November 7, 2006

Mr. William Levis
Senior Vice President and Chief Nuclear Officer
PSEG LLC - N09
P. O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 05000354/2006004

Dear Mr. Levis:

On September 30, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Hope Creek Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 11, 2006, with Mr. George Barnes 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.

The report documents two self-revealing findings of very low safety significance (Green). One of these findings was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in this report as a non-cited violation. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Hope Creek Generating Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) 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/

Mel Gray, Chief
Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000354/2006004
w/Attachment: Supplemental Information

cc w/encl:
G. Barnes, Site Vice President
D. Winchester, Vice President - Nuclear Assessments
W. F. Sperry, Director - Business Support
M. Massaro, Hope Creek Plant Manager
J. J. Keenan, Esquire
M. Wetterhahn, Esquire
Consumer Advocate, Office of Consumer Advocate
L. A. Peterson, Chief of Police and Emergency Management Coordinator
P. Baldauf, Assistant Director of Radiation Protection and Release Prevention, State of New Jersey
K. Tosch, Chief, Bureau of Nuclear Engineering, NJ Dept. of Environmental Protection
H. Otto, Ph.D., DNREC Division of Water Resources, State of Delaware
N. Cohen, Coordinator - Unplug Salem Campaign
W. Costanzo, Technical Advisor - Jersey Shore Nuclear Watch
E. Zobian, Coordinator - Jersey Shore Anti Nuclear Alliance

Distribution w/encl:
S. Collins, RA
M. Dapas, DRA
M. Gray, DRP
B. Welling, DRP
G. Malone, DRP, Senior Resident Inspector
T. Wingfield, DRP, Resident Inspector
K. Venuto, DRP, Resident OA
B. Sosa, RI OEDO
H. Chernoff, NRR
D. Collins, NRR
S. Bailey, PM, NRR
ROPreports@nrc.gov (All Inspection Reports)
Region I Docket Room (with concurrences)

DOCUMENT NAME: C:\FileNet\ML063110624.wpd

SUNSI Review Complete: MKG (Reviewer's Initials)

After declaring this document "An Official Agency Record" it **will/~~will not~~** be released to the Public.

To receive a copy of this document, indicate in the box: "**C**" = Copy without attachment/enclosure "**E**" = Copy with attachment/enclosure "**N**" = No copy

OFFICE	RI/DRP		RI/DRP			
NAME	GMalone/MKG for		MGray/MKG			
DATE	11/07/06 * via telecon		11/07/06			

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	050000354
License No:	NPF-57
Report No:	05000354/2006004
Licensee:	Public Service Enterprise Group Nuclear LLC
Facility:	Hope Creek Generating Station
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Dates:	July 1, 2006 through September 30, 2006
Inspectors:	G. Malone, Senior Resident Inspector T. Wingfield, Resident Inspector J. Schoppy, Senior Reactor Inspector J. Furia, Senior Health Physicist S. Pindale, Senior Reactor Inspector B. Welling, Senior Project Engineer D. Tifft, Project Engineer
Approved By:	Mel Gray, Chief Projects Branch 3 Division of Reactor Projects

Enclosure

TABLE OF CONTENTS

SUMMARY OF FINDINGS iii

REACTOR SAFETY 1
1R01 Adverse Weather Protection 1
1R04 Equipment Alignment 2
1R05 Fire Protection 3
1R07 Heat Sink Performance 4
1R11 Licensed Operator Requalification Program 4
1R12 Maintenance Effectiveness 5
1R13 Maintenance Risk Assessments and Emergent Work Control 7
1R14 Operator Performance During Non-Routine Evolutions and Events 9
1R15 Operability Evaluations 10
1R19 Post-Maintenance Testing 10
1R22 Surveillance Testing 11
1R23 Temporary Plant Modifications 12
1EP6 Drill Evaluation 12

RADIATION SAFETY 13
2OS1 Access Control to Radiologically Significant Areas 13
2OS2 ALARA Planning and Controls 14
2OS3 Radiation Monitoring Instrumentation and Protective Equipment 15
2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems 16

OTHER ACTIVITIES 17
4OA1 Performance Indicator Verification 17
4OA2 Identification and Resolution of Problems 18
4OA3 Event Followup 22
4OA6 Meetings, Including Exit 23
4OA7 Licensee-Identified Violations 24

SUPPLEMENTAL INFORMATION A-1
KEY POINTS OF CONTACT A-1
LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED A-1
LIST OF DOCUMENTS REVIEWED A-1
LIST OF ACRONYMS A-16

SUMMARY OF FINDINGS

IR 05000354/20060004; 07/01/2006 - 09/30/2006; Hope Creek Generating Station; Maintenance Effectiveness, and Maintenance Risk Assessments and Emergent Work Control.

The report covered a 13-week period of inspection by resident inspectors, and announced inspections by regional reactor inspectors and a senior health physics inspector. One Green non-cited violation (NCV) and one green finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding was identified when an operations work control supervisor caused an inadvertent trip of the 10K107 instrument air compressor. During a tagging operation on the 00K107 air compressor, the supervisor verified that a key would fit properly in the 00K107 air compressor uninterruptible power supply (UPS) by testing it in the in-service 10K107 air compressor UPS. When the supervisor removed the key, the 10K107 air compressor tripped resulting in an instrument air system transient. PSEG stopped all work activities to brief crews on the transient, proper use of human performance tools, and site procedures.

  This performance deficiency is more than minor because it is associated with the configuration control and human performance attributes of the Initiating Events Cornerstone and affected the cornerstone's objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors completed a Phase 1 screening of the finding using Appendix A of Inspection Manual Chapter 0609, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and determined that a more detailed Phase 2 evaluation was required to assess the safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available. The finding was determined to be of very low safety significance based upon a Significance Determination Process Phase 2 evaluation. The performance deficiency had cross-cutting aspect in the area of human performance related to the work practices component in that the individual did not use human performance error prevention techniques and proceeded in the face of uncertainty. (Section 1R13)

Cornerstone: Mitigating Systems

- Green. A self-revealing, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the 'A' core spray pump minimum flow check valve remained open, resulting in 56 hours of unplanned unavailability of the 'A' core spray loop. PSEG did not implement corrective actions developed following a similar condition on the 'C' core spray check valve on November 12, 2004. PSEG's corrective actions included repairing the check valve, updating the check valve maintenance procedure, and creation of periodic preventative maintenance tasks to internally inspect the core spray pump minimum flow check valve.

  This performance deficiency is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined the finding to be of very low safety significance (Green), based on a Phase 1 SDP screening. The performance deficiency had a cross-cutting aspect in the area of problem identification and resolution in the corrective action program component in that the appropriate corrective actions to address the missing pin on the 'C' core spray minimum flow check valve were not implemented in a timely manner to prevent a similar failure in the 'A' core spray minimum flow check valve. (Section 1R12)

B. Licensee Identified Violations

Violations of very low safety significance, which were identified by PSEG have been reviewed by the inspectors. Corrective actions taken or planned by PSEG have been entered into PSEG's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

The Hope Creek Generating Station began the inspection period operating at 100% power. On July 11, 2006, operators reduced reactor power to 57% in response to decreasing vacuum in the main condenser caused by degraded steam jet air ejector performance. The reactor was returned to 100% power on July 12, 2006. Operators reduced reactor power to 66% on August 4, 2006, to perform power suppression testing. Following completion of the test, reactor power was returned to 100% on August 7, 2006. Operators reduced reactor power to 78% on August 25, 2006, after the turbine auxiliaries cooling system was inadvertently isolated when a return isolation valve failed closed. Operators restored plant conditions to normal and returned reactor power to 100% on August 26, 2006. Operators reduced reactor power to 84% on August 31, 2006, in response to increasing offgas flow caused by a failure of a condensate drain tank level instrument. Reactor power was returned to 100% on September 1, 2006.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope (2 site specific samples)

The inspectors reviewed PSEG's response to two site specific weather-related conditions. During and following a period of significant rainfall (including several severe lightning storms), the inspectors walked down the service water (SW) intake structure (including the SW traveling screens room), emergency diesel generator (EDG) building roof, station power transformers, the 500KV blockhouse and switchyard, the reactor building steam vent room, and the fire water pump house.

During four consecutive days of abnormally high ambient air and river temperatures, the inspectors walked down the SW intake structure, various auxiliary building locations, and all elevations of the reactor building to verify proper operation of safety significant equipment. The inspectors also monitored various heat-affected plant parameters using the computerized plant monitoring system. The inspectors verified that these adverse weather conditions did not adversely impact mitigating systems equipment or increase the likelihood of a loss of offsite power. The inspectors interviewed operations personnel to assess personnel readiness and availability for adverse weather response. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown (3 samples)

a. Inspection Scope

The inspectors performed a partial walkdown of the following three systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors reviewed applicable operating procedures, walked down control systems components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that PSEG had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program. Documents reviewed are listed in the attachment.

- 'B', 'C', and 'D' trains of service water, emergency diesel generators (EDGs), and 4kV switchgear rooms during the emergent unavailability of the 'A' service water pump on July 14, 2006;
- 'A' standby liquid control (SLC) train when the 'B' train was out-of-service for maintenance on August 2, 2006; and
- 'B' and 'D' EDGs and service water trains after a 'C' EDG fuel oil transfer valve failure and a trip of the 3-4 500 kV breaker on September 19, 2006.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope (1 sample)

The inspectors conducted one complete walkdown of accessible portions of the control rod drive (CRD) and hydraulic control unit (HCU) system on September 1 and 7, 2006. The inspectors used PSEG procedures and other documents listed in the attachment to verify proper system alignment and functional capability. The inspectors also verified CRD and HCU electrical power requirements, labeling, appropriateness of any operator workarounds, hangers and support installation, and associated support systems status. The walkdowns also included evaluation of system piping and equipment to verify pipe hangers were in satisfactory condition, oil reservoir levels appeared normal, running CRD pump noise and vibration levels appeared normal, radiation and contamination areas were properly marked, system parameters were within established ranges, and equipment deficiencies were appropriately identified.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Fire Protection - Quarterly Tours

a. Inspection Scope (9 samples)

The inspectors conducted a tour of the nine areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources within the areas were controlled in accordance with PSEG's administrative procedures, fire detection and suppression equipment was available for use, that passive fire barriers were maintained in good material condition, and that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with PSEG's fire plan. Documents reviewed are listed in the attachment.

- Fire water pump house;
- Control equipment mezzanine (upper cable spreading room);
- Electrical access area room 5339 (102' auxiliary building);
- 'A', 'B', 'C', and 'D' emergency diesel generator rooms (102' auxiliary building);
- 'A', 'B', 'C', and 'D' class 1E switchgear rooms (130' auxiliary building);
- 'A' safety auxiliaries cooling system (SACS) heat exchanger and pump room (102' reactor building);
- 'B' SACS heat exchanger and pump room (102' reactor building);
- Control rod drive pump area and motor control center area (77' reactor building); and
- Motor control center area, residual heat removal heat exchanger room, safeguard instrument rooms and reactor auxiliaries cooling system pump and heat exchanger area (77' reactor building).

b. Findings

No findings of significance were identified.

