



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

October 23, 2015

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

**SUBJECT: HOPE CREEK GENERATING STATION UNIT 1 – INTEGRATED INSPECTION
REPORT 05000354/2015003**

Dear Mr. Braun:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Hope Creek Generating Station (HCGS). The enclosed report documents the inspection results, which were discussed on October 8, 2015, with Mr. P. Davison, Site Vice President of Hope Creek, and other members of your staff.

NRC inspectors 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 inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. Additionally, the NRC inspectors documented one Severity Level IV violation with no associated finding. Further, inspectors documented one licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the non-cited violations 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 HCGS. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at HCGS.

In accordance with Title 10 of the *Code of Federal Regulations* (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's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Glenn T. Dentel, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000354/2015003
w/Attachment: Supplementary 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. 05000354/2015003

Licensee: Public Service Enterprise Group (PSEG) Nuclear LLC

Facility: Hope Creek Generating Station (HCGS)

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

Dates: July 1, 2015 through September 30, 2015

Inspectors: J. Hawkins, Senior Resident Inspector
S. Haney, Resident Inspector
S. Barr, Senior Emergency Preparedness Inspector
J. Brand, Reactor Inspector
L. Dumont, Reactor Inspector
R. Nimitz, Senior Health Physicist
A. Turilin, Project Engineer

Approved By: Glenn T. Dentel, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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SUMMARY

Inspection Report 05000354/2015003: 07/01/2015 – 09/30/2015; Hope Creek Generating Station; Adverse Weather Protection, Follow-up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified one NRC-identified Severity Level IV violation and one self-revealing finding of very low safety significance (Green), both of which were non-cited violations (NCVs). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

Cornerstone: Mitigating Systems

- Severity Level IV. The inspectors identified a severity level IV (SL IV) NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) 10.50.9(a), "Completeness and Accuracy of Information," for PSEG's failure to provide accurate and complete information in a license amendment request regarding technical specification (TS) 3.7.3 "Flood Protection." This information was material to NRC because it was used, in part, as the basis for the approval and issuance of a license amendment to remove the Unit 2 service water intake structure (SWIS) watertight doors from TS flood protection requirements. PSEG's corrective actions include reinstatement of the Unit 2 watertight doors in the technical requirements manual (TRM) flood protection requirements. Additionally, since the inaccurate license change request submittal in 1998, PSEG implemented LS-AA-117, "Written Communications," which requires that all license amendment requests and documents submitted to the NRC under oath and affirmation shall receive a Technical Verification Team review. The Technical Verification Team review consists of a page-by-page review of the subject document that identifies and validates all statements of fact, assumptions, data inputs and calculations which could alter the conclusions reached in the document.

The inspectors evaluated this issue using the traditional enforcement process because the performance deficiency had the potential to impact the NRC's ability to perform its regulatory function. Specifically, this violation impacted the regulatory process in that the inaccurate information was material to the NRC's determination that there was reasonable assurance the proposed removal of the Unit 2 SWIS bay watertight doors from the Hope Creek TSs would not result in plant operations that would endanger the health and safety of the public. The inspectors concluded that had the information been complete and accurate at the time provided, it likely would have resulted in a reconsideration of this regulatory position. The inspectors determined that the performance deficiency identified is a Severity Level IV violation, because: the risk associated with an external flooding event at Hope Creek is very low (less than 10^{-8} per year), the flood protection TS requirement has been changed to a TRM requirement, and the procedure revision to HC.OP-AB.MISC-0001, "Acts of Nature," ensured that all of the SWIS exterior doors would be closed during high river water level conditions. The performance deficiency was screened against the Reactor Oversight Process (ROP) per the guidance of IMC 0612, Appendix B, "Issue Screening," and no

associated ROP finding was identified. In accordance with IMC 0612, Appendix B, this traditional enforcement issue is not assigned a cross-cutting aspect. (Section 1R01)

Cornerstone: Occupational Radiation Safety

- Green. A self-revealing Green NCV of TS 6.12.2 was identified when a worker entered a posted locked high radiation area (LHRA) without proper authorization. Specifically, the worker entered the LHRA without being signed onto the proper radiation work permit (RWP) or receiving a pre-entry LHRA briefing, and subsequently received a dose rate alarm. Upon identification, PSEG promptly restricted the worker's access to the radiologically controlled area (RCA). This condition has been entered into PSEG's corrective action program (CAP) as notification (NOTF) 20701814.

This finding was more than minor since it was associated with the program and process attribute of the Occupational Radiation Safety cornerstone and adversely affected its objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine reactor operation. Additionally, the finding was similar to IMC 0612, Appendix E, Example 6.h, which describes an improper entry into a high radiation area (HRA). Specifically, the worker entered the LHRA without being signed on to the proper RWP, without receiving a pre-entry LHRA briefing from radiation protection (RP) staff, and subsequently received a dose rate alarm. The finding was evaluated using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, where it screened to very low safety significance (Green) since it was not associated with an as low as is reasonably achievable (ALARA) issue, did not involve an overexposure, did not constitute a substantial potential for overexposure, and did not compromise PSEG's ability to assess dose. The inspectors determined this finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, in that the worker did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, the worker lacked situational awareness when they became distracted and crossed a radiological boundary without the appropriate authorization. [H.12] (Section 4OA3.1)

Other Findings

One violation of very low safety significance that was identified by PSEG was reviewed by the inspectors. Corrective actions taken or planned by PSEG have been entered into PSEG's corrective action program. This violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

The Hope Creek Generating Station began the inspection period at full rated thermal power (RTP). On September 18, 2015, operators reduced power to approximately 50 percent to support planned turbine valve testing, control rod scram time testing, control rod sequence exchange, and to repair a leak on an extraction steam bleeder trip valve. Operators returned the unit to full power on September 21, 2015. On September 28, 2015, an automatic reactor scram occurred following trips of both reactor recirculation pumps. The station was progressing through troubleshooting and unit restart activities at the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

External Flooding

a. Inspection Scope

During the week of July 27, 2015, the inspectors performed an inspection of the external flood protection measures for Hope Creek. The inspectors reviewed the UFSAR, Chapters 2.4.2, "Floods," and 3.4, "Water Level (Flood) Design," which described the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors also reviewed the limiting conditions for operations and the surveillance requirements in TRM 3/4.7.3, "Flood Protection." The inspectors' review focused on the Hope Creek SWIS. Specifically, the inspectors walked down the SWIS and inspected the condition of the walls to ensure there were no openings (exposed to the outside) that could make the plant susceptible to external flooding. The inspectors also inspected the flood doors present in that area, which are listed in TRM Table 3.7.3-1, "Perimeter Flood Doors." The inspectors verified that the doors were in conformance with the plant maintenance procedures and drawings. Additionally, the inspectors reviewed the abnormal operating procedure, HC.OP-AB.MISC-0001, "Acts of Nature," for mitigating external flooding during severe weather to confirm that PSEG had planned and established adequate measures to protect against external flooding events. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

Introduction. The inspectors identified a SL IV NCV of 10 CFR 50.9(a), "Completeness and Accuracy of Information," for PSEG's failure to provide accurate and complete information in a license amendment request regarding TS 3.7.3 "Flood Protection." This information was material to NRC because it was used, in part, as the basis for the approval and issuance of a license amendment to remove the Unit 2 SWIS watertight doors from TS flood protection requirements.

Description. The Hope Creek station service water (SSW) system (SSWS) ensures the availability of cooling water to support operability of the emergency core cooling systems (ECCS) by providing cooling water to the safety auxiliaries cooling system (SACS) heat exchangers during normal and emergency conditions. The SSW pumps and other major system components are housed in the SWIS. The SSW pumps take suction on individual bays that draw water from the Delaware River. The SWIS is a Seismic Category I structure that is designed to withstand the static and dynamic effects from postulated external floods. The SWIS contains four adjacent bays that each have access to the exterior of the building and the common traveling water screen room. Two of those bays house equipment associated with the Unit 1 'A' and 'B' SSW loops. The two remaining bays are empty, inactive Unit 2 bays. The exterior watertight doors to the SSW bays are normally kept open during plant operation, and are closed during high river water level conditions and when severe storm warnings are in effect.

In December 1998, PSEG submitted a license amendment request to remove the Hope Creek Unit 2 SWIS watertight doors from TS 3.7.3 flood protection requirements with the justification that a failure to close a SSWS intake structure door would have no impact on Unit 1 safety-related SSWS components for watertight doors associated with the empty Unit 2 SSWS bays. In September 1999, the NRC issued TS Amendment 122 which implemented the requested change. During the inspectors' review of the external flooding design for the SWIS, they identified a note in the abnormal operating procedure HC.OP-AB.MISC-0001, "Acts of Nature," that stated:

Doors in Bays 2 & 4 are NOT required per [technical requirements] Table 3.7.3-1; however, watertight doors in ALL Bays are to be closed within one hour.

In November 2004, the PSEG Quality Assurance organization identified that the Unit 2 watertight doors were, in fact, required for flood protection of the Unit 1 SSWS because the internal walls of the SWIS bays were not rated to provide external flood protection (NOTF 20211794). The December 1998 license amendment request states that, "A failure to close a SSWS intake structure door would have no impact on safety-related SSWS components for watertight doors associated with empty Unit 2 SSWS bays, or would only impact one loop of SSWS if a door associated with an active bay could not be closed." The Hope Creek Updated Final Safety Analysis Report (UFSAR), meanwhile, states that, "The worst single access door left open is postulated to be the exterior door at elevation 100 feet-6 inches at the east wall of the SWIS. If the water could enter this door, it might render the SSWS inoperative and prevent a continuous safe shutdown." Licensing performed an evaluation (Order 70042919) and determined that the license change request did not receive adequate review prior to being submitted and resulted in an incorrect statement in the license change request. The evaluation listed the following corrective actions:

- Performed a procedure change to HC.OP-AB.MISC-0001, "Acts of Nature," to direct closure of the Unit 2 SWIS watertight doors
- Review open corrective maintenance activities, if any, on the Unit 2 SWIS watertight doors
- Complete required maintenance activities, to restore Unit 2 SWIS watertight doors to the same level required by TS operability
- Review preventive maintenance activities for the Unit 1 SWIS watertight doors and ensure that similar ones are in place for Unit 2 SWIS watertight doors

- Submit a license change request to add the Unit 2 SWIS watertight doors back into TS

The inspectors verified the Hope Creek abnormal operating procedure HC.OP-AB.MISC-0001, "Acts of Nature," was revised following performance of the evaluation as an administrative control to ensure that all of the SWIS exterior doors would be procedurally-required to be closed even though the TS no longer directed their closure. The inspectors also verified that outstanding corrective maintenance was completed and that preventive maintenance was the same and up-to-date for all of the SWIS watertight doors. However, the inspectors identified that the corrective action to reinstate the Unit 2 watertight doors under the Flood Protection TS was never completed. In September 2013, PSEG submitted a license amendment request to relocate the Hope Creek TS 3.7.3 flood protection requirements to the Hope Creek TRM. In December 2014, the NRC issued TS Amendment 196 which implemented the requested change.

Following NRC identification of inadequacies associated with the Unit 2 watertight doors, PSEG took corrective action to reinstate the flood protection requirements for the doors in the Hope Creek TRM. Additionally, since the inaccurate license change request submittal in 1998, PSEG implemented LS-AA-117, "Written Communications," which requires that all license amendment requests and documents submitted to the NRC under oath and affirmation shall receive a Technical Verification Team review. The Technical Verification Team review consists of a page-by-page review of the subject document that identifies and validates all statements of fact, assumptions, data inputs and calculations which could alter the conclusions reached in the document.

Analysis. PSEG's failure to provide complete and accurate information in a license amendment request in December 1998 in accordance with 10 CFR 50.9(a) is a performance deficiency that was reasonably within PSEG's ability to foresee and correct and should have been prevented. This violation impacted the regulatory process in that the inaccurate information was material to the NRC's determination that there was reasonable assurance the proposed removal of the Unit 2 SWIS bay watertight doors from the Hope Creek TSs would not result in plant operations that would endanger the health and safety of the public. The inspectors concluded that had the information been complete and accurate at the time provided, it likely would have resulted in a reconsideration of this regulatory position. Because the issue had the potential to affect the NRC's ability to perform its regulatory oversight function, the inspectors evaluated this performance deficiency in accordance with the Traditional Enforcement process. The inspectors determined that this performance deficiency is a Severity Level IV violation, because: the risk associated with an external flooding event at Hope Creek is very low (less than 10^{-8} per year), the flood protection TS requirement has been changed to a TRM requirement, and the procedure revision to HC.OP-AB.MISC-0001, "Acts of Nature," ensured that all of the SWIS exterior doors were closed during high river water level conditions. The performance deficiency was screened against the ROP per the guidance of IMC 0612, Appendix B, "Issue Screening," and no associated ROP finding was identified. In accordance with IMC 0612, Appendix B, this traditional enforcement issue is not assigned at cross-cutting aspect.

