

SAFEGUARDS INFORMATION



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

January 31, 2007

Enclosure 2 contains Safeguards Information. When Separated from Enclosure 1, this document is not Safeguards Information.

Mr. William Levis
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 05000354/2006005

Dear Mr. Levis:

On December 31, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Hope Creek Generating Station. The enclosed inspection report documents the inspection results, which were discussed on January 5, 2007, with Mr. G. 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 one NRC-identified finding and two self-revealing findings of very low safety significance (Green). This report also documents, in Enclosure 2, one finding of very low security significance (Green) as determined by the Physical Protection Significance Determination Process. The deficiency was promptly corrected or compensated for, and the plant was in compliance with applicable physical protection and security requirements within the scope of this inspection before the inspectors left the site. These findings were determined to involve violations of NRC requirements. Additionally, licensee-identified violations which were determined to be of very low safety significance are listed in this report. However, because of the very low safety significance and because they are entered into your corrective action

WARNING: Violation of Section 147 of the Atomic Energy Act, "Safeguards Information," is subject to civil and criminal penalties.

Safeguards information determination made by:
Name/Title James M. Trapp, Chief
Organization RI/DRS/PSB1
Basis DG-SG-1: (300) Physical Protection Program
Signature /RA/
Date 01/31/07

SAFEGUARDS INFORMATION

program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. 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 and 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: 1. Inspection Report 05000354/2006005
w/Attachment: Supplemental Information
2. Inspection Report 05000272/2006005, 05000311/2006005 and
05000354/2006005 w/Attachment: Supplemental Information (**Contains
Safeguards information (SGI)**)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 050000354

License No: NPF-57

Report No: 05000354/2006005

Licensee: Public Service Enterprise Group Nuclear LLC

Facility: Hope Creek Generating Station

Location: P.O. Box 236
Hancocks Bridge, NJ 08038

Dates: October 1, 2006 through December 31, 2006

Inspectors: G. Malone, Senior Resident Inspector
T. Wingfield, Resident Inspector
B. Welling, Senior Project Engineer
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Approved By: Mel Gray, Chief
Projects Branch 3
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SUMMARY OF FINDINGS

IR 05000354/2006005; 10/01/2006 - 12/31/2006; Hope Creek Generating Station; Maintenance Effectiveness, Other Activities.

The report covered a 13-week period of inspection by resident inspectors, and announced inspections by a regional operations inspector and a regional senior health physics inspector. Three Green non-cited violations (NCVs) 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: Mitigating Systems

- Green. A self-revealing non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when maintenance personnel lifted an energized lead (wire) that inadvertently tripped the 'B' control room chiller during maintenance on the 'B' control area battery room exhaust fan. PSEG's corrective actions included revising the maintenance planning development procedure and conducting a review of other relay replacement preventative maintenance procedures to identify weaknesses similar to those discovered during the investigation of this issue.

The inspectors determined the failure to provide appropriate procedures, drawings, or instructions for the replacement of a relay constituted a performance deficiency and a finding. The finding is more than minor because it is associated with the procedure quality attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. The inspectors conducted a Phase 1 SDP screening and determined the issue to be of very low safety significance (Green). The finding has a cross-cutting aspect in the area of human performance because personnel proceeded in the face of uncertainty or unexpected circumstances by deciding to lift two leads without understanding the effect that action would have on safety-related equipment. (Section 1R12)

- Green. A self-revealing non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the safety auxiliaries cooling system (SACS) throttle valve to the 'C' emergency diesel generator (EDG) was found out of its required position on August 11, 2006. PSEG's corrective actions included performing a flow balance on the EDG to correct SACS valve positions and implementing a modification to the SACS to increase available cooling flow to the EDGs. The finding is self-revealing, rather than licensee-identified, because the inspectors communicated concerns of unusually high lube oil temperatures during summer conditions to PSEG personnel that were not confirmed by PSEG for several months due to repetitive

deferrals of corrective action orders to evaluate the condition. PSEG had surveillance test data that demonstrated that all of the EDGs were exhibiting higher than normal lube oil temperatures during summer months and thus could reasonably have discovered the configuration control error before high summer temperatures challenged the capability of the EDG.

The inspectors determined that positioning equipment contrary to PSEG's configuration control and safety tagging procedures was a performance deficiency and a finding. The finding is more than minor because it is associated with the configuration control attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors conducted a Phase 1 SDP screening and determined the issue to be of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance because self and peer checks were not used effectively to verify the correct position of the SACS throttle valve following maintenance activities. (Section 4OA2)

- Green. The inspectors identified a non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action," when lube oil temperature exceeded the procedural limit of 170 degrees F on the 'B' EDG during a surveillance test on July 31, 2006. PSEG determined that a throttle valve in the SACS was not in the required position, which caused a reduction of cooling flow to the EDG lube oil cooler. The finding is NRC-identified because the inspectors communicated concerns of unusually high lube oil temperatures during summer conditions to PSEG personnel that were not confirmed by PSEG for several months due to repetitive deferrals of corrective action orders to identify the condition. PSEG's corrective actions included performing a flow balance on the EDG to correct SACS valve positions and implementing a modification to SACS to increase available cooling flow to the EDGs.

The finding is more than minor because it is associated with the configuration control attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors conducted a Phase 1 SDP screening and determined the issue to be of very low safety significance (Green). The finding has a cross-cutting aspect in the area of problem identification and resolution because PSEG did not promptly identify deficiencies that caused higher than expected temperatures in EDG lube oil systems. (Section 4OA2)

B. Licensee Identified Violations

Violations of very low safety significance, that 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 operated continuously at or near full power for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope (1 sample)

The inspectors reviewed the scope of PSEG's cold weather preparations to verify they adequately prepared equipment to operate reliably in freezing conditions. Specifically, inspectors performed a detailed review of PSEG's adverse weather procedures for seasonal extremes, interviewed engineering and operations personnel, and walked down portions of the service water, condensate storage, and fire protection systems that can be impacted by cold temperatures. The inspectors verified that heat tracing and insulation used to protect these systems were functional and that system conditions were adequate to support operation in cold weather. The documents reviewed during this inspection are listed in the attachment. This inspection satisfied one inspection sample for the onset of cold weather.

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 completed walkdowns to determine whether there were discrepancies that could impact the function of the system, and therefore, potentially increase risk. 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 personnel 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.

- 'A' through 'E' filtration, recirculation and ventilation system fans while the 'F' fan was tagged for planned maintenance on October 27, 2006;

- 'A' control room emergency filtration (CREF) system and support equipment during maintenance on the 'B' CREF system on October 31 - November 2, 2006; and
- 'A' service water train during emergent work on the 'C' service water train on October 20, 2006.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Fire Protection - Tours

a. Inspection Scope (8 samples)

The inspectors conducted tours of eight areas to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources 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. The eight areas toured are listed below with their associated pre-fire plan designator. Other documents reviewed are listed in the attachment.

- FRH-II-522, cable spreading room;
- FRH-II-713, 'A' and 'C' service water (SW) pump rooms;
- FRH-II-713, 'B' and 'D' SW pump rooms;
- FRH-II-713, SW traveling water screen room;
- FRH-II-552, electrical access area;
- FRH-II-413, 'C' residual heat removal pump room;
- FRH-II-512, high pressure coolant injection 250 Vdc battery room; and
- FRH-II-512, reactor core isolation cooling 250 Vdc battery room.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

.1 Internal Flooding

a. Inspection Scope (1 sample)

The inspectors reviewed selected risk-important plant design features and PSEG procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors focused on mitigation strategies and equipment in the 'A' safety auxiliaries cooling system (SACS) pump room. The inspectors reviewed flood analysis and design documents, including the updated final safety analysis report (UFSAR), engineering calculations, and abnormal operating procedures. The

inspectors observed the condition of wall penetrations, watertight doors, flood alarm switches, and drains to assess their readiness to contain flow from an internal flood in accordance with the design basis. In addition, the inspectors walked down the 'A' SACS room and adjacent rooms in the reactor building to assess potential flooding vulnerabilities.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Requalification Activities Review By Resident Staff

a. Inspection Scope (1 sample)

The resident inspectors observed one annual licensed operator requalification simulator scenario on October 12, 2006, to assess operator performance and training effectiveness. The scenario involved a loss of two inverters and a recirculation pump seal leak into containment with a failed reactor jet pump. The inspectors assessed simulator fidelity and observed the simulator instructor's critique of operator performance. The inspectors also observed control room activities with emphasis on identified areas for improvement. Finally, the inspectors reviewed applicable documents associated with licensed operator requalification as listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Biennial Review

a. Inspection Scope (1 sample)

The following inspection activities were performed using NUREG-1021, Rev. 9, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program," NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)," and 10 CFR 55.46 Simulator Rule as acceptance criteria.

The inspectors reviewed documentation of operating history since the last requalification program inspection. The inspectors also discussed facility operating events with the resident staff. Documents reviewed included NRC inspection reports, plant performance insights, licensee event reports (LERs), and corrective action program notifications that involved human performance issues for licensed operators to ensure that operational events were not indicative of possible training deficiencies. Documents reviewed are listed in the attachment.