.2 Fire Protection - Annual Drill Observation

a. Inspection Scope (1 sample)

The inspectors observed an unannounced fire drill conducted in the heating ventilation air conditioning (HVAC) equipment rooms 5703 and 5704 on August 9, 2006. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. The inspectors verified that PSEG staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke

removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope (1 sample)

The inspectors verified the readiness and availability of a sample of risk-important heat exchangers by monitoring PSEG programs and checking maintenance and inspection records. Specifically, the review included the reactor core isolation cooling (RCIC) and high pressure coolant injection (HPCI) system room coolers, which are cooled by the safety auxiliaries cooling system. The inspectors reviewed design basis documentation, procedures, and cooler inspection results to ensure that the coolers could provide adequate heat removal from the RCIC and HPCI rooms. In addition, the inspectors walked down the coolers, and discussed cooler performance, maintenance and inspection with system and design engineers. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope (1 sample)

The resident inspectors observed a simulator training scenario on July 19, 2006, to assess operator performance and training effectiveness. The scenario involved a trip of one circulating water pump and subsequent loss of an electrical bus, resulting in the loss of the normal heat sink. The inspectors assessed simulator fidelity and observed the simulator instructor's critique of operator performance. The inspectors also observed control room operator response to a simulated security-related threat activity. Finally, the inspectors reviewed applicable documents associated with licensed operator requalification as listed in the attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope (3 samples)

The inspectors reviewed the three samples listed below for items such as: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the Maintenance Rule (MR); (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and (8) appropriateness of performance criteria for structures, systems, and components (SSCs) or functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs or functions classified as (a)(1). Documents reviewed are listed in the attachment. Items reviewed included the following:

- ‘A’ core spray minimum flow check valve failure on June 20, 2006;
- ‘B’ service water traveling screen shear pin failure on May 28, 2006; and
- 00K107 and 10K107 instrument air compressor unavailability on July 31, 2006.

b. Findings

Introduction: A Green self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the 'A' core spray pump minimum flow check valve stuck open, resulting in 56 hours of unplanned unavailability of the 'A' core spray loop.

Description: On November 12, 2004, PSEG identified during corrective maintenance that the disc retaining nut pin for the 'C' core spray pump minimum flow check valve was missing and the disc retaining nut was several turns loose. PSEG’s evaluation order 70042741 identified that all four core spray pump minimum flow check valves and four condensate transfer-to-core spray check valves were of the same model as the failed valve. PSEG created corrective action orders to revise the check valve maintenance procedures to incorporate steps to verify the integrity of internal parts and to revise the maintenance plans to incorporate confirmation of disc, disc nut, and disc nut pin condition.

On November 15, 2005, the management screening committee approved closure of the corrective action item to revise the check valve maintenance plans and procedures prior to the revisions actually being completed because a new notification, 20262031, was written to evaluate the creation of open and inspect activities for all valves within the check valve program. This action was not consistent with PSEG's corrective action process procedure in that corrective actions program database operations should not be closed until the required action is completed. The inspectors determined that issues identified in notification 20262031 did not have corrective action orders created until evaluation order 70058747 was created on September 14, 2006.

On June 20, 2006, the 'A' core spray loop was declared inoperable when operators discovered the 'A' core spray pump rotating backward when the 'C' core spray pump was in service for testing. The corrective maintenance activity to open and inspect the 'A' core spray pump minimum flow check valve, H1BE -1-BE-V028, revealed that the check valve disc was separated from the valve hinge and the disc nut and disc nut pin were missing. In response, PSEG included open and inspect activities for the 'B', 'C', and 'D' core spray pump minimum flow check valves during the next scheduled system outage work windows. PSEG's evaluation determined that current preventive maintenance tasks for core spray check valves did not address the integrity of valve internals. PSEG also determined that corrective actions related to the failure of the 'C' core spray minimum flow check valve in November 2004, were not fully created or implemented. In addition, the inspectors identified that evaluation order 70047421 did not fully address the extent of condition, did not call for an inspection of other valves of the same type, and did not note that the vendor manual contained direction to peen the ends of the disc nut retention pin during re-assembly and this was not incorporated in PSEG maintenance procedures.

Analysis: The inspectors determined that the failure to implement the corrective actions for the 'C' core spray pump minimum flow check valve condition in November 2004, resulted in 56 hours of unplanned unavailability for the 'A' core spray loop in June 2006, and was a performance deficiency.

This issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

In accordance with NRC Inspection Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined the finding to be of very low safety significance (Green). The finding was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its Technical Specification Allowed Outage Time, and did not screen as potentially risk significant due to external events. The performance deficiency associated with the failure of the 'A' core spray minimum flow check valve had a cross-cutting aspect in the area of problem identification and resolution, specifically in the corrective action program component, in that appropriate corrective actions to address the missing pin on the 'C' core spray minimum flow check valve were not implemented in a timely manner to prevent a similar failure in the 'A' core spray minimum flow check valve.

Enforcement: 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, PSEG did not implement corrective actions for the failure of the 'C' core spray minimum flow check valve on November 12, 2004. As a result, the 'A' core spray minimum flow check valve failed on June 20, 2006, resulting in 56 hours of unplanned unavailability. PSEG's corrective

actions included the creation of the open and inspect preventive maintenance activities for the core spray minimum flow check valves and revision of the maintenance procedures to include vendor manual guidance requiring peening of the check valve disc nut retention pins. Because this finding is of very low safety significance and has been entered into PSEG's corrective action program (evaluation 70058747), this finding is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 05000354/2006004-01, 'A' Core Spray Minimum Flow Check Valve Failure**.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope (5 samples)

The inspectors reviewed five on-line risk management evaluations through direct observation and document reviews for the following five configurations:

- Reactor protection system Group 3 logic blown fuse on July 13, 2006;
- Hope Creek risk management response associated with severe weather warnings on August 29, 2006;
- Trip of the 10K107 instrument air compressor while the 00K107 was unavailable on September 2, 2006;
- 'A' essential switchgear room chiller out of service for scheduled maintenance on September 11, 2006; and
- Trip of the 3-4 500 kV ring bus breaker and 'C' EDG fuel oil transfer valve failure while the 'C' service water pump was unavailable for planned maintenance on September 19, 2006.

The inspectors reviewed the applicable risk evaluations, work schedules and control room logs for these configurations to verify that concurrent planned and emergent maintenance and test activities did not adversely affect the plant risk already incurred with these configurations. PSEG's risk management actions were reviewed during shift turnover meetings, control room tours, and plant walkdowns. The inspectors also used PSEG's on-line risk monitor (Equipment Out Of Service workstation) to gain insights into the risk associated with these plant configurations. Finally, the inspectors reviewed notifications documenting problems associated with risk assessments and emergent work evaluations. Documents reviewed are listed in the attachment.

b. Findings

Introduction: A Green self-revealing finding occurred when an operations work control supervisor caused an inadvertent trip of the protected 10K107 instrument air compressor, leading to an instrument air system transient. Because the issue involved non-safety related equipment, there was no violation of NRC requirements.

Description: On September 2, 2006, operators were in the process of removing the 00K107 instrument air compressor from service through their tagout process for

corrective maintenance. The in-service 10K107 instrument air compressor was protected in accordance with station risk and work management procedures to prevent accidental loss of a redundant train of equipment. To verify the proper key required to complete tagging of the 00K107 air compressor, the operations work control supervisor inserted the key into the uninterruptible power supply (UPS) for the in-service 10K107 air compressor control panel. When the supervisor removed the key, the 10K107 air compressor tripped resulting in an instrument air system transient. Instrument air header pressure decreased, the emergency instrument air compressor auto-started in accordance with plant design, and operators started the temporary diesel air compressor. Air header pressure began to recover at 83 psig which was 13 psig above the value requiring manual trip of the reactor plant per the applicable loss of instrument air procedure. Operators restarted the 10K107 air compressor and air header pressure was restored to pre-transient levels.

PSEG's procedure, "On-line Risk Assessment," (SHOP-27) states that work that will directly affect the availability of protected equipment shall not be allowed. PSEG procedure, "Component Configuration Control," (SHOP-103) delineates what must be done if a component has to be placed in a position other than its normal position due to equipment malfunction and states that operators shall not change the position of any component unless it is addressed within the procedure. Use of PSEG procedure, "Operations Troubleshooting and Evolutions Plan Development," (SHOP-08) is required, in part, to ensure the protection of plant equipment during troubleshooting for evolutions which involve simple tasks. PSEG's procedure, "Operations Standards," (SHOP-01) describes supervisor involvement as being actively engaged in key plant activities to ensure performance standards are met. Procedure HU-AA-102, "Technical Human Performance Practices," provides guidance for evaluating activities for worst case scenarios and identifying error precursors. Contrary to the above procedures, the work control supervisor performed work that directly affected the availability of protected equipment, did not use the guidance contained in SHOP-103 or SHOP-08 for troubleshooting or changing the configuration of the 10K107 UPS, and did not ensure that the performance standards provided in procedure HU-AA-102 were met.

Analysis: The inspectors determined that the failure to follow the applicable procedures for on-line risk assessment, configuration control of risk-significant equipment, troubleshooting, and operations standards was a performance deficiency.

This issue was more than minor because it is associated with the configuration control and human performance attributes of the Initiating Events Cornerstone and affected the cornerstone's objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

In accordance with NRC Inspection Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," the inspectors completed a Phase 1 screening of the finding and determined that a more detailed Phase 2 evaluation was required to assess the safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available.

The inspectors used the Risk-Informed Inspection Notebook for Hope Creek Generating Station, Revision 2, to conduct a Phase 2 evaluation. The inspectors made the following assumptions: 1) an exposure time of less then three days was used to identify the Initiating Event Likelihood per Table 1, "Categories of Initiating Events for Hope Creek Generating Station," in the Risk-Informed Inspection Notebook for Hope Creek Generating Station because the 10K107 service air compressor was unavailable for a period of five minutes; 2) using Table 1 in the Risk-Informed Inspection Notebook for Hope Creek Generating Station, the specified initiating event likelihood of four (4) was increased by one order of magnitude to three (3), because the finding directly affects the likelihood of an initiating event (per usage rule 1.3, of IMC 0609, Appendix A, Attachment 2); 3) full credit was given for available mitigation capability equipment; and 4) operator recovery credit was given because sufficient time was available, environmental conditions allowed access to take appropriate action, procedures describing the appropriate operator actions existed and were used, operators are trained to respond to a loss of instrument air, and the 10K107 air compressor was made available and returned to service.

