



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415
August 4, 2011

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

SUBJECT: HOPE CREEK GENERATING STATION UNIT 1 - NRC INTEGRATED
INSPECTION REPORT 05000354/2011003

Dear Mr. Joyce:

On June 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Hope Creek Generating Station. The enclosed inspection report documents the inspection results discussed on July 13, 2011, with Mr. Lewis 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.

Based on the results of this inspection, no findings were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

Arthur L. Burritt, Chief
Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000354/2011003
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-354

License No: NPF-57

Report No: 05000354/2011003

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Hope Creek Generating Station

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

Dates: April 1, 2011 through June 30, 2011

Inspectors: A. Patel, Acting Senior Resident Inspector
B. Smith, Acting Senior Resident Inspector
J. Hawkins, Acting Resident Inspector
L. Kern, Project Engineer
A. Turilin, Project Engineer
J. Furia, Senior Health Physicist
B. Yip, Security Specialist
S. Pindale, Senior Reactor Engineer
G. Meyer, Senior Reactor Engineer

Approved By: Arthur L. Burritt, Chief
Projects Branch 3
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000354/2011003; 04/01/2011 - 06/30/2011; Hope Creek Generating Station; Routine Integrated Inspection Report.

This report covers a three-month period of inspection by resident inspectors, and announced inspections by a regional radiation specialist and reactor engineers. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

No findings were identified.

Enclosure

REPORT DETAILS

Summary of Plant Status

The Hope Creek Generating Station operated at or near full power for the duration of the inspection period with the following exception. On May 20, 2011, operators reduced power to 76 percent for planned maintenance on feedwater heating and to perform a control rod pattern adjustment. The unit was restored to full power on May 22, 2011.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01 - 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors completed one readiness for seasonal extreme weather conditions inspection sample. The inspectors reviewed PSEG's seasonal readiness procedures and reviews associated with hot weather conditions. The inspectors reviewed system health reports and walked down systems that could be subject to increased heat conditions during the summer months. The inspectors focused on the readiness of the station service water system, the circulating water system, and the emergency diesel generators. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate AC Power System

a. Inspection Scope

The inspectors completed one inspection sample to evaluate the readiness of PSEG's offsite and alternate AC power systems for adverse weather. Inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate AC power systems during adverse weather were appropriate. The inspectors reviewed station procedures affecting these areas and communications protocols with the transmission system operator to verify that the appropriate information could be exchanged when issues arose that could impact the offsite power system. The inspectors also reviewed the material condition of offsite AC power systems and onsite alternate AC power systems and performed a walkdown of the switchyard. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 - 4 samples)Partial Walkdownsa. Inspection Scope

The inspectors completed four partial walkdown inspection samples. The inspectors performed partial system walkdowns for the systems listed below to verify the operability of redundant or diverse trains and components when safety equipment was unavailable. The inspectors completed walkdowns to determine whether there were discrepancies in the system's alignment that could impact the function of the system, and therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down system components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that PSEG had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program (CAP). The documents reviewed are listed in the Attachment.

- A, C, and D emergency diesel generators (EDGs) with B EDG out-of-service on April 19
- A and C service water (SW) pumps and traveling water screens with B SW pump out-of-service on May 17
- A control rod drive (CRD) pump with B CRD pump out-of-service on May 23
- Reactor core isolation cooling (RCIC) A room cooler with RCIC B room cooler out-of-service on June 6

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q - 6 samples)Fire Protection - Toursa. Inspection Scope

The inspectors completed six quarterly fire protection inspection samples. The inspectors performed tours of the areas listed below 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 areas toured are listed below with their associated pre-fire plan designator. The documents reviewed are listed in the Attachment.

- FRH-11-413, C Residual Heat Removal (RHR)
- FRH-11-412, D RHR

- FRH-11-414, A Core Spray (CS)
- FRH-11-411, B CS
- FRH-11-414, C CS
- FRH-11-411, D CS

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

Underground Bunkers/Manholes Subject to Flooding

a. Inspection Scope

The inspectors completed one flood protection measure inspection 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. Specifically, the inspectors focused on condition of safety-related cables located in underground manholes. The inspectors examined the conditions of the SW cables in manhole vaults MH103 and MH105. The inspectors reviewed PSEG's manhole inspection and any pumping of water found in the manholes and verified that PSEG followed their corrective actions for an operability evaluation associated with the cables. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A - 1 sample; 71111.07T - 3 samples)

.1 Annual Heat Sink Performance

a. Inspection Scope

The inspectors selected the A EDG lube oil heat exchanger (HX) cooled by safety auxiliary cooling system (SACS) for review. The inspectors verified that bio-fouling programs existed and were managed in accordance with PSEG procedures and commitments to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," and that HX performance data demonstrated satisfactory performance. The inspectors walked down the A EDG lube oil HX while it was in operation and reviewed the maintenance history to identify potential degraded conditions or gaps in the preventative maintenance program. The inspectors also reviewed notifications in the CAP to verify that PSEG was identifying EDG lube oil HX problems at the appropriate threshold and that corrective actions addressed the identified problems and were effective. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Triennial Heat Sink Performance

a. Inspection Scope

Based on the plant specific risk assessment and previous inspections, the inspectors selected the following heat sink samples:

- 1B SACS HX
- 1B reactor auxiliary cooling system (RACS) HX
- Ultimate heat sink (B loop of SW system to Delaware River)

The Hope Creek probabilistic risk assessment showed the risk importance of SW (ultimate heat sink), SACS (cooling of safety-related components), and RACS (cooling of emergency instrument air compressor). Both SACS and RACS are closed loop cooling systems with HXs cooled by SW. The risk assessment also showed the risk importance of associated operator actions for manually starting a SW pump, isolating a SW pipe rupture in the RACS room, and controlling SACS heat loads.