The inspectors reviewed four exam sets (i.e., weeks 1, 2, 3 and 4) for simulator scenarios and two weeks of job performance measures (JPMs) administered during this current exam cycle to ensure the quality of these exams met or exceeded the criteria

established in the Examination Standards and 10 CFR 55.59. The inspectors compared these four scenario sets for repeatability. The inspectors also compared the “practice” scenarios used just prior to the exam administration to ensure no exam security issues were present.

The inspectors observed the administration of operating examinations to operating shifts E and C. The operating examinations consisted of two simulator scenarios and one set of five JPMs administered to each individual. The inspectors observed the training department staff administer four simulator scenarios, four simulator JPMs, and four in-plant JPMs.

The inspectors also reviewed all comprehensive written exams administered for the current requalification cycle for quality and exam security issues.

Conformance with Simulator Requirements Specified in 10 CFR 55.46

The inspectors observed simulator performance during the conduct of the examinations and reviewed discrepancy reports to verify compliance with the requirements of 10 CFR 55.46. The inspectors also reviewed:

- The list of open and closed Simulator Deficiency Reports (SDRs). The 34 open SDRs were reviewed to determine if deficiencies are being adequately prioritized and are being corrected in a timely manner. One SDR was reviewed in detail for proper resolution of issues.
- The controlling documents to ensure simulator capability, configuration control, and testing meet the guidance in ANSI/ANS 3.5, 1985.
- The completed simulator test schedule for 2004-2006. All annual transient tests performed in 2004, 2005, and 2006, as well as all malfunction simulator tests performed in 2006 were reviewed. The inspectors confirmed that the annual performance tests were being performed at the appropriate frequency and that the tests compared the simulator data to actual plant data or best estimate data as appropriate.

Conformance with Operator License Conditions

- Remediation training records were reviewed. The adequacy of remedial training was assessed by review of remediation packages for two examples of biennial written exam failures and twenty examples of segment exam failures and simulator or JPM performance deficiencies.
- Proficiency watch-standing and reactivation records were reviewed. One licensed operator reactivation record was reviewed as well as a random sample watch-standing documentation (i.e., all staff license individuals) for time on shift to verify currency and conformance with the requirements of 10 CFR 55.

Licensee’s Feedback System

The inspectors interviewed instructors, training/operations management personnel, and operators for feedback regarding the implementation of the licensed operator

requalification program to ensure the requalification program was meeting their needs and responsive to their noted deficiencies/recommended changes. The inspectors reviewed 20 individual feedback forms.

Review of Licensee Requalification Exam Results

On December 21, 2006, the inspectors conducted an in-office review of licensee requalification exam results. These results included the annual operating tests and Comprehensive Written Exams administered this year. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspectors verified that:

- Crew failure rate on the dynamic simulator was less than 20%. (Failure rate was 0%.)
- Individual failure rate on the dynamic simulator test was less than or equal to 20%. (Failure rate was 0%.)
- Individual failure rate on the walkthrough test (JPMs) was less than or equal to 20%. (Failure rate was 0%.)
- Individual failure rate on the comprehensive written exam was less than or equal to 20%. (Failure rate was 2%.)
- More than 75% of the individuals passed all portions of the exam. (98% of the individuals passed all portions of the exam.)

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)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). In addition, the inspectors specifically reviewed events where ineffective equipment maintenance had resulted in invalid automatic actuations of engineered safeguards systems affecting the operating units. Documents reviewed are listed in the attachment. Items reviewed included the following:

- 'B' control room chiller and ventilation train trip on September 7, 2006;

- 'C' service water traveling screen shear pin failure on October 21, 2006; and
- 'B' emergency diesel generator starting air failure on October 13, 2006.

b. Findings

Introduction: A Green self-revealing non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when maintenance technicians lifted an energized lead (wire) while working on the 'B' control area battery room exhaust fan and caused an inadvertent trip of the 'B' control room chiller (BK-400).

Description: On September 7, 2006, maintenance technicians lifted an energized lead in accordance with the work order instructions for a 22-year relay replacement preventive maintenance activity on the 'B' control area battery room exhaust fan (BV-410) control logic. The lifting of the lead also removed power from the low flow circuitry for the 'B' control equipment room supply fan (BV-407), which caused the BV-407 to trip. The trip of the BV-407 resulted in a trip of the 'B' control room chiller and ventilation train.

The BV-410 relay replacement work order referenced a system schematic and did not reference detailed wiring diagrams. When assembling the original work order for the relay replacement, PSEG planners did not reference plant drawings that indicated that additional equipment would be impacted when lifting the energized lead associated with the H1GK-1KY-1D-C-483-1V0413 (GK-V0413) relay for the BV-410 fan.

Prior to lifting the energized lead, maintenance technicians identified the work plan was inadequate because an unknown additional wire was located on the energized lead connection point. The maintenance supervisor and technicians reviewed additional drawings that were not included in the work package, but were unable to positively identify the additional lead because the drawings were illegible. However, the team decided not to revise the work plan and proceeded with the relay replacement based on experience with similar relay panel wiring. The 'B' control room chiller subsequently tripped when the additional lead was lifted.

Analysis: The inspectors determined that the failure to provide appropriate procedures for the replacement of the GK-V0413 relay constituted a performance deficiency and a finding. The finding is more than minor because it is associated with the procedure quality attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the availability 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 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, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk significant per 10 CFR 50.65, for greater than 24 hours, and did not screen as potentially risk significant due to external events. The finding has a cross-cutting aspect in the area of human performance because personnel proceeded in the face of uncertainty or unexpected circumstances

by deciding to lift two leads without positively knowing the effect that action would have on safety-related equipment.

Enforcement: 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances. Contrary to the above, PSEG did not provide appropriate guidance for the replacement of the GK-V0413 relay which resulted in three hours of unplanned availability of the 'B' control room chiller and ventilation train on September 7, 2006. PSEG's corrective actions included revising the maintenance planning development procedure to specifically require review of circuits for daisy chained circuits when lifting leads, developing a technical review template to be used in reviewing all 22-year relay replacement preventative maintenance (PM) orders and planning library copies, and conducting a review of a sampling of other 22-year relay replacement PMs for similar oversights. 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 05000354/2006005-01, Unplanned Trip of the 'B' Control Room Chiller and Ventilation Train.**

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

a. Inspection Scope (5 samples)

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

- Emergent unavailability of the 'B' service water (SW) pump during the planned maintenance on the 'D' SW pump on October 3, 2006 (a yellow risk condition);
- 1AD483 inverter troubleshooting and re-alignment on October 11-12, 2006;
- Planned maintenance on 'A' EDG ventilation trains on October 12-13, 2006;
- Emergent maintenance on the 10D420 125 V DC bus on December 8, 2006; and
- PSEG risk management actions associated with continued plant operation with a steam leak on the 3A feedwater heater extraction steam line on November 18, 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

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)a. Inspection Scope (4 samples)

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

- 'C' and 'D' suppression pool to drywell vacuum breakers indicated partially open on October 19, 2006;
- high pressure coolant injection suppression pool suction check valve inservice testing methodology issue on November 7, 2006;
- 'B' technical support center and 1E panel room chiller on November 24, 2006; and
- 'D' emergency diesel generator output breaker inoperability due to card failure on November 27, 2006.

The inspectors reviewed the technical adequacy of the operability determinations to ensure 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 screenings. Notifications and documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)a. Inspection Scope (1 sample)

The inspectors reviewed work performed to address vibration on the 'B' reactor recirculation pump prior to pump replacement in April 2006. The work included installing and removing balance weights, modifying vibration probe locations, and machining the pump coupling. The inspectors reviewed the maintenance and design change processes to ensure they were appropriately followed and the pump design basis was maintained.

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 or license 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.

- Work order (WO) 30105764/30120261, Replacement of 'D' service water spray wash booster pump and motor;
- WO 30045625, Replacement of K015A reactor protection system relay;
- WO 60065409, Inspection and repair of valve 1-AP-V050;
- WO 60066049, Replacement of the reactor core isolation cooling K23 relay; and
- WO 30135090, Inspection and weld repair of valve 1-BE-V032.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (4 samples)

The inspectors witnessed four 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 50099007, suppression pool to drywell vacuum breaker monthly operability test on October 19, 2006;
- WO 50098629, service water subsystem 'A' valves inservice test on October 20, 2006;
- WO 50099157, 'B' emergency diesel generator monthly operability test on October 27, 2006; and
- WO 50097983, 'G' diesel fuel oil transfer pump inservice test on November 3, 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 06-018) associated with the 00K107 and 10K107 station air compressors. The modification bypassed the aftercooler outlet temperature trip function for each compressor. The inspectors verified the modification was consistent with the design and licensing bases of the instrument air system and that the performance capability of the system was not degraded by the modification. The inspectors reviewed documents to verify PSEG followed their processes for implementing temporary modifications on plant SSCs. 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 also 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.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope (1 sample)

Resident inspectors evaluated the conduct of a simulator examination scenario on October 12, 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 to verify that event classification and notifications were completed in accordance with the Hope Creek Event Classification Guide. The inspectors also observed PSEG's critique of the examination 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: Public Radiation Safety

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

a. Inspection Scope (11 samples)

The inspectors reviewed the most current Radiological Effluent Release Report to verify that the program was implemented as described in Radiological Effluent Technical Specification/Offsite Dose Calculation Manual (RETS/ODCM); reviewed the report for significant changes to the ODCM and to radioactive waste system design and operation; determined whether the changes to the ODCM were made in accordance with Regulatory Guide 1.109 and NUREG-0133 and were technically justified and documented; determined whether the modifications made to radioactive waste system design and operation changed the dose consequence to the public; verified that technical and/or 10 CFR 50.59 reviews were performed when required; and, determined whether radioactive liquid and gaseous effluent radiation monitor setpoint calculation methodology changed since completion of the modifications.