The inspectors determined that the finding was of very low safety significance (Green) using Table 2, "Initiators and System Dependency for Hope Creek Generating Station," and Table 3.10, "SDP Worksheet for Hope Creek - Loss of Instrument Air (LOIA)," in the Risk-Informed Inspection Notebook for Hope Creek Generating Station, Revision 2. The dominant core damage sequence involved the total loss of instrument air and the subsequent loss of high pressure injection and the failure to depressurize. The performance deficiency had a cross-cutting aspect in the area of human performance related to the work practices component in that the individual did not use human performance error prevention techniques and proceeded in the face of uncertainty.

Enforcement: The 10K107 instrument air compressor is not a safety-related component and no violation of regulatory requirements occurred. PSEG entered this problem into the corrective action program as notification 20296072. **FIN 05000354/2006004-02, Inadvertent Instrument Air Compressor Trip**.

1R14 Operator Performance During Non-Routine Evolutions and Events (71111.14)

a. Inspection Scope (1 sample)

The inspectors evaluated PSEG's performance in response to a degraded main condenser vacuum condition requiring an emergent power reduction on July 12, 2006, to determine whether the operator responses were consistent with applicable procedures, training, and PSEG's expectations. The inspectors observed control room activities and reviewed control room logs and applicable operating procedures to assess operator performance. PSEG's evaluations of operator performance were also reviewed. The inspectors walked down control room displays and portions of plant systems to verify status of risk significant equipment and interviewed operators and engineers. The inspectors also observed portions of the subsequent return to full power. Documents reviewed are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (6 samples)

The inspectors reviewed six operability determinations for degraded or non-conforming conditions associated with:

- NOTF 20288247, 'B' reactor recirculation pump second stage seal pressure decrease;
- NOTF 20293502, inadequate SACS flow to the 'B' and 'C' emergency diesel generators;
- NOTF 20287950, oscillation power range monitor single-loop enable set-point adequacy;
- NOTF 20296548, high pressure coolant injection steam supply line vibrations;
- NOTF 20295618, degraded condition on 'B' service water pump lube water; pressure instrument root valve; and
- NOTF 20297415, diesel fuel oil specification change impact.

The inspectors reviewed the technical adequacy of the operability determinations to verify the conclusions were justified. The inspectors also walked down accessible equipment to corroborate the adequacy of PSEG's operability determinations. Additionally, the inspectors reviewed other PSEG identified safety-related equipment deficiencies during this report period and assessed the adequacy of their operability screens. Notifications and documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (5 samples)

The inspectors reviewed the five post-maintenance tests listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed test procedures to verify the procedure adequately tested the safety functions that may have been affected by the maintenance activity and the acceptance criteria in the procedure were consistent with the Updated Final Safety Analysis Report (UFSAR) and other design basis documentation. The inspectors also witnessed the test or reviewed the test data to verify test results adequately demonstrated restoration of the affected safety functions. Documents reviewed are listed in the attachment.

- WO 60062304, replacement of ‘B’ station service water strainer breaker overloads;
- WO 50025253, ‘B’ standby liquid control motor operated valve environmental qualification preventative maintenance;
- WO 60063990, ‘B’ control area supply fan temperature switch set-point change;
- WO 60064635, open, inspect, and repair of check valve AP-V036; and
- WO 30098513, replacement of core spray reactor low pressure injection permissive relay.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (8 samples)

The inspectors witnessed eight surveillance tests and/or reviewed test data of selected surveillance tests listed below to verify that the test met the requirements of the Technical Specifications, UFSAR, and station procedures. The inspectors also determined whether the testing effectively demonstrated that the structures, systems, and components were operationally ready and capable of performing their intended safety functions. Documents reviewed are listed in the attachment.

- WO 50095595, reactor core isolation cooling pump in-service test on July 6, 2006;
- Weekly control rod drive accumulator operability check on July 10, 2006;
- WO 50097522, ‘D’ emergency diesel generator operability test on July 10, 2006;
- WO 50096456, suppression chamber/drywell vacuum breaker operability test on July 14, 2006;
- Daily core thermal limits surveillance test on July 23, 2006;
- WO 50096471, ‘A’ service water pump in-service test on August 16, 2006;
- WO 50084448, main steam line flow channel calibration on August 17, 2006; and
- WO 50097103, ‘A’ core spray loop valves in-service test on September 14, 2006.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope (1 sample)

The inspectors reviewed a temporary plant modification (T-Mod 06-019 and 06-020) associated with the residual heat removal (RHR) heat exchanger safety auxiliaries cooling system (SACS) outlet valves. The modification provided a new throttle capability for the RHR heat exchanger SACS outlet valves. The inspectors verified the modification was consistent with the design and licensing bases of the RHR and SACS systems and that the performance capability of each system was not degraded by the modification. The inspectors reviewed documents to verify PSEG followed their processes for implementing temporary modifications on safety-related equipment. In addition, the inspectors verified the modified equipment alignment through control room instrumentation and plant walkdowns of accessible portions of the affected equipment. The inspectors further reviewed notifications documenting problems associated with equipment affected by temporary modifications. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope (1 sample)

Resident inspectors evaluated the conduct of a PSEG emergency drill on July 19, 2006, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation (PAR) development activities. The inspectors observed emergency response operations in the simulated control room and the emergency operations facility to verify that event classification and notifications were done in accordance with the Hope Creek Event Classification Guide. The inspectors also reviewed PSEG's critique documentation of the drill to compare any inspector-observed weakness with those identified by PSEG personnel in order to verify whether PSEG was properly identifying weaknesses.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope (14 Samples)

The inspectors reviewed all PSEG Performance Indicators (PIs) for the Occupational Exposure Cornerstone for followup. The licensee had no PI events in this cornerstone for the period from January 1 - September 25, 2006.

The inspectors reviewed Radiation Work Permits for airborne radioactivity areas with the potential for individual worker internal exposures of >50 mrem Committed Effective Dose Equivalent [CEDE] (20 Derived Air Concentration-hrs).

The inspectors verified barrier integrity and engineering controls performance (e.g., High Efficiency Particulate Air ventilation system operation).

The inspectors reviewed and assessed the adequacy of PSEG's internal dose assessment for any actual internal exposure greater than 50 mrem CEDE. No internal exposures of this magnitude were reported by PSEG during the period from January 1 - September 25, 2006.

The inspectors examined PSEG's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools.

For high radiation work areas with significant dose rate gradients (factor of 5 or more), the inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel, and verified the adequacy of PSEG controls.

The inspectors discussed with the Radiation Protection Manager High Dose Rate-High Radiation Area, and Very High Radiation Area (VHRA) controls and procedures. The inspectors verified that any changes to PSEG procedures did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with first-line Health Physics (HP) supervisors the controls in place for special areas that have the potential to become VHRA during certain plant operations. The inspectors determined that these plant operations require communication beforehand with the HP group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors reviewed PSEG's self assessments, audits, licensee event reports, and special reports related to the access control program since the last inspection, and

determined that identified problems were entered into the corrective action program for resolution.

The inspectors reviewed corrective action reports related to access controls. Included in this review were high radiation area radiological incidents (non-Performance Indicators (PI), identified by PSEG) in high radiation areas <1R/hr that have occurred since the last inspection in this area.

For repetitive deficiencies or significant individual deficiencies in problem identification and resolution identified above, the inspectors assessed whether PSEG's self-assessment activities were also identifying and addressing these deficiencies.

The inspectors reviewed PSEG documentation packages for possible PI events occurring since the last inspection; determined if any of these events involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter; and, determined what barriers had failed and if there were any barriers left to prevent personnel access. The inspectors reviewed unintended exposures >100 mrem Total Effective Dose Equivalent (or >5 rem Skin Dose Equivalent or >1.5 rem Lens Dose Equivalent), for which the inspectors needed to determine if there were any overexposures or substantial potential for overexposure. There were no PSEG events which occurred between July 1, 2005, and July 10, 2006, which met any of the above criteria.

The inspectors reviewed radiological problem reports since the last inspection which found that the cause of the event was due to radiation worker errors; determined if there was an observable pattern traceable to a similar cause; and, determined if this perspective matches the corrective action approach taken by PSEG to resolve the reported problems. The inspectors discussed with the Radiation Protection Manager any problems with the correction actions planned or taken. The inspectors verified adequate posting and locking of entrances to all high dose rate - high radiation areas, and very high radiation areas (if reasonably accessible).

The inspectors reviewed radiological problem reports since the last inspection that found that the cause of the event was radiation protection technician error; determined if there was an observable pattern traceable to a similar cause; and, determined if this perspective matched the corrective action approach taken by PSEG to resolve the reported problems.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope (4 Samples)

The inspectors reviewed PSEG's self assessments, audits, and special reports related to the as low as is reasonably achievable (ALARA) program since the last inspection

and determined if PSEG's overall audit program's scope and frequency (for all applicable areas under the Occupational Cornerstone) met the requirements of 10 CFR 20.1101(c).

The inspectors determined if identified problems were entered into the corrective action program for resolution; reviewed dose significant post-job (work activity) reviews and post-outage ALARA report critiques of exposure performance; and, determined if identified problems were properly characterized, prioritized, and resolved in an expeditious manner.

The inspectors evaluated PSEG's performance with respect to collective outage exposures for Hope Creek refueling outage RFO13. The outage exposure goal was 90 person-rem, while collective exposure (as measured by electronic dosimetry) was 88.4 person-rem.

The inspectors reviewed PSEG's method for adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work are encountered.

Utilizing PSEG records, the inspectors determined the historical trends and current status of tracked plant source terms. The inspectors determined that PSEG was making allowances or developing contingency plans for expected changes in the source term due to changes in plant fuel performance or changes in plant primary chemistry.

The inspectors attended the September 25, 2006, station ALARA committee meeting, and reviewed the documents provided to committee members.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope (2 Samples)

The inspectors reviewed the Hope Creek Updated Final Safety Analysis Report (UFSAR) to identify applicable radiation monitors associated with transient high and very high radiation areas, including those used in remote emergency assessment.

The inspectors identified the types of portable radiation detection instrumentation used for job coverage of high radiation area work, other temporary area radiation monitors currently used in the plant, and continuous air monitors associated with jobs with the potential for workers to receive 50 mrem CEDE.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

a. Inspection Scope

The inspectors reviewed one notification written in February 2006, involving the disposal of chemical wastes, and three notifications written during the 2006 refueling outage (RFO13) involving the collection and discharge of water from the radiologically controlled area.

Notification 20276295 describes the collection of liquid scintillation media (liquid) by the Chemistry Department that was directed to the detergent drain system. A review of the Hope Creek UFSAR, Section 11.2.2.1.5, entitled Detergent Waste Processing Subsystem, indicated that miscellaneous sources of high conductivity, low activity water may be deposited into the detergent waste subsystem. Materials in the detergent waste subsystem are then sampled for discharge or processed and then discharged.