The inspectors reviewed the selected SACS, RACS, and SW system material condition, maintenance, and testing to ensure that PSEG maintained the risk-significant components consistent with licensing requirements and design assumptions. In addition, the inspectors reviewed the associated operational, abnormal, and emergency procedures to verify a congruent, accurate approach to achieving system cooling objectives.

The inspectors walked down the applicable cooling components in the B SW intake bay, B SACS room, RACS room, and emergency instrument air compressor area of the turbine building. Also, the inspectors inspected remote controls (pump breakers and remote shutdown panel) associated with operator actions. The inspectors reviewed records of completed HX and buried piping inspections, intake bay silt surveys, preventive maintenance activities, and functional tests to confirm that ongoing activities maintained cooling functional capabilities. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11Q - 1 sample)

Regualification Activities Review by Resident Staff

a. Inspection Scope

The inspectors completed one quarterly licensed operator regualification program inspection sample. The inspectors observed a licensed operator annual regualification simulator scenario (SG-676) on May, 3, 2011, to assess operator performance and training effectiveness. The scenario involved a seismic event coincident with a loss of coolant accident and loss of an inverter. The inspectors assessed simulator fidelity and observed the simulator instructors' critique of operator performance. The inspectors also

observed control room activities with emphasis on simulator identified areas for improvement. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q - 3 samples)

a. Inspection Scope

The inspectors completed three maintenance effectiveness inspection samples. For the equipment performance issues listed below, the inspectors evaluated items such as: appropriate work practices; identifying and addressing common cause failures; scoping in accordance with 10 CFR 50.65(b) of the Maintenance Rule; characterizing reliability issues for performance; trending key parameters for condition monitoring; charging unavailability for performance; classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and 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). The documents reviewed are listed in the Attachment.

- 50.65(a)(3) evaluation from February 2009 to August 2010
- Safety Relief Valves (SRVs)
- EDGs

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 6 samples)

a. Inspection Scope

The inspectors completed six maintenance risk assessment samples for planned and emergent work control. The inspectors reviewed on-line risk management evaluations through direct observation and document reviews for the following six plant configurations:

- B EDG and cable spreading room cardox system out-of-service during week of April 18
- Reactor Manual Control System out-of-service for emergent maintenance during week of May 2
- C SW pump and C RHR room cooler out-of-service during week of May 9
- B SW pump and 10K107 instrument air compressor out-of-service during week of May 16
- Salem gas turbine and D SW pump out-of-service during week of May 23
- Yellow risk status during maximum emergency generation alert on May 31

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. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 - 6 samples)

a. Inspection Scope

The inspectors completed six operability evaluation inspection samples. The inspectors reviewed the operability determinations for the degraded or non-conforming conditions associated with the following systems:

- Control rod 22-07 failed transponder card
- H SRV main seat leakage
- B RHR HX degraded grating
- A SW pump seal excessive leak off
- Degraded equipment hatch flood barrier seal between SACS rooms
- Degraded D SW pump B phase cable

The inspectors reviewed the technical adequacy of the operability determinations to ensure the conclusions were justified. The inspectors also walked down accessible equipment to verify 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 screening. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 - 2 samples)

Temporary Modifications

a. Inspection Scope

The inspectors completed two plant modification inspection samples by reviewing the key characteristics associated with the two temporary plant modifications described below. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the temporary modifications. The inspectors verified the post-modification testing was adequate to ensure the SSCs

would function properly. The 10 CFR 50.59 evaluation associated with the temporary modifications were also reviewed. Documents reviewed are listed in the Attachment.

- Temporary modification 11-007, De-rate B EDG Lube Oil Keep Warm Heater BE406. This modification reduced the heat output of the B EDG lube oil heater due to a higher than normal lube oil temperatures. The modification eliminated the need for operators to manually control lube oil temperature by locally cycling the heater breaker.
- Temporary modification 11-008, Remove Internals of Check Valve EPV-016, B Spray Wash Booster Pump Check Valve. The modification involved removing the internals of the B spray wash check valve due to the identification of a broken check valve disc connection. Adequate parts were not available for the station to repair the check valve. The temporary modification specified manual cross-tie valve, EPV-020, between the B and D spray wash systems to be maintained in the closed position.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 - 7 samples)

a. Inspection Scope

The inspectors completed seven post-maintenance testing inspection samples. The inspectors reviewed the post-maintenance tests for the maintenance items listed below to verify that procedures and test activities ensured system operability and functional capability following completion of maintenance. The inspectors reviewed applicable test procedures to verify that they tested all safety functions potentially affected by the associated maintenance activities. The inspectors verified that for each potentially affected safety function the acceptance criteria stated in the procedure was consistent with the Updated Final Safety Analysis Report (UFSAR) and other design documentation. The inspectors witnessed completion of the testing or reviewed the completed test results to confirm acceptance criteria were met and verified satisfactory restoration of all safety functions affected by the maintenance activities. The documents reviewed are listed in the Attachment.