The inspectors determined that anomalous results reported in the current Radiological Effluent Release Report were adequately resolved. The inspectors reviewed RETS/ODCM to identify the effluent radiation monitoring systems and its flow measurement devices; reviewed effluent radiological occurrence performance indicator incidents for onsite follow-up; reviewed PSEG self assessments, audits, and licensee event reports that involved unanticipated offsite releases of radioactive material; and, reviewed the UFSAR description of all radioactive waste systems.

The inspectors walked down the major components of the gaseous and liquid release systems (e.g., radiation and flow monitors, demineralizers and filters, tanks, and vessels) to observe current system configuration with respect to the description in the UFSAR, ongoing activities, and equipment material condition.

The inspectors reviewed several radioactive liquid and gaseous waste release permits, including the projected doses to members of the public.

The inspectors reviewed the records of any abnormal releases or releases made with inoperable effluent radiation monitors and reviewed PSEG's actions for these releases to ensure an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment.

The inspectors reviewed changes made by PSEG to the ODCM as well as to the liquid or gaseous radioactive waste system design, procedures, or operation since the last inspection. For each system modification and each ODCM revision that impacted effluent monitoring or release controls, the inspectors reviewed PSEG's technical justification and determined whether the changes affected PSEG's ability to maintain effluents as low as is reasonable achievable (ALARA) and whether changes made to monitoring instrumentation resulted in a non-representative monitoring of effluents.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that PSEG had properly calculated the offsite dose from radiological effluent releases and to determine if any annual RETS/ODCM (i.e., Appendix I to 10 CFR Part 50 values) were exceeded and, if appropriate, issued a Performance Indicator (PI) report if any quarterly values were exceeded.

The inspectors reviewed air cleaning system surveillance test results and PSEG specific methodology to ensure that the system is operating within PSEG's acceptance criteria. The inspectors also reviewed surveillance test results and methodology PSEG uses to determine the stack and vent flow rates and verified that the flow rates are consistent with RETS/ODCM or UFSAR values.

The inspectors reviewed the records of any abnormal releases made with inoperable radiation monitors, and determined that there were no releases of this type since the last inspection of this area. The inspectors also verified that PSEG's records of spills, leaks and other unusual occurrences were properly maintained in accordance with 10 CFR 50.75(g).

The inspectors reviewed records of radiation monitoring system (RMS) instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device and reviewed any completed system modifications and the current effluent radiation monitor alarm setpoint value for

agreement with RETS/ODCM requirements. The inspectors also reviewed calibration records of radiation measurement (i.e., counting room) instrumentation associated with effluent monitoring and release activities and reviewed quality control records for the radiation measurement instruments.

The inspectors reviewed the results of the interlaboratory comparison program to verify the quality of radioactive effluent sample analyses performed by PSEG; reviewed the PSEG's quality control evaluation of the interlaboratory comparison test and associated corrective actions for any deficiencies identified; and reviewed the results from the PSEG's quality assurance audits and determined that PSEG met the requirements of the RETS/ODCM.

The inspectors reviewed PSEG's licensee event reports, special reports, audits, and self assessments related to the RETS/ODCM program performed since the last inspection. The inspectors determined that identified problems were entered into the corrective action program for resolution. The inspector also reviewed problem notifications affecting RETS/ODCM.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope (1 sample)

Cornerstone: Public Radiation Safety

The inspectors reviewed a listing of PSEG action reports for the period January 1, 2006, through October 16, 2006, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences per site that exceed 1.5 millirem per quarter (mrem/qtr) whole body dose or 5 mrem/qtr organ dose for liquid effluents; or 5 mrads/qtr gamma air dose, 10 mrads/qtr beta air dose; or 7.5 mrems/qtr organ doses from I-131, I-133, H-3 and particulates for gaseous effluents.

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 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 Semi-Annual Review to Identify Trends

a. Inspection Scope (1 sample)

As required by Inspection Procedure 71152, Identification and Resolution of Problems, the inspectors performed a review of PSEG's corrective action program (CAP) and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues, but also considered the results of daily inspector CAP item screening discussed in Section 40A2.1. The review also included issues documented outside the normal CAP in system health reports, corrective maintenance work orders, component status reports, site monthly meeting reports and maintenance rule assessments. The inspectors' review nominally considered the six-month period of June 1, 2006, through November 30, 2006, although some examples expanded beyond those dates when the scope of the trend warranted. The inspectors specifically trended engineering program and corrective action program effectiveness. The inspectors compared and contrasted their results with the results contained in Hope Creek's latest monthly Business Plan Performance Reports. Corrective actions associated with a sample of the issues identified in PSEG's performance indicator were reviewed for adequacy. Documents reviewed are listed in the attachment.

b. Assessment and Observations

No findings of significance were identified.

The inspectors concluded that PSEG's identification of engineering problems was consistent with those identified by inspectors over the period reviewed. PSEG's evaluations were of sufficient scope and depth to address identified problems. The inspectors concluded that corrective actions were adequate in addressing engineering and corrective action program product quality.

.3 Annual Sample: Operations Excellence Plan

a. Inspection Scope (1 sample)

The inspectors reviewed PSEG's actions related to the Hope Creek Operations Excellence Plan that was examined during the NRC's special inspection of the safety conscious work environment (SCWE), Inspection Report 05000272; 311/2006012 and 05000354/2006011, dated July 31, 2006. In that report, the NRC noted that although improvements to the work environment at Salem and Hope Creek were substantial and sustainable, PSEG had missed some opportunities to address negative perceptions of the work environment in the Hope Creek Shift Operations work group. Further, the NRC observed that PSEG's plan to address these perceptions, the Hope Creek Operations Excellence Plan, did not initially include detailed analysis of survey and assessment results. In response, PSEG made adjustments to the plan to include analysis and actions for the survey and assessment results.

The NRC's Mid-Cycle Performance Review letter for Hope Creek, dated August 31, 2006, stated that the NRC intended to continue to monitor performance in the SCWE during baseline inspections. Additionally, the letter stated that the NRC intended to

review actions from the Operations Excellence Plan, as tracked in the corrective action program and intended to further improve the work environment in the operations work group, through a baseline problem identification and resolution sample inspection. During this review, the inspectors reviewed corrective action program notifications, supporting documentation, and discussed the actions with Hope Creek personnel.

b. Findings and Observations

No findings of significance were identified.

The inspectors determined that PSEG had made progress on a number of actions described in the Hope Creek Operations Excellence Plan. These actions were intended to improve the work environment and workers' perceptions, and covered such areas as overtime mitigation, succession planning, departmental communication, and accountability.

The inspectors discussed the actions with several Hope Creek personnel. All of the personnel interviewed stated that they felt free to raise safety concerns and they believed that plant equipment performance had improved during the past year. Many of those interviewed indicated that progress had been made on the items in the Operations Excellence Plan, and the overall work environment had improved over the past year or two. However, others perceived that some aspects of the work environment had not improved and were concerned about both the rate of attrition in the operations department and some communications issues between management and staff.

The inspectors concluded that PSEG had made adequate progress on the Hope Creek Operations Excellence Plan; however, there remained a range of perceptions among operations personnel on the progress to date. The inspectors observed that the Operations Excellence Plan remains a living document with a number of ongoing actions intended to further improve the work environment.

4. (Closed) URI 05000354/2006004-03, Elevated Emergency Diesel Generator Lube Oil Temperatures

a. Inspection Scope

On July 31, 2006, during a surveillance test of the 'B' emergency diesel generator (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 also the acceptance criteria in the surveillance test procedure. On August 10, 2006, PSEG determined that the safety auxiliaries cooling system (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. This issue was 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. The inspectors completed the review of

PSEG's evaluations and concluded there were two findings associated with the issue. This URI is closed.

b. Findings

(.1) Mispositioned Valve Results in Reduced Cooling Flow to the 'C' Emergency Diesel Generator

Introduction: A Green self-revealing non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when a SACS throttle valve to the 'C' EDG was found out of its required position on August 11, 2006.

Description: On July 31, 2006, PSEG equipment operators observed that lube oil temperatures on the 'B' EDG exceeded the procedural limit of 170 degrees F during a surveillance test. PSEG investigated the issue and found that a SACS throttle valve was mispositioned such that cooling water flow was reduced to the 'B' EDG. On August 10, 2006, PSEG performed a flow balancing procedure to optimize flow to the 'B' EDG and position the SACS throttle valve to its correct position. Additionally, PSEG increased the amount of SACS flow available to the EDGs by implementing a temporary modification that throttled a normally full-open valve to the residual heat removal (RHR) heat exchangers on August 8, 2006. This throttling reduced the amount of excess cooling to the RHR heat exchanger and made more coolant available to the EDGs. The temporary modification was inspected and documented in NRC Integrated Inspection Report 05000354/2006004 in Section 1R23. The temporary modification was made a permanent plant modification during this inspection period.