Notification 20280233 describes the discharge of approximately 10,000 gallons of water from the safety auxiliaries cooling system (SACS), which was isolated from service during a refueling outage. Normally, the water drained from this system would be directed to the liquid radwaste system for processing, or released via the cooling tower blowdown effluent pathway, but these discharge paths were not available during the refueling outage. The notification also identified that only one sample of this release was taken, and analyzed to environmental Lower Limit of Detection (LLD) standards. Beginning on the evening of April 13, 2006, and continuing until April 20, 2006, approximately 10,000 gallons of water were discharged via an alternate disposal pathway referred to by PSEG as the “overland express,” directly to a storm drain located on the west side of the Unit 1 reactor building. Following discussions with the inspectors, Chemistry Department personnel identified additional documented samples taken during this discharge (at least one sample taken and analyzed every 12 hours during the period of discharge). The inspectors observed that these samples were analyzed to either environmental or effluent LLDs. The inspectors determined that this method of discharge, sampling, and analysis was in compliance with NRC rules and regulations.

Notifications 20280764 and 20280188 describe the discharge of water collected in drums from the service water system during RFO13. The inspectors reviewed PSEG documents which indicated that beginning on April 16, 2006, water drained from the station service water system onto the floor of the 77' elevation of the reactor building and was routinely collected into 55 gallon drums. The contents of the drums were then discharged into the detergent water drain tank (a liquid radwaste processing subsystem component) via a shower drain located on the 124' elevation of the Service and Radwaste Building, and discharged via a monitored pathway. On April 18, 2006, approximately 150 gallons of service water were drained from valve 2357B, and collected into three 55 gallon drums. These drums were sampled to effluent LLD standards, pumped back into the service water drain tank and subsequently discharged

to the west side storm drain via the “overland express.” The inspectors determined that this method of discharge, sampling and analysis was in compliance with NRC rules and regulations.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope (2 samples)

Cornerstone: Mitigating Systems

The inspectors reviewed the PSEG submittal for the safety system functional failures performance indicator (PI). The inspectors verified the accuracy and completeness of reported safety system functional failures during the period of July 1, 2004, through June 30, 2006. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, “Regulatory Assessment Indicator Guideline,” Revision 4, were used to verify the basis in reporting for each data element.

The inspectors reviewed portions of the operations logs and discussed the methods for compiling and reporting the PIs with cognizant licensing, engineering, and maintenance rule personnel. The inspectors also independently screened maintenance rule cause determination and evaluation reports. The inspectors compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. Licensee event reports (LERs) issued during the referenced time frame were also reviewed for safety system functional failures and are listed in the attachment.

Cornerstone: Occupational Radiation Safety

The inspectors reviewed all PSEG PIs for the Occupational Exposure Cornerstone. The inspectors reviewed a listing of PSEG action reports for the period from January 1 - September 25, 2006, for issues related to the occupational radiation safety performance indicator, which measures non-conformances with high radiation areas greater than 1R/hr and unplanned personnel exposures greater than 100 mrem total effective dose equivalent (TEDE), 5 rem skin dose equivalent (SDE), 1.5 rem lens dose equivalent (LDE), or 100 mrem to the unborn child.

The inspectors reviewed the data for PI events involving dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter. If so, the inspectors assessed what barriers had failed and if there were any barriers left to prevent personnel access. For unintended exposures >100 mrem TEDE (or >5 rem SDE or >1.5 rem LDE), the

inspectors evaluated if there were any overexposures or substantial potential for overexposure. The inspectors determined that PSEG had no occurrences during the period specified which met these criteria.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of all items entered into PSEG's corrective action program. This was accomplished by reviewing the description of each new notification and attending daily management review committee meetings. Documents reviewed are listed in the attachment.

.2 Annual Sample: Operator Workarounds

a. Inspection Scope (1 specific and 1 cumulative sample)

The inspectors reviewed one specific workaround condition and performed one cumulative review of PSEG's identified operator workaround conditions. The inspectors reviewed a workaround condition involving potential unavailability of the standby offgas train (notification 20108190). The inspectors determined whether the problem impacted the functional capability of mitigating equipment and whether the condition would have impacted operation of the equipment.

The inspectors performed a cumulative review of PSEG's identified operator workaround conditions. The inspectors reviewed PSEG's list of operator burdens and concerns, temporary modifications, and operability determinations to assess the potential for these issues to impact the operators' ability to properly respond to plant transients or postulated accident conditions. In addition, the inspectors reviewed PSEG's list of deficient control room computer points and locked-in overhead annunciators to determine whether operators could adequately identify degraded plant equipment. The inspectors further reviewed operator logs and control room instrument panels to evaluate potential impacts on operator ability to implement abnormal and emergency operating procedures. Finally, the inspectors toured the plant and control room to identify potential workaround conditions not previously identified by PSEG. Documents reviewed for this inspection activity are listed in the attachment.

b. Findings and Observations

No findings of significance were identified.

.3 Nitrogen Leakage into the Safety and Turbine Auxiliaries Cooling System (1 sample)

a. Inspection Scope

The inspectors reviewed PSEG's actions to resolve issues associated with increased nitrogen consumption in the safety and turbine auxiliaries cooling system (STACS). The STACS contains two accumulators that utilize nitrogen for accumulator level control. The accumulator's level control system adds nitrogen to the accumulator to reduce level and ports the nitrogen to atmosphere to raise level.

On April 20, 2004, PSEG discovered increased amounts of gas in the turbine auxiliaries cooling system (TACS) while working on the non-safety related turbine building chiller units. PSEG's evaluation of the issue concluded that the STACS accumulators were the most likely source of the gas in-leakage. Corrective actions included an inspection of the accumulator internals during the twelfth refueling outage (RFO12) in October, 2004. PSEG also increased the frequency of venting the TACS to one time per week. PSEG did not find gas in the safety auxiliaries cooling system (SACS) side of the system.

The accumulators internals were inspected and replaced during RFO12 in late 2004. Inspections revealed that a foam layer on the internal diaphragm was saturating with water. This additional weight damaged the nitrogen/water floating diaphragm and allowed increased nitrogen leakage into the STACS. The diaphragms were replaced without the foam. Nitrogen consumption after RFO12 returned to expected rates.

On October 21, 2005, control room operators received alarms for STACS accumulator level. Operators vented the STACS at the accumulators and at the system high point in TACS. The venting restored level and cleared the alarms. PSEG inspected nitrogen supply lines and found no leaks.

On December 22, 2005, operations personnel identified an increasing trend in nitrogen consumption in STACS. Nitrogen consumption on the supply accumulator increased three-fold from rates obtained following RFO12. PSEG continued to monitor nitrogen consumption and planned troubleshooting activities for the next refueling outage.

During RFO13 in April 2006, PSEG replaced a number of solenoid valves in the accumulator nitrogen makeup and control system. Following RFO13, nitrogen consumption returned to expected values.

The inspectors interviewed engineers and reviewed design basis documents, notifications, and evaluations to assess PSEG's resolution of the issue. Documents reviewed are listed in the attachment.

b. Findings and Observations

No findings of significance were identified.

The inspectors found that PSEG entered issues associated with STACS nitrogen usage into the corrective action program at an appropriate threshold.

The inspector determined that PSEG performed a number of activities to evaluate the nitrogen consumption issue, including using leak detectors on nitrogen supply piping, repairing the accumulator diaphragms in RFO12, periodic venting of SACS and TACS, and monitoring accumulator venting frequency. PSEG did not determine the root cause of the increased nitrogen consumption; however, PSEG engineering concluded that the nitrogen consumption was likely due to a combination of leakage past the floating diaphragm and normal operation of the accumulator level control system and was sufficiently monitored through frequent system venting on the STACS. PSEG concluded that the SACS was not susceptible to the nitrogen intrusion issues because of system geometry, frequent venting, and a system design that utilized high point expansion tanks that were continuously vented to atmosphere. PSEG scheduled inspections of the STACS accumulators during RFO14 in October 2007.

The inspectors concluded that PSEG's actions to monitor nitrogen usage and increase system venting were appropriate to maintain the SACS system capable of performing its safety function. The inspectors further concluded that the corrective actions taken and planned by PSEG were adequate to address the nitrogen leakage issues.

.4 Elevated Emergency Diesel Generator (EDG) Lube Oil Temperatures (1 sample)

a. Inspection Scope

The inspectors reviewed an issue associated with a trend of increasing lube oil temperatures on the emergency diesel generators (EDGs) observed by equipment operators in August 2005. The EDG lube oil system is cooled by the safety auxiliaries cooling system (SACS) through a skid-mounted heat exchanger. The EDG vendor recommended a maximum operating lube oil temperature of 170 degrees Fahrenheit (F), which also serves as a technical specification (TS) limit for EDG operability.

On August 8, 2005, PSEG equipment operators observed lube oil temperatures on the ‘D’ EDG at 168 degrees F during the monthly surveillance test. A simple evaluation (70049720) was performed by the system engineer. PSEG concluded that the temperatures observed were expected for summer conditions based on a review of data from surveillance tests performed over the past four years during the month of August. A second simple evaluation (70049822) was created on August 8, 2006, to evaluate the vendor-recommended maximum operating lube oil temperature of 170 degrees F. The vendor continued to recommend that value as the maximum operating temperature. PSEG concurred with the conclusion and maintained the lube oil maximum temperature at 170 degrees F.

On December 15, 2005, after reviewing the evaluations from August 8, 2005, NRC inspectors questioned PSEG on the rigor of the evaluations. Specifically, data from surveillance tests showed that EDG lube oil temperatures were approaching TS limiting conditions when service water (SW) and SACS temperatures were at moderate values.

The inspectors questioned past operability of the four EDGs and whether the EDGs would exceed design lube oil temperatures during design basis service water and SACS temperature conditions. Upon review of the questions, PSEG found that there was an unexpected difference between actual EDG lube oil temperatures and those that were predicted in design SACS heat load calculations. PSEG wrote notification 20265096 to examine the effects of SACS temperature on EDG lube oil temperature. PSEG concluded the EDGs remained operable because SW temperatures were low during the winter months, temperature limits were challenged only during the warmest days of summer, and the EDGs have passed all surveillance tests to date. Evaluation 70052404 was created to address the discrepancy between the design calculations and actual field measurements. PSEG created corrective action plans to perform a thermal performance test of the heat exchangers on one EDG and then create a thermal performance model of the EDG heat exchangers using the data obtained from the performance test. These corrective actions were originally due on March 30, 2006, but were moved to June 30, 2006, based on engineering's recommendation to obtain data when SACS was at higher temperatures. On June 30, 2006, data was acquired by PSEG, but the due date for the analysis of the data and modeling was extended to November 29, 2006.