- 24V battery charger AD-304 after battery discharge on April 1
- B EDG output breaker replacement on April 19
- A SW pump gasket replacement on May 10
- B SW strainer breaker thermal overload replacement on May 19
- B CRD pump seal leak off pipe replacement on May 24
- A SW makeup valve Bailey card replacement on June 1
- A and C CS pump normal and emergency power start delay timing relay replacement on June 3

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 - 8 samples)a. Inspection Scope

The inspectors completed eight surveillance testing (ST) inspection samples. The inspectors witnessed performance of and/or reviewed test data for the risk-significant STs listed below to verify that the SSCs tested satisfied Technical Specifications, UFSAR, and procedure requirements. The inspectors verified that test acceptance criteria were clear, demonstrated operational readiness, and were consistent with design documentation; that test instrumentation had current calibrations and the correct range and accuracy for the application; and that tests were performed as written with applicable prerequisites satisfied. Upon ST completion, the inspectors confirmed that equipment was returned to the status specified to perform its safety function. The documents reviewed are listed in the Attachment.

- A EDG monthly surveillance test on April 4
- High pressure coolant injection in-service test on April 12
- C SACS pump in-service test on April 13
- A control room emergency filtration system surveillance test on April 13
- Containment isolation valve, 1GSHV-5050A & 5052A, leak rate test on May 9
- Reactor coolant system leakage determination on May 12
- A standby liquid control surveillance test on June 2
- D EDG monthly surveillance test on June 23 following a scheduled maintenance window

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors completed one drill evaluation inspection sample. The inspectors observed emergency plan response actions at the technical support center during a force on force emergency preparedness drill on June 8, 2011. The inspectors verified that emergency classification declarations and notifications were completed in accordance with 10 CFR 50.72, 10 CFR 50, Appendix E, and the Hope Creek emergency plan implementing procedures. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Radiation Safety - Public and Occupational

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

The inspectors observed several locations where PSEG monitors potentially contaminated material leaving the radiological controlled area and inspected the methods used for control, survey, and release from these areas. The inspectors verified that the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed PSEG's criteria for the survey and release of potentially contaminated material. The inspectors verified that there was guidance on how to respond to an alarm that indicated the presence of licensed radioactive material.

The inspectors reviewed PSEG's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters.

The inspectors selected sealed sources from PSEG's inventory records that presented the greatest radiological risk and verified that sources are accounted for and had been verified to be intact.

Risk-Significant High Radiation Area (HRA) and Very High Radiation Area (VHRA) Controls

The inspectors discussed with the Radiation Protection Manager the controls and procedures for high-risk HRAs and VHRAs. The inspectors verified that any changes to PSEG procedures did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with first-line health physics supervisors the controls in place for special areas that have the potential to become VHRAs during certain plant operations. The inspectors verified that PSEG controls for all VHRAs, and areas with the potential to become a VHRA, ensured unauthorized individuals were not able to gain access to the area.

Radiation Protection Technician Proficiency

The inspectors observed the performance of the radiation protection technician with respect to radiation protection work requirements. The inspectors determined that technicians were aware of the radiological conditions in their workplace, the radiation work permit controls/limits were in place, and that their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors determined that there was no observable pattern traceable to a similar cause. The inspectors determined that this perspective matched the corrective action approach taken by PSEG to resolve the reported problems.

b. Findings

No findings were identified.

Enclosure

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

Specials Dosimetric Situations

Declared Pregnant Workers

The inspectors verified that PSEG informed workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors selected individuals who had declared their pregnancy during the current assessment period and verified that PSEG's radiological monitoring program for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed the exposure results and monitoring controls employed by PSEG and with respect to the requirements of 10 CFR Part 20.

Dosimeter Placement and Assessment of Effective Dose Equivalent for External Exposures

The inspectors reviewed PSEG's methodology for monitoring external dose in situations in which non-uniform fields are expected or large dose gradients exist. The inspectors verified that PSEG had established criteria for determining when alternate monitoring techniques were to be implemented.

The inspectors reviewed dose assessments performed using multibadging during the current assessment period. The inspectors verified that the assessment was performed consistently with PSEG procedures and dosimetric standards.

Shallow Dose Equivalent (SDE)

The inspectors reviewed SDE dose assessments for adequacy. The inspectors evaluated PSEG's method for calculating SDE from distributed skin contamination or discrete radioactive particles.

Neutron Dose Assessment

The inspectors evaluated PSEG's neutron dosimetry program, including dosimeter type(s) and/or survey instrumentation.