Enforcement. 10 CFR 50.9(a) requires, in part, that information provided to the Commission by a licensee shall be complete and accurate in all material respects. Contrary to the above, on December 30, 1998, PSEG provided information to the NRC in a license amendment request requesting a change to flood protection requirements in TS 3.7.3 that was not complete and accurate in all material respects. Specifically, PSEG submitted a license amendment request to remove the Hope Creek Unit 2 SWIS watertight doors from TS flood protection requirements with the justification that a failure to close a Unit 2 watertight door would have no impact on Unit 1 safety-related SSWS components. However, the Unit 2 watertight doors were, in fact, required for flood protection of the Unit 1 SSWS because the internal walls of the SWIS bays were not rated to provide external flood protection. PSEG's corrective actions include reinstatement of the Unit 2 watertight doors in the TRM flood protection requirements. Additionally, since the inaccurate license change request submittal in 1998, PSEG implemented LS-AA-117, "Written Communications," which requires that all license amendment requests and documents submitted to the NRC under oath and affirmation shall receive a Technical Verification Team review. The Technical Verification Team review consists of a page-by-page review of the subject document that identifies and validates all statements of fact, assumptions, data inputs and calculations which could alter the conclusions reached in the document. Because the violation was of Severity Level IV significance and was entered into PSEG's CAP as NOTF 20697920, this violation is being treated as a NCV consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000354/2015003-01, Inaccurate Information Provided to the NRC in License Amendment Request for Service Water Bay Watertight Doors)**

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 'B' core spray (CS) loop during planned maintenance on the 'C' emergency diesel generator (EDG) on July 9, 2015
- 'C' SACS pump during unplanned maintenance on the 'A' SACS pump motor junction box on July 11, 2015
- 'A' SACS pump during planned maintenance on the 'C' SACS pump for flow element troubleshooting on August 4, 2015
- 'B' and 'D' residual heat removal (RHR) pumps during 'C' RHR pump planned maintenance on September 2, 2015

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TS, work orders (WOs), NOTFs, and the impact of ongoing work activities on redundant trains in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies.

The inspectors also reviewed whether PSEG staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On August 19, 2015, the inspectors performed a complete system walkdown of the Class 1E 480 volts alternating current (VAC) system and Class 1E batteries. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment lineup procedures, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability and equipment cooling, support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PSEG staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure PSEG appropriately evaluated and resolved any deficiencies.

b. Inspection Scope

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q - 4 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that PSEG controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- FRH-II-531, EDG rooms on July 20, 2015
- FRH-II-424, motor control center area on July 29, 2015
- FRH-II-512, reactor core isolation cooling (RCIC) battery charger room on August 18, 2015
- FRH-II-522, cable spreading room on September 10, 2015

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on August 11, 2015 that involved a simulated fire in the Hope Creek technical support center (TSC) electrical room. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that PSEG personnel identified deficiencies, openly discussed them in a self-critical manner at the post-drill debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with PSEG's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including service water cable manholes MH-102, MH-103, and MH-105, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering

devices were not installed. For those cables found submerged in water, the inspectors verified that PSEG had conducted an operability evaluation for the cables and were implementing appropriate corrective actions.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

.1 Quarterly Review of Licensed Operator Regualification Testing and Training (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 4, 2015, that included a seismic event, loss of the BD481 120 VAC inverter, loss of the electrohydraulic control system, anticipated transient without scram (ATWS), loss of coolant accident (LOCA), and high pressure coolant injection (HPCI) system malfunction. The inspectors evaluated operator performance during the simulated event and verified completion of critical tasks, risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager. Additionally, the inspectors assessed the ability of the training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room 71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed a high risk activity to restore the 'A' moisture separator reheater emergency dump valve following corrective maintenance on September 14, 2015. The inspectors also observed a planned down power to support the conduct of main turbine valve testing on September 18, 2015. The inspectors observed reactivity manipulations to verify that procedure use and crew communications met established expectations and standards. The inspectors observed pre-shift briefings and reactivity control briefings to verify that the briefings met the criteria specified in the criteria specified in OP-AA-101-111-1004, "Operations Standards," Revision 6 and HU-AA-1211, "Pre-Job Briefings," Revision 13. Additionally, the inspectors observed licensed operator performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that PSEG was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the structure, system, or component was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by PSEG staff was reasonable. As applicable, for structures, systems, and components classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these structures, systems, and components to (a)(2). Additionally, the inspectors ensured that PSEG staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- filtration, recirculation, and ventilation system (FRVS) radiation monitoring system flow rate sensors found out of tolerance on July 8, 2015
- fire detection system carbon dioxide system fire detector failures on September 10, 2015

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that PSEG performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that PSEG personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When PSEG performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- 'C' EDG jacket water heater failure and loss of the 10B431 Class 1E 480 VAC motor control center on August 4, 2015
- 'A' circulating water pump discharge valve failed closed on September 3, 2015
- 'A' moisture separator reheater emergency dump valve emergent repair and restoration on September 14, 2015
- Planned downpower for main turbine valve testing and control rod scram time testing on September 18, 2015
- Mitigating strategies for beyond design basis external events validation drill on September 22, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- HPCI to CS injection valve failure to open on July 6, 2015 (Order 70178126)
- Local power range monitor upscale alarm on July 13, 2015 (NOTF 20696511)
- One inch hole originating from plant construction in the wall between the reactor building and auxiliary building found on July 28, 2015 (Order 80115166)
- 'C' EDG jacket water heater failure on August 4, 2015 (NOTF 20699521)
- Refueling outage safety relief valve (SRV) as-found set point failures on September 15, 2015 (NOTF 20692390)
- Annual review of operator workarounds (OWAs)

The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to PSEG's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of OWAs, the inspectors determined whether the measures in place would function as intended and were properly controlled by PSEG. Based on the review of the selected OWAs listed above, the inspectors verified that PSEG identified OWAs at an appropriate threshold and addressed them in a manner that effectively managed OWA-related adverse effects on operators and SSCs.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)Permanent Modificationsa. Inspection Scope

The inspectors evaluated modifications to the SWIS ventilation damper actuator arm implemented by design change package 80108126. This design change fabricated a new actuator linkage with additional keyways. This modification will allow the SWIS dampers to be manually positioned if an actuator fails. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the design change, including the damper operation.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 5 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- 'B' post-accident monitoring system level transmitter replacement on July 8, 2015 (Order 60124506)
- 'B1' oscillation power range monitor module replacement on July 16, 2015 (Order 50168148)
- HPCI CS injection valve BJHV-F006 troubleshooting on August 5, 2015 (Order 60124524)
- 'A' SACS relay replacements on August 31, 2015 (Order 40028468)
- 'D' CS relay replacement on September 24, 2015 (Orders 30192142 and 30262505)

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied technical specifications, the UFSAR, and PSEG procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- HC.IC-CC.SA-0002, redundant reactivity control system Division 2, Channel A ATWS Recirculation pump trip, the week of July 15, 2015
- HC.OP-ST.KJ-0004, 'D' EDG monthly operability test on July 20, 2015
- HC.OP-IS.BC-0004, DP202, 'D' RHR pump in-service test on July 22, 2015
- HC.OP-ST.BD-0003, RCIC Functional Verification – 18 months, on August 20, 2015
- HC.OP-IS.EG-0001, 'A' SACS pump, AP210, in-service test on August 27, 2015
- HC.OP-IS.BH-0003, 'A' standby liquid control pump, AP208, two year comprehensive test on August 27, 2015

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness1EP2 Alert and Notification System Evaluation (71114.02 - 1 sample)a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the alert and notification system (ANS). During this inspection, the inspectors conducted a review of the Artificial Island siren testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency (FEMA) approved ANS Design Report to ensure PSEG's compliance with design report commitments for system maintenance and testing. The inspection was conducted in accordance with NRC Inspection Procedure 71114.02. 10 CFR 50.47(b)(5) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 – 1 sample)

a. Inspection Scope

The inspectors conducted a review of the Hope Creek Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of key PSEG staff to respond to an emergency event and to verify PSEG's ability to activate their emergency response facilities (ERFs) in a timely manner. The inspectors reviewed: the PSEG Nuclear LLC Emergency Plan for ERF activation and ERO staffing requirements; the ERO duty roster; applicable station procedures; augmentation test reports; the most recent drive-in drill reports; and corrective action reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. The inspection was conducted in accordance with NRC Inspection Procedure 71114.03. 10 CFR 50.47(b) (2) and related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Maintaining Emergency Preparedness (71114.05 - 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of PSEG's efforts to maintain the Hope Creek emergency preparedness (EP) program. The inspectors reviewed: memorandums of agreement with offsite agencies; the 10 CFR 50.54(q) Emergency Plan change process and practice; PSEG's maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary, backup, and alternative ERF maintenance. The inspectors also verified PSEG's compliance at Salem and Hope Creek with NRC EP regulations regarding: emergency action levels for hostile action events; protective actions for on-site personnel during events; emergency declaration timeliness; ERO augmentation and alternate facility capability; evacuation time estimate updates; on-shift ERO staffing analysis; and, ANS back-up means.

The inspectors further evaluated PSEG's ability to maintain the Hope Creek EP programs through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, self-assessments, and 10 CFR 50.54(t) reviews. Also, the inspectors reviewed a sample of EP-related condition reports initiated at Hope Creek from January 2014 through June 2015. The inspection was conducted in accordance with NRC Inspection Procedure 71114.05. 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

The inspectors reviewed PSEG performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TSs, applicable Regulatory Guides (RGs), and the procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed occupational exposure performance indicators, RP program audits, and reports of operational occurrences in occupational radiation safety.

Radiological Hazard Assessment

The inspectors reviewed recent plant radiation surveys and any changes to plant operations since the last inspection to identify any new radiological hazards for onsite workers or members of the public.

Contamination and Radioactive Material Control

The inspectors reviewed and observed monitoring of potentially contaminated material leaving the radiological control area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors reviewed inventory and leak checking of radioactive sources and reviewed transactions of nationally tracked sources.

Radiological Hazards Control and Work Coverage

The inspectors evaluated in-plant radiological conditions, including airborne radioactivity controls, and performed independent radiation measurements during facility walk-downs. The inspectors reviewed the control of highly activated or contaminated materials stored within the spent fuel pools and the posting and physical controls for selected HRAs, LHRAs and very high radiation areas (VHRA).

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

The inspectors reviewed PSEG performance with respect to maintaining occupational individual and collective radiation exposures ALARA. The inspectors used the requirements contained in 10 CFR 20, applicable RGs, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed Hope Creek collective dose history and trends; ongoing and planned radiological work activities; radiological source term history and trends; and ALARA dose estimating and tracking procedures.

Radiological Work Planning

The inspectors reviewed radiological work activities including; exposure estimates; exposure reduction requirements; exposure results achieved (dose rate reductions, actual dose); person-hour estimates and results achieved; and post-job reviews that identify lessons learned.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed: current annual collective dose estimate; collective dose basis methodology; and measures to track, trend, reduce, and adjust occupational doses for ongoing work activities.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR 20, RG 8.15, RG 8.25, NUREG/CR-0041, TS, and procedures required by TS as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR to identify ventilation and radiation monitoring systems associated with airborne radioactivity controls; respiratory protection program procedures; and current performance indicators for unintended internal exposure incidents.

Use of Respiratory Protection Devices

The inspectors reviewed the use of respiratory protection devices in the plant to include applicable ALARA evaluations, respiratory protection device certification, respiratory equipment storage, and training curricula.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by PSEG's corrective action program.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, Regulatory Guides, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: radiation protection program audits and procedures associated with dosimetry operations.

External Dosimetry

The inspectors reviewed onsite storage of dosimeters and use of "correction factors" to align electronic personal dosimeter (EPD) results with National Voluntary Laboratory Accreditation Program (NVLAP) dosimetry results.

Internal Dosimetry

The inspectors reviewed procedures; passive personnel monitoring, whole body counter measurement sensitivity and use; whole body count monitoring of plant radionuclides; dose assessments based on air sample monitoring and the use of respiratory protection; and internal dose assessments.

Special Dosimetry Situations

The inspector reviewed exposure controls for declared pregnant workers and the use of neutron dosimetry.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

a. Inspection Scope

The inspectors reviewed performance in assuring the accuracy and operability of radiation monitoring instruments used to protect occupational workers and for effluent monitoring and analysis. The inspectors used the requirements in 10 CFR 20, 10 CFR 50, Appendix I; technical specifications; Offsite Dose Calculation Manual (ODCM); RGs; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed PSEG's 2013 and 2014 annual effluent and environmental reports; the UFSAR and ODCM; RP audits; records of in-service survey instrumentation; and procedures for instrument source checks and calibrations.