On July 31, 2006, during a surveillance test of the 'B' EDG, equipment operators recorded lube oil temperatures at 172 degrees F. This temperature was 2 degrees above the vendor recommended limit for lube oil temperature, 170 degrees F, which was the acceptance criteria in the surveillance test procedure. The subsequent evaluation by PSEG determined that the actual vendor recommended temperature limit was 175 degrees F and that 170 degrees F was the recommended alarm set-point based on a nominal 4 degrees instrument accuracy. On August 10, 2006, PSEG determined that the SACS supply valve to the 'B' EDG heat exchangers was incorrectly throttled to a position that reduced the amount of SACS flow to the heat exchangers. PSEG performed a past operability assessment of the 'B' EDG (notification 20293502) and determined that the 'B' EDG remained operable from August 8, 2005, through August 10, 2006. PSEG also found a SACS valve in an incorrectly throttled position on the 'C' EDG on August 11, 2006. Both valves were returned to their proper position.

b. Findings and Observations

This issue is unresolved pending PSEG's completion of applicable evaluations and inspector review of PSEG's past-operability evaluations of the EDGs and evaluations associated with the apparent cause and extent of condition of the configuration control issues. **(URI 05000354/2006004-03, Elevated EDG Lube Oil Temperatures)**

.5 Safety Conscious Work Environment Metric Review

a. Inspection Scope

The inspectors reviewed PSEG's progress in addressing safety conscious work environment (SCWE) issues that were discussed in the NRC's annual assessment letter

dated March 3, 2006. In that letter, the NRC staff documented a SCWE substantive cross-cutting issue and stated the NRC would continue to monitor progress in this area.

On August 29, 2006, the inspectors conducted a sampling review of PSEG's SCWE metrics, or performance indicators (PIs), for second quarter 2006. Documents reviewed are listed in the attachment.

b. Findings and Observations

No findings of significance were identified.

In second quarter 2006, PSEG identified 24 PIs as being green or satisfactory while five PIs were identified as red or needing improvement. This was consistent with the results from the first quarter 2006, when there were 24 green PIs and six red PIs. One of the green performance indicators reported in the first quarter 2006 documented the results of a safety culture survey of the workforce completed in the first quarter of 2006. This PI was not included in the second quarter results.

4OA3 Event Followup (71153)

.1 (Closed) LER 05000354/2006-003-00, As-Found Values for Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable

On April 21, 2006, PSEG determined that the as-found lift setpoint for three of fourteen main steam safety relief valves (SRVs) failed to open within the required Technical Specification (TS) actuation pressure setpoint tolerance. TS 3.4.2.1 provides an allowable pressure band of +/- 3 percent for an individual SRV. All three of the SRVs opened above the required pressure band at 3.2 percent. PSEG determined that the apparent cause for the 'A,' 'C,' and 'K' SRV setpoint failures was corrosion bonding/sticking of the pilot disc. The pilot assemblies for each of the failed SRVs was replaced with a fully tested spare assembly. All of the fourteen SRVs currently installed at Hope Creek had the pilot discs replaced with discs made of the BWROG-recommended Stellite 21 material during the last refueling outage. The enforcement aspects of this finding are discussed in Section 4OA7. This LER is closed.

.2 Unplanned Power Reduction - Loss of the Turbine Auxiliaries Cooling System (1sample)

a. Inspection Scope

The inspectors observed the control room operators' response to a loss of turbine auxiliaries cooling system (TACS) on August 25, 2006. The control room operators reduced reactor power to approximately 78% in response to increasing temperatures in loads serviced by TACS. The operators determined that a TACS return isolation valve had failed in the closed position. Equipment operators manually opened the valve to restore TACS flow.

The inspectors observed the control room operators' actions, plant parameters, and reviewed equipment response to the degraded condition and verified that operators responded to the transient in accordance with plant procedures. The inspectors discussed the transient and control room operator performance with PSEG management. The inspectors reviewed the event for reportability in accordance with NUREG 1022, Event Reporting Guidelines. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.3 Unplanned Power Reduction due to Degraded Main Condenser Vacuum (1 sample)

a. Inspection Scope

On August 31, 2006, the inspectors observed the control room operators' response to decreasing main condenser vacuum conditions. Main condenser offgas flow rate trended from approximately 30 standard cubic feet per minute (scfm) to 59 scfm over a period of 10 hours. Offgas flow rate rapidly increased at 4:30 pm from 59 to 155 scfm over a 30 minute period. At 5:10 pm, main condenser vacuum decreased from 3.6 to 4.3 inches of mercury (in. Hg). The control room operators reduced reactor power in accordance with procedures to 84% to stabilize main condenser vacuum. The operators determined that a low-level condition in a non-safety related condensate drain tank caused by a faulted level indicator allowed air to enter the condenser through the drain tank. Equipment operators established manual control of the level control valve associated with the condensate drain tank and restored level to the normal band. Following the restoration of level to the condensate drain tank, main condenser vacuum and offgas flow rates returned to 3.3 in. Hg and 30 scfm respectively.

The inspectors observed the control room operators' actions, plant parameters, and reviewed equipment response to the degraded condition and verified that operators responded to the transient in accordance with plant procedures. The inspectors discussed the transient with PSEG operators and management. The inspectors reviewed the event for reportability in accordance with NUREG 1022, Event Reporting Guidelines. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On October 10, 2006, the inspectors presented their findings to members of PSEG management led by Mr. G. Barnes. None of the information reviewed by the inspectors was considered proprietary.

4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) was identified by PSEG and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- Technical Specification (TS) 3.4.2.1, "Safety/Relief Valves," requires that 13 of the 14 safety relief valves (SRVs) open within a lift setpoint of +/- 3 percent of the specified code safety valve function lift setting. Contrary to this requirement, on April 21, 2006, PSEG identified that 3 of 14 SRVs experienced setpoint drift outside of the TS limit. PSEG entered this issue into their corrective action program as notification 20281208. This finding is of very low safety significance, based on a Phase 1 SDP screening, because the SRVs would have functioned to prevent a reactor vessel over-pressurization. The finding resulted in the inoperability of three SRVs, but did not result in a loss of system safety function.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

G. Barnes, Site Vice President
J. Clancy, Chemistry Manager
B. Booth, Operations Director
W. Kopchick, II, Shift Operations Superintendent
D. Boyle, Operations Services Manager
M. Crisafuli, Maintenance Superintendent
S. Afarian, Engineer
C. Johnson, Engineer
J. Molner, Emergency Preparedness Supervisor
B. Sebastian, Radiation Protection Manager
S. Trickett, Acting Radiation Protection Manager - Hope Creek

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000354/2006004-03	URI	Elevated Diesel Lube Oil Temperatures (Section 4OA2.4)

Opened/Closed

05000354/2006004-01	NCV	'A' Core Spray Minimum Flow Check Valve Failure (Section 1R12)
05000354/2006004-02	FIN	Inadvertent Instrument Air Compressor Trip (Section 1R13)

Closed

05000354/2006003-00	LER	As Found Values for Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable (Section 4OA3.1)

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 (HC.OP-AP.ZZ-0108)
HCGS NCO Narrative Logs
HCGS Plant Status Reports
Weekly Reactor Engineering Guidance to Hope Creek Operations
Hope Creek Operations Night Orders and Temporary Standing Orders
Risk Informed Inspection Notebook for Hope Creek Generating Station

Section 1R01: Adverse Weather Protection

Procedures
HC.OP-AB.MISC-0001, Rev. 7, Acts Of Nature
NC.OP-DG.ZZ-0002, Rev. 6, Severe Weather Guide
HC.PRA-005.05, Rev. 2, PRA System Notebook Main Condenser, Condensate, and Feedwater Systems

Operating Experience
NRC Information Notice 93-53, Supplement 1: Effect of Hurricane Andrew on Turkey Point Nuclear Generating Station and Lessons Learned, dated 4/29/94

Corrective Action Notifications

20246048	20266045	20271598	20289172	20262577	20290601
20262577	20268121	20274631	20290215	20290599	20290609
20263127					

Other Documents
HC.RW-FT.HB-0001, Sump Pump Status Check - Monthly, dated 7/10/06
Hope Creek Generating Station Individual Plant Examination for External Events, dated July 1997

Section 1R04: Equipment Alignment

Procedures
HC.OP-SO.EA-0001, Rev. 28, Service Water System Operation
HC.OP-SO.EA-0001, Rev. 29, Service Water System Operation
HC.OP-ST.BH-0001, Rev. 5, SLC Valve Operability Test - Monthly
HC.OP-IS.BH-0101, Rev. 7, Standby Liquid Control System Valves - Inservice Test
HC.OP-IS.BH-0001, Rev. 42, Standby Liquid Control Pump - AP208 - Inservice Test
HC.OP-SO.BH-0001, Rev. 9, Standby Liquid Control System Operation
HC.OP-AR.ZZ-0008, Rev. 31, Overhead Annunciator Window Box C1
HC.OP-SO.BF-0001, Rev. 26, CRD Hydrualic System Operation
HC.OP-ST.BF-0001, Rev. 26, Control Rod Drive Exercise - Weekly
HC.OP-ST.BF-0002, Rev. 7, Control Rod Drive Accumulator Operability Check - Weekly
HC.OP-ST.BF-0003, Rev. 6, SDV Vent/Drain Valve Operability Test - Monthly
HC.OP-ST.BF-0006, Rev. 4 and 5, Scram Discharge Volume Vent and Drain Functional Test - 18 Months

HC.OP-IS.BF-0101, Rev. 15, Control Rod System Valves - Inservice Test
HC.ER-DG.ZZ-0002, Rev. 2, System Function Level Maintenance Rule Scoping vs. Risk Reference
HC.MD-CM.KJ-0009, Rev. 6, Diesel Generator Fuel Oil System Maintenance
HC.OP-SO.KJ-0001, Rev. 43, Emergency Diesel Generators Operation
HC.OP-ST.KJ-0002, Rev. 60, Emergency Diesel Generator 1BG400 Operability Test - Monthly
HC.OP-ST.KJ-0004, Rev. 60, Emergency Diesel Generator 1DG400 Operability Test - Monthly
HC.OP-IS.EA-0002, Rev. 45, B Service Water Pump - BP502 - Inservice Test
HC.OP-IS.EA-0004, Rev. 39, D Service Water Pump - DP502 - Inservice Test
HC.OP-IS.EA-0102, Rev. 48, Service Water Subsystem B Valves - Inservice Test

Drawings
M-48-1, Sheet 1, Rev. 11, Standby Liquid Control
J-3000-1, Sheet 9, Rev. 5, Overhead Annunciator System Window Box Layout and Legend
M-46-1, Sheet 1, Rev. 22, Control Rod Drive Hydraulic - Part A
M-46-1, Sheet 2, Rev. 6, Control Rod Drive Hydraulic - Part A
M-47-1, Sheet 1, Rev. 20, Control Rod Drive Hydraulic - Part B
M-47-1, Sheet 2, Rev. 4, Control Rod Drive Hydraulic - Part B
M-10-1, Sheet 1, Rev. 49, Service Water
M-10-1, Sheet 2, Rev. 37, Service Water
M-30-1, Sheet 1, Rev. 26, Diesel Engine Auxiliary Systems Fuel Oil