The inspectors selected neutron exposure situations and verified that (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron dosimetry was properly calibrated. The inspectors verified that interference by gamma radiation had been accounted for in the calibration. The inspectors verified that time and motion evaluations were representative of actual neutron exposure events, as applicable.

For the special dosimetric situations reviewed in this section, the inspectors determined how PSEG assigned dose of record for total effective dose equivalent, SDE, and lens dose equivalent.

Problem Identification and Resolution

The inspectors verified that problems associated with occupational dose assessment were being identified by PSEG at an appropriate threshold and were properly addressed for

resolution in their CAP. In addition, the inspectors verified the appropriateness of the corrective actions for the problems documented by PSEG involving occupational dose assessment.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

Walkdowns and Observations

The inspectors selected portable survey instruments in use or available for issuance. The inspectors checked calibration and source check stickers for currency and assessed instrument material condition and operability.

The inspectors observed PSEG staff perform source checks for various types of portable survey instruments. The inspectors determined that high-range instruments were source checked on all appropriate scales.

Whole Body Counter (WBC)

The inspectors reviewed the methods and sources used to perform WBC functional checks before daily use of the instrument. The inspectors determined that check sources were appropriate and align with the plant's isotopic mix. The inspectors reviewed WBC calibration reports completed since the last inspection to verify that calibration sources were representative of the plant source term and that appropriate calibration phantoms were used.

Portable Survey Instruments, Area Radiation Monitors (ARMs), Electronic Dosimetry, and Continuous Air Monitors

The inspectors reviewed calibration documentation for at least one of each type of instrument. For portable survey instruments and ARMs, the inspectors reviewed detector measurement geometry and calibration methods and had PSEG demonstrate use of its instrument calibrator.

The inspectors selected portable survey instruments that did not meet acceptance criteria during calibration or source checks and verified that PSEG had taken appropriate corrective action for instruments found significantly out of calibration.

The inspectors verified that PSEG had evaluated the possible consequences of instrument use since the last successful calibration or source check.

Instrument Calibrator

The inspectors reviewed the current output values for PSEG's portable survey and ARM instrument calibrator units. The inspectors verified that PSEG periodically measured calibrator output over the range of the instruments used through measurements by ion chamber/electrometer.

The inspectors verified that the measuring devices had been calibrated by a facility using National Institute of Sciences and Technology traceable sources and that correction factors for these measuring devices were properly applied by PSEG in its output verification.

Calibration and Check Sources

The inspectors reviewed PSEG's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste", source term to determine if the calibration sources used were representative of the types and energies of radiation encountered in the plant.

Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring instrumentation were being identified by PSEG at an appropriate threshold and were properly addressed for resolution in their CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151 - 2 samples)

a. Inspection Scope

The inspectors reviewed PSEG's program for gathering, evaluating and reporting information for the PIs listed below. The inspectors used the definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to assess the accuracy of PSEG's collection and reporting of PI data. The documents reviewed are listed in the Attachment.

Cornerstone: Barrier Integrity

- Reactor Coolant System (RCS) Leakage
- RCS Activity

The inspectors reviewed the data reported for these PIs for the period April 1, 2010, through March 31, 2011. The records reviewed included PI data summary reports, licensee event reports, surveillance testing data, chemistry data, and operator narrative logs. The inspectors verified the accuracy of the PIs and discussed the results with the personnel responsible for data collection and evaluation.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 - 1 annual sample; 1 trend sample)

.1 Routine Review of Items Entered into the CAP

a. Inspection Scope

As specified by IP 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of all items entered into PSEG's CAP. This was accomplished by reviewing the description of each new notification and attending management review committee meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Operator Workarounds

a. Inspection Scope

The inspectors performed a cumulative review of PSEG's identified operator workaround conditions. The inspectors reviewed PSEG's list of operator workarounds, operator burdens and concerns, temporary modifications, and operability determinations to assess the potential for these issues to impact the operators' ability to properly respond to plant transients or postulated accident conditions. The inspectors also reviewed operator logs and control room instrument panels to evaluate potential impacts on operator ability to implement abnormal and emergency operating procedures. Finally, the inspectors toured the plant and control room to identify potential operator workaround conditions not previously identified by PSEG. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

The inspectors determined that PSEG appropriately identified conditions that impacted operators' ability to respond to plant transients or postulated accident conditions and entered them into the CAP and that Operations personnel reviewed the cumulative impact of operator burdens, concerns, and workarounds on a periodic basis.

.3 Semi-Annual Review to Identify Trends: Self-Assessments

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety issues, as specified by IP 71152, "Identification and Resolution of Problems." The inspectors reviewed repetitive or closely-related issues that may have been documented by PSEG outside of the CAP, such as trend reports, system health reports, status reports, operator logs, and other issue/concern lists. The inspectors also reviewed the PSEG CAP database for the prior year to assess notifications written in various subject areas to evaluate whether safety issues or adverse trends were apparent.