Walkdowns and Observations

The inspectors conducted walkdowns of plant area radiation monitors, continuous air monitors and radioactive effluent monitors. The inspectors assessed material condition of these systems and that the monitor configurations aligned with the ODCM and the UFSAR. The inspectors checked the calibration and source check status of various portable radiation survey instruments and contamination detection monitors for personnel and equipment.

Calibration and Testing Program

The inspectors reviewed calibration and functional testing results for the following:

- process and effluent monitors (FRVS, south plant vent (SPV), north plant vent (NPV), cooling tower blowdown, and liquid radwaste discharge);
- gamma spectroscopy and liquid scintillation counting system;
- whole body counting system;

- post-accident monitoring and sampling equipment including procedures for effluent sample analysis (Drywell Atmosphere Post-Accident (DAPA) and FRVS Effluent High Range);
- effluent monitor set-point determination (FRVS, SPV)

Instrument Calibrator

The inspectors reviewed the calibration standards used for portable instrument calibrations and response checks to verify that instruments were calibrated by a facility that used National Institute of Science and Technology traceable sources.

Calibration and Check Sources

The inspectors reviewed the plant waste stream characterization to assess whether the calibration sources used were representative of the radiation encountered in the plant.

Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring instrumentation were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 – 1 sample)

a. Inspection Scope

The inspectors reviewed the treatment, monitoring, and control of radioactive gaseous and liquid effluents. The inspectors used the requirements in 10 CFR 20, 10 CFR 50, Appendix I; TS; ODCM; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted in-office review of the PSEG's 2013 and 2014 annual radioactive effluent and environmental reports, radioactive effluent program documents, UFSAR, ODCM, and applicable event reports.

Walkdowns and Observations

The inspectors walked down selected gaseous and liquid effluent monitoring systems to assess the material condition and verify proper alignment according to plant design.

Sampling and Analyses

The inspectors reviewed: radioactive liquid and gaseous effluent sampling activities, representative effluent sampling requirements; and compensatory measures taken during effluent discharges with inoperable effluent radiation monitoring instrumentation (NPV, SPV, and floor drain sample tank).

Instrumentation and Equipment

The inspectors reviewed the methodology PSEG uses to determine the effluent stack and ventilation flow rates with respect to ODCM or FSAR designated values. The inspectors also reviewed surveillance test results for Technical Specification required ventilation effluent discharge systems (FRVS).

Dose Calculations

The inspectors reviewed: changes in reported dose values from the previous annual radioactive effluent release reports; several liquid and gaseous radioactive waste discharge permits; the scaling method for hard-to-detect radionuclides; ODCM changes; land use census changes; public dose calculations (monthly, quarterly, annual); and records of abnormal gaseous or liquid radioactive releases.

Groundwater Protection Initiative Implementation

The inspectors reviewed: groundwater monitoring results; anomalous results or missed groundwater samples; leakage or spill events including entries into the decommissioning file (10 CFR50.75 (g)); and PSEG's evaluation of any positive groundwater sample results including stakeholder notifications and effluent reporting requirements. The inspector also reviewed PSEG's evaluation of the source and dose impact of gaseous tritium condensation on the Turbine Building roof.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the radioactive effluent monitoring and control program were identified at an appropriate threshold and properly addressed in PSEG's corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151 – 8 samples)

.1 Mitigating Systems Performance Index (MSPI)

a. Inspection Scope

The inspectors reviewed PSEG submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2014 through June 30, 2015:

- Emergency AC Power System (MS06)
- High Pressure Injection System (MS07)
- Heat Removal System (MS08)
- Residual Heat Removal System (MS09)
- Cooling Water Support System (MS10)

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed PSEG's operator narrative logs, CAP records, MSPI reports, key performance indicator summary records, operating data reports and the MSPI basis document, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Emergency Preparedness Performance Indicators

a. Inspection Scope

The inspectors reviewed data for the following three EP PIs: (1) drill and exercise performance; (2) ERO drill participation; and, (3) ANS reliability. The last NRC EP inspection at Salem and Hope Creek was conducted in the second calendar quarter of 2014. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the second calendar quarter of 2014 through the second calendar quarter of 2015 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 7, was used as reference criteria.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 - 3 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that PSEG entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended condition report screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, PSEG performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Annual Sample: Extent of Condition (EOC) Review for Water Intrusion in the RCIC Turbine Oil System

a. Inspection Scope

The inspectors performed an in-depth review of PSEG's work group evaluation (WGE) and corrective actions associated with order 70174237. This evaluation was performed as a result of a Green self-revealing NCV 05000354/2015001-01, Failure to Identify and Correct a Condition Adverse to Quality (CAQ) Associated with the Reactor Core Isolation Cooling System Insulation and Oil, issued on April 21, 2015. As part of the NCV, the inspectors determined that PSEG did not promptly identify and correct a CAQ, in part, due to failing to initiate a NOTF identifying an adverse trend in RCIC oil moisture content and level on multiple occasions.

The inspectors assessed PSEG's problem identification threshold, causal analyses, technical evaluations, extent of condition reviews, and the prioritization and timeliness of corrective actions to determine whether PSEG was appropriately identifying, characterizing, and correcting problems associated with this issue. The inspectors reviewed the circumstances of the RCIC water intrusion into the oil event and operating experience to ascertain the appropriateness of corrective actions. Previous opportunities for PSEG to have identified and corrected issues with safety and non-safety related component oil analysis trending were reviewed by the inspectors. The inspectors also assessed PSEG's corrective actions to prevent recurrence. The inspectors compared the actions taken to the requirements of PSEG's corrective action program and 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action. In addition, the inspectors reviewed documentation associated with this issue, including condition and failure analysis reports, oil analysis records, and interviewed engineering personnel to assess the effectiveness of the planned and implemented corrective actions.

b. Findings and Observations

No findings were identified.

In response to NCV 05000354/2015001-01, PSEG completed WGE 70174237 which identified behavioral, process, and procedural gaps as the causes of the increasing water content trend in the RCIC oil system not being identified. Specifically, PSEG noted deficiencies in the oil analysis program data review process and procedures, as well as limitations with the oil analysis database. PSEG created corrective actions, which included:

- Replacing the oil in the RCIC turbine oil system;
- Reviewing the oil analysis trends for all critical and non-critical components in the oil analysis program to determine if there are any undetected adverse trends;
- Revising OP-AA-102-102, General Area Checks and Operator Field Rounds, and MA-AA-716-230-1001, Oil Analysis Interpretation Guideline; and,
- Implementing an upgraded oil analysis database, and until the database is upgraded, conduct bi-monthly oil trend review meetings.

PSEG's EOC for the oil analysis program included reviewing 145 critical and non-critical components for any undetected adverse trends. PSEG documented four existing adverse trends that were already captured in the oil analysis program, including main turbine control oil, RCIC turbine oil, main generator seal oil and the service air compressor inboard bearing. PSEG's review did not identify any undetected adverse trends, but it did identify four non-adverse trends that were added to the oil analysis program for monitoring, including the water content in the 'A,' 'B, and 'C' EDG rocker arm oil samples and the 'C' EDG crankcase oil sample. PSEG then documented NOTF 20694025 discussing that numerous oil samples for critical and non-critical components were not getting analyzed in a timely manner, if at all, due to changes in the radiation protection release process from Hope Creek's RCA.

The inspectors reviewed PSEG's evaluation, EOC, oil analysis program, and corrective action program documentation. The inspectors reviewed the compensatory measures associated with PSEG's ongoing operability evaluation (OPEVAL) for the RCIC pump failing to rotate during low pressure testing on May 10, 2015. OPEVAL compensatory measure No. 1 (70176529-0090) was created in support of RCIC system continued operability and required PSEG to complete a lubrication analysis of the RCIC pump inboard and outboard bearing housing oil samples taken on May 10 and 14, 2015, during low pressure and high pressure In-service test, respectively. The lubrication analysis was reviewed by PSEG, which determined that the oil was satisfactory for all four RCIC pump bearing oil samples with no indications of bearing degradation that could contribute to the RCIC pump's seized condition.

The RCIC pump bearing oil is sampled on an 18 month frequency, and the recent sample results were:

	5/10/2015	5/14/2015	6/24/2015	9/9/2015	9/10/2015
RCIC Pump – Inboard Bearing					
Particle Count/mL - 4um	57,050	66,041	55,929	15,649	14,019
Particle Count/mL - 6um	8,070	8,379	14,396	1,633	1,972
Particle Count/mL - 14um	589	387	1,526	163	143
ISO Code 4406:99 (4um/6um/14um)	23/20/16	23/20/16	23/21/18	21/18/15	21/18/14
RCIC Pump – Outboard Bearing					
Particle Count/mL - 4um	22,600	64,491	30,958	17,518	10,757
Particle Count/mL - 6um	1,627	7,825	5,355	1,494	2,008
Particle Count/mL - 14um	148	296	1,090	237	168
ISO Code 4406:99 (4um/6um/14um)	22/18/14	23/20/15	22/20/17	21/18/15	21/18/15

The oil analysis vendor rated the February 2014 samples as ‘marginal’ due to particle contamination and recommended increased sampling frequency to monitor the component. The inspectors found that no increased sampling was performed by PSEG as recommended by the vendor.

The inspectors reviewed Hope Creek’s procedure for Oil Analysis Interpretation, MA-AA-716-230-1001, and the program basis document for Lubricating Oil Analysis, SH-PBD-AMP.XI.M39, to determine if the program requirements were being followed. MA-AA-716-230-1001, Section 1.4.1 Guidelines, explains that corrective actions should be considered when the following limits are exceeded: for all pumps the fault limit is 18/16/14. MA-AA-716-230-1001 goes on to state that when oil analysis indicates an excessive particle level, fluid replacement is warranted. SH-PBD-AMP-XI.M39, Section 3.5 Monitoring and Trending, and Section 3.7 Corrective Actions (per NUREG-1801) state, in part, “The analytical results from the lubricating oil samples are reviewed and compared to the Normal, Alert, and Fault ranges, and entered into the database for trending purposes. As the results trend out of the Normal ranges, or if there is an unusual trend, an SAP notification is initiated to evaluate the conditions and implement corrective actions, such as filtering or oil replacement, to maintain the lubricating oil contaminants within acceptable limits.”

The inspectors questioned PSEG’s rationale for documenting that the RCIC pump oil samples were satisfactory even though the analysis showed the particle numbers to be well above the high range of the acceptance band. The inspectors found that the particulate count in the RCIC pump oil samples were all greater than 25 times the high range of the acceptance band, and significantly exceeded the fault limit thresholds for particle counts of 18/16/14 in MA-AA-716-230-1001, Attachments 22 and 24. This procedure requires that the component exceeding the Fault limits be designated as ‘ORANGE’ or ‘Restricted,’ requiring work to be scheduled emergently (within 6 to 13

weeks of identification) because the component is rapidly degrading and should be relied on only for a period of a few weeks.

PSEG's apparent cause evaluation (Order 70176824) for the RCIC pump failing to rotate found, in part, that gaps existed in the frequency of oil sampling and analysis being performed on the RCIC pump as recommended by the vendor and the performance centered monitoring (PCM) template. The PCM template recommended a six month oil sampling frequency, and PSEG was conducting the sampling on an 18 month frequency. The inspectors determined that PSEG failed to initiate a NOTF for an adverse trend in the RCIC pump inboard and outboard bearing oil samples having high particle counts. The inspectors also noted that the RCIC pump had not been included in Hope Creek's oil analysis program adverse trending, even though an adverse trend in particle count existed, nor had any increased sampling of the RCIC pump oil been initiated. PSEG initiated NOTF 20695133 on June 25, 2015, in response to the inspector's observations. As a result of this NOTF, PSEG has initiated corrective actions to: 1) track the RCIC pump oil high particulate as an adverse trend in the oil analysis program; 2) adequately disposition the high particulate count in the RCIC pump oil and the potential impact on bearing function; and, 3) revise oil analysis procedures to standardize particle count limits.

The inspectors reviewed PSEG's technical evaluation documented in Order 70178071, which dispositioned the RCIC pump oil high particulate and its potential impact on bearing life and function. PSEG's review of the RCIC Pump oil analyses and vibration data for the inboard or outboard bearings did not identify any conditions which could immediately impact bearing function. Although the design of the RCIC pump results in less than ideal oil sampling practices, resulting in a history of elevated particulate levels in the bearing oil that can cause accelerated bearing wear, there is no indication of abnormal bearing wear in either the oil or vibration trends. Due to the limited runtime of the RCIC pump, abnormal bearing wear is not expected for the scheduled operating life of the pump.

The inspectors determined this issue to be a performance deficiency, but that it was not more than minor because it was a failure to implement a procedural requirement that had no actual safety impact or consequences on the RCIC pump performance nor was likely to lead to further degradation of the pump within the scheduled operating life. Further, the issue did not cause nor likely result in the inoperability of the RCIC system.

