093133, 20093191, 20093395, and 20093741).

The inspectors reviewed the following documents:

- *Maintenance Testing Program Matrix* (NC.NA-TS.ZZ-0050)
- *CP202, C Residual Heat Removal Pump In-service Test* (HC.OP-IS.BC-0002)
- *Residual Heat Removal Subsystem C Valves - Inservice Test* (HC.OP-IS.BC-0103)
- *Emergency Diesel Generator BG400 Operability Test* - Monthly (HC.OP-ST.KJ-0002)

- *Accountability Controls Checklist* (SH.MD-AP.ZZ-52, Attachments 5,6,7,8)
- *Fire Pump Capacity Test* (HC.FP-ST.KC-0006)

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

.1 C SW Pump IST

a. Inspection Scope

The inspectors reviewed the results of the C SW pump IST. The inspectors reviewed the test procedure to verify that applicable system requirements for operability were incorporated correctly into the test procedure, test acceptance criteria were consistent with the TS and UFSAR requirements, and the system was capable of performing its intended safety function. The inspectors also reviewed notifications concerning problems encountered during surveillance testing (20094816, 20094819, and 20095237).

b. Findings

The inspectors identified that PSEG Nuclear did not incorporate a change in the TS minimum river level requirement into the C SW pump IST procedure. The finding was of very low safety significance and resulted in a non-cited violation for failure to comply with 10CFR50, Appendix B, Criterion III requirements.

TS Amendment 106 incorporated the recommendation of Engineering Calculation EA-0003, which raised the required minimum river level from 76 feet to 80 feet. The basis for this change, as stated in Engineering Calculation EA-0003 Section 5.9.4 was that undesirable surface vortices at the SW pump inlet may occur with flow rates in excess of 21,600 gpm with a pump bay elevation of 76 feet. However, the current revision of PSEG Nuclear procedure HC.OP-IS.EA-0003, *C Service Water Pump - CP502 - Inservice Test*, Attachment 3, Step 5.1.21I, establishes the required pit level at greater than or equal to 76 feet.

If left uncorrected, the operation of the pump below the required river level could result in damage to the SW pump due to the formation of surface vortices at the pump inlet. The safety significance of this finding was very low, because the level measured during the test was 88 feet. Additionally, procedure HC.OP-DL.ZZ-0003*, Log 3 Control Console Log Condition 1, 2 and 3,* requires the control room operators to record river level every two hours and the inspector verified that the logs were properly updated to incorporate the revised minimum river level of 80 feet.

10 CFR 50, Appendix B, Criterion III, *Design Control*, requires that measures shall be established to assure that regulatory requirements and design basis are correctly translated into procedures. Contrary to the above, PSEG Nuclear did not translate the requirements of TS Amendment 106, which increased the required minimum river level from 76 to 80 feet, into procedure HC.OP-IS.EA-0003. However, because the violation is of very low significance (Green) and PSEG Nuclear entered the deficiency into their corrective action system (notification 20095237), this finding is being treated as a non-cited violation, consistent with Section VI.A of the Enforcement Policy, issued May 1, 2000 (65FR25368). **(NCV 50-354/02-02-02)**

.2 D SW Spray Wash Pump and A SACS Valves IST

a. Inspection Scope

The inspectors observed portions of and reviewed the results of the D SW spray wash pump and the A SACS valves IST. The inspectors reviewed the test procedures to verify that applicable system requirements for operability were incorporated correctly into the test procedures, test acceptance criteria were consistent with the TS and UFSAR requirements, and the systems were capable of performing their intended safety functions. The inspectors also reviewed notifications concerning problems encountered during surveillance testing (20091162, 20092017, 20092051, 20092101, 20092206, 20092231, 20092307, and 20092600).