The inspectors focused on potential trends in specific problem areas identified in the selected self-assessments. The inspectors reviewed PSEG's evaluation of deficiencies identified by their self-assessments, including related extent of condition assessments. This review was evaluated against PSEG's CAP guidelines and 10 CFR 50, Appendix B to determine whether potential adverse trends were properly identified and evaluated. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

The inspectors evaluated PSEG's problem identification and resolution performance by comparing the results of selected PSEG's self-assessments to station performance in the selected areas over the past year. In particular, the inspectors reviewed equipment and personnel performance to determine whether repeat or similar performance weaknesses existed in the areas that were self-assessed by PSEG. While no significant adverse trends were identified, the inspectors noted that PSEG identified several instances where some minor items had not been entered into the CAP and additional instances where corrective actions were either not completed or were not timely. The inspectors confirmed that PSEG responded appropriately, and these items were entered into the CAP for evaluation and resolution.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

The inspectors assessed the activities and actions taken by PSEG to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of PSEG's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as specified by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as specified by 10 CFR 50.54(hh); (2) an assessment of PSEG's capability to mitigate station blackout (SBO) conditions, as specified by 10 CFR 50.63 and station design bases; (3) an assessment of PSEG's capability to mitigate internal and external flooding events, as specified by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by PSEG to identify any potential loss of function of this equipment during seismic events possible for the site.

Inspection Report 05000354/2011009 (ML111300180) documented detailed results of this inspection activity.

.2 (Closed) NRC Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"

On May 13, 2011, the inspectors completed a review of PSEG's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the SAMGs were available and updated, (2) whether PSEG had procedures and processes in place to control and update its SAMGs, (3) the nature and extent of PSEG's training of personnel on the use of SAMGs, and (4) PSEG personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for Hope Creek Generating Station were provided in an Attachment to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated May 27, 2011 (ML111470361).

4OA6 Meetings, including Exit

On July 13, 2011, the inspectors presented inspection results to Mr. D. Lewis and other members of his staff. The inspectors asked PSEG whether any materials examined during the inspection were proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

PSEG Personnel

E. Carr, Operations Director
E. Casulli, Shift Operations Superintendent
K. Chambliss, Work Management Director
P. Duca, Senior Engineer, Regulatory Assurance
D. Boyle, Shift Manager
D. Bush, System Engineer
T. Carucci, FIN Team Leader
L. Davis, System Engineer
M. Gaffney, Regulatory Assurance Manager
L. Gorecki, System Engineer
C. Johnson, Senior Engineer
F. Jones, System Engineer
K. Knaide, Engineering Director
W. Kopchick, Plant Engineering Manager
D. Lewis, Hope Creek Plant Manager
G. Lichty Technical Specialist
F. Mooney, Maintenance Director
J. Perry, Hope Creek Site Vice President
S. Peterkin, Radiation Protection Support Superintendent
M. Resser, Fire Protection Engineer
A. Shabazian, Maintenance Rule Coordinator
G. Siefert, Design Engineer
H. Trimble, Radiation Protection Manager
L. Wagner, Salem Plant Manager
A. Whatley, System Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

NONE

LIST OF DOCUMENTS REVIEWED

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

Hope Creek Generating Station UFSAR
Technical Specification Action Statement Log
HCGS NCO Narrative Logs

Section 1R01: Adverse Weather Protection

Procedures

HC.OP-AB.BOP-0004, Grid Disturbances, Revision 18

WC-AA-101, On-line Work Management Process, Revision 19
WC-AA-107, Seasonal Readiness, Revision 10
HC.OP-GP.ZZ-0003, Section 5.2, Securing the Plant from Winter Operations, Revision 24

Other Documents

2011 Hope Creek Summer Readiness Affirmation certification letter

Orders

80102805

Notifications

20506759

Section 1R04: Equipment Alignment

Procedures

HC.OP-SO.KJ-0001, Emergency Diesel Generators Operation, Revision 59
HC.OP-AB.COOL-0001, Station Service Water, Revision 17
HC.OP-SO.BF-0001, CRD Hydraulic System Operation, Revision 30
HC.OP-SO.GR-0001, Reactor Building Ventilation System Operation, Revision 22

Notifications (*NRC-identified)

20510846*

Drawings

M-10-1(Q), Hope Creek Generating Station Service Water, Revision 52
M-46-1, Control Rod Drive, Revision 24

Section 1R05: Fire Protection Measures

Procedures

FRH-II-411, Core Spray Pump Rooms, Revision 3
FRH-II-412, RCIC Pump & Turbine Room, Revision 3
FRH-II-413, HPCI Pump & Turbine Room, Revision 3
FRH-II-414, Core Spray Pump Rooms, CRW-DRW Pumps & Sumps Room, Revision 3