On August 11, 2006, PSEG performed flow balancing on the 'C' EDG. The SACS throttle valve to the 'C' EDG was found to be 2 3/4 turns open instead of the required 4 turns open. Following an engineering evaluation, PSEG determined that the 'B' and 'C' EDGs were operable. PSEG reviewed past operability using service water temperature data from August 8, 2005, to August 10, 2006. PSEG determined that the EDGs remained operable through the period. PSEG also concluded that flow balancing tests on the 'A' or 'D' EDGs were not necessary because surveillance test data indicated satisfactory SACS flow.

PSEG evaluated the mispositioning event on the 'C' EDG and determined that the valve was likely mispositioned following work clearance activities on January 11, 2006. The review identified that temperature trends through the EDG heat exchanger changed after the work activity in January 2006 such that the measured temperature difference across the heat exchanger changed from approximately 17 degrees F to approximately 26 degrees F. PSEG could not find records of the work clearance or which individuals were involved in the valve positioning. PSEG identified the most likely cause to be that an equipment operator incorrectly positioned the valve and that the concurrent verifier failed to identify the improper valve position. PSEG configuration control and safety tagging procedures require that all valve manipulations be conducted in accordance with work control documents that identify the proper position of the valve to be manipulated.

Analysis: The inspectors determined that the positioning of components contrary to PSEG's configuration control and safety tagging procedures was a performance deficiency and a finding. The finding is more than minor because it is associated with the configuration control attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined the issue 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, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk significant per 10 CFR 50.65, for greater than 24 hours, and did not screen as potentially risk significant due to external events. The finding has a cross-cutting aspect in the area of human performance because self and peer checks were not used effectively to verify the correct position of the SACS throttle valve.

Enforcement: 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, equipment operators positioned valves contrary to the instructions in PSEG procedure SH.OP-AP.ZZ-0015, "Safety Tagging Operations," on January 11, 2006, resulting in reduced SACS flow to the 'C' EDG. The valves remained in the incorrect position until August 11, 2006. PSEG performed flow balancing procedures on the 'C' EDG on August 11, 2006, and established the correct configuration and SACS flow to the EDG. Because this finding is of very low safety significance and has been entered into the corrective action program in notification 20293067, this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000354/2006005-02, Mispositioned Valve Results in Reduced Cooling Flow to the 'C' Emergency Diesel Generator)**

(.2) High Temperature Condition on 'B' Emergency Diesel Generator Not Fully Identified in a Timely Manner

Introduction: The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action," when lube oil temperature exceeded the procedural limit of 170 degrees F on the 'B' EDG during a surveillance test on July 31, 2006.

Description: On August 8, 2005, PSEG equipment operators observed lube oil temperatures on the 'D' EDG at 168 degrees F during the monthly surveillance test. An evaluation (70049720) was performed by the system engineer to analyze the issue. 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 evaluation (70049822) was created on August 8, 2005, to evaluate the adequacy of the vendor-recommended maximum operating lube oil temperature of 170 degrees F. The vendor continued to recommend 170 degrees F 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 content of the evaluations. Specifically, data from surveillance tests showed that EDG lube oil temperatures sometimes approached technical specification limiting conditions when service water (SW) and SACS temperatures were at moderate values on all four EDGs. The inspectors questioned past operability of the four EDGs and whether the EDGs would exceed design lube oil temperatures during higher 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 an engineering 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. A subsequent engineering 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. PSEG also determined that the 175 degrees F limit was a nominal value based on the use of vendor supplied, skid-mounted temperature instruments. 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. Additionally, PSEG increased the amount of SACS flow

available to the EDGs by implementing a temporary modification that throttled a normally full-open valve to the RHR heat exchangers on August 8, 2006. This throttling reduced the amount of excess cooling to the RHR heat exchanger and made more cooling available for the EDGs. The temporary modification was inspected and documented in NRC Integrated Inspection Report 05000354/2006004 in Section 1R23. The temporary modification was made a permanent plant modification during this inspection period.

Analysis: The inspectors determined that PSEG did not fully identify a condition adverse to quality in a timely manner. Specifically, evaluations that were created to identify deficiencies in the EDG lube oil cooling system in response to inspector questions were deferred several months beyond the seasonal period when the systems would be challenged again by higher ambient air and heat sink temperatures. The finding is more than minor because it is associated with the configuration control attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined the issue 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, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk significant per 10 CFR 50.65, for greater than 24 hours, and did not screen as potentially risk significant due to external events. The finding has a cross-cutting aspect in the area of problem identification and resolution because PSEG did not promptly identify deficiencies that caused higher than expected temperatures in EDG lube oil systems.

Enforcement: 10 CFR 50 Appendix B, Criterion XVI, "Corrective Actions," states, 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 promptly identify deficiencies that caused higher than expected temperatures in EDG lube oil systems, which was initially observed during testing on August 8, 2005. This led to the delayed discovery of mispositioned SACS throttle valves on the 'B' EDG that resulted in exceeding the 170 degrees F procedural limit on lube oil temperature during a surveillance test of the 'B' EDG on July 31, 2006. Because this finding is of very low safety significance and has been entered into the corrective action program in notification 20293067, this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000354/2006005-03, High Temperature Condition on 'B' Emergency Diesel Generator Not Fully Identified in a Timely Manner)**

- .5 Annual Sample: Problems with Moisture Separator and Feedwater Heater Valves
- a. Inspection Scope (1 sample)

The inspectors reviewed PSEG's actions to resolve problems associated with feedwater heater and moisture separator level control. A number of issues have been identified in

the PSEG corrective action process (CAP) describing degraded conditions relating to level controllers, drain valves and dump valves. The issues were selected for review based on their potential to increase the likelihood of an initiating event, or cause the actuation of a safety system. The inspectors reviewed PSEG procedures, vendor documents, design change packages, notifications, orders, corrective actions, apparent cause investigations, and a root cause analysis to understand the equipment functions and operational history, as well as the identification, evaluation, and corrective actions associated with the degraded conditions. System engineers, design engineers, reactor operators and other PSEG staff were interviewed to supplement the document review process.

The following examples illustrate a sampling of issues associated with feedwater heater and moisture separator level control problems:

In October and November of 2005, PSEG removed the 6A feedwater heater (FWH) from service several times due to higher-than-expected vibrations in the 6A cascading drain piping to the 5A FWH. An apparent cause evaluation of the vibrations revealed flashing in the valve internals of the 6A FWH level control valve (LCV) 1AFLV-1506A due to a higher-than-expected pressure drop within the valve. Corrective actions were implemented to replace 1AFLV-1506A during refueling outage 13 (RF13) with a new LCV designed with staged pressure drops specifically to prevent internal flashing (DCP 80088090). An extent of condition investigation revealed acceptable vibration levels in the remainder of the heater drain lines. However, additional corrective actions were implemented to replace the 6B and 6C FWH LCVs during the next refueling outage (RF14) in October 2007.

On May 12, 2006, the 5C FWH tripped during preparations to place the 'C' reactor feed pump in service. PSEG personnel tuned the level controllers of several feedwater heaters and subsequently identified a water hammer condition that contributed to the 5C FWH trip. Corrective actions were taken to address this condition.

b. Findings and Observations

No findings of significance were identified.

The inspectors determined that PSEG appropriately identified degraded conditions associated with feedwater heater and moisture separator level control and entered them into the corrective action program. Evaluations of degraded conditions were thorough, and included considerations for extent of condition. The inspectors determined that corrective actions developed by PSEG adequately addressed the identified deficiencies.

4OA3 Event Followup (71153)

.1 (Closed) LER 05000354/2006-004-00, Main Steam Line Radiation Monitor Set Points

On August 23, 2006, PSEG identified that all main steam line radiation monitors (MSLRMs) were inoperable. Technical Specification 3.3.2, "Isolation Action Instrumentation," requires that MSLRM isolation trip systems without operable channels be placed in the tripped condition within one hour. PSEG placed the 'A' and 'C' trip systems in a tripped condition, but contrary to the requirement, PSEG did not place the 'B' or 'D' MSLRM trip system in a tripped condition within one hour. The inspectors

reviewed the LER and evaluations associated with the performance deficiency. The enforcement aspects of this finding are discussed in Section 4OA7. This LER is closed.

4OA5 Other Activities

Temporary Instruction 2515/169: Mitigating Systems Performance Index Verification

a. Inspection Scope (1 sample)

Temporary Instruction (TI) 2515/169 was issued on July 25, 2006, to verify that licensees have correctly implemented the Mitigating Systems Performance Index (MSPI) guidance for reporting unavailability and unreliability of the monitored safety systems. The MSPI replaces the four safety system unavailability (SSU) indicators currently in use in the Reactor Oversight Process. The MSPI monitors the unavailability and unreliability of the same four safety systems that comprise the SSU indicators; however, it also monitors the cooling water support systems for those four safety systems. For Hope Creek, the systems monitored by the MSPI are: high pressure coolant injection (HPCI) system, reactor core isolation cooling (RCIC) system, the suppression pool cooling function of the residual heat removal (RHR) system, the emergency diesel generators (EDGs), and the cooling system comprised of the service water (SW) system and safety auxiliaries cooling system (SACS).