.3 Annual Sample: Unannounced Fire Drill Assessment

a. Inspection Scope

The inspectors performed an in-depth review of PSEG's Focused Area Self-Assessment (FASA) and corrective actions associated with NOTF 20674128 regarding the inadequacy of PSEG's fire protection drill assessments. NOTF 20674128 was generated as a result of fire protection drill assessment deficiencies identified by NRC inspectors during a number of unannounced fire drills. PSEG's fire brigade consists of six members with the sole duty to respond to fires at both Hope Creek and Salem. Therefore, identified deficiencies in the area of fire brigade drill assessment at both Hope Creek and Salem were reviewed by the inspectors.

The inspectors assessed PSEG's problem identification threshold, fire drill assessment records, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether PSEG was appropriately identifying, characterizing, and correcting problems associated with this issue. In addition, the inspectors reviewed documentation associated with this issue, including fire drill critique records, interviewed PSEG's fire personnel, and observed an unannounced fire protection drill in order to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors concluded that PSEG took the appropriate actions to identify and evaluate the cause of the deficiencies. The apparent cause was determined to be an inadequate procedure associated with fire protection drill performance. PSEG promptly investigated the issue and completed a detailed FASA to identify and correct drill performance gaps. The FASA was conducted in response to deficiencies identified during PSEG's assessment of fire protection drill performance. The FASA evaluated fire brigade drill performance in accordance with NRC regulatory requirements, PSEG's fire protection program, and industry and internal operating experiences. Subsequently, PSEG's fire drill performance procedure, FP-AA-024, was revised to implement the recommended corrective actions. Specifically, clear documentation of performance acceptance criteria were added into the procedure. For instance, if one critical assessment criteria or two non-critical assessment criteria were concluded to be unsatisfactory, the drill was automatically failed. Also, each brigade member drill performance was graded either satisfactory or unsatisfactory. Finally, PSEG invited outside observers, which were not associated with their fire department, to their post-drill critique discussions to challenge their critiques.

The inspectors determined that PSEG's overall response to the issue was timely, commensurate with the safety significance, and the actions taken and planned were reasonable to resolve the identified deficiencies of their fire protection drill assessments.

.4 Annual Sample: 'H' Safety Relief Valve (SRV) Main Seat Leakage

a. Inspection Scope

The inspectors reviewed PSEG's identification, evaluation, and resolution regarding main seat leakage from the Hope Creek Generating Station (HCGS) 'H' main steam (MS) safety relief valve (SRV). Specifically, on August 12, 2014, HCGS operators reported a loud banging noise emanating from the torus (i.e., suppression pool). The time duration between occurrences was approximately 5 seconds. The noise continued until September 5, 2014, when the plant was shutdown to resolve the issue (Notification 20658912).

Fourteen SRVs are installed in the HCGS main steam system to provide two main safety functions - an overpressure safety function and an automatic depressurization safety function. The SRVs are two-stage SRVs consisting of a pilot stage, a main stage and a pneumatic operator for remote-manual operation. The SRV overpressure safety operation is accomplished via a mechanical spring set point on each SRV. This function is independent of the pneumatic supply to each SRV and is based on the pressure

sensed at the pilot disc of each SRV. The pneumatic operator is supplied by the safety related primary containment instrument gas system (PCIG) via a normally de-energized solenoid valve. A backup nitrogen accumulator is also provided for each SRV. The SRVs are maintained closed by the spring force acting against system pressure. Two of the fourteen SRVs are also provided with low-low settings to ensure that the containment, SRV discharge lines, and reactor overpressure protection design bases are not exceeded. The SRVs are installed such that each valve discharge is piped through a separate line to a point below the minimum water level in the primary containment suppression pool, permitting the steam to condense in the pool. A tee (T) quencher assembly is installed at the discharge end of each relief valve.

Industry operating experience has shown the two-stage SRVs to experience seat leakage and setpoint drift, as documented in numerous NRC communications. Industry experience and evaluations have determined the cause of the setpoint drift is due to corrosion bonding which forms between the mating surfaces of the pilot disc and the seat in the pilot body. This inspection was performed to review the adequacy of PSEG evaluations and corrective actions for the 'H' SRV main seat leakage, suppression pool noise, and evaluations of the SRV discharge piping and T-quencher cyclic loading due to the condensate induced water hammer.

The inspectors reviewed applicable notifications, corrective actions and surveillance test results to evaluate the adequacy of PSEG's performance in the areas of problem identification, evaluation, extent-of-condition reviews, and corrective actions. The inspectors compared the actions taken to the requirements of PSEG's corrective action program and 10 CFR Part 50, Appendix B. The inspectors reviewed PSEG's actions to address other possible or contributing causes. The inspectors also reviewed videos of visual inspections performed on the 'H' SRV discharge piping and T-quencher, piping supports, and hanger supports to independently verify that no visible indications were identified as a result of the water hammer. The inspectors interviewed system and design engineering and regulatory assurance personnel to assess the acceptability and effectiveness of the implemented corrective actions and to evaluate the adequacy of PSEG's administrative controls for SRV seat leakage.

b. Findings and Observations

No findings were identified.

Technical Specification (TS) 3.4.2.1, "Safety/Relief Valves," requires that 13 of the 14 SRVs be operable to ensure the safety function. Furthermore, TS surveillance requirement 4.4.2.2 requires verification that the safety function lift setpoints of the SRVs are within +/- 3% of the nominal setpoint. This surveillance testing is conducted during refueling outages when the SRVs are accessible during reactor shutdown conditions. The inspectors noted that SRV pilot valve seat leakage had previously caused a maintenance outage in February 2012, after the leak rate exceeded administrative operating limits imposed by PSEG. In addition, seat leakage of the pilot valves had been previously observed in one SRV during cycle 16 (2009), and two SRVs during cycle 17 (2011). During troubleshooting in August 2014, while the plant was operating, HCGS was able to determine that the 'H' SRV seat leakage originated from the main seat and not from the pilot valve. Pilot and main valve seat leakage can pose an SRV operability concern and may contribute to drift of the lift setpoint settings.

A failure mode causal team was developed with input from subject matter experts throughout the industry including General Electric, vendors, and peer stations to evaluate and determine the cause. The cause of the suppression pool noise was determined to be condensation induced water hammer in the T-quencher of the 'H' SRV. The inspectors reviewed the technical evaluation performed under 70169494-0010 which calculated stresses and hanger loads to determine high stress locations along the 'H' SRV discharge piping inside of the suppression pool and provide the locations where non-destructive examinations would be performed to verify acceptability of the piping joints, and hangers, to determine if indications of flaws existed due to fatigue. Although the piping analysis determined stresses attributed to the waterhammer event were within the required code allowance, visual inspections of the 'H' SRV piping and associated T-quencher above and below the water line were performed. The inspectors verified that multiple walkdowns and visual inspections of the 'H' SRV piping had been performed by PSEG engineers. The inspectors also reviewed video recordings of the inspections of the 'H' SRV piping as well as hangers and welds in the suppression pool below the water line. These inspections verified the affected pipe supports, hangers, and pipe welds were not damaged by the water hammer condition.

The inspectors also reviewed notification 20684902 which evaluated a condition indicating the 'H' SRV accumulator was depressurized. This issue was identified on April 13, 2015, during a refueling outage. The 'H' SRV is one of the two redundant SRVs used for the automatic safety/relief low-low setting per TS 3.4.2.2. This function is accomplished by providing these valves with altered solenoid valve setpoints to allow primary containment instrument gas (PCIG), or the backup accumulator, to open the SRVs at a setting that are lower than the remaining SRVs. The cause of the potentially depressurized 'H' SRV accumulator could not be determined. However, the inspectors verified that the PCIG system remained available and continued to provide adequate pressure to the 'H' SRV; thus its low-low safety relief function remained available. The inspectors also noted that the 'H' SRV's normal safety/relief function is performed by the mechanical spring setpoint and its associated pilot valve, and this function does not rely on PCIG system pressure or accumulator pressure. The inspectors verified there were no other TS requirements associated with the accumulator. In addition, the 'H' SRV is not required to provide the depressurization protection function (ADS), which does require an operating accumulator.

Overall, the inspectors determined that PSEG's corrective actions were reasonable in addressing the probable and contributing causes of the 'H' SRV main seat leakage, and 'H' SRV accumulator leakage issue.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 4 samples)

.1 Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that PSEG made appropriate

emergency classification assessments and properly reported the event in accordance with 10 CFR 50.72 and 50.73. The inspectors reviewed PSEG's follow-up actions related to the events to assure that PSEG implemented appropriate corrective actions commensurate with their safety significance.

- Reviewed the one inch diameter hole discovered between the Reactor Building and Auxiliary Building on July 28, 2015 (EN 51274)
- Conducted a review of the circumstances and on-going PSEG investigations associated with an unauthorized LHRA entry into the turbine building steam tunnel on September 5, 2015
- Reviewed the automatic reactor scram following 'A' and 'B' reactor recirculation pump trips during redundant reactivity control system surveillance testing on September 28, 2015 (EN 51430)

b. Findings

Introduction. A self-revealing, Green NCV of TS 6.12.2 was identified when a worker did not comply with a radiological barrier and posting, and entered a LHRA without proper authorization. Specifically, on September 5, 2015, an equipment operator entered a posted LHRA without signing on to the proper RWP and receiving a pre-entry LHRA briefing, and subsequently received a dose rate alarm.

Description. On September 5, 2015, two equipment operators were performing routine monthly LHRA rounds in accordance with HC.OP-DL.ZZ-0031, "Turbine Building High Radiation Area Inspection Log," to access turbine building HRAs and look for signs of steam leaks. Operator 1 was authorized to enter HRAs to look for visible or audible indications of leakage. Operator 1 was signed onto RWP 1, Task 1901, "Turbine Building – Steam Affected Area Inspections All Areas," which designated a dose alarm of 150 millirem (mrem) and a dose rate alarm of 1200 mrem/hour. Operator 1 also received a pre-entry LHRA briefing prior to conducting rounds. Operator 2 was not authorized for entry into HRAs or LHRAs, was not signed onto the same RWP, and did not receive a pre-entry LHRA briefing. Operator 2 was signed onto the RWP 1, Task 1000, "Turbine Building Non-High Radiation Areas," which designated a dose alarm of 10 mrem and a dose rate alarm of 60 mrem/hour. Operator 2 was present to provide verification that the high radiation area doors were locked upon Operator 1's exit. Operator 1 made an entry into the turbine building steam tunnel, a posted LHRA with accessible whole body radiation dose rates in excess of 1.0 rem/hour. Operator 2 inappropriately followed Operator 1 into the room. Operator 2 recognized the error, reported to radiation protection and noted the receipt of a high dose rate alarm on her EPD. Operator 2 received 0.4 mrem during the entry, and the highest dose rate indicated by the EPD was 112 mrem/hour. PSEG promptly restricted the worker's access to the RCA pending further investigation and entered the issue into their CAP as NOTF 20701814.

TS 6.12.2, High Radiation Area, requires, in part, that HRAs with dose rates greater than 1.0 rem/hour at 30 centimeters, but less than 500 rads/hour at one meter from the radiation source, be controlled by requiring the issuance of a RWP. In addition, any individual permitted to enter such areas shall possess a radiation monitoring device that continuously integrates the radiation dose rates in the area and alarms when a preset dose alarm setpoint is reached; entry into such areas with this monitoring device may be

made after the dose rate levels in the area have been determined and personnel have been made knowledgeable of them. Contrary to the above, on September 5, 2015, a worker entered a posted LHRA without being signed on to the proper RWP, did not receive a pre-entry LHRA briefing prior to the entry that would have made the worker knowledgeable of the radiological conditions in such areas, and subsequently received a dose rate alarm.

Analysis. The worker's entry to a LHRA without proper authorization was a performance deficiency that was reasonably within PSEG's ability to foresee and correct and should have been prevented. The issue was evaluated in accordance with IMC 0612, Appendix B, and determined to be more than minor since it was associated with the program and process attribute of the Occupational Radiation Safety cornerstone and adversely affected its objective to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive material during routine reactor operation. Additionally, the finding was similar to IMC 0612, Appendix E, Example 6.h, which describes an improper entry into an HRA. Specifically, the worker entered the LHRA without being signed on the proper RWP, without receiving a pre-entry LHRA briefing from RP staff, and subsequently received a dose rate alarm. The finding was then evaluated using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, where it screened to very low safety significance (Green) since it was not associated with an ALARA issue, did not involve an overexposure, did not constitute a substantial potential for overexposure, and did not compromise PSEG's ability to assess dose. PSEG determined no other personnel entered the area.