Section 1R06: Flood Protection Measures

Procedures

HC.MD-PM.ZZ-0022, SSW Electrical Manhole Water Inspection, Revision 1

Notifications

20511588 20512327

Orders

30207010 30206737 30206449 30206250 30205970 80101120
70099153 70124418

Calculations

602-0012, Category I Electric Manholes, Revision 1

Section 1R07: Heat Sink Performance**Procedures**

ER-AA-340, GL 89-13 Program Implementing Procedure, Revision 5
 ER-AA-340-1001, GL 89-13 Program Implementation Instructional Guide, Revision 7
 ER-AA-340-1002, Service Water Heat Exchanger and Component Inspection Guide, Revision 5
 ER-AA-340-1100, Hope Creek 89-13 Program Basis Document, Revision 8
 ER-AA-340-2000, Balance-of-Plant Heat Exchanger and Component Inspection Guide, Revision 4
 HC.OP-AB.COOL-0002, Safety/Turbine Auxiliaries Cooling System, Revision 6
 MA-AA-734-461, Bolt Torquing and Bolting Sequence Guidelines, Revision 1
 HC.CH-SA.ZZ-0014, Sampling Station Cooling Water Systems, Revision 7
 HC.MD-PM.EA-0001, Service Water Strainer - Clean & Inspect, Revision 24
 HC.MD-PM.EA-0002, Service Water Intake Bay Silt Survey and Silt Removal, Revision 18
 HC.MD-PM.KB-0001, Emergency Instrument Air Compressor PM, Revision 8
 HC.OP-AB.COOL-0001, Station Service Water, Revision 17
 HC.OP-AR.ZZ-0001, Overhead Annunciator Window Box A1, Revision 20
 HC.OP-AR.ZZ-0002, Box D2, RACS Pump Room Flooded, Revision 20
 HC.OP-EO.ZZ-0319, Restoring Instrument Air in an Emergency, Revision 2
 HC.OP-FT.EA-0001, Validating SSWS Flow through SACS HXs, Revision 11
 HC.OP-FT.KB-0001, Emergency Instrument Air Compressor, Revision 2
 HC.OP-GP.EA-0001, Service Water Emergency Makeup Deadleg Flushing, Revision 4
 HC.OP-IO.ZZ-0008, Shutdown from Outside Control Room, Revision 30
 HC-SSBD-SLI, Selective Leaching Inspection Basis Document, Revision 1

Notifications

20452236 20483736 20485402 20491479 20495188

Drawings

M-12-1, Sh. 1, P&ID Safety Auxiliaries Cooling Auxiliary Building, Revision 31
 M-10-1, Service Water, Revision 52
 M-10-2, Service Water, Revision 40
 M-13-1, Reactor Auxiliary Cooling, Revision 37
 M-15-0, Sh. 1, Compressed Air, Revision 45
 M-15-0, Sh. 3, Compressed Air, Revision 16
 NU-D-1022-11, SACS Heat Exchanger - Cross Section, Revision 16
 P-0072-0, Intake Structure Building, Revision 22
 S-3-702, Steel Pipe Wye with 45° Elbow, Revision 0

Calculations

EG-0020, STACS – Required Flows and Heat Loads - EPU, Revision 10
 EG-0047, HCGS Ultimate Heat Sink Temperature Limits - EPU, Revision 5
 H-1-EA-MDC-4010, Finite Element Analysis of Service Water Strainer, Revision 0

Orders

30040552 50125226 60092192 80103456 30113454 30138488
 30138717 30139398 30158523 30179544 30170702 70092059
 70102605 70109775

Other Documents

CD-881F, Inspection of Service Water Piping During RF04 Generic Letter 89-13, Sept. 30, 1992

Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment
 VTD PM018Q-0056, Lube Oil System, Revision 24
 VTD PM018Q-0290, Heat Exchanger Data Sheet Lube Oil Heat Exchangers, Revision 1
 VTD PM018Q-0499, Operation and Maintenance Manual for Colt Industries Diesel Generator,
 Revision 24
 VTD PM018Q-0504, Field Alignment Procedure Setting and Alignment Instruction, Revision 2
 GL 89-13 Program Focused Area Self-Assessment Report, dated 9/10/2010
 Joy Technologies Technical Manual for Air Compressor
 Program Health Reports, GL 89-13 Program, 1Q 2010 through 1Q 2011
 Report on Scanning of Joints - Underground Service Water Loop B, dated 4/2006
 System Health Reports, Service Water, 1Q 2010 through 1Q 2011
 Service Water Strainer Structural Improvements, Revision 0
 Service Water Hypochlorination Upgrades, Revision 1

Section 1R11: Licensed Operator Regualification Program

Other Documents

Scenario Guide SG-676, Licensed Operator Simulator Scenario, 5/3/2011

Section 1R12: Maintenance Effectiveness

Procedures

ER-AA-201, Emergency Diesel Reliability Program, Revision 0
 OP-AA-106-101-1006, Operational and Technical Decision Making Process, Revision 6
 OP-AA-108-111, Adverse Condition Monitoring and Contingency Planning, Revision 6

Notifications (*NRC identified)

20507527*	20503001	20496540	20501113	20501279	20501299
20501473	20500813	20494289	20494255	20487342	20487740
20486356	20416966*	20450707	20468516		

Orders

80103453	70105471	60092116
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Drawings

I-P-AB-08, System Isometric/Reactor Building Main Steam in Drywell Relief Valve- Discharge
 from Line A, Revision 12
 I-P-AB-10, System Isometric/Reactor Building Main Steam in Drywell Relief Valve- Discharge
 from Line C, Revision 13

Calculations

H-1-AB-MDC-2024, Main Steam SRV Tailpipe Temperature Monitoring Criteria, Revision 0