The inspectors reviewed the Hope Creek MSPI Bases Document, Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4, station procedures, maintenance rule data, notifications, control room operating logs, technical specification log entries, system engineering notebooks, and a compilation of MSPI data to complete the following inspection requirements:

- On a sampling basis, the inspector will review the licensee's list of surveillance activities which, when performed, do not render the train unavailable due to the short duration of the activity (less than 15 minutes).
- On a sampling basis, the inspector will review the licensee's list of surveillance activities which, when performed, do not render the train unavailable due to the credit for operator recovery activities as defined by Nuclear Energy Institute (NEI) 99-02 (Regulatory Assessment Performance Indicator Guideline), Revision 4, page F-6.
- For each MSPI system, using the general concepts discussed in Section 1.2.2 of Appendix F of NEI 99-02, Revision 4, the inspector will independently determine the baseline planned unavailability hours and confirm that these hours were correctly translated into the basis document.
- On a sampling basis for each MSPI system, using operating logs, corrective maintenance records, and condition reports, the inspector will confirm that the actual planned and unplanned unavailability data is accurate.
- On a sampling basis for each MSPI system, based on a review of related maintenance and test history, the inspector will confirm the accuracy of the failure data (demand failures, run/load failures, and failures to meet the risk-significant mission time, as applicable) for the identified monitored components.

The TI also requires the documentation of the following questions and their answers:

1. For the sample selected, did the licensee accurately document the baseline planned unavailability hours for the MSPI systems?
2. For the sample selected, did the licensee accurately document the actual unavailability hours for the MSPI systems?
3. For the sample selected, did the licensee accurately document the actual unreliability information for each MSPI monitored component?
4. Did the inspector identify significant errors in the reported data, which resulted in a change to the indicated index color? Describe the actual condition and corrective actions taken by the licensee, including the date when the revised PI information was submitted to the NRC.
5. Did the inspector identify significant discrepancies in the basis document which resulted in (1) a change to the system boundary; (2) an addition of a monitored component; or (3) a change in the reported index color? Describe the actual condition and corrective actions taken by the licensee, including, the date of when the bases document was revised.

b. Findings and Observations

No findings of significance were identified.

In response to the five questions listed in the Inspection Scope, the inspectors determined that:

1. PSEG accurately documented the baseline unavailability hours for the MSPI systems.
2. PSEG accurately documented the actual unavailability hours for the MSPI systems.
3. PSEG accurately documented the actual unreliability information for each MSPI monitored component.
4. The inspectors did not identify significant errors in the reported data that resulted in a change to the indicated index color.
5. The inspectors did not identify significant discrepancies in the basis document which resulted in (1) a change to the system boundary; (2) an addition of a monitored component; or (3) a change in the reported index color.

4OA6 Meetings, Including Exit

On January 5, 2007, 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 violations of very low significance (Green) were identified by PSEG and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as non-cited violations.

- Technical Specification 3.3.2, "Isolation Action Instrumentation," requires that main steam radiation monitor (MSLRMs) isolation trip systems without operable channels be placed in the tripped condition within one hour. Contrary to this requirement, on August 23, 2006, PSEG identified that all MSLRMs were inoperable but did not place the 'B' or 'D' MSLRM trip system in a tripped condition within one hour. The 'A' and 'C' trip systems were placed in a tripped condition. PSEG entered this issue into their corrective action program as notification 20294984. The issue was determined to be of very low safety significance, based on IMC 0609, Appendix C, Occupational Radiation Safety Significance Determination Process, because it was not an ALARA planning or work controls issue, there was neither substantial potential for nor an actual overexposure, and the ability to assess dose was not compromised.
- 10 CFR 55.46(d)(1) requires, in part, that simulator performance test results be retained for four years or until superceded by updated test results. Contrary to this requirement, the documentation of simulator performance testing, per NRC Regulatory Guide 1.149, Rev. 2 and ANSI/ANS 3.5-1993, consisted of a computer database listing the date of the test and any comments by the tester. There were no test procedures stating what criteria were used to evaluate these test results for malfunctions, as satisfying the acceptance criteria of the ANSI standard or retention of data for most of the tests conducted. This was identified in PSEG's corrective action program as order 70057878. This issue was of very low safety significance because there was no impact on operator performance and no actual impact to simulator fidelity.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

G. Barnes, Site Vice President
M. Massaro, Plant Manager
B. Booth, Operations Manager
P. Tocci, Training Director
M. Jesse, Regulatory Assurance Manager
M. Bruecks, Manager, Nuclear Security
K. Knaide, Senior Manager Plant Engineering
E. Parker, Operations Training Manager
J. DeFebo, Nuclear Oversight Manager
E. Carter, Simulator Supervisor
J. D'Sousa, Technical Specialist, ODCM
E. Martin, Emergency Diesel Generators System Engineer
L. Mayer, Radiation Monitoring System Engineer
W. Wikoff, Ventilation System Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

05000354/2006005-01	NCV	Unplanned Trip of the 'B' Control Room Chiller and Ventilation Train (Section 1R12)
05000354/2006005-02	NCV	Mispositioned Valve Results in Reduced Cooling Flow to the 'C' Emergency Diesel Generator (Section 4OA2.4)
05000354/2006005-03	NCV	High Temperature Condition on 'B' Emergency Diesel Generator not Fully Identified in a Timely Manner (Section 4OA2.4)

Closed

05000354/2006004-03	URI	Elevated EDG Lube Oil Temperatures (Section 4OA2.4)
05000354/2006-004-00	LER	Main Steam line Radiation Monitor Set Points (Section 4OA3.1)

LIST OF DOCUMENTS REVIEWED

In addition to the documents identified in the body of this report, the inspectors reviewed portions of 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
 HCGS Safety Evaluation Report (NUREG-1048)
 USNRC Standard Review Plan (NUREG-0800)
 Standard Technical Specifications General Electric Plants, BWR/4 (NUREG-1433)

Section 1R01: Adverse Weather Protection

Procedures

WC-AA-107, Rev. 2, Seasonal Readiness
 HC.OP-GP.ZZ-0003, Rev. 18, Station Preparations For Winter Conditions
 HC.OP-SO.DA-0001, Rev. 36, Circulating Water System Operation

Corrective Action Notifications

20243287	20261514	20288581	20264441	20276339	20288363
20249453	20264233	20219599	20264788	20291618	20302553
20260373	20285340	20245838			

Orders

80089440	70049812	80086828	70049134	80087262	70058754
70048656	70051633	70058867			

Section 1R04: Equipment Alignment

Procedures

HC.OP-AP.ZZ-0108, Rev. 25, Operability Assessment and Equipment Control Program
 SH.OP-AP.ZZ-0027, Rev. 12, On-Line Risk Assessment
 HC.OP-SO.GU-0001, Rev. 23, Filtration, Recirculation, and Ventilation System Operation
 HC.OP-SO.GK-0001, Rev. 10, Control Area Ventilation System Operation
 HC.OP-SO.GJ-0001, Rev. 43, Control Area Chilled Water System Operation
 HC.OP-SO.EA-0001, Rev. 29, Service Water System Operation

Completed Surveillances

HC.OP-ST.GK-0003, B - Control Room Emergency Filtration System Functional Test - Monthly, dated 11/3/06
 HC.OP-ST.GK-0001, A - Control Room Emergency Filtration System Functional Test - Monthly, dated 10/18/06

Drawings

M-76-1, Sheet 1, Rev. 19, Reactor Building Air Flow Diagram
 M-83-1, Sheet 1, Rev. 26, Reactor Building Supply Control Diagram

M-84-1, Sheet 1, Rev. 30, Reactor Building Exhaust Control Diagram
 M-78-1, Rev. 21, Aux. Bldg. Control Area Air Flow Diagram
 M-90-1, Rev. 28, Auxiliary Building Control Area Chilled Water System - Control Area Chillers

Corrective Action Notifications

20282325 20302897 20303253

Other Documents

HCGS PRA Risk Evaluation Form for Work Week No. 1448 (10/29/06 - 11/04/06)
 WCDs 4178836, 4188567

Section 1R05: Fire Protection

Procedures

Hope Creek Pre-Fire Plan FRH-II-522, Rev. 5, Cable Spreading Room, Elevation 77'
 Hope Creek Pre-Fire Plan FRH-II-713, Rev. 4, Service Water Intake Structure
 FRH-II-512 Battery Rooms Elevation: 54'-0"
 FRH-II-552 Control Room & Electrical Access Area Elevation: 137'-0"
 FRH-II-413 RHR Pump & Heat Exchanger Rooms Elevation: 54'-0"
 HC.FP-PM.QB-0039, Rev. 3, Appendix R Standby Self-Contained 8 Hour Battery Powered
 Emergency Light Unit Inspection and Preventative Maintenance
 HC.FP-AP.ZZ-0004, Rev. 10, Actions for Inoperable Fire Protection - Hope Creek Station
 Salem and Hope Creek Fire Impairment Log Book, dated 10/5/06
 Salem and Hope Creek Hot Work Log Book, dated 10/5/06

Corrective Action Notifications

20267155 20299030 20299361 20294216 20295332
 20291877 20299054 20299442 20299475
 20299029 20299154

Section 1R06: Flood Protection Measures

Procedures

HC.OP-AB.COOL-0002, Rev. 1, Safety/Turbine Auxiliary Cooling System
 HC.OP-AB.COOL-0003, Rev. 2, Reactor Auxiliary Cooling
 HC.OP-AB.CONT-0003, Rev. 3, Reactor Building
 HC.OP-AR.ZZ-0001 Window A1-B5, SACS Pump Room Flooded