The inspectors determined this finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, in that the worker did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, the worker lacked situational awareness when they became distracted and crossed a radiological boundary without the appropriate authorization. [H.12]

Enforcement. TS 6.12.2, requires, in part, that HRAs with dose rates greater than 1.0 rem/hour at 30 centimeters but less than 500 rads/hour at one meter from the radiation source, be controlled by requiring the issuance of a RWP, and that any individual permitted to enter such areas shall possess a radiation monitoring device that continuously integrates the radiation dose rates in the area and alarms when a preset dose alarm setpoint is reached; entry into such areas with this monitoring device may be made after the dose rate levels in the area have been determined and personnel have been made knowledgeable of them. Contrary to the above, on September 5, 2015, a worker entered a LHRA and without being signed on to the proper RWP, did not receive a pre-entry LHRA briefing prior to the entry that would have made the worker knowledgeable of the radiological conditions in such areas, and subsequently received a dose rate alarm. PSEG's corrective action included restricting the worker's access to the RCA. Because this finding was of very low safety significance (Green) and entered into PSEG's CAP as NOTF 20701814, this finding is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000354/2015003-02, Unauthorized Locked High Radiation Area Entry)**

.2 (Closed) Licensee Event Report (LER) 05000354/2015-003-00, Conditions Prohibited by Technical Specifications Due to Low Pressure ECCS Inoperabilities

a. Inspection Scope

From 4:00 a.m. on May 4, through May 5, 2015, at 10:42 a.m., during a planned Reactor Pressure Vessel (RPV) cold hydrostatic test, classified as an operation with the potential to drain the reactor vessel (OPDRV), PSEG failed to comply with TS 3.5.2, which requires that at least two low pressure ECCS subsystems be operable in Operational Condition (OPCON) 4. This TS requires that with only one ECCS subsystem operable, two subsystems shall be restored to an operable status within four hours or suspend all OPDRV activities. Contrary to this requirement, PSEG conducted the RPV pressure test OPDRV activity with only one low pressure ECCS subsystem operable. This condition existed for approximately 30 hours and 42 minutes. TS compliance was restored at 10:42 a.m. on May 5, 2015, when a second low pressure ECCS system was returned to an operable status. PSEG reported this in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

In response to the LER and the associated PSEG NOTF 20692069, the inspectors reviewed PSEG's causal evaluation (Order 70176984) for ECCS TS compliance in OPCON 4. PSEG's evaluation determined the cause of the TS non-compliance to be a failure to properly assess the operability status of all the ECCS subsystems which could be used to meet TS 3.5.2. PSEG's corrective actions for this issue included submitting the required LER per 10 CFR 50.73, and revising the operability assessment procedure to include guidance clarifying the ECCS TS requirements and determination of operability. PSEG's evaluation also determined that there were no actual consequences or safety significance associated with this event based on the other low pressure ECCS subsystems that were available for inventory makeup, therefore no actual loss of system safety function. PSEG supported this by stating that at the time of the event:

- 1) the 'A' RHR subsystem was aligned for shutdown cooling, and isolated from the reactor coolant system to support the RPV pressure test, but could have been realigned from the control room to the low pressure coolant injection (LPCI) mode of operation by repositioning pump suction and discharge valves.
- 2) the 'C' RHR subsystem was available to be placed in the LPCI mode of operation, if required, by removing the pump breaker from the pull-to-lock position.

The inspectors reviewed PSEG's conclusions with regard to the TS non-compliance, and questioned the fact that operators recognized the potential TS non-compliance on May 5, 2015, at 10:42 a.m. when the 'C' LPCI pump was taken out of pull to lock, restoring it to an operable status and restoring compliance with TS 3.5.2, but the NOTF 20692069 for the issue was not entered into the CAP until May 15, 2015. PSEG's CAP procedure LS-AA-120 for the Issue Identification and Screening Process states, in section 4.1, to do not delay in completing or initiating immediate actions to create a NOTF. Contrary to this, PSEG operations management delayed the initiation and completing of NOTF 20692069 for approximately 10 days while assessment of the issue was performed by PSEG Regulatory Assurance. The inspectors determined that PSEG's delay in entering this issue into the CAP was a performance deficiency, but that it was not more than minor because it was a failure to follow a procedural requirement

that had no actual safety impact or consequences on the operability of the ECCS subsystems as compliance was restored when the issue was recognized by operators at 10:42 a.m. on May 5, 2015. In addition, PSEG ultimately entered in issue in its CAP and initiated corrective actions to address the concern. The enforcement aspects of this issue concerning the TS non-compliance are discussed in Section 4OA7 of this report. This LER is closed.

4OA6 Meetings, including Exit

On October 8, 2015, the inspectors presented the inspection results to Mr. P. Davison, Site Vice President of Hope Creek, and other members of the Hope Creek staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy, for being dispositioned as a NCV:

- In OPRCON 4, Hope Creek TS 3.5.2, "ECCS - Shutdown," requires that at least two low pressure ECCS subsystems be operable, and with only one ECCS subsystem operable, two subsystems shall be restored to an operable status within four hours or all OPDRV activities must be suspended. Contrary to this requirement, from May 4, at 4:00 a.m. through May 5, 2015, at 10:42 a.m., PSEG conducted an RPV cold hydrostatic test, classified as an OPDRV activity, with only one low pressure ECCS subsystem operable. This condition existed for approximately 30 hours and 42 minutes. TS compliance was restored at 10:42 a.m. on May 5, 2015, when a second low pressure ECCS subsystem was returned to an operable status. PSEG reported this in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS. PSEG entered this issue into their CAP as NOTF 20692069. PSEG's corrective actions for this issue included submitting the required LER per 10 CFR 50.73, performing a causal evaluation, and revising the operability assessment procedure to include guidance clarifying the ECCS TS requirements and determination of operability. The failure to comply with TS 3.5.2 did not have any actual consequences or loss of system safety function because other low pressure ECCS subsystems were available for inventory makeup. Therefore, this finding is of very low (Green) safety significance based on an SDP issue screening, because the ECCS subsystems would have functioned to provide reactor vessel inventory makeup. The closure of the LER associated with this event was documented in Section 4OA3.2 of this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION**KEY POINTS OF CONTACT**Licensee Personnel

P. Davison, Site Vice President
 E. Carr, Plant Manager
 M. Biggs, Maintenance Rule Program Coordinator
 D. Burgin, Emergency Preparedness Corporate Functional Area Manager
 D. Bush, Regulatory Assurance Performance Indicator Coordinator
 J. Carlin, Fire Protection Superintendent
 S. Connelly, System Engineer
 A. Contino, System Engineer
 M. Davis, Shift Manager
 M. Dior, System Engineering Manager
 P. Duke, Licensing Manager
 T. Gallagher, Emergency Services Regulatory Compliance Specialist
 S. Forbes, Maintenance Supervisor
 T. Fowler, Operations Training Manager
 T. MacEwen, Licensing Engineer
 L. Myers, Senior Reactor Operator
 M. Rooney, System Engineer
 S. Simpson, Regulatory Assurance
 K. Swing, System Engineer
 B. Thomas, Licensing Engineer
 H. Trimble, Radiation Protection Manager
 J. Wend, Radiation Protection Support Superintendent

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened/Closed

05000354/2015003-01	NCV	Inaccurate Information Provided to the NRC in License Amendment Request for Service Water Bay Watertight Doors (Section 1R01)
05000354/2015001-02	NCV	Unauthorized Locked High Radiation Area Entry (Section 4OA3.1)

Closed

05000354/2015-003-00	LER	Conditions Prohibited by Technical Specifications Due to Low Pressure ECCS Inoperabilities (Section 4OA3.2)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

EP-AA-121-1003, Equipment Important to Emergency Response – Work Prioritization, Revision 0
 EP-HC-111-107, Section H - Hazards & Other Conditions Affecting Plant Safety, Revision 0
 EP-HC-111-207, HCGS ECG – EAL Technical Basis, Revision 0
 ER-HC-310-1009, Home Creek Generating Station – Maintenance Rule Scoping, Revision 11
 HC.MD-PM.ZZ-0007, Missile Resistant and Watertight Doors P.M., Revision 10
 HC.OP-AB.MISC-0001, Acts of Nature, Revision 0
 HC.OP-AB.MISC-0001, Acts of Nature, Revision 6
 HC.OP-AB.MISC-0001, Acts of Nature, Revision 26
 HC.OP-AB.ZZ-0139, Acts of Nature, Revision 18
 HC.OP-AB.ZZ-0139, Acts of Nature, Revision 19
 HC.OP-AR.ZZ-0002, Overhead Annunciator Window Box A2, Revision 24
 HC.OP-DL.ZZ-0014, Monday Shift Routine Log, Revision 34
 HC.OP-DL.ZZ-0026, Surveillance Log, Revision 110
 HC.OP-DL.ZZ-0026, Surveillance Log, Revision 148
 HC.OP-DL.ZZ-0026, Surveillance Log, Revision 150
 HC.OP-IS.EA-0001, A Service Water Pump – AP502 – Inservice Test, Revision 55
 LS-AA-101, License and Technical Specifications Amendment Process, Revision 4
 LS-AA-101-1000, License Amendment and Technical Specifications Change Request Process, Revision 8
 LS-AA-117, Written Communications, Revision 10
 LS-AA-117-1002, Typical Licensing and Regulatory Affairs Correspondence Concurrence Form, Revision 5
 OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 12

Notifications (*NRC-identified)

20188035	20211794	20212706	20291749	20291750	20329058
20329059	20350553	20352360	20353992	20372313	20430330
20438976	20479732	20529103	20584673	20616526	20617096
20663246	20674646	20688848	20691802	20692153	20693878
20697602	20697920*	20698002*	20699873*	20701369	20702148
20702163*					

Maintenance Orders/Work Orders

30150952	30157722	60076981	70039165	70042919	70061365
70177109	80076556	80077329			

Drawings

C-0100, Service Water Intake Structure Plans at El. 93'-0" & 100'-0", Revision 12
 C-0102, Service Water Intake Structure Plans at El. 122'-0" & 128'-0", Revision 11
 P-0071-0, Equipment Location Intake Structure Building, Revision 23
 P-0072-0, Sheet 1, Equipment Location Intake Structure Building, Revision 23
 P-0072-0, Sheet 2, Equipment Location Intake Structure Building, Revision 22

Section 1R04: Equipment AlignmentProcedures

HC.OP-AB.ZZ-0170, Loss of 4.16kV Bus 10A401 A Channel, Revision 8
 HC.OP-AB.ZZ-0171, Loss of 4.16kV Bus 10A402 B Channel, Revision 10
 HC.OP-AB.ZZ-0172, Loss of 4.16kV Bus 10A403 C Channel, Revision 7
 HC.OP-AB.ZZ-0173, Loss of 4.16kV Bus 10A404 D Channel, Revision 6
 HC.OP-AR.ZZ-0001, Overhead Annunciator Window Box A1, Revision 22
 HC.OP-AR.ZZ-0026, CRIDS Computer Points Book 7 D4600 thru D4799, Revision 6
 HC.OP-IS.EG-0001, A SACS Pump – AP210 – Inservice Test, Revision 40
 HC.OP-SO.PG-0001, 480V Electrical Distribution System, Revision 21
 HC.OP-ST.BC-0001, RHR System Piping and Flow Path Verification - Monthly, Revision 22
 HC.OP-ST.BE-0004, B Core Spray Loop System Piping and Flow Path Verification – Monthly,
 Revision 4
 OP-AA-108-116, Protected Equipment Program, Revision 10

Notifications (*NRC-identified)

20646523	20661176	20663848	20665089	20666275	20666678
20666679	20668649	20669097	20669104	20669858	20671834
20673130	20676769	20678543	20678660	20679573	20682581
20683131	20685297	20685428	20685469	20685486	20685507
20685520	20687717	20689346	20691515	20691628	20692860
20693233	20696397	20696818	20698460	20698522	20698755*
20698756*	20699617*				

Maintenance Orders/Work Orders

60124618	70134157	70165411	70173912	70178565	80103987
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Drawings

E-0001, Single Line Diagram Station, Revision 24
 E-0006, Sheet 1, Single Line Meter & Relay Diagram 4.16 kV Class 1E Power System,
 Revision 11
 E-0006, Sheet 2, Single Line Meter & Relay Diagram 4.16 kV Class 1E Power System,
 Revision 10
 E-0011, Sheet 1, Single Line Meter & Relay Diagram 25V DC System – Unit 1, Revision 19
 E-0011, Sheet 2, Single Line Meter & Relay Diagram 25V DC System – Unit 1, Revision 19
 E-0018, Sheet 1, Single Line Meter & Relay Diagram 480 Volt Class 1E Unit Substation
 10B410, 10B420, 10B430, 10B440, 10B450, 10B460, 10B470, 10B480, Revision 34
 E-0018, Sheet 2, Single Line Meter & Relay Diagram 480 Volt Class 1E Unit Substation
 10B410, 10B420, 10B430, 10B440, 10B450, 10B460, 10B470, 10B480, Revision 39
 M-51-1, Sheet 1, Residual Heat Removal, Revision 47
 M-51-1, Sheet 2, Residual Heat Removal, Revision 42
 M-52-1, Sheet 1, Core Spray, Revision 31