Corrective Action Notifications

20282584	20282735	20283989	20297632	20297681	20297598
20282677	20291639	20282657	20297475	20297682	20291710

Orders

70057121	60062943	30136736	70061615	60065309	60064180

Other Documents
WCD 4184761

Section 1R05: Fire Protection

Procedures
Hope Creek Pre-Fire Plan FRH-III-714, Rev. 4, Fire Water Pump House
Hope Creek Pre-Fire Plan FRH-II-542, Rev. 7, Control Equipment Mezzanine, Elevation 117' & 124'
Hope Creek Pre-Fire Plan FRH-II-533, Rev. 6, Electrical Access Area, Elevation 102'
Hope Creek Pre-Fire Plan FRH-II-531, Rev. 6, Diesel Generator Rooms, Elevation 102'
Hope Creek Pre-Fire Plan FRH-II-541, Rev. 6, Class 1E Switchgear Rooms , Elevation 130'
Hope Creek Pre-Fire Plan FRH-II-433, Rev. 3, ‘A’ SACS Heat Exchanger & Pump Room, Elevation 102'
Hope Creek Pre-Fire Plan FRH-II-432, Rev. 3, ‘B’ SACS Heat Exchanger & Pump Room, Elevation 102'
Hope Creek Pre-Fire Plan FRH-II-421, Rev. 3, CRW Pumps Area & MCC Area, Elevation 77'

Hope Creek Pre-Fire Plan FRH-II-423, Rev. 3, MCC Area, RHR Heat Exchanger Room, Safeguard Instrument Rooms & RACS Pumps & Heat Exchanger Area, Elevation 77'
HC.FP-AP.ZZ-0004, Rev. 10, Actions for Inoperable Fire Protection - Hope Creek Station

Corrective Action Notifications
20290176 20290354 20290391

Orders
30110360

Other Documents
Salem and Hope Creek Fire Impairment Log Book, dated 07/07/2006
Fire Drill Form 4 Information Sheets, dated 08/09/2006

Section 1R07: Heat Sink Performance

Procedures
ER-AA-340-2000, Balance-of-Plant Heat Exchanger Inspection, Testing and Maintenance Guide, Rev. 2

Drawings
M-11-1, Sheet 1, Safety Auxiliaries Cooling - Reactor Building, Rev. 29
M-11-1, Sheet 2, Safety Auxiliaries Cooling - Reactor Building, Rev. 39

Corrective Action Notifications
20196709 20196413 20293651

Orders
30066574 30069531 30084888 30069919 30075063 30070017
30085842

Section 1R11: Licensed Operator Requalification Program

Procedures
NC.EP-EP.ZZ-0102, Rev. 12, Emergency Coordinator Response
HC.OP-EO.ZZ-0101FC, Rev. 10, Reactor Pressure Vessel (RPV) Control
HC.OP-EO.ZZ-0101-Conv, Rev. 6, RPV Control Conversion Document
HC.OP-EO.ZZ-0102FC, Rev. 11, Primary Containment Control
HC.OP-AB.ZZ-0000, Rev. 3, Reactor Scram
HC.OP-AB.BOP-0006, Rev. 8, Main Condenser Vacuum

Corrective Action Notifications
20292800

Section 1R12: Maintenance Effectiveness

Procedures
HC.OP-SO.KA-0001, Rev. 17, Service Air System Operation
HC.OP-SO.KB-0001, Rev. 17, Instrument Air Operation
HC.OP-AR.KA-0001, Rev. 3, Compressed Air Panel 00C188 Alarm Response Procedure
HC.OP-AR.KA-0002, Rev. 6, 00C190 & 10C190 Service Air Compressor Panel Alarm Response Procedure
HC.OP-AR.KB-0001, Rev. 4, Emergency Instrument Air Panel 10C189 Alarm Response Procedure
HC.OP-AB.COMP-0001, Rev. 2, Instrument and/or Service Air
SH.OP-AP.ZZ-0027, Rev. 12, On-Line Risk Assessment
SH.OP-AP.ZZ-0103, Rev. 12, Component Configuration Control
SH.OP-AP.ZZ-0001, Rev. 12, Operations Standards
SH.OP-AP.ZZ-0008, Rev. 5, Operations Troubleshooting and Evolutions Plan Development
NC.WM-AP.ZZ-0003, Rev. 5, Regular Maintenance Process
MA-AA-716-004, Rev. 5, Conduct of Troubleshooting
HU-AA-101, Rev. 3, Human Performance Tools and Verification Practices
HU-AA-102, Rev. 1, Technical Human Performance Practices
HC.OP-IS.BE-0101, Rev. 24, Core Spray Subsystem A Valves - In-service Test
HC.OP-IS.BE-0001, Rev. 36, A & C Core Spray Pumps - AP206 and CP206 - In-service Test
MA-AA-733-1001, Rev. 3, Guidance For Check Valve General Visual Inspection
MA-AA-733-1002, Rev. 0, Guidance For Non-Intrusive (Diagnostic) Testing of Check Valves
HC.MD-GP.ZZ-0237, Rev. 0 and 1, General Instructions For Disassembly, Inspection and Reassembly of Anchor Darling Testable Check Valves
HC.MD-GP.ZZ-0101, Rev. 1, Disassembly and Reassembly of Swing Disc Check Valves
HC.MD-GP.ZZ-0112, Rev. 3 and 4, General Instructions For Disassembly, Inspection and Reassembly of Check Valves
HC.MD-GP.ZZ-0092, Rev. 2, General Instructions For Inspection of Check Valves

Drawings
M-15-0, Sheet 1, Rev. 18, Compressed Air Service
M-15-0, Sheet 3, Rev. 11, Compressed Air

Corrective Action Notifications

20175470	20235316	20262819	20292699	20296072	20286128
20175680	20241237	20263048	20292699	20296545	20215439
20175766	20241668	20263140	20292852	20127247	20222849
20176177	20242577	20263167	20294526	20145544	20235593
20179059	20245153	20264289	20294982	20169632	20262031
20194628	20246952	20292020	20295475	20196497	20281676
20196824	20255667	20292118	20295476	20210626	20288483
20197926	20258185	20292212	20286473	20210993	20288523
20198751	20261593	20292230	20291965	20214289	20288697
20207596	20262037	20292260	20291967	20157359	20295542
20215154	20262619	20292390	20221332		

Orders

60064139	80089981	30101960	60063505	70033178	70044239
70049041	30007904	60035436	70002457	70058747	30130521
70060086	30041187	60036918	70042741	80071671	70058157
70060995	30073363	60052556	60063155	80089685	50097027

Other 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
Prompt Investigation Report 20296072, Inadvertent Trip of 10-K-107
Hope Creek Narrative Log, September 2, 2006
HCGS UFSAR Section 9.3 Process Auxiliaries
Temporary Modification No. 06-018, Bypass 00K107 and 10K107 Aftercooler Outlet Temperature Trip
HC PRA-005.10, System Information Notebook, Instrument Air System
HCGS Equipment Out Of Service (EOOS) Data
PI Process Book, Computerized Plant Information Database
PP301302Q-0186, Sheet 1, Rev. 20, Instructions for the Installation, Operation, and Maintenance of Gate, Globe and Check Valves, Anchor/Darling Valve Company Maintenance Manual for Swing Check Valves
Hope Creek Maintenance Rule Computer System Core Spray System Information
VTD PM020Q, Rev. 18, Instructions for Installation, Operation, and Maintenance for Q Class Traveling Water Screens
Plant Health Committee Report, Service Water, 2Q 2006

Operating Experience

NRC Information Notice 1993-16: Failures of Nut-Locking Devices in Check Valves, dated 2/19/1993
NRC 10CFR21 Notification: Anchor-Darling Check Valve Hinge Arms, dated 8/2/1995
LER 05000388/2005004-00: Common Mode Failure of the Inboard ‘A’ and ‘B’ Loop RHR Shutdown Cooling Testable Check Valves due to Vibration-Induced Seat Damage, dated 3/02/2005
NRC Information Notice 2001-14: Problems With Incorrectly-Installed Swing Check Valves, dated 10/03/2001
NRC Information Notice 2000-21: Detached Check Valve Disc Not Detected By Use of Acoustic and Magnetic Nonintrusive Test Techniques, dated 12/15/2000

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

HC.ER-DG.ZZ-0002, Rev. 2, System Function Level Maintenance Rule Scoping vs. Risk Reference
HC.OP-AP.ZZ-0108, Rev. 0, On-Line Risk Assessment
NC.OP-DG.ZZ-0002, Rev. 6, Severe Weather Guide

HC.OP-AB.MISC-0001, Rev. 6, Acts of Nature
WC-AA-101, Rev. 12, On-Line Work Control Process
HC.MD-CM.KJ-0009, Rev. 6, Diesel Generator Fuel Oil System Maintenance
HC.OP-SO.KJ-0001, Rev. 43, Emergency Diesel Generators Operation
HC.OP-ST.KJ-0002, Rev. 60, Emergency Diesel Generator 1BG400 Operability Test - Monthly
HC.OP-ST.KJ-0004, Rev. 60, Emergency Diesel Generator 1DG400 Operability Test - Monthly
HC.OP-IS.EA-0002, Rev. 45, B Service Water Pump - BP502 - Inservice Test
HC.OP-IS.EA-0004, Rev. 39, D Service Water Pump - DP502 - Inservice Test
HC.OP-IS.EA-0102, Rev. 48, Service Water Subsystem B Valves - Inservice Test
HC.OP-SO.KA-0001, Rev. 17, Service Air System Operation
HC.OP-SO.KB-0001, Rev. 17, Instrument Air Operation
HC.OP-AR.KA-0001, Rev. 3, Compressed Air Panel 00C188 Alarm Response Procedure
HC.OP-AR.KA-0002, Rev. 6, 00C190 & 10C190 Service Air Compressor Panel Alarm Response Procedure
HC.OP-AR.KB-0001, Rev. 4, Emergency Instrument Air Panel 10C189 Alarm Response Procedure
HC.OP-AB.COMP-0001, Rev. 2, Instrument and/or Service Air
SH.OP-AP.ZZ-0027, Rev. 12, On-Line Risk Assessment
SH.OP-AP.ZZ-0103, Rev. 12, Component Configuration Control
SH.OP-AP.ZZ-0001, Rev. 12, Operations Standards
SH.OP-AP.ZZ-0008, Rev. 5, Operations Troubleshooting and Evolutions Plan Development
MA-AA-716-004, Rev. 5, Conduct of Troubleshooting
HU-AA-101, Rev. 3, Human Performance Tools and Verification Practices
HU-AA-102, Rev. 1, Technical Human Performance Practices

Drawings
M-15-0, Sheet 1, Rev. 18, Compressed Air Service
M-15-0, Sheet 3, Rev. 11, Compressed Air