Drawings

J-11-0, Rev. 10, Logic Diagram Safety Auxiliaries Cooling
 J-25-0, Rev. 6, Logic Diagram Plant Leak Detection

Corrective Action Notifications

20153715 21053716 20247022 20268878 20278269 20299578

Orders

40000818 60056297

Other Documents

HC.RW-FT.HB-0001, Sump Pump Status Check - Monthly, dated 10/2/06
 CD-273Y, Commitment Status Report, dated 6/7/85
 CALC. No. 11-28, Rev. 4, Reactor Building Flood Calculations for Elevation 102'

Section 1R11: Licensed Operator Requalification ProgramProcedures

HC.OP-AP.ZZ-0108, Rev. 25, Operability Assessment and Equipment Control Program
 HC.OP-AB.IC-0001, Rev. 5, Control Rod
 HC.OP-AB.CONT-0001, Rev. 0, Drywell Pressure
 HC.OP-AB.CONT-0002, Rev. 2, Primary Containment
 HC.OP-AB.CONT-0004, Rev. 1, Radioactive Gaseous Release
 HC.OP-AB.COOL-0003, Rev. 2, Reactor Auxiliary Cooling
 HC.OP-AB.RPV-0006, Rev. 1, Safety/Relief Valve
 HC.OP-AB.ZZ-0001, Rev. 7, Transient Plant Conditions
 HC.OP-SO.BF-0002, Rev. 26, Individual CRD Operation
 HC.OP-SO.BG-0001, Rev. 39, Reactor Water Cleanup System Operation
 HC.OP-SO.GU-0001, Rev. 23, Filtration, Recirculation and Ventilation System Operation
 HC.OP-EO.ZZ-0101, Rev. 10, Reactor Pressure Vessel Control
 HC.OP-EO.ZZ-0101FC, Rev. 10, Reactor Pressure Vessel Control Flow Chart
 HC.OP-EO.ZZ-0102, Rev. 11, Containment Control
 HC.OP-EO.ZZ-0102FC, Rev. 11, Containment Control Flow Chart
 SH.TQ-TC.ZZ-0305(Z), Rev 20, NRC Licensed Operator Requalification Program
 NC.TQ-TC.ZZ-0026(Z), Rev 13, Development and Administration of Licensed Operator
 Requalification Exams
 TQ-AA-210-4101, Rev 1, Remedial Training Notification and Action on Failure
 SH.OP-DD.ZZ-0067(Z), Rev 4, Personnel Selection, Training and Qualification
 SH.OP-DD.ZZ-0067(Z), Rev 4, Operator Watch Standing Documentation
 HC.OP-AP.ZZ-0005(Q), Rev 12, Department Operating Practices

Corrective Action Notifications

20237793	20253139	20265700	20291492	20254206	20268721
20241015	20254048	20289479	20292029	20263384	20206631
20246280	20254459	20289507	20298846		

Orders

80083428	70050626	70059184	70062176	70057878	70036769
70048262	70050769	60064150	70041194	70038083	70052792
80083455	70059593				

Other Documents

Hope Creek Event Classification Guide
 TQ-AA-1013 Rev 1: "Simulator Coordinator/Simulator Review Board Simulator Testing
 Review Board Member Orientation Guideline."
 ANSI 3.5, 1993, "Nuclear Power Plant Simulators for Use in Operator Training and
 Evaluation"
 NC.TQ-WB.ZZ-0003(Z) Rev 6: "Simulator Performance Evaluations"
 TQ-AA-210 Rev 8: "TSD Process Activities"
 TQ-AA-302, Rev 6, "Simulator Testing and Documentation"

TQ-AA-303, Rev 4, "Controlling Simulator Core Updates and Thermal-Hydraulic Model Updates"
 TQ-AA-304, Rev 0, "Simulator Modifications and Projects Planning"
 Regulatory Guide 1.149, Rev 2, "Nuclear Power Plant Simulation Facilities for use in Operator License Examinations"
 Simulator Work Request H-2006-097, "Main Steam Line Monitors response to RPS Bus loss"
 LER 2004-01-00, "Manual Reactor Scram Following Isolation of Primary Containment Instrument Gas (PCIG)"
 LER 2004-010-00, "Manual Reactor Scram Due to Separator Line Failure"
 LER 2005-005-00, "A Control Room Emergency Filtration (CREF) Train Inoperable for Greater Than Allowed Outage Time"
 ANS 3.5-1993 Appendix B Tests (a) through (j) Test Year 2004
 ANS 3.5-1993 Appendix B Tests (a) through (j) Test Year 2005
 ANS 3.5-1993 Appendix B Tests (a) and (b) Test Year 2006
 Stability Test 2004, 2005, 2006
 Steady State Test 2004, 2005, 2006
 Normal Evolution Test 2005: Shutdown from Rated Power to Cold Shutdown

Section 1R12: Maintenance Effectiveness

Procedures

ER-AA-310-1004, Rev. 5, Maintenance Rule - Performance Monitoring
 HC.ER-DG.ZZ-0002, Rev. 2, Hope Creek Generating Station System Function Level Maintenance Rule Scoping
 HC.MD-PM.EP-0001, Rev. 15, Service Water Traveling Screen Inspection
 HC.OP-AP.ZZ-0108, Rev. 25, Operability Assessment and Equipment Control Program
 HC.OP-AR.GJ-0004, Rev. 2, Chiller 1BK400 Control Panel 1BC490
 HC.OP-AR.GM-0001, Rev. 5, Diesel Area HVAC Local Panel 1EC483
 HC.OP-AR.ZZ-0019, Rev. 15, Overhead Annunciator Window Box E6
 HC.OP-SO.EA-0001, Rev. 29, Service Water System Operation
 HC.OP-SO.EP-0001, Rev. 15, Service Water Traveling Screens System Operation
 HC.OP-SO.GJ-0001, Rev. 43, Control Area Chilled Water System Operation
 HC.OP-ST.KJ-0002, Rev. 60, Emergency Diesel Generator 1BG400 Operability Test - Monthly
 MA-AA-716-004, Rev. 6, Conduct of Troubleshooting
 MA-HC-716-004-001, Rev. 0, Conduct of Troubleshooting
 MA-HC-716-010-0001, Rev. 0 and Rev. 1, Maintenance Planning
 SH.OP-AP.ZZ-0008, Rev. 5, Operations Troubleshooting and Evolutions Plan Development
 SH.OP-AP.ZZ-0027, Rev. 12, On-Line Risk Assessment
 SH.OP-AP.ZZ-0102, Rev. 15, Use of Procedures

Drawings

M-30-1, Sh. 3, Rev. 18, Diesel Engine Auxiliary Systems Starting Air & Lube Oil
 E-0493-0, Sh. 1, Rev. 6, Electrical Schematic Diagram Auxiliary Building Control Area Battery Exhaust Fans

Corrective Action Notifications

20217955	20299167	20301449	20301840	20302330	20301191
20261165	20299713	20301667	20302326	20302470	20276168
20297475	20301324	20301677	20302222	20300500	20296457

Orders

60065725	70062184	30117429	30132919	70044239	60063355
60065787	60050841	30125973	30136736	60065612	70061423
60665475					

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
 Hope Creek Diesel Generator System Plant Health Committee Third Quarter 2006 Presentation
 Hope Creek Inservice Testing Database
 Hope Creek Maintenance Rule System Performance Information
 Vendor Technical Document (VTD) PM780AQ-0010, Sh. 5, Rev. 16, Diesel Area HVAC Control Panel 1DC483 Wiring Diagram
 VTD PM780AQ-0010, Sh. 6, Rev. 11, Diesel Area HVAC Control Panel 1DC483 Wiring Diagram
 VTD PM018Q-0048, Sh. 1, Rev. 13, Starting & Control Air System
 VTD PM018Q-0048, Sh. 2, Rev. 12, Starting & Control Air System
 VTD PM018Q-0425, Rev. 5, Starting and Control Air Electrical Schematic

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

SH.OP-AP.ZZ-0027, Rev. 12, On-Line Risk Assessment
 SH.OP-AP.ZZ-0102, Rev. 15, Use of Procedures
 HC.OP-SO.EP-0001, Rev. 15, Service Water Traveling Screens System Operation
 HC.OP-SO.EA-0001, Rev. 29, Service Water System Operation
 HC.OP-AB.COOL-0001, Rev. 9, Station Service Water
 HC.OP-AP.ZZ-0108, Rev. 25, Operability Assessment and Equipment Control Program
 HC.OP-AB.BOP-0001, Rev. 4, Feedwater Heating
 HC.OP-SO.PN-0001, Rev. 16, 120 VAC Electrical Distribution
 HC.OP-AB.ZZ-0136 Attachment 9, Rev. 9, 1AD483 Inverter

Corrective Action Notifications

20299167	20299527	20299698	20299703	20284475	20300053
20299320					

Orders

60062930

Other Documents

WCDs 4188662, 4187315
 SE.MR.HC.02, System Function Level Maintenance Rule VS Risk Reference
 HCGS PSA Risk Evaluation Forms for Work Week Nos. 144 to 156 and 701
 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