The inspectors reviewed the following documents:

- *D Spray Wash Pump DP507 Inservice Test* (HC.OP-IS.EP-0004)
- *Safety Auxiliaries Cooling System Valves - Subsystem A Valves - Inservice Test* (HC.OP-IS.EG-0101)
- *Hope Creek Generating Station Inservice Testing Program Submittal, Interval 2 (December 21, 1997 through December 20, 2006)*
- *Inservice Testing Program* (NC.NA-AP.ZZ-0070)

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

(Closed) URI 50-354/01-08-01: PSEG Nuclear's RHR unavailability performance indicator calculated value. This issue was unresolved pending NEI and NRC concurrent Frequently Asked Question (FAQ) response. The NEI and NRC concurrent resolution (FAQ No. 302 dated February 28, 2002) stated that because no risk/safety significant functions were lost, the condition would have been recognizable, the recovery actions were virtually certain to be successful, and an operability determination commensurate with the risk/safety significance of the issue was developed, PSEG Nuclear did not have to count any unavailability as a result of the SACS relief valve incident.

4OA2 Identification and Resolution of Problems

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

a. Section 1RO7.1 - Failure to establish adequate corrective actions to assure that a SW intake area silt accumulation issue was promptly identified and corrected.

b. Section 1R22.1 - Failure to incorporate a change in the TS minimum river level requirement into the C SW pump IST procedure. This demonstrated weak identification of a design control deficiency.

Additional items associated with PSEG Nuclear's corrective action program were reviewed without findings and are listed in Sections 1R01, 1R04, 1RO5, 1R06, 1R12, 1R13, 1R14, 1R15, 1R16, 1R19, and 1R22.2 of this report.

4OA3 Event Follow-up

(Closed) LER 354/2001-010: Rod Block Monitor Channel Inoperable Due to Failed Local Power Range Monitor Card. (Note: This LER was later renumbered to 2001-10-00 as 2001-09 was submitted as a Special Report to the NRC the month before.) On December 20, 2001, operators discovered that a local power range monitor (LPRM), that had previously been bypassed on December 12, 2001, continued to provide an upscale input to the rod block monitor (RBM) system. The cause of the erroneous input to the RBM system was a failed LPRM card in the power range monitoring panel. Technicians replaced the card and checked other bypassed LPRMs for a similar condition. Technicians found no other deficiencies. The failure to properly bypass this LPRM in a timely manner as required by TS 3.1.4.3 constitutes a violation of minor safety significance and is not subject to formal enforcement action in accordance with Section IV of the NRC's Enforcement Policy.

4OA4 Cross-cutting Issues

On March 20, 2002 plant operators found the B RHR minimum flow manual isolation valve out of position. The mis-positioning of this valve involved human performance. (Section 4OA7.1)

4OA6 Management Meetings

a. Exit Meeting Summary

On April 3 the inspectors presented their overall findings to members of PSEG Nuclear management led by Lon Waldinger. PSEG Nuclear management stated that none of the information reviewed by the inspectors was considered proprietary.

b. PSEG Nuclear/NRC Management Meeting

The NRC conducted the annual assessment meeting with PSEG Nuclear on March 26, 2002. During the meeting the NRC discussed the status of the performance indicators, inspection findings, and performance trends for the completed assessment cycle. PSEG Nuclear provided a brief synopsis of ongoing initiatives to address areas of concern. The meeting occurred at the PSEG Nuclear Training Center and was open for public observation. A copy of the slide presentation can be found in ADAMS under Accession #ML020870584.

4OA7 Licensee Identified Violations

The following findings of very low significance were identified by PSEG Nuclear and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as Non-Cited Violations (NCV).

Cornerstone: Mitigating Systems

.1 **NCV 50-354/2002-002-03:** Technical Specification 6.8.1 requires that written procedures shall be established, implemented and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33 requires that procedures be developed for equipment control. PSEG Nuclear procedure NC.NA-OP.ZZ-0005,*Station Operating Practices*, requires that manually operated valves that do not have position indication in the control room and would render an ECCS inoperable shall be locked to prevent inadvertent or unauthorized valve operation. On March 20, 2002 plant operators found the B RHR minimum flow manual isolation valve, 1-BC-V032, unlocked and shut. The valve's required position is locked open. Based on an analysis of vendor information, operating experience feedback, emergency operating procedures, RHR design basis, and operating crew simulator response; PSEG Nuclear determined that B RHR remained capable of performing its design functions with BC-V032 closed. PSEG Nuclear entered this issue into their problem identification and corrective action system as notification 20094581. This is being treated as a Non-Cited Violation.