Miscellaneous

Protected Equipment Log for 'B' Core Spray Loop, dated July 9, 2015
 DEH150206, 'A' SACS HX Sheared Anchor Bolt at Unistrut Support Brace, Revision 0
 DEH110053, SWIS Instrument Tubing Support Broken Anchor Bolts, Revision 0
 DCP 80104106, EG-0046, Safety/Turbine Auxiliaries Cooling System Operation, Revision 0
 HC-15-166, 50.59 for DEH150206
 HC MCR Narrative Logs for August 1 through August 4, 2015

Section 1R05: Fire ProtectionProcedures

FP-HC-004, Action for Inoperable Fire Protection – Hope Creek Station, Revision 3
 FRH-II-362, TSC Electrical, Mechanical, HVAC Equipment Rooms and Vent Stack Enclosure
 Elevations: 153'-0" and 172'-3" (Roof), Revision 6
 FRH-II-424, Hope Creek Pre-Fire Plan, MCC Area, Elevation 77'-0", Revision 3
 FRH-II-512, Hope Creek Pre-Fire Plan, RCIC Battery Charger Room, Elevation 54'0",
 Revision 5
 FRH-II-522, Hope Creek Pre-Fire Plan, Cable Spreading Room, Elevation 77'0", Revision 6
 FRH-II-531, Hope Creek Pre-Fire Plan, Diesel Generator Rooms, Elevation: 102'-0", Revision 8
 HC.FP-PT.KC-0021, Exciter Housing CO2 System (1C17) Functional Test and Inspection,
 Revision 8
 HC.FP-SO.KC-0001, Fire Protection Water Suppression Systems Operation, Revision 6
 HC.FP-ST.QK-0029, Class 1 Fire Detection Functional Test, Revision 10
 HC.FP-ST.KC-0021, CO₂ Systems Operability and Partial Discharge Test, Revision 18
 HC.FP-SV.ZZ-0056, Fire Barrier Inspection, Revision 8
 HC.OP-ST.GU-0002, Reactor Building Integrity Functional Test, Revision 15

Notifications

20440937	20576105	20601350	20619175	20678960	20694102
20695945	20696740	20697181	20697866	20698884	20699226
20699423	20699847	20702042	20702152	20702154	

Maintenance Orders/Work Orders

30197640	50154442	60112491	60124932	70178491	70178658
80115166					

Drawings

A-0532-0, Sheet 1, Separation Criteria Reactor Bldg Plan El. 77, Revision 4
 A-0542-0, Sheet 1, Separation Criteria Aux. Building – Control Diesel El. 77'-0, Revision 9
 E-4444-0, Sheet 1, Fire Protection CO2 Flooding Systems, Revision 5,
 M-22-0, HC Fire Protection – Carbon Dioxide Systems, Revision 22

Miscellaneous

53832548, Fire Drill Record, Dated 8/11/2015
 Design Calculation 11-0066, HCGS FRVS Drawdown Time and Post-LOCA Reactor Building
 Temperature-EPU, Revision 10
 VTD PA400F-0154, Bisco DTL 040, Pipe Thru Barrier, SE-Foam/Caulk, Revision 5

Section 1R06: Flood Protection MeasuresProcedures

HC.CH-SO.LE-0002, Operation of the Station Service Water Cable Vault Dewatering System,
 Revision 1

Notifications

20693566	20693668	20693744	20693771	20693776
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Maintenance Orders/Work Orders

70099153

Drawings

FSK-P-500, Sheet 1 and 2, Cable Vault Dewatering System Piping, Revision 0

Section 1R11: Licensed Operator Regualification ProgramProcedures

HC.OP-AB.BOP-0003, Turbine Hydraulic Pressure, Revision 4
 HC.OP-AB.CONT-0001, Drywell Pressure, Revision 3
 HC.OP-AB.MISC-0001, Acts of Nature, Revision 26
 HC.OP-AB.ZZ-0001, Transient Plant Conditions, Revision 29
 HC.OP-AB.ZZ-0136, Loss of 120 VAC Inverter, Revision 23
 HC.OP-AR.ZZ-0011, Overhead Annunciator Window Box C6, Revision 61
 HC.OP-AR.ZZ-0024, CRIDS Computer Points Book 5 D3624 thru D4288, Revision 11
 HC.OP-EO.ZZ-0101AFC, ATWS - RPV Control, Revision 3
 HU-AA-1211, Pre-Job Briefings, Revision 13
 OP-AA-101-111-1004, Operations Standards, Revision 6
 OP-AA-103-102, Watchstanding Practices, Revision 11

Miscellaneous

REMA 2015-0068, September 2015 TVT and Deep Shallow Exchange, Revision 0
 Scenario Guide (SG)-676, Seismic/Loss of Inverter/Loss of EHC/LOCA/HPCI Malfunction, dated
 July 26, 2015

Section 1R12: Maintenance EffectivenessProcedures

FP-HC-004, Action for Inoperable Fire Protection – Hope Creek Station, Revision 3
 FRH-II-424, Hope Creek Pre-Fire Plan, MCC Area, Elevation 77'-0", Revision 3
 FRH-II-512, Hope Creek Pre-Fire Plan, RCIC Battery Charger Room, Elevation 54'0", Revision
 5
 FRH-II-522, Hope Creek Pre-Fire Plan, Cable Spreading Room, Elevation 77'0", Revision 6
 FRH-II-531, Hope Creek Pre-Fire Plan, Diesel Generator Rooms, Elevation: 102'-0", Revision 8
 HC.FP-PT.KC-0021, Exciter Housing CO2 System (1C17) Functional Test and Inspection,
 Revision 8
 HC.FP-SO.KC-0001, Fire Protection Water Suppression Systems Operation, Revision 6
 HC.FP-ST.QK-0029, Class 1 Fire Detection Functional Test, Revision 10
 HC.FP-ST.KC-0021, CO2 Systems Operability and Partial Discharge Test, Revision 18
 HC.FP-SV.ZZ-0056, Fire Barrier Inspection, Revision 8
 HC.IC-SC.SP-0001, Process Radiation Monitoring – Non-Divisional Flow Elements 1SP-FE-
 4811-1, 2, 3 and 4 Filtration Recirculation Vent Process Flow, Revision 16
 HC.OP-SO.SP-0001, Radiation Monitoring System Operation, Revision 14
 HC.OP-ST.GU-0002, Reactor Building Integrity Functional Test, Revision 15

Notifications

20332914	20440937	20576105	20601350	20619175	20678960
20694102	20695945	20696740	20696893	20697181	20697490
20697866	20698884	20699226	20699423	20699847	20699924
20702042	20702152	20702154			

Maintenance Orders/Work Orders

30197640	50154442	50161484	60112491	60124932	70178491
70178658	80115166				

Drawings

A-0532-0, Sheet 1, Separation Criteria Reactor Bldg Plan El. 77, Revision 4
 A-0542-0, Sheet 1, Separation Criteria Aux. Building – Control Diesel El. 77'-0, Revision 9
 E-4444-0, Sheet 1, Fire Protection CO2 Flooding Systems, Revision 5,
 M-22-0, HC Fire Protection – Carbon Dioxide Systems, Revision 22

Miscellaneous

53832548, Fire Drill Record, Dated 8/11/2015
 Design Calculation 11-0066, HCGS FRVS Drawdown Time and Post-LOCA Reactor Building
 Temperature-EPU, Revision 10
 VTD PA400F-0154, Bisco DTL 040, Pipe Thru Barrier, SE-Foam/Caulk, Revision 5

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

ER-AA-310-1004, Maintenance Rule - Performance Monitoring, Revision 14
 HC.OP-AB.BOP-0006, Main Condenser Vacuum, Revision 16
 HC.OP-AB.ZZ-0172, Loss of 4.16kV Bus 10A403 C Channel, Revision 7
 HC.OP-AR.ZZ-0002, Overhead Annunciator Window Box A2, Revision 24
 HC.OP-SO.DA-0001, Circulating Water System Operation, Revision 62
 MA-AA-716-004, Conduct of Troubleshooting, Revision 12
 MA-HC-716-004, Conduct of Troubleshooting (Hope Creek), Revision 0
 WC-AA-105, Work Activity Risk Management, Revision 3

Notifications (*NRC-identified)

20698484	20698578	20698579	20698941	20698957	20698961
20698963	20698967	20699021	20699027	20699440	20699521
20701497	20701517	20701778	20701786	20702217*	20702397
20702492	20702494	20703725			

Maintenance Orders/Work Orders

60125630 80115131

Drawings

PM018Q-0050, Sheet 1, Jacket Water System, Revision 18

Miscellaneous

HCGS PRA Risk Evaluation Form for August 2, 2015, through August 8, 2015, Revision 0
 HCGS PRA Risk Evaluation Form for August 2, 2015, through August 8, 2015, Revision 1
 Protected Equipment Log – C-EDG Inop, dated August 4, 2015

Section 1R15: Operability Determinations and Functionality AssessmentsProcedures

ER-AA-2002, System Health Indicator Program, Revision 11
 FP-HC-004, Action for Inoperable Fire Protection – Hope Creek Station, Revision 3
 HC.FP-SV.ZZ-0056, Fire Barrier Inspection, Revision 8
 HC.OP-AB.IC-0004, Neutron Monitoring, Revision 8
 HC.OP-IS.BJ-0101, High Pressure Coolant Injection System Valves – Inservice Test,
 Revision 66
 HC.OP-SO.SE-0001, Nuclear Instrumentation System Operation, Revision 23
 HC.OP-ST.GU-0002, Reactor Building Integrity Functional Test, Revision 15
 HC.OP-ST.ZZ-0001, Power Distribution Lineup – Weekly, Revision 36

OP-AA-102-103, Operator Work-Around Program, Revision 3
 OP-AA-102-103-1001, Operator Burdens Program, Revision 2
 OP-AA-108-115, Operability Determinations & Functionality Assessments, Revision 4

Notifications

20648251	20651351	20652451	20654746	20655190	20666227
20678960	20690570	20692390	20694102	20694841	20695867
20695961	20696511	20696514	20697206	20697866	20699521

Maintenance Orders/Work Orders

30254333	50175294	60124524	70165469	70166546	70177495
70178126	70178491	70178658	80070969	80115148	80115166

Drawings

E-13.002, 480V Ground Fault Protection Coordination, Revision 0
 E-6075-0, Sheet 3, High Pressure Coolant Injection Pump Discharge Valve F006, Revision 6

Miscellaneous

Hope Creek Narrative Logs, July 13, 2014
 Hope Creek Performance Indicator 2014-0239, Main Control Room Deficiencies, dated June 2015
 Hope Creek Performance Indicator 2014-0242, Operator Burdens, dated June 2015
 Hope Creek Performance Indicator 2014-0242, Operator Workarounds, dated June 2015
 MA-HC-716-004, Troubleshooter 15045, Revision 0
 Quarterly Operator Burden Assessment, dated 2015 – 2nd Quarter

Section 1R18: Plant Modifications

Procedures

HC.OP-AB.HVAC-0001, HVAC, Revision 9

Maintenance Orders/Work Orders

60117826 80108126

Miscellaneous

DCP 80108126, 'B' SWIS damper Actuator Arms

Section 1R19: Post-Maintenance Testing

Procedures

HC.IC-CC.SE-0052, Nuclear Instrumentation System Division 2 – OPRM Channel B1 Oscillation Power Range Monitor, Revision 15
 HC.OP-IS.BJ-0101, High Pressure Coolant Injection System Valves – Inservice Test, Revision 66
 HC.OP-SO.BJ-0001, High Pressure Coolant Injection System Operation, Revision 48
 HC.OP-ST.BB-0001, Recirculation Jet Pump Operability – Daily, Revision 52
 HC.OP-ST.SH-0001, Accident Monitoring Instrumentation Channel Check – Monthly, Revision 35
 MA-AA-716-012, Post-Maintenance Testing, Revision 20
 MA-AA-723-307, Relay Testing, Revision 3

Notifications

20653757	20661893	20662247	20676499	20695593	20698795
20700421					

Maintenance Orders/Work Orders

30192142	30262505	50168148	50168283	50168563	50175294
50177792	60117856	60119804	60124506	60124524	70169038
70173241	70178126	80090019			

Drawings

E-0106-0, Sheet 2, Electrical Schematic Diagram Class 1E 4.16kV Sta.Power System Bus a403 & A404 Diff. and OC Prot, Revision 9

E-6442-0, Sheet 6, Electrical Schematic Diagram 4.16kV Circuit Breaker Control Core Spray Pumps, Revision 6