Other Documents

System Performance Improvement Plan Strategy- Emergency Diesel Generators
 Maintenance Rule Performance Data for EDGs
 Hope Creek 10CFR50.65 (a)(3) Periodic Assessment, 2/2009 – 8/2010
 H & R SRV Temperature Trend Graphs
 Engineering Test Report Model 7567F SRV Leakage Tolerance Test dated 8/5/83

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

OP-AA-101-112-1002, On-Line Risk Assessment, Revision 5
 WC-AA-101, On-Line Work Management Process, Revision 19

Notifications (*NRC identified)

20511393* 20511051*

Other Documents

HCGS PRA Risk Evaluation for Work Week 1116
 HCGS PRA Risk Evaluation for Work Week 1118
 HCGS PRA Risk Evaluation for Work Week 1119
 HCGS PRA Risk Evaluation for Work Week 1120
 HCGS PRA Risk Evaluation for Work Week 1121
 HCGS PRA Risk Evaluation for Work Week 1122
 NUMARC 93-01, Section 11, Industry Guidelines for Monitoring the Effectiveness of
 Maintenance at Nuclear Power Plants, Revision 2

Section 1R15: Operability EvaluationsProcedures

OP-AA-108-115-1001, LCO Entry/Exit & Operability Determination SAP Guidance, Revision 1
 OP-HC-108-115-1001, Operability Assessment and Equipment Control Program, Revision 11
 OP-AA-108-115, Operability Determinations, Revision 3
 HC.FP-SV.ZZ-0026, Flood and Fire Barrier Penetration Seal Inspection, Revision 6

Notifications (*NRC identified)

20503735	20506096	20506891	20507534*	20507546*	20487870
20507618*	20511055*	20511588	20420237	20512327	

Orders

60093686	70123220	80104131	70124418
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Drawings

C-0317-0, Project Civil Standards Grating & Floor Plates Typical Details, Revision 10
 M-97-1, HCGS Building and Equipment Drain Reactor Building, Revision 16

Calculations

11-0028, Reactor Bldg Flood Calc El. 102, Revision 4

Other Documents

OTDM-HC-2011, Elevated Tailpipe Temperature on SRV-H, 3/25/2011
 Technical Evaluation 80103987, SWIS Pump Room Instrument Tubing Stanchion Report
 HC PRA-012, Hope Creek Internal Flood Report, Revision 2

Section 1R18: Plant Modifications50.59 Reviews, Screenings and Evaluations

HC-11-054, TCCP 11-007/80103985, Revision 0
 HC-11-058, TCCP 11-008/80104147, Revision 0

Procedures

HC.OP-AB.COOL-0001, Station Service Water, Revision 17

Calculations

SC-KJ-0185, Diesel Generator A-D Lube Oil Temperature and Jacket Water Temperature, Revision 4

Design Change Package

4HT-11-007, De-rate B EDG Lube Oil Heater, Revision 0

4HT-11-008, Remove Internals of Check Valve, Revision 0

Drawings

M-30-1, HCGS Diesel Engine Auxiliary Systems Starting Air & Lube Oil, Revision 19

M-10-1, Sheet 1, HCGS Service Water, Revision 52

Notifications (*NRC identified)

20509201 20510945 20511739*

Orders

80103985 60096618 80104147

Section 1R19: Post-Maintenance TestingProcedures

MA-AA-734-461, Bolt Torquing and Bolting Sequence Guidelines, Revision 1

HC.MD-CM.EA-0001, Service Water Pump & Motor Removal & Replacement, Revision 28

HC.OP-IS.EA-0001, Service Water Pump – In-service Test, Revision 47

HC.OP-SO.EA-0001, Service Water System Operation, Revision 34

HC.OP-SO.BF-0001, CRD Hydraulic System Operation, Revision 30

HC.MD-IS.EA-0101, Service Water Subsystem A Valves- In-service Test, Revision 5

MA-AA-716-012, Post Maintenance Testing, Revision 16

OP-HC-108-115-1001, Operability Assessment and Equipment Control Program, Revision 12

Completed Surveillances

HC.OP-ST.KJ-0002, Emergency Diesel Generator Operability Test, 4/19/2011

HC.IC-CC.BE-0012, Sore Spray – Division 1 Channels E21A-K22A, and E21A-K21A Pump Start Delay – Normal and Emergency Power, 6/3/2011

Notifications (*NRC identified)

20510224* 20510229* 20271832 20367629 20512387*

Orders

50139700 30197602 60095939 60076769 30115244

Drawings

M-10-1, Sheet 1, HCGS Service Water, Revision 52

M-51-1, Sh. 1, Residual Heat Removal, Revision 41

Section 1R22: Surveillance TestingProcedures

HC.MD-FT.KJ-0004, Emergency Diesel Generator Voltage Regulator Testing/Calibration, Revision 2

HC.OP-FT.KJ-0004, Emergency Diesel Generator 1DG400 – Functional Test, Revision 7

HC.OP-IS.BJ-0001, HPCI Main and Booster Pump Set In-service Test, Revision 53

HC.OP-ST.KJ-0004, Emergency Diesel Generator 1DG400 Operability Test, Revision 72