Corrective Action Notifications

20290832	20175766	20215154	20258185	20264289	20292699
20297632	20176177	20235316	20261593	20292020	20292852
20297475	20179059	20241237	20262037	20292118	20294526
20297681	20194628	20241668	20262619	20292212	20294982
20297682	20196824	20242577	20262819	20292230	20295475
20297598	20197926	20245153	20263048	20292260	20295476
20291710	20198751	20246952	20263140	20292390	20296072
20175470	20207596	20255667	20263167	20292699	20296545
20175680					

Orders

30136736	60065309	60064139	70060086	70060995	80089981
70061615	60064180	70049041			

Other Documents
NRC Regulatory Guide 1.182, Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants

NUMARC 93-01, Industry Guideline For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Section 11- Assessment of Risk Resulting from Performance of Maintenance Activities, dated February 11, 2000
Prompt Investigation Report 20296072, Inadvertent Trip of 10-K-107
Hope Creek Narrative Log, September 2, 2006
HCGS UFSAR Section 9.3 Process Auxiliaries
Temporary Modification No. 06-018, Bypass 00K107 and 10K107 Aftercooler Outlet Temperature Trip
HC PRA-005.10, System Information Notebook, Instrument Air System
HCGS Equipment Out Of Service (EOOS) Data
PI Process Book, Computerized Plant Information Database

Section 1R14: Operator Performance During Non-routine Evolutions and Events

Procedures
HC.OP-AB.BOP-0006, Rev. 8, Main Condenser Vacuum

Corrective Action Notifications
20290600 20291754 20291763

Orders
70059573

Other Documents
Plant Operation with Elevated Condensate Temperatures Adverse Condition Monitoring & Contingency Plan, dated 7/11/06
OTDM No. HC-2006-0014, Main Condenser Air Removal System, Main Condensate System, dated 7/11/06

Section 1R15: Operability Evaluations

Procedures
HC.OP-AP.ZZ-0108, Rev. 25, Operability Assessment and Equipment Control Program
NC.CA-DG.ZZ-0103, Rev.1, Adverse Condition Monitoring and Contingency Planning
NC.CA-DG.ZZ-0102, Rev.1, Operational and Technical Decision Making Process Desk Guide
HC.OP-AR.ZZ-0008, Rev. 31, C1-E4 Window - Reactor Recirc Pump Vib Hi
HC.OP-AR.ZZ-0008, Rev. 31, C1-E5 Window - Reactor Recirc B Trouble
HC.OP-AR.ZZ-0008, Rev. 31, D2925 - Recirc Pump B Seal LKG Flow
HC.OP-AR.ZZ-0008, Rev. 31, D2927 - Recirc Pump B Seal Stage Flow
HC.OP-AB.RPV-0003, Rev. 12, Recirculation System/Reactor Power Oscillations
HC.OP-AB.CONT-0006, Rev. 4, Drywell Leakage
HC.OP-GP.ZZ-0005, Rev. 5, Drywell Leakage Source Detection
SH.OP-AP.ZZ-0008, Rev. 5, Operations Troubleshooting and Evolutions Plan Development
HC.OP-DL.ZZ-0026, Rev. 104, Surveillance Log
HC.IC-CC.SE-0048, Rev. 6, Nuclear Instrumentation System, Division I - OPRM Channel A1, Oscillation Power Range Monitor

HC.IC-FT.SE-0048, Rev. 2, Nuclear Instrumentation System, Division I - OPRM Channel A1, Oscillation Power Range Monitor
HC.IC-TR.SE-0020, Rev. 2, Nuclear Instrumentation System, Division I - OPRM Channel A1, Oscillation Power Range Monitor
HC.IC-GP.SE-0015, Rev. 0, Nuclear Instrumentation System, OPRM Data and Setpoint Loading Instruction
HC.RE-RA.BB-0002, Rev. 16, Core Flow Determination
HC.CH-AP.ZZ-0041, Rev. 10, Hope Creek Generating Station Diesel Fuel Oil Testing Program
HC.CH-SA.ZZ-0011, Rev. 17, Diesel Fuel Oil Sampling

Operating Experience
NRC Information Notice 2005-08: Monitoring Vibration to Detect Circumferential Cracking of Reactor coolant and Reactor Recirculation Pump Shafts, dated 4/5/05
NRC Integrated Inspection Report 05000249/2005010, dated 11/7/05

Corrective Action Notifications

20264449	20288247	20264379	20287950	20292056	20293250
20278430	20290632	20292644	20292041	20292158	20296548
20288247	20227172	20293551	20285667	20295618	20286240
20288996	20172074	20293502	20291897	20292962	20297415
20283015					

Orders

60058360	80089949	70059960	70052303	50096844	50097282
80065875	70035899	80090019	50096489	50096845	50096255
70061426	70059959	70045420	50096502	50097300	50096258
60064321					

Other Documents
NRC Inspection Manual, Part 9900, Technical Guidance, Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety
'B' Reactor Recirculation Pump 2nd Stage Seal Monitoring Adverse Condition Monitoring & Contingency Plan, dated 6/22/06
OTDM No. HC-2006-0013, BP201 'B' Reactor Recirculation Pump Mechanical Seal, dated 6/26/06
Temporary Log 06-061, 'B' Recirc Pump Seal Parameters, dated 7/11/06
HC.MD-CB.BB-0003, Reactor Recirculation Pump Seal Changeout, dated 4/14/06
HC.MD-CM.BB-0008, Reactor Recirculation Pump N-7500 Mechanical Seal Rebuild, dated 4/13/06
VTD 322556, Rev. 2, TM-0301 N-7500 Instruction Manual - Maintenance of the Byron Jackson N-7500 Seal Cartridge
Instrument Calibration Data for OPRM Modules A1, A2, B1, B2, C1, C2, D1, and D2
Post-R13 Outage Core Flow Determination Data
BWROG Letter 96113 From K. Donovan, BWROG Chairman, to L. E. Phillips, NRC Reactor System Branch, September 17, 1996
OTDM No. HC-2006-0017, Oscillation Power Range Monitor (OPRM), dated 8/03/06

H-1-SE-ECS-0173 (008), Rev. 0, OPRM Technical Manual
H-1-SE-ECS-0173 (004), Rev. 1, OPRM Design Document
H-1-SE-ECS-0173 (020), Rev. 1, Critical Software Package - OPRM Setpoints
Ross Enterprises Fuel Oil Analysis Report, August 14, 2006
Ross Enterprises Fuel Oil Pipeline Pre-Shipment Certification and Product Transfer Documentation, August 30, 2006

Section 1R19: Post-Maintenance Testing

Procedures
NC.NA-AP.ZZ-0050, Rev. 7, Station Post Maintenance Testing
HC.OP-SO.EA-0001, Rev. 28, Service Water System Operation
HC.OP-IS.BH-0101, Rev. 7, Standby Liquid Control System Valves - Inservice Test
HC.OP-IS.BJ-0101, Rev. 51, High Pressure Coolant Injection System Valves - Inservice Test
MA-AA-723-301, Rev. 2, Periodic Inspection of Limitorque Model SMB/SB/SBD-000 through 5 Motor Operated Valves
NC.MD-AP.ZZ-0050, Rev. 7, Maintenance Testing Program Matrix
HC.IC-CC.BB-0023, Rev. 7, Nuclear Boiler - Division 2 Channel B21-N2690K Reactor Pressure (Core Spray Permissive)

Drawings
M-55-1, Rev. 24, High Pressure Coolant Injection

Corrective Action Notifications
20290519 20293140 20294199 20297252

Orders
60062304 80089453 30098513 50085821 70053532 80090340
60063990 60064635

Other Documents
Equipment Qualification Maintenance and Surveillance Information Sheet P303A-HV-003
VTD PP301302Q-0186, Rev. 20, Instructions for the Installation, Maintenance, and Operation of Gate, Globe, and Check Valves

Section 1R22: Surveillance Testing

Procedures
HC.OP-IS.BD-0001, Rev. 40, Reactor Core Isolation Cooling Pump-OP203-Inservice Test
HC.RA-AP.ZZ-0051, Rev. 4, Leakage Reduction Program
HC.RE-ST.ZZ-0001, Rev. 16, Core Thermal Limits Surveillance
NC.NF-AP.ZZ-6000, Rev. 4, Hope Creek Core Operating Limits Report Generation and Distribution
HC.MD-PM.ZZ-0004, Rev. 27, Limitorque Valve Operator Inspection and Lubrication
NC.DE-PS.ZZ-0033, Rev. 4, Motor Operated Valve Program

NC.DE-PS.ZZ-0033-A18, Rev. 0, Motor Operated Valve Program Appendix 18 MOV Tracking and Trending Assessment
ER-AA-302, Rev. 3, Motor-Operated Valve Program Engineering Procedure
ER-AA-302-1004, Rev. 3, Motor-Operated Valve Performance Trending

Completed Surveillances
HC.OP-ST.BF-0002, Control Rod Drive Accumulator Operability Check - Weekly, dated 6/27/06 & 7/3/06
HC.OP-IS.BD-0001, Reactor Core Isolation Cooling Pump-OP203-Inservice Test, dated 5/4/06 & 7/6/06
HC.OP-ST.KJ-0004, Emergency Diesel Generator 1DG400 Operability Test - Monthly, dated 6/12/06 & 7/10/06
HC.OP-ST.GS-0004, Suppression Chamber/Drywell Vacuum Breaker Operability Test - Monthly; dated 1/4/06, 1/23/06, 2/22/06, 3/20/06, 4/27/06, 5/17/06, 6/14/06, and 7/14/06
HC.OP-IS.EA-0001, Rev. 39, 'A' Service Water Pump - AP502 - Inservice Test, dated 8/16/06
HC.IC-SC.AB-0009, Rev. 13, Main Steam - Division 1, Channel B21-N688A, Main Steam Line Flow, dated 8/17/06
HC.OP-IS.BE-0101, Core Spray Subsystem A Valves - In-service Test, dated 3/30/06, 4/30/06, 6/23/06 (am), 6/23/06 (pm), and 9/14/06
HC.OP-IS.BE-0001, A & C Core Spray Pumps - AP206 and CP206 - In-service Tests, dated 3/29/06, 6/20/06, 6/22/06, & 9/12/06

Drawings
M-52-1, Sh. 1, Rev. 30, Core Spray
E-6025-0, Sh. 1, Rev. 4, Electrical Schematic Diagram Core Spray System Core Spray Reactor Isolation Valves

Operating Experience
NRC Information Notice 2005-08: Potentially Significant Problems Resulting From Human Error Involving Wrong Unit, Wrong Train, or Wrong Component Events, dated 6/11/87
NRC Generic Letter 89-10: Safety-Related Motor-Operated Valve Testing and Surveillance, dated 6/28/1989
NRC Bulleting 85-03: Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings
NRC Information Notice 92-17: NRC Inspections of Programs Being Developed at Nuclear Power Plants in Response to Generic Letter 89-10
NRC Information Notice 86-29: Effects of Changing Valve Motor-Operator Switch Settings
NRC Inspection Report 05000272/2005007, 05000311/2005007, and 05000354/2005006
NRC Inspection Report 05000354/2005007, 05000272/2005012, and 05000311/2005012