Miscellaneous

311690, Relay Test Manual, Revision 14

Technical Specification Action Statement Log 15-148

Section 1R22: Surveillance TestingProcedures

HC.IC-CC.SA-0002, RRCS Division 2, CH A ATWS Recirculation Pump Trip, Revision 16

HC.IC-CC.SA-0004, RRCS Division 2, CH B ATWS Recirculation Pump Trip, Revision 16

HC.OP-IS.BC-0004, DP202, 'D' Residual Heat Removal Pump In-service Test, Revision 41

HC.OP-IS.EG-0001, 'A' SACS Pump – AP210 – In-service Test, Revision 40

HC.OP-ST.KJ-0004, Emergency Diesel Generator 1DG400 Operability Test - Monthly, Revision 76

Notifications

20696881	20697120	20697379	20698577	20698606	20700960
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Maintenance Orders/Work Orders

50163418	50165104	50176852	50176981	50177155	70165411
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Section 1EP2: Alert and Notification System EvaluationProcedures

EP-AA-121-1002, PSEG Alert Notification System (ANS) Program, Revision 1

EP-AA-121-1004, PSEG ANS Corrective Maintenance, Revision 1

EP-AA-121-1005, PSEG ANS Preventive Maintenance, Revision 2

EP-AA-121-1006, PSEG ANS Siren Monitoring, Troubleshooting, and Testing, Revision 1

Other Documents

ANS maintenance records, January 2014 – June 2015

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Final REP-10 Design Review Report, PSEG Salem and Hope Creek Generating Stations, American Signal Corporation, dated 1/6/2006

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Letter from FEMA Region III to Delaware Emergency Management Agency, Status of Provisions for Back-up Alert and Notification for the Salem Hope Creek Nuclear Power Station Emergency Planning Zone, dated 11/28/2012

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PSEG Nuclear LLC Emergency Plan, Section 6.0, Notification Methods – Response Organizations, Revision 18

Section 1EP3: Emergency Response Organization Staffing and Augmentation System

Procedures

EP-AA-120-1007, Maintenance of Emergency Response Organization, Revision 5

EP-AA-120-1010, ERO Training Administration, Revision 0

EP-AA-121-1001, Automated Call-Out System Maintenance, Revision 1

HC.EP-EP.ZZ-0204, Emergency Response Callout/Personnel Recall, Revision 2

Other Documents

ERO roster dated 7/13/2015

ERO training records dated 7/14/2015

Hope Creek Generating Station and Salem Generating Station, On-Shift Staffing Analysis Report, Revision 0

Monthly pager test results, January 2014-June 2015

PSEG Nuclear LLC Emergency Plan, Section 3.0, Emergency Organization, Revision 30

PSEG Nuclear LLC Emergency Plan, Section 16.0 Radiological Emergency Response Training, Revision 23

Section 1EP5: Maintaining Emergency Preparedness

Procedures

EP-AA-120, Emergency Plan Administration, Revision 5

EP-AA-120-1001, 10 CFR 50.54(q) Change Evaluation, Revision 3

EP-AA-121, Emergency Response Facilities and Equipment Readiness, Revision 2

EP-AA-121-1003, Equipment Important to Emergency Response – Work Prioritization, Revision 0

EP-AA-122, Drills and Exercises, Revision 4

EP-AA-122-1002, Drill and Exercise Evaluation, Revision 0

EP-AA-124-1001, Facilities Inventories and Surveillances, Revision 2

EP-AA-125, Emergency Preparedness Self Evaluation Process, Revision 1

LS-AA-104, 50.59 Review Process, Revision 6

WC-AA-106, Work Week Screening and Processing, Revision 12

Other Documents

Audit NOSA-HPC-14-02, Emergency Preparedness Audit Report, dated 4/9/2014

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Check-In Self-Assessment (70161506) for NRC Inspection and Graded Exercise Preparations

Check-In Self-Assessment (70163699) for EP Drill and Exercise Performance (DEP) Indicator

Check-In Self-Assessment (80112281) for Knowledge Retention and Transfer – Emergency Preparedness

Check-In Self-Assessment (80112333) for Emergency Preparedness Training Program

Check-In Self-Assessment (80112351) for ERO Staffing and Augmentation System

Memoranda of Understanding between Department of Commerce – National Weather Service and PSEG Nuclear, LLC
Memoranda of Understanding Cumberland County Office of Emergency Management and PSEG Nuclear, LLC
Memoranda of Understanding Delaware Department of Safety and Homeland Security, Delaware Emergency Management Agency and PSEG Nuclear, LLC
Memoranda of Understanding Kent County Department of Public Safety Kent County EOC and PSEG Nuclear, LLC
Memoranda of Understanding Maryland Emergency Management and Civil Defense Agency/NJ State Police
Memoranda of Understanding Memorial Hospital of Salem County and PSEG Nuclear, LLC
Memoranda of Understanding New Castle County Delaware, Delaware Emergency Management Agency and PSEG Nuclear, LLC
Memoranda of Understanding NJ State Police/NJ Department of Environmental Protection/PSEG
Memoranda of Understanding Pennsylvania Emergency Management Agency/NJ State Police
Memoranda of Understanding Salem County Department of Emergency Services and PSEG Nuclear, LLC
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NOH-12-028, Nuclear Oversight 3C12 Mid-Cycle Assessment Report, dated 2/13/2013
NOSPA-HC-13-2C, Nuclear Oversight Assessment Report, May through August 2013
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NOSPA-HC-14-1C, Nuclear Oversight Assessment Report, January through May 17, 2014
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NOSPA-HC-14-3C, Nuclear Oversight Assessment Report, September 1 through December 31, 2014
NOSPA-HC-15-1C, Nuclear Oversight Assessment Report, January 1 through April 30, 2015
PSEG Nuclear LLC Emergency Plan, Revision 76
Salem-Hope Creek Nuclear Generating Station Development of Evacuation Time Estimates, Revision 0
S14-01, Emergency Preparedness Onsite Drill Critique Report
S14-02, Emergency Preparedness Onsite Drill Critique Report
S14-03, Emergency Preparedness Onsite Drill Critique Report
H15-01, Emergency Preparedness Onsite Drill Critique Report

Section 2RS1: Access Control to Radiologically Significant Areas

Procedures

HC.RP-TI.XX-0003(Q), Reactor Cavity, Fuel Pool and Drywell Special Evolution, Revision 25
RP-AA-300, Radiological Survey Program, Revision 1
RP-AA-300-1002, Electron Capture Isotope Control, Revision 1
RP-AA-301, Radiological Air sampling Program, Revision 5
RP-AA-302, Alpha Source Term Characterization, Revision 4
RP-AA-303, Personnel Air Sampling, Revision 1
RP-AA-503, Unconditional Release Survey Methods, Revision 8
RP-AA-800, Control Inventory, and Leak Checking of Radioactive Sources, Revision 10

Miscellaneous

Collective Dose Report
Corrective Action Documents (various)
Current Source Term
Passive Whole-body Count Study

Section 2RS2: Occupational ALARA Planning and Controls

Procedures

HC.RP-TI.XX-0003(Q), Reactor Cavity, Fuel Pool and Drywell Special Evolution, Revision 25

Miscellaneous

ALARA Plans (various)
Corrective Action Documents (various)
Daily Occupational Dose Reports
Outage Task Breakdown and Dose Estimates

Section 2RS3: In-plant Airborne Radioactivity Control and Mitigation

Procedures

RP-AA-300-1002, Electron Capture Isotope Control, Revision 1
RP-AA-300, Radiological Survey Program, Revision 1
RP-AA-301, Radiological Air Sampling Program, Revision 5
RP-AA-302, Alpha Source Term Characterization, Revision 4
RP-AA-303, Personnel Air Sampling, Revision 1

Miscellaneous

Air Sample Results (various)
Collective Dose Report
Corrective Action Documents (various)
Current Source Term
Hope Creek Outage Task Breakdown and Dose Estimates
Occupational Dose Reports
Respirator Training Curricula

Section 2RS4: Occupational Dose Assessment

Procedures

RP-AA-220, Bioassay Program, Revision 9
RP-AA-270, Prenatal Radiation Exposure, Revision 6

Miscellaneous

Annual Bioassay Program Review
Technical Bases Document- Hope Creek Alpha Characterization, Current Source Term
HRP-14-0013, Requirements for Counting Air Samples for Alpha Activity, August 2014
Collective Dose Report
Outage Task Breakdown and Dose Estimates
ALARA Plans (various)
Occupational Dose Reports
Corrective Action Documents (various)

Section 2RS5: Radiation Monitoring Instrumentation

Procedures

CY-AA-130-150, Chemistry Quality Assurance, Revision 0
CY-AA-130-205, Radiochemistry Quality Control, Revision 0
CY-HC-120-1011, Sample Preparation of Particulate and Iodine Filters for Post-Accident
Conditions, Revision 0

HC.CH-AB.RC-0001(Q), Sampling Reactor Coolant and RHR Heat Exchanger Outlet Under Accident Conditions, Revision 1
 HC.CH-EO.SH-0004(Q), Post Accident Sample Analysis, Revision 11
 HC.CH-SA.ZZ-0002, Compositing Effluent Samples, Revision 15
 HC.IC-CC.SP-0031, Process Radiation Monitoring – Non Divisional Monitor H1SP-1SPRY-4811 Filtration Recirculation Ventilation System Vent (WRGM), Revision 26
 HC.IC-CC.SP-0026, Process Radiation Monitoring – Channel A 1SP-RE-4825A Drywell Atmosphere Post-Accident Use, Revision 11
 HC.IC-CC.SP-0042, Process Radiation Monitoring – Non Divisional Monitor H1SP-1SPRY-4825B Drywell Atmosphere Post-Accident (DAPA), Revision 26
 HC.IC-DC.ZZ-0340(Q), Device/Equipment Calibration Fluid Components Flowmeters Model LT81A, Revision 0
 HC.IC-FT.SP-0015, Process Radiation Monitoring – Non Divisional Monitor H1SP-1SPRY-4873B North Plant Vent (WRGM), Revision 41
 HC.IC-FT.SP-0022(Q), Process Radiation Monitoring – Non Divisional Monitor H0SP-0SPRY-8817 Cooling Tower Blowdown, Revision 19
 HC.IC-GP.SP-0003, Process Radiation Monitoring – Non Divisional Monitor RM-80, Revision 6
 HC.IC-GP.SP-0005, Process Radiation Monitoring – Non Divisional RD-10B Detector, Revision 13
 HC.IC-SC.SP-0004, Process Radiation Monitoring – Non Divisional Sensor FT-4816 South Plant Vent Flow Rate Monitor, Revision 13
 HC.IC-SC.SP-0008, Process Radiation Monitoring – Non Divisional Channel H1SP-1SPRE-4811A Filtration Recirculation Ventilation System Vent Low Range Noble Gas, Revision 19
 HC.IC-SC.SP-0009, Process Radiation Monitoring – Non Divisional Channel H1SP-1SPRE-4811B1 Filtration Recirculation Ventilation System Vent High Range Noble Gas, Revision 19
 HC.IC-SC.SP-0014, Process Radiation Monitoring – Non Divisional Channel H1SP-1SPRE-4875B South Plant Vent Low Range Noble Gas, Revision 19
 HC.IC-SC.SP-0028, Non Divisional Channel H1SP-1SPRE-4861 Liquid Radwaste Discharge Monitor, Revision 19
 HC.IC-SC.SP-0029(Q), Process Radiation Monitoring – Non Divisional Monitor H0SP-0SPRY-8817 Cooling Tower Blowdown Monitor, Revision 19
 HC.IC-SC.SP-0058, Non Divisional Channel 0HB-FIT-N120 Liquid Radwaste Discharge Flow, Revision 9
 HC.OP-ST.GU-0001, FRVS Operability Test (All Fans Method) – Monthly, Revision 39
 HC.RP-TI.SP-0002(Q), Operation of FRVS Skid (post-accident iodine), Revision 27
 NC.RS-WC.ZZ-0402(Q), Whole Body Counter Calibration, Revision 4
 NC.RS-TI.ZZ-0594(Q), Generic Calibration of New and Non-Standard Instrumentation, Revision 3

Miscellaneous

Calibration Reports (Ge-Li Detector 1, Liquid Scintillation Detector)
 Cooling Tower Radiation Monitor Set-point Determination
 FRVS WRGM Operability Determination
 Instrument Test and Calibration Data (various) (FRVS, NPV, SPV, Cooling Tower Blowdown, Liquid Radioactive Waste, and Hardened Plant Vent)
 Operator Round Checks (FRVS Bucket Trap Checks)
 Process Radiation Monitoring System Health Reports
 South Plant Vent Set-point Determination
 Supervisory Directive GEM 5