HCGS PRA Risk Evaluation Form for Work Week No. 145 (10/8/06 - 10/14/06)
 HC-2205-0026, Issue Resolution Documentation - 1AD483 Inverter, dated 1/11/06
 NC.CA-DG.ZZ-0102, Rev. 1, Operational and Technical Decision Making Process Desk Guide

Section 1R15: Operability Evaluations

Procedures

HC.OP-AP.ZZ-0108, Rev. 25, Operability Assessment and Equipment Control Program
 HC.OP-ST.ZZ-0006, Rev. 14, Drywell to Suppression Chamber Leak Rate Test - 18 Months
 HC.OP-ST.GS-0004, Suppression Chamber/Drywell Vacuum Breaker Operability Test - Monthly
 HC.OP-IS.BJ-0101, Rev. 51, High Pressure Coolant Injection System Valves - Inservice Test
 ER-AA-321, Rev. 6, Administrative Requirements For Inservice Testing
 HU-AA-104-101, Rev. 1, Procedure Use and Adherence
 SH.MD-GP.ZZ-0022, Rev. 1, Bolt Torquing and Bolting Sequence Guidelines
 HC.MD-GP.ZZ-0237, Rev. 2, General Instructions For Disassembly, Inspections and Reassembly of Anchor Darling Testable Check Valves
 SH.MD-GP.ZZ-0003, Rev. 9, General Instructions For Valve Packing
 HC.OP-SO.GJ-0001, Rev. 43, Control Area Chilled Water System Operation
 HC.IC-GP.ZZ-0031, Rev. 16, Bailey Logic Module Type 862
 HC.IC-GP.ZZ-0055, Rev. 2, General Procedure: Bailey Type 862 Module Functional Test
 HC.IC-GP.ZZ-0075, Rev. 9, Bailey Logic Module Type 862 (Solid State Logic Module Tester)
 HC.SE-PR.RL-0001, Rev. 6, Bailey 862 Logic Module Trending Program
 HC.OP-SO.GJ-0001, Rev. 43, Control Area Chilled Water System Operation
 MA-AA-716-004, Rev. 6, Conduct of Troubleshooting
 MA-HC-716-004-001, Rev. 0, Conduct of Troubleshooting
 SH.OP-AP.ZZ-0008, Rev. 5, Operations Troubleshooting and Evolutions Plan Development
 SM-SH-102-1001, Rev. 0, Warehouse Operations

Drawings

M-57-1, Rev. 40, Containment Atmosphere Control
 M-55-1, Sh. 1, Rev. 38, High Pressure Coolant Injection
 M-56-1, Sh. 1, Rev. 31, HPCI Pump Turbine
 E3080-0, Sh. 1, Rev. 12, Class 1E Sta. Pwr. Switchgear - 4.16KV System Diesel Generator Circuit Breaker

Corrective Action Notifications

20290609	20272986	20305721	20305903	20299595	20268258
20288391	20273722	20305907	20305871	20274560	20268512
20266590	20304096	20305702	20305898	20274095	20267600
20267024	20285718	20305730	20305818	20274055	20296457
20291204	20252458	20305749	20305577	20272559	20301022
20303916	20285989	20305938	20305550	20268781	

Orders

70056604	70057968	60063267	70063813	70054833	60060407
70058861	80085119	30135090	60066527	60061269	70053092
70052848	50093848	30108211	60066473	70053153	60060347
70059468	60066568	70063888			

Other Documents

NRC Generic Letter No. 91-18, Revision 1, Resolution of Degraded and Nonconforming Conditions

NRC Inspection Manual Chapter 9900 Technical Guidance: Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety

Calculation 12-148, Rev. 6, Drywell/Torus Allowable Leakage

VTD 10855-M150A(Q), Installation, Operation, and Testing Instructions for Model LD240-447 Slim Line Vacuum Breaker Valve Designed for Dynamic Closing Loads

VTD PJ200Q-0599, Rev. 13, 4.16KV Sys. Diesel Gen. Circuit Breaker (1) 52-40407

D3.40, Rev. 6, Design, Installation, and Test Specification for Containment Atmosphere Control System for the Hope Creek Generating Station

Hope Creek IST Component Requirements for valves 1-GS-PSV-4946C and -4946D

Condition Resolution Operability Determination Notebook

Inoperable Instrument/Alarm/Indicators/Lamps/Device Log

Inoperable Computer Point Log

Hope Creek Operator Workaround List

Hope Creek Operator Concerns List

Hope Creek Plant Health Committee Meeting Minutes, September 18, 2006

H1RL - Control Complex System Third Quarter Plant Health Committee System Presentation

Weld ID WQN-11, FW-1 Documentation For W/O 30135090

Standard Specification Q-01, Rev. 11, Quality Requirements For Suppliers

Section 1R17: Permanent Plant Modifications

Procedures

SH.MD-IT.ZZ-3906(Q), Rev 1, Vibration Analysis of Rotation Equipment

HC.MD-CM.BB-0003(Q), Rev 15, Reactor Recirculation Pump Seal Changeout

NC.WM-AP.ZZ-0003(Q), Rev 1, Regular Maintenance Process

NC.DE-AP.ZZ-0008(Q), Rev 2, Control of Design and Configuration Change, Tests, and Experiments for Workbook Style Change Packages

NC.WM-AP.ZZ-0001(Q), Rev 13, Work Management Process

Corrective Action Notifications

20033256 20050361

Orders

60036037	60014335	700 8245	80036347
60014335	60018593	70029861	

Other Documents

N1-B31-C001-0124, Technical Manual, Reactor Coolant Pump, Byron Jackson

H-1-BB-MEE-1878, Hope Creek 'B' Recirculation Pump Vibration Analysis

ECA No. 80036347, "B" Reactor Recirculation Pump Vibration Proximity Probe Relocation

Section 1R19: Post-Maintenance Testing

Procedures

NC.MD-AP.ZZ-0050, Rev. 7 & 8, Maintenance Testing Program Matrix

NC.NA-AP.ZZ-0050, Rev. 7, Station Post Maintenance Testing

HC.OP-SO.EP-0001, Rev. 15, Service Water Traveling Screens System Operation

HC.OP-SO.EA-0001, Rev. 29, Service Water System Operation
 HC.MD-GP.ZZ-0237, Rev. 2, General Instructions for Disassembly, Inspection and Reassembly
 of Anchor Darling Testable Check Valves
 HC.OP-IS.BD-0101, Rev. 47, Reactor Core Isolation Cooling System Valves - Inservice Test
 HC.OP-ST.BD-0003, Revs. 11 & 12, RCIC Functional Verification - 18 Months

Completed Surveillances

HC.OP-IS.EA-0004, D Service Water Pump DP502 - Inservice Test, dated 10/5/06
 HC.OP-IS.EP-0004, D Spray Water Pump DP507 - Inservice Test, dated 10/4/06
 HC.OP-ST.BD-0003, RCIC Functional Verification - 18 Months, dated 1/13/05

Drawings

PN1-C71-1020-0006, Sheet 12, Rev. 8, Elementary Diagram Reactor Protection System
 PN1-C71-1020-0006, Sheet 18, Rev. 12, Elementary Diagram Reactor Protection System
 PN1-C71-1020-0006, Sheet 20, Rev. 14, Elementary Diagram Reactor Protection System
 M-49-1, Rev. 18, Reactor Core Isolation Cooling
 10855-N1-E51-1040-59 SH 13, Rev. 3, ELEM DIAG Reactor Core ISLN Cooling SYS

Corrective Action Notifications

20298982	20299278	20299461	20303233	20303303	20303497
20299223	20299316	20302710	20303273	20303444	

Orders

30045625	60054135	60066049	60066135
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Other Documents

NC.NA-TS.ZZ-0050, Maintenance Testing Program Matrix
 Hope Creek IST Component Requirement Sheet for valve 1-AP-051
 VTD 10855-P-301 Instructions for the Installation, Operation and Maintenance of Gate, Globe
 and Check Valves
 Master RCIC Evolution Plan - K23 Relay Re-test, dated 11/1/06

Section 1R22: Surveillance Testing

Procedures

HC.OP-ST.ZZ-0006, Rev. 14, Drywell to Suppression Chamber Leak Rate Test - 18 Months
 HC.OP-ST.GS-0004, Suppression Chamber/Drywell Vacuum Breaker Operability Test -
 Monthly
 HC.OP-IS.EA-0101, Rev. 42, Service Water Subsystem 'A' Valves - Inservice Test
 HC.OP-SO.JE-0001, Rev. 18, Diesel Fuel Oil Storage & Transfer System Operation

Completed Surveillances

HC.OP-IS.JE-0007, G Diesel Fuel Oil Transfer Pump - GP401 - Inservice Test , dated 11/3/06
 & 8/6/06
 HC.OP-IS.JE-0008, H Diesel Fuel Oil Transfer Pump - HP401 - Inservice Test , dated 11/3/06
 & 8/6/06

Drawings

M-57-1, Rev. 40, Containment Atmosphere Control

Corrective Action Notifications

20290609	20266590	20302693	20303174	20303233	20303303
20288391	20267024	20303063		20303273	
	20291204				

Orders

70056604	70059468	50075877	50093764	50096623	50098629
70058861	50080409	50089469	50094973	30062443	50099157
70052848					