Corrective Action Notifications

20220342	20281160	20290153	20253009	20203031	20186536
20251232	20281172	20290155	20256467	20242233	20206786
20251245	20281173	20290342	20242447	20243278	20019473
20251349	20281533	20221980	20277477	20269417	20239521
20258660	20290068	20222678	20277992	20269423	20246345
20281159	20290143	20231973	20201072	20152802	20273576

20289605	20222530	20269657	20221980	20288802	20184786
20227627	20271010	20281676	20231973	20273578	20273470

Orders

70048665	70059014	70045369	70053967	50092633	60063505
70055814	40017740	60057465	70053601	30115756	60063613
70059892	60064389	70045455	60062432	50094822	50097103

Other Documents
Hope Creek Generating Station Unit 1 Core Operating Limits Report Cycle 14/Reload 13 dated May 1, 2006

Section 1R23: Temporary Plant Modifications

Procedures
HC.OP-FT.EA-0001, Rev. 5, Validating SSWS Flow Through SACS HXs

Drawings
M-11-1, Sh. 1, Rev. 29, Safety Auxiliaries Cooling Reactor Building
M-11-1, Sh. 2, Rev. 39, Safety Auxiliaries Cooling Reactor Building
E-0223-0, Sh. 1, Rev. 5, Electrical Schematic Diagram Safety Auxiliaries Cooling RHR HX BE205 Outlet Valve HV-2512A
E-0223-0, Sh. 2, Rev. 6, Electrical Schematic Diagram Safety Auxiliaries Cooling RHR HX BE205 Outlet Valve
E-0021-1, Sh. 1, Rev. 18, 480 Volt MCC Tabulation Class 1E MCC - Reactor Area 10B212, 10B222, 10B232, & 10B242
E-0021-1, Sh. 3, Rev. 16, 480 Volt MCC Tabulation Class 1E MCC - Reactor Area 10B212, 10B222, 10B232, & 10B242
J-11-0, Sh. 16, Rev. 8, Logic Diagram Safety Auxiliaries Cooling

Corrective Action Notifications

20292715	20292430	20265096	20249423

Orders

80090125	80090126

Other Documents
EG-0020, Rev. 8, STACS Required Flows and Heat Loads
PJ200Q-2232, Rev. 4, RHR HX BE205 Outlet Valve HV-2512B
PJ200Q-2260, Rev. 3, RHR HX AE205 Outlet Valve HV-2512A

Section 1EP6: Drill Evaluation

Procedures
HC.OP-AB.ZZ-0136, Rev. 9, Loss of 120 VAC Inverter
HC.OP-AB.RPV-0001, Rev. 6, Reactor Power

HC.OP-AB.RPV-0003, Rev. 12, Recirculation System / Reactor Power Oscillations
HC.OP-AB.RPV-0004, Rev. 1, Reactor Level Control
HC.OP-AB.MISC-0002, Rev. 6, CRIDS / Overhead Annunciators / PPC Computer
HC.OP-AB.BOP-0001, Rev. 4, Feedwater Heating

Corrective Action Notifications

20285759	20291511	20291492	20291850	20292493	20292497
20291449	20291522	20291582	20291278	20292557	20293213
20291472	20290409				

Orders
70059785

Other Documents
Hope Creek Event Classification Guide
EP-H06-02, Hope Creek Simulator Scenario Guide, Loss of Overhead Annunciators, LOCA with Downcomer Break, Breach in RCIC

Section 2OS1: Access Control to Radiologically Significant Areas

Orders

70036473	70045211	70047978	70048271	80086612	80088020
70037278	71145256	70048032	70048279	80087030	80088283
70041462	71145673	70048068	70048303	80087092	80088302
70042742	71145915	70048072	70048312	80087093	80088434
70043539	70046060	70048079	80085092	80087207	80088732
70044096	71146248	70048080	80085293	80087241	80088767
70044096	70046636	70048125	80085458	80087477	80089068
70044349	70047219	70048164	80085577	80087525	80089072
70044540	70047659	70048167	80085835	80088012	80089392
70044758	70047754	70048177	80086400	80088015	
70044962	70047945	70048217	80086511		

Other Documents
Self-Assessment Reports: 80077786-0040; 70046060-0080; 80066418-120; 80077786-00
Nuclear Oversight Audit # NOSA-HPC-05-06
Quality Assurance Assessment Report 2005-0053

Section 2OS2: ALARA Planning and Controls

Procedures
NC.RP-TI.ZZ-0203, High Radiation Area Key Control
NC.RP-TI.ZZ-0204, Posting of Radiological Signs and Barriers
NC.RP-TI.ZZ-0602, Radiation and Contamination Surveys
NC-RP.TI-ZZ-0704, TIP Room Entries

Other Documents
Self-Assessment Reports: 80077786-0040; 70046060-0080; 80066418-120; 80077786-00
Nuclear Oversight Audit # NOSA-HPC-05-06

Section 2OS3: Radiaiton Monitoring Instrumentation

Other Documents
Updated Final Safety Analysis Report, Section 12.3.4, Area Radiation and Airborne Radioactive Materials Monitoring Instrumentation

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

Corrective Action Notifications
20280188 20280764 20276295 20280233

Section 4OA1: Performance Indicator Verification

Procedures
HC.ER-DG.ZZ-0002, Rev. 2, System Function Level Maintenance Rule Scoping vs. Risk Reference
HC.ER-DG.ZZ-0003, Rev. 0, Preventable and Repeat Preventable System Functional Failure Determination
ER-AA-310-1004, Rev. 5, Maintenance Rule - Performance Monitoring

Corrective Action Notifications
20286061 20286030

Orders
70058157 70056741 70056675 70058063 70055864 70055182

Other Documents
LER 2004-006, 07/16/2004, High Pressure Coolant Injection Design System Requirements Not Demonstrated
LER 2004-009, 11/19/2004, As Found Values for Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable
LER 2004-010, 10/10/2004, Manual Reactor Scram Due to Moisture Separator Dump Line Failure
LER 2005-002, 03/27/2005, Through-Wall Leak on 'B' Reactor Recirculation System Decontamination Port
LER 2005-003, 06/07/2005, Reactor Coolant System Leak from Check Valve Position Indicator
LER 2005-004, 05/09/2005, 'A' Control Room Emergency Filtration (CREF) Train Inoperable with 'B' CREF Out Of Service
LER 2005-005, 06/28/2005, 'A' Control Room Emergency Filtration (CREF) Train Inoperable for Greater than Allowed Outage Time

LER 2005-007, 06/19/2005, 'B' Control Room Emergency Filtration (CREF) Train Inoperable Greater Than Allowed By Technical Specifications
LER 2005-008, 08/28/2005, Technical Specification Shutdown due to 'B' Suppression Chamber to Drywell Vacuum Breaker Not Closed
LER 2006-003, 04/21/2006, As Found Values for Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable
Hope Creek Maintenance Rule Computer System Information

Section 4OA2: Identification and Resolution of Problems

Procedures
SH.OP-AP.ZZ-0030, Rev. 8, Operator Burden Program
HC.OP-ST.KJ-0001, Rev. 57, Emergency Diesel Generator 1AG400 Operability Test - Monthly

Drawings
M-12-1, Rev. 13, Safety Auxiliaries Cooling Auxiliary Building

Corrective Action Notifications

20108190	20275734	20249423	20291679	20292798	20199983
20251208	20292430	20293502	20293541	20293503	20215390
20293551	20295875	20265096	20292644	20273346	20214921
20273346	20293607	20216600	20273346	20186751	20220400
20265806	20265096	20258640	20220180	20216170	
	20249133				

Orders

70026201	70043522	60048751	80090103	70051281	70052404
70059940	70060079	70052016	70049720	80077618	70038773
60051090	70049822	80077617	70043521		

Other Documents
PSEG Metrics for Improving the Work Environment, Salem and Hope Creek Generating Stations, Quarterly Report, July 27, 2006
Hope Creek 2005 PI&R Inspection Question/Answer Form Item Numbers: 2671, 2831, 2832, 2833, 2834, 2614
Calculation E-9, Rev. 8, Standby Class 1E Diesel Generator Sizing
Calculation EG-0020, Rev. 8, STACS - Required Flows and Heat Loads
VTD PM018Q-0290 Lube Oil Heat Exchangers Standby Diesel Generators

Section 4OA3: Event Followup

Procedures
HC.OP-AB.BOP-0006, Rev. 9, Main Condenser Vacuum
HC.OP-GP.AD-0001, Rev. 7, Condenser Tube/Shell Leak Investigation

HC.OP-AB.COOL-0002, Rev. 1, Safety/Turbine Auxiliaries Cooling System

Drawings
M-05-1, sheet 3, Rev. 17, Condensate
M-11-1, sheet 1, Rev. 17, Safety Auxiliaries Cooling Reactor Building

Corrective Action Notifications
20281208 20295881 20295830 20296204 20295737 20295252
20210558

Orders
70056675 70042439 70061279

Other Documents
Hope Creek Licensee Event Report 05000354/2006003-00, As Found Values For Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable, June 15, 2006
Hope Creek Maintenance Rule Program Expert Panel Meeting Minutes, September 12, 2006
Control Room Narrative Logs dated 8/29/06 through 8/31/06
Control Room Narrative Logs dated 8/25/06

LIST OF ACRONYMS

ALARA	As Low As Is Reasonably Achievable
BWROG	Boiling Water Reactor Owners Group
CEDE	Committed Effective Dose Equivalent
CRD	Control Rod Drive
EDG	Emergency Diesel Generator
HCGS	Hope Creek Generating Station
HCU	Hydraulic Control Unit
HP	Health Physics
HPCI	High Pressure Coolant Injection
HVAC	Heating Ventilation Air Conditioning
LDE	Lend Dose Equivalent
LERs	Licensee Event Reports
LLD	Lower Limit of Detection
LOIA	Loss of Instrument Air
MR	Maintenance Rule
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OPRM	Oscillation Power Range Monitor
PAR	Protective Action Recommendation
PI	Performance Indicators
PSEG	Public Service Enterprise Group Nuclear LLC
RCIC	Reactor Core Isolation Cooling
SACS	Safety Auxiliaries Cooling System

scfm	Standard Cubic Feed Per Minute
SCWE	Safety Conscious Work Environment
SDE	Skin Dose Equivalent
SDP	Significance Determination Process
SLC	Standby Liquid Control
SRVs	Safety Relief Valves
SSCs	Structures, Systems, and Components
STACS	Safety and Turbine Auxiliaries Cooling System
SW	Service Water
TACS	Turbine Auxiliaries Cooling System
TEDE	Total Effective Dose Equivalent
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UPS	Uninterruptible Power Supply
VHRA	Very High Radiation Area