.2 **NCV 50-354/2002-002-04:** Hope Creek Generating Station Facility Operating License Condition 2.C.7, requires PSEG Nuclear to implement and maintain all provisions of the approved Fire Protection Program as described in the UFSAR. USFAR Figure 9.5-13 and P&ID M-00, sheet 2, note 34, indicate that the motor driven fire pump suction strainer, TS112, was a temporary start-up strainer which was replaced by a removable spool piece. Contrary to this requirement, PSEG Nuclear identified that temporary start-up strainer was still installed. PSEG Nuclear entered this issue into their problem identification and corrective action system as notifications 20093648 and 20093714. This is being treated as a Non-Cited Violation.

SUPPLEMENTAL INFORMATION

a. Key Points of Contact

Michael Ambrosino, Engineering Supervisor
Russell Burke, Engineering Supervisor
John Carlin, VP - Nuclear Reliability
Terry Cellmer, Radiation Protection Manager
Matt Conroy, Maintenance Rule Supervisor
Mike Dammann, Maintenance Manager - Controls & Power Distribution
Paul Duke, Licensing Engineer
Kurt Krueger, Operations Manager
Greg Morrison, Engineering Supervisor
Devon Price, Assistant Operations Manager
Gabor Salamon, Nuclear Safety & Licensing Manager
Larry Wagner, Director - Site Work Integration & Management

b. List of Items Opened, Closed, and Discussed

Opened/Closed

50-354/02-02-01	NCV	PSEG Nuclear did not establish adequate corrective actions to assure that a SW intake area silt accumulation issue was promptly identified and corrected. (Section 1R07.1)
50-354/02-02-02	NCV	PSEG Nuclear did not incorporate a change in the TS minimum river level requirement into the C SW pump IST procedure. (Section 1R22.1)
50-354/02-02-03	NCV	PSEG Nuclear failed to maintain configuration control of the B RHR minimum flow manual isolation valve. (Section 4OA7.1)
50-354/02-02-04	NCV	PSEG Nuclear failed to implement and maintain all provisions of the approved Fire Protection Program. (Section 4OA7.2)
50-354/01-10-00	LER	Rod block monitor channel inoperable due to failed local power range monitor card. (Section 4OA3)

Closed

05000354/01-08-01	URI	PSEG Nuclear's RHR unavailability performance indicator calculated value. (Section 4OA1)

c. List of Documents Reviewed

In addition to the documents identified in the body of this report, the inspectors reviewed the following documents and records:

Hope Creek Generating Station (HCGS) Updated Final Safety Analysis Report
Technical Specification Action Statement Log (SH.OP-AP.ZZ-108)
HCGS NCO Narrative
HCGS Plant Status Report
Weekly Reactor Engineering Guidance to Hope Creek Operations
Recirculation Jet Pump Operability - Daily (HC.OP-ST.BB-0001), dated 2/10/02
Turbine Valve Testing - Monthly (HC.OP-ST.AC-0002)

d. List of Acronyms

CAS	Count Room Analysis System
DBT	Design Basis Threat
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
FAQ	Frequently Asked Question
HCGS	Hope Creek Generating Station
IST	Inservice Testing
LPRM	Local Power Range Monitor
NCV	Non Cited Violation
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PMT	Post Maintenance Testing
PSEG	Public Service Electric Gas
PSFF	Preventable System Functional Failure
RBM	Rod Block Monitor
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SACS	Safety Auxiliaries Cooling System
SDP	Significance Determination Process
SW	Service Water
TARP	Transient Assessment Response Plan
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report