Other Documents

Calculation 12-148, Rev. 6, Drywell/Torus Allowable Leakage
 VTD 10855-M150A(Q), Installation, Operation, and Testing Instructions for Model LD240-447
 Slim Line Vacuum Breaker Valve Designed for Dynamic Closing Loads
 D3.40, Rev. 6, Design, Installation, and Test Specification for Containment Atmosphere Control
 System for the Hope Creek Generating Station
 Hope Creek IST Component Requirements for valves 1-GS-PSV-4946C and -4946D

Section 1R23: Temporary Plant Modifications

Procedures

NC.DE-AP.ZZ-0030, Rev. 5, Control of Temporary Modifications

Drawings

M-15-0, Sh. 1, Rev. 43, Compressed Air Service
 M-15-0, Sh. 3, Rev. 15, Compressed Air Service
 E-0425-0, Sh. 2, Rev. 5, Electrical Schematic Diagram 7.2kV Ckt Breaker Control Station Air
 Compressors

Orders

80089981

Other Documents

VTD PM050-0014, Sh. 2, Rev. 17, Schematic Wiring

Section 1EP6: Drill Evaluation

Procedures

HC.OP-AP.ZZ-01018, Rev. 25, Operability Assessment and Equipment Control Program
 HC.OP-AB.IC-0001, Rev. 5, Control Rod
 HC.OP-AB.CONT-0001, Rev. 0, Drywell Pressure
 HC.OP-AB.CONT-0002, Rev. 2, Primary Containment
 HC.OP-AB.CONT-0004, Rev. 1, Radioactive Gaseous Release
 HC.OP-AB.COOL-0003, Rev. 2, Reactor Auxiliary Cooling
 HC.OP-AB.RPV-0006, Rev. 1, Safety/Relief Valve
 HC.OP-AB.ZZ-0001, Rev. 7, Transient Plant Conditions
 HC.OP-SO.BF-0002, Rev. 26, Individual CRD Operation
 HC.OP-SO.BG-0001, Rev. 39, Reactor Water Cleanup System Operation
 HC.OP-SO.GU-0001, Rev. 23, Filtration, Recirculation and Ventilation System Operation
 HC.OP-EO.ZZ-0101, Rev. 10, Reactor Pressure Vessel Control
 HC.OP-EO.ZZ-0101FC, Rev. 10, Reactor Pressure Vessel Control Flow Chart

HC.OP-EO.ZZ-0102, Rev. 11, Containment Control
HC.OP-EO.ZZ-0102FC, Rev. 11, Containment Control Flow Chart

Corrective Action Notifications

20237793	20246280	20254048	20265700	20289507	20292029
20241015	20253139	20254459	20289479	20291492	20298846

Orders

80083428	80083455	70050769	70059184	70062176	70052792
70048262	70050626	70059593	60064150		

Other Documents

Hope Creek Event Classification Guide

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

Other Documents

2005 Radioactive Effluent Release Report Salem and Hope Creek Generating Stations
Offsite Dose Calculation Manual for PSEG Nuclear LLC Hope Creek Generating Station,
Revision 21

Methyl Iodide test data for charcoal filtration units: TSC; CREF; FRVS Vent

RMS Channel Calibration

Liquid Radwaste Discharge Line to the Cooling Tower Discharge Line
Turbine Building Circulating Water Dewatering Sump Discharge Line to the Cooling Tower
Cooling Tower Blowdown Effluent
FRVS Noble Gas Activity Monitor
South Plant Vent Noble Gas Activity Monitor
North Plant Vent Noble Gas Activity Monitor

Flow Monitor Calibration

Liquid Radwaste Discharge Line to Cooling Tower Blowdown Line
Cooling Tower Blowdown Weir
Turbine Building Circulating Water Dewatering Sump Discharge Line to the Cooling Tower
FRVS Sampler Flow Rate Monitor
FRVS Flow Rate Monitor
South Plant Vent Flow Rate Monitor
South Plant Vent Sampler Flow Rate Monitor
North Plant Vent Flow Rate Monitor
North Plant Vent Sampler Flow Rate Monitor

Liquid Radioactive Waste Release Permits: 201394.009.341.L; 201395.006.123.L
Gaseous Radioactive Waste Release Permits: 201053.001.395.G; 201054.013.433.G;
201055.014.081.G

Section 4OA2: Identification and Resolution of Problems

Procedures

SH.OP-AP.ZZ-0015, Rev. 20, Safety Tagging Operations
SH.OP-AP.ZZ-0103, Rev. 12, Component Configuration Control

LS-AA-120, Rev. 6, Issue Identification and Screening Process
 LS-AA-125, Rev. 10 Corrective Action Program Procedure
 HC.IC-LC.AF-0005(Z), Rev. 4, Feedwater Heater Level Drain/Dump & Wide Range Level
 Loops

Corrective Action Notifications

20293502	20284446	20283892	20233620	20284042	20283606
20219869	20284053	20296099	20260190	20237733	20284052
20254104	20260363	20230237	20284185	20260243	
20260291		20255731			

Orders

30114152	70050670	60065045	60051384	60053455	70046388
60055307	30117609	70050928	70041898	70057495	

Other Documents

Work Control Document 4155175
 Hope Creek Business Plan Performance Reports
 PSEG SCWE Metric Quarterly Reports
 PSEG SAP Corrective Action System Reports For Notification, Order, and Assignment
 Generation
 DCP 80088090, Rev. 0, Feedwater Heater Drain Valve Replacements
 DCP 80060797, Rev. 1, Feedwater Heater Dump Valve Replacements
 NC.CA-DG.ZZ-0102, 05/10/2006, Issue Resolution Document Form OTDM No. HC-2006-0010
 HC.ER-DG.ZZ-0002(Z), Rev. 2, System Function level maintenance Rule Scoping vs. Risk
 Reference
 Apparent Cause Investigation Report, Rev. 0, '6A' Feedwater Heater Drain Excessive Vibration
 (from Order 70041898)
 Root Cause Analysis Report, Rev. 1, Hope Creek Moisture Separator Drain Line Failure (from
 order 70050928)
 GEK 72336A, Rev. A (March 1981), MS/Reheater Drain Systems, GE Industrial/Power Systems
 PJ300-0035-02-001, March 1979, VERITRAK Indication Controller vendor manual (Feedwater
 Heater Controllers)

Section 4OA5: Other Activities

Drawings

M-10-1, sheets 1-4, Service Water
 M-11-1, sheets 1-4, Safety Auxiliaries Cooling, Reactor & Auxiliary Building
 M-30-1, sheets 1-3, Diesel Engine Auxiliary Systems
 M-49-1, sheet 1, Reactor Core Isolation Cooling
 M-50-1, sheet 1, RCIC pump turbine
 M-51-1, sheets 1-2, Residual Heat Removal
 M-55-1, High Pressure Coolant Injection
 M-56-1, HPCI pump turbine

Other Documents

Hope Creek MSPI Basis Document, Rev. 1
 NEI 99-02, Rev. 4, Regulatory Assessment Performance Indicator Guideline
 Hope Creek Control Room Narrative Logs dated 10/1/2002 - 6/30/2006
 Maintenance Rule reliability and availability data from 10/1/2002 - 6/30/2006
 Technical Specification Limiting Condition for Operation Logs dated from 10/1/2002 - 6/30/2006
 ROP Performance Indicator data for 10/1/2002 - 6/30/2006
 PSEG engineering database to document reliability and unavailability data for MSPI systems for use in the MSPI basis document

Section 40A7: Licensee-Identified Violations

Procedures

SH.OP-AP.ZZ-0008, Rev. 5, Operations Troubleshooting and Evolutions Plan Development

Corrective Action Notifications

20293921	20294977	20294978	20294979	20294984	20295131
20294904					

Orders

60064986	60064987	60064988	60064989	70060949	70060877
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Other Documents

HCGS Technical Specification 3.3.2
 HCGS Narrative Logs
 HCGS Licensee Event Report 2006-004-00, Dated October 23, 2006

LIST OF ACRONYMS

ALARA	As Low As Is Reasonably Achievable
CAP	Corrective Action Program
CREF	Control Room Emergency Filtration
EDG	Emergency Diesel Generator
FWH	Feedwater Heater
HCGS	Hope Creek Generating Station
HPCI	High Pressure Coolant Injection
JPMs	Job Performance Measures
LCV	Level Control Valve
LERs	Licensee Event Reports
MR	Maintenance Rule
MS	Moisture Separator
MSLRMs	Main Steam Line Radiation Monitors
MSPI	Mitigating Systems Performance Index
NCVs	Non-Cited Violations
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PI	Performance Indicator
PM	Preventative Maintenance

PSEG	Public Service Enterprise Group Nuclear LLC
QA	Quality Assurance
RCIC	Reactor Core Isolation Cooling
RETS	Radiological Effluent Technical Specifications
RHR	Residual Heat Removal
RMS	Radiation Monitoring System
SACS	Safety Auxiliaries Cooling System
SCWE	Safety Conscious Work Environment
SDP	Significance Determination Process
SDRs	Simulator Deficiency Reports
SSCs	Structure, System, and Components
SSU	Safety System Unavailability
SW	Service Water
TI	Temporary Instruction
UFSAR	Updated Final Safety Analysis Report
VTD	Vendor Technical Document
WCD	Work Clearance Document
WO	Work Order