HC.OP-ST.SK-001, Alternate RCS Leakage Determination, Revision 8ER-AA-321, Administrative Requirements for In-service Testing, Revision 11

LRT-VOL2-ATT.2, Summarized Listing of Administrative and IST Limits, Revision 5

Completed Surveillances

HC.OP-IS.EG-0003, C SACS Pump – In-service Test, 4/12/2011

HC.OP-IS.BJ-0001, HPCI Main and Booster Pump – In-service Test, 4/13/2011

HC.OP-ST.GK-0001, A Control Room Emergency Filtration System Functional Test, 4/14/2011

HC.OP-LR.GS-0002, Containment Isolation Valve Type C Leak Rate Test CIVS 1GSHV-505A and 1GSHV-5052A, 5/9/2011

HC.OP-IS.BH-0003, Standby Liquid Control Pump – In-service Test, 6/2/2011

Notifications

20460895	20465091	20482662	20504799	20510090	20510630
20510737	20515730				

Orders

50138138	50139505	50137916	60090056	30048142	30141286
50141348					

Drawings

M-56-1, HCGS HPCI Pump Turbine, Revision 16

Other Documents

Drywell Floor Drain Sump Fact Sheet

VTD PM018Q-0499, Operation and Maintenance Manual for Colt Industries Diesel Generator, Revision 24

Section 1EP6: Drill EvaluationProcedures

EP-AA-125-1002-F01, DEP Observation Checklist, Revision 2

ECG Attachment 8, Secondary Communicator Log, Revision 26

HCGS ECG, 9.0 Hazards – Internal/External, Revision 10

Section 2RS4: Occupational Dose AssessmentProcedures

RP-AA-220, Bioassay Program, Revision 6

RP-AA-210, Dosimetry Issue, Usage, and Control, Revision 10

Other Documents

NVLAP 2011 Certificate of Accreditation for Landauer, Inc. (Glenwood, IL) #100518-0

Comanche Peak NPP Self-Assessment SA-2009-028, On-Site Assessment of Landauer Personnel Dosimetry Performance Testing conducted for NVLAP at Pacific Northwest National Laboratory for Landauer, Inc., dated 4/28/2008
 NVLAP On-Site Assessment Report for Landauer, Inc., 5/25 - 5/28/2010

Section 2RS5: Radiation Monitoring Instrumentation

Other Documents

FASTSCAN Whole Body Counter System Calibration, 2/20/2009 and 3/1/2010
 K&S Associates Transfer Standard Calibration Reports, No. 110050 (dated 1/17/2011) and No. 101877 (dated 7/29/2010)
 CTI Calibration Certificates for Electronic Dosimeters, dated 9/10/2009
 IDC-HF Electronic Dosimeter Calibrator Calibration Report, dated 3/15/2011
 Battelle Laboratory Calibration Report #09222, dated 12/3/2009

Section 40A1: Performance Indicator Verification

Procedures

LS-AA-2001, Collection and Reporting of NRC Performance Indicator Data, Revision 11
 LS-AA-2100, Monthly Data Elements for NRC Reactor Coolant System Leakage, Revision 6

Other Documents

Daily Surveillance Log Data
 Daily Dose Equivalent Iodine-131 Sample Data

Section 40A2: Problem Identification and Resolution

Procedures

LS-AA-125, Corrective Action Program Procedure, Revision 13

Notifications

20470450	20475280	20475437	20477848	20479293	20479490
20480051	20480851	20488196	20488286		

Other Documents

Focused Area Assessment Report (70105646/70106839): NRC Generic Letter 89-13 Program (SW System Problems Affecting Safety-Related Equipment), dated 9/10/2010
 Focused Area Assessment Report (701056470): Hope Creek Problem Identification and Resolution, dated 10/11/2010
 Focused Area Assessment Report (70107148): Hope Creek MOV Program, dated 12/1/2010
 Focused Area Assessment Report (70107149): Hope Creek Maintenance and Technical Training Accreditation, dated 9/17/2010
 Hope Creek Margin Management List
 Quarterly Operator Burden Assessment, 1st Quarter 2011, dated 5/12/2011
 HPCI System Health Report, 1st Quarter 2011
 RCIC System Health Report, 1st Quarter 2011
 RHR System Health Report, 1st Quarter 2011
 SW System Health Report, 1st Quarter 2011

LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access and Management System
ARM	Area Radiation Monitor
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CRD	Control Rod Drive
CS	Core Spray
EDG	Emergency Diesel Generator
HRA	High Radiation Area
HX	Heat Exchanger
NRC	Nuclear Regulatory Commission
PI	Performance Indicator
PSEG	Public Service Enterprise Group Nuclear LLC
RACS	Reactor Auxiliary Cooling System
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SACS	Safety Auxiliary Cooling System
SAMG	Severe Accident Management Guideline
SDE	Shallow Dose Equivalent
SRV	Safety Relief Valve
SSC	Structures, Systems, and Components
ST	Surveillance Testing
SW	Service Water
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area
WBC	Whole Body Counter