Section 2RS6: Radioactive Gaseous and Liquid Effluent TreatmentProcedures

HC.IC-CC.SP-0031, Process Radiation Monitoring – Non Divisional Monitor H1SP-1SPRY-4811 Filtration Recirculation Ventilation System Vent (WRGM), Revision 26
 HC.IC-DC.ZZ-0340(Q), Device/Equipment Calibration Fluid Components Flowmeters Model LT81A, Revision 0
 HC.IC-FT.SP-0015, Process Radiation Monitoring – Non Divisional Monitor H1SP-1SPRY-4873B North Plant Vent (WRGM), Revision 41
 HC.IC-GP.SP-0003, Process Radiation Monitoring – Non Divisional Monitor RM-80, Revision 6
 HC.IC-GP.SP-0005, Process Radiation Monitoring – Non Divisional RD-10B Detector, Revision 13
 HC.IC-SC.SP-0004, Process Radiation Monitoring – Non Divisional Sensor FT-4816 South Plant Vent Flow Rate Monitor, Revision 13
 HC.IC-SC.SP-0014, Process Radiation Monitoring – Non Divisional Channel H1SP-1SPRE-4875B South Plant Vent Low Range Noble Gas, Revision 19
 HC.OP-AB.CONT-0004, Radioactive Gaseous Release, Revision 6
 HC.OP-ST.GU-0001, FRVS Operability Test (All Fans Method) – Monthly, Revision 39

Miscellaneous

10 CFR 50.59 Screenings
 2013 and 2014 PSEG Hope Creek Effluent and Environmental Annual Reports
 2014 Ground Water Protection Program (RGPP) Report
 Calibration Reports (Ge-Li Detector 1, Liquid Scintillation Detector)
 Cooling Tower Radiation Monitor Set-point Determination
 Effluent Alarm Set-point Determinations (South Plant Vent, Filtered Recirculation Ventilation System, Liquid Radioactive Waste, Cooling Tower Blow-down)
 FRVS WRGM Operability Determination
 Instrument Test and Calibration Data (various) (FRVS, NPV, SPV, Cooling Tower Blowdown, Liquid Radioactive Waste, and Hardened Plant Vent)
 Laboratory Cross Check data (Inter and Intra)
 Operator Round Checks (FRVS Bucket Trap Checks)
 Process Radiation Monitoring System Health Reports
 Radioactive Release Analyses (liquid and gaseous discharges)
 Sampling Plans (storm drains)
 South Plant Vent Set-point Determination
 Supervisory Directive GEM 5

Section 4OA1: Performance Indicator VerificationProcedures

EP-AA-125-1001, EP Performance Indicator Guidance, Revision 1
 EP-AA-125-1002, ERO Performance - Performance Indicators Guidance, Revision 4
 EP-AA-125-1003, ERO Readiness - Performance Indicators Guidance, Revision 1
 EP-AA-125-1004, ANS Reliability - Performance Indicators Guidance, Revision 1
 ER-AA-2008, MSPI Failure Determination and Evaluation, Revision 0
 ER-AA-310-1004, Maintenance Rule – Performance Monitoring, Revision 14
 ER-AA-310-1004-F1, Maintenance Rule Functional Failure Cause Determination (FFCDE) Form, Revision 3
 ER-AA-600-1047, Mitigating Systems Performance Index Basis Document, Revision 4
 HC-MSPI-001, Hope Creek Generating Station Nuclear Regulatory Commission Regulatory Oversight Process Mitigating System Performance Index Basis Document, Revision 7

LS-AA-2001, Collecting and Reporting of NRC Performance Indicator Data, Revision 11
 LS-AA-2200, Mitigating System Performance Index Data Acquisition & Reporting, Revision 4
 OP-AA-101-112-1002, On-Line Risk Assessment, Revision 8
 WC-AA-101, On-Line Work Management Process, Revision 24

Notifications (*NRC-identified)

20661678	20664830	20666010	20670717	20684861	20686443
20689406	20689892	20690781	20702796*		

Maintenance Orders/Work Orders

60120557	70162113	70170235	70175589	70176744	70176824
70177058					

Miscellaneous

ANS Reliability PI data, April 2014 – June 2015
 Consolidated Data Entry MSPI Derivation Reports, Cooling Water System, June 2015
 Consolidated Data Entry MSPI Derivation Reports, Emergency AC Power System, June 2015
 Consolidated Data Entry MSPI Derivation Reports, Heat Removal System, June 2015
 Consolidated Data Entry MSPI Derivation Reports, High Pressure Injection System, June 2015
 Consolidated Data Entry MSPI Derivation Reports, Residual Heat Removal System, June 2015
 DEP PI data, April 2014 – June 2015
 ERO Drill Participation PI data, April 2014 – June 2015
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-159, A1
 SACS HX 201 HX – EAHV2371A, dated June 5, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-208, C SSW
 Pump, dated August 3, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-228, H1EA-
 EA-HV-2355A, dated September 2, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-232, H1KJ-
 1C-G-400 C EDG, dated September 5, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-257, H1BC-
 52-222013 MOV BC-HVF003B RHR HX SHL OTL, dated September 11, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-269, BJ HV-
 4866 Supp Chmbr Lvl Inst Ln, dated June 25 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-280, B SSW
 Pump, dated October 8, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-301, B SSW
 Pump, dated November 13, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-304, D SSW
 Pump, dated November 17, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-316, C SSW
 Pump, dated, November 30, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 14-337, 'A' EDG,
 dated December 29, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-034, H1KJ-
 1A-G-400 A EDG, dated January 29, 2014
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-040, H1KJ-
 1B-G-400 B EDG, dated February 9, 2015
 OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-034, H1KJ-
 1A-G-400 A EDG, dated January 29, 2015

- OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-044, B1E201 HX – EGHV2491, dated February 11, 2015
- OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-060, H1KJ-1C-G-400 C EDG, dated March 2, 2015
- OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-063, A2 SACS HX, dated March 4, 2015
- OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-094, H1EG-1A-P-210 'A' Safety Auxiliary Cooling (SAC) Pump, dated March 31, 2015
- OP-HC-108-115-1001, Form 1, Technical Specification Action Statement Log, 15-099, HPCI, dated April 3, 2015

Section 40A2: Problem Identification and Resolution

Procedures

- CC-AA-211, Fire Protection Program, Revision 5
- FP-AA-001, Precautions Against Fire, Revision 2
- FP-AA-012, Fire Protection Organization, Duties and Staffing, Revision 2
- FP-AA-014, Fire Protection Training Program, Revision 3
- FP-AA-024, Fire Drill Performance, Revision 1
- FP-HC-004, Action for Inoperable Fire Protection – Hope Creek Station, Revision 3
- HC.FP-EO.ZZ-0001(Z), Fire and Medical Emergency Response Manual, Hope Creek Control Fire Response, Revision 12
- HC.FP-ST.QK-0029(F), Class 1 Fire Detection Functional Test, Revision 10
- HC.OP-AR.QK-0001(F), Fire Protection Status Panel 10C671 Alarm Summary, Revision 23
- HC.OP-AR.QK-0002(F), Fire Protection Status Panel 10C671 Alarm Responses, Revision 21
- SH.FP-EO.ZZ-0002(Q), Fire Department Fire Response, Revision 4
- TQ-AA-205, Training Records, Revision 3

Notifications

20658565	20669418	20674128	20689977	20690631	20693225
20694451	20694452	20694455	20697753	20698499	20698650
20699516*	20699517*	20699518	20699662	20699665	20699676*
20699738	20699742*	20702025	20702166*		

Maintenance Orders/Work Orders

70172535

Miscellaneous

- 2014 End of Year Drill Review
- 53652529, Fire Drill Record, dated 11/10/2014
- 53670967, Fire Drill Record, dated 12/9/2014
- 53674950, Fire Drill Record, dated 12/16/2014
- 53832548, Fire Drill Record, dated 8/11/2015
- Focus Area Self-Assessment, dated 4/7/2015
- FRH-II-362, Hope Creek Pre Fire Plan, Rev. 6
- Night order package HC 10C671
- Quarterly Drill Reviews, dated 3/17/2015
- Quarterly Drill Reviews, dated 6/22/2015
- S2AD043014, Fire Drill Record, dated 4/30/2014
- S2UAD40714, Fire Drill Record, dated 4/7/2014
- S5UAD100114, Fire Drill Record, dated 10/1/2014
- UADS5012515, Fire Drill Record, dated 1/28/2015

Section 40A3: Follow-up of Events and Notices of Enforcement DiscretionProcedures

HC.FP-SV.ZZ-0056, Fire Barrier Inspection, Revision 8
 HC.IC-FT.SA-0001, Functional Test Redundant Reactivity Control System – Division 1 Channel A, C22-N403A, N402A ATWS Recirculation Pump Trip, Revision 9
 HC.IC-FT.SA-0003, Functional Test Redundant Reactivity Control System – Division 1 Channel B, C22-N403E, N402E ATWS Recirculation Pump Trip, Revision 14
 HC.OP-IO.ZZ-0003, Startup from Cold Shutdown to Rated Power, Revision 107
 HC.OP-IO.ZZ-0010, Scram Recovery, Revision 17
 HC.OP-IS.ZZ-0001, In-service System Leakage Test of the Reactor Coolant Pressure Boundary, Revision 44
 HC.OP-SO.SA-0001, Redundant Reactivity Control System Operation, Revision 5
 HC.OP-ST.GU-0002, Reactor Building Integrity Functional Test, Revision 15
 LS-AA-120, Issue Identification and Screening Process, Revision 13
 MA-HC-716-004, Conduct of Troubleshooting (Hope Creek), Revision 0
 OP-HC-108-102, Management of Operations with the Potential to Drain the Reactor Vessel OP- (OPDRV), Revision 4
 OP-AA-108-108, Unit Restart Review, Revision 12
 OP-HC-108-114-1001, Hope Creek Post-Trip Data Collection, Revision 9
 OP-HC-108-115-1001, Operability Assessment and Equipment Control Program, Revision 30
 RP-AA-460, Controls for High and Very High Radiation Areas, Revision 17

Notifications

20563465	20646597	20690269	20693678	20694102	20697866
20698126	20698244	20698671	20698801	20701814	20702068
20703518	20703871	20704324	20704540		

Drawings

A-0532-0, Separation Criteria, Reactor Building Plan – Elev. 77'-0", Revision 4

Maintenance Orders/Work Orders

50136602	50179908	60107445	70176984	70178985	80115166
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Miscellaneous

Hope Creek LER 2015-003-00, Conditions Prohibited by Technical Specifications Due to Low Pressure ECCS Inoperabilities dated July 6, 2015
 Hope Creek Narrative Logs dated May 2-5 and July 26-30, 2015
 Hope Creek Shift Training Notebook 2015-14, ECCS Technical Specification Requirements in Operational Conditions 4 and 5
 HC-MODE-011, Mode Change with Inoperable Station Service Water Pump, Revision 0

LIST OF ACRONYMS

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
AC	alternating current
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
ANS	alert and notification system
ATWS	anticipated transient without scram
CAP	corrective action program
CAQ	condition adverse to quality
CFR	Code of Federal Regulations
CS	core spray
DAPA	drywell atmosphere post-accident
DCP	design change package
EAL	Emergency Action Level
ECCS	emergency core cooling system
EDG	emergency diesel generator
EO	equipment operator
EOC	extent of condition
EP	emergency preparedness
EPD	electronic personal dosimeter
ERF	emergency response facility
ERO	emergency response organization
FASA	focused area self-assessment
FEMA	Federal Emergency Management Agency
FRVS	filtration, recirculation, and ventilation system
HCGS	Hope Creek Generating Station
HPCI	high pressure coolant injection
HRA	high radiation area
IMC	Inspection Manual Chapter
LER	licensee event report
LHRA	Locked High Radiation Area
LOCA	loss of coolant accident
LPCI	low pressure coolant injection
mrem	millirem
NCV	non-cited violation
NEI	Nuclear Energy Institute
NOTF	notification
NPV	north plant vent
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
ODCM	offsite dose calculation manual
OPCON	Operational Condition
OPDRV	operation with the potential to drain the reactor vessel
OPEVAL	operability evaluation
OWA	operator workaround
PCM	performance centered maintenance
PI	performance indicators
PSEG	Public Service Enterprise Group Nuclear LLC

RCA	radiologically controlled area
RCIC	reactor core isolation cooling
RG	Regulatory Guide
RHR	residual heat removal
ROP	Reactor Oversight Process
RP	radiation protection
RPV	reactor pressure vessel
RTP	rated thermal power
RWP	radiation work permit
SACS	safety auxiliaries cooling system
SDP	Significance Determination Process
SPV	south plant vent
SRV	safety relief valve
SSC	structure, system, or component
SSW	station service water
SSWS	station service water system
SWIS	service water intake structure
TRM	technical requirements manual
TS	technical specifications
TSC	technical support center
UFSAR	Updated Final Safety Analysis Report
VAC	volts alternating current
VHRA	very high radiation area
WGE	work group evaluation
WO	work order