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## Hope Creek 1 – Quarterly Plant Inspection Findings

### 3Q/2017 – Plant Inspection Findings

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### Initiating Events

**Significance:** G Dec 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

#### **Trip of Protected RWCU Pump during Maintenance Activity**

A self-revealing very low safety significance (Green), non-cited violation of Title 10 of the Code of Federal Regulations (10 CFR) 50.65(a)(4) was identified for inadequately assessing and managing risks associated with maintenance activities to prevent plant transients that upset plant stability. Specifically, because PSEG did not identify a conflict with the reactor water cleanup (RWCU) pump trip logic prior to conducting a planned breaker swap, the 'A' RWCU pump tripped while it was credited to as a defense-in-depth system for decay heat removal (DHR). PSEG assigned a corrective action to perform a work group evaluation and address lessons learned from this event.

The issue was more than minor because it was associated with the Equipment Performance (availability) attribute of the Initiating Event cornerstones and adversely affected its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown. Additionally, this issue was similar to IMC 0612, Appendix E, examples 7.e and 7.f, in that the resulting increased risk put the plant into a higher risk category. In this case, the plant risk would have been reclassified from Yellow to Orange when RWCU pump was unavailable during residual heat removal (RHR) shutdown cooling outage window. The inspectors evaluated the finding using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," Attachment 1, Exhibit 1, "Initiating Event Screening Questions." The inspectors determined the finding was Green because no quantitative phase 2 analysis was required, and RWCU system was not identified as a major system on Table G1 for Decay Heat Removal safety function. This finding had a cross-cutting aspect in the area of Human Performance, Work Management, because PSEG did not identify and appropriately manage risk associated with the breaker swap activity. Specifically, PSEG's work order to swap the breaker was not planned or scheduled during a RWCU system outage window where the plant shutdown safety risk would have been properly managed.

Inspection Report# : 2016004 ([pdf](#))

## Mitigating Systems

**Significance:**  Mar 31, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Inadequate Control of Defective Material Causes the 'A' EDG to Fail to Start**

A self-revealing very low safety significance (Green) NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50, Appendix B, Criterion VIII, "Identification and Control of Materials, Parts and Components," was identified because PSEG did not have adequate control measures to prevent the use of defective parts. Specifically, following the 'C' emergency diesel generator (EDG) speed switch (SS) failure on August 4, 2016, PSEG's control measures did not prevent the installation of the previously failed SS, with susceptible degradation due to the component's previous failure history, known manufacturing and design deficiencies, and damage sustained during the receipt inspection process, into the 'A' EDG on January 6, 2017. Consequently, less than one month later on February 3, 2017, the 'A' EDG failed to start due to a failed SS. PSEG's corrective actions (CAs) included replacing the SS, identifying an equivalent replacement for the currently installed SS design, scheduling the replacement of the new SSs, and performing extent of condition inspections and testing of all the installed and spare EDG SSs.

The issue was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, PSEG's installation of a previously failed SS, with susceptible degradation due to the component's previous failure history, known manufacturing and design deficiencies, and damage sustained during the receipt inspection process, into the 'A' EDG on January 6, 2017, led to the 'A' EDG failing to start on February 3, 2017. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated October 7, 2016, and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding was Green because it was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent the actual loss of a safety function of a single train for greater than its technical specifications (TSs) allowed outage time, and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety-significant in PSEG's maintenance rule program (MRP) for greater than 24 hours. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because PSEG did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, PSEG did not thoroughly evaluate their previous failure analyses (FA) performed on the failed SSs to ensure that resolutions addressed the actual failure mode. Inspection Report# : 2017001 (*pdf*)

**Significance:**  Mar 31, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Inadequate Preventive Maintenance Replacement Schedule for the HPCI Overspeed Trip Tappet Reset Spring**

A self-revealing Green non-cited violation (NCV) of TS 6.8.1, "Procedures," was identified because PSEG did not establish an appropriate preventive maintenance (PM) schedule for the high pressure coolant injection (HPCI) overspeed trip system reset spring.

Specifically, PSEG's major inspection PM frequency and scope justification for the HPCI turbine major inspection and overhaul PM was determined to be inadequate. As a result, the HPCI overspeed tappet reset spring was not replaced for 8.5 years, resulting in the reset spring's force falling below the required force range. As a result, on April 7, 2016, the HPCI turbine tripped and then reset shortly after being started because of the low reset spring force, making the HPCI system unable to automatically initiate and inject at rated flow within 35 seconds as required per TSs. PSEG's immediate CAs included replacing the reset spring, adding replacement of the spring to the 6.87 year HPCI environmental qualification (EQ) PM, and evaluating the storage requirements for similar springs in inventory. The issue was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate PM frequency and scope for the reset spring resulted in the low spring force due to the spring's age allowing the trip tappet assembly to float upward on a HPCI system start-up and tripping the turbine when no actual overspeed condition existed. In accordance with IMC 0609.04, "Initial Characterization of Findings," dated October 7, 2016, and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the inspectors determined that this finding was Green because it was not a design or qualification deficiency, did not involve an actual loss of safety function, did not represent the actual loss of a safety function of a single train for greater than its TS allowed outage time and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety-significant in PSEG's MRP for greater than 24 hours. Specifically, following the overspeed trip on April 7, 2016, HPCI was restored to operable status in approximately 36 hours. The inspectors determined there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance as the inadequate PM schedule for the HPCI overspeed trip tappet assembly reset spring involved multiple missed opportunities to re-evaluate the PM scope and frequency from 2005 through 2009. In accordance with IMC 0612, the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance.

Inspection Report# : 2017001 (*pdf*)

**Significance:**  Dec 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Inadequate Implementation of a Design Change Causes Multiple 'B' Channel Instruments to be Inoperable**

A self-revealing Green non-cited violation (NCV) of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," and Technical Specification (TS) 3.0.4 was identified for PSEG not effectively implementing the design change package (DCP) process. Specifically, PSEG inadequately implemented their configuration change control procedure, CC-AA-103, and a design change package (DCP 80108179) for rerouting a 'B' channel instrument line (LT-N085B) by not fully restoring the system upon completion of the DCP on November 3, 2016. As a consequence, multiple main control room (MCR) indicators became inoperable without PSEG identifying the problem until operators transitioned the reactor plant to startup, Operational Condition (OPCON) 2 or Mode 2, on November 9, 2016. This constituted a violation of TS 3.0.4 because PSEG transitioned to OPCON 2 while multiple limiting conditions for operability (LCO) were not met. PSEG's corrective actions included securing the reactor startup, conducting system troubleshooting/restoration prior to recommencing the reactor startup, completing an apparent cause evaluation of the issue and an extent of condition on all DCPs completed during the refueling outage, and revising their

preventive maintenance procedures to ensure that the instrument racks are properly backfilled on a frequent reoccurring basis and following any instrument rack maintenance.

The issue was more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone and adversely affected its objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage), in that, multiple 'B' channel reactor water level instruments that fed the RPS logic were inoperable. Additionally, the finding was similar to IMC 0612, Appendix E, example 3.g, which describes an operator not following a procedure and making a mode change without all the required equipment operable. The IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process (SDP)," Section 4.1 - Scope, states that "if the plant is shut down and the entry conditions for Residual Heat Removal/Decay Heat Removal (RHR/DHR) and RHR/DHR cooling have not been met then Appendix G does not apply." Because of this, the finding was evaluated using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Per Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance (Green) because although the finding represented a deficiency affecting the qualification of a mitigating system and caused multiple 'B' channel instruments to be inoperable, it did not represent a loss of system and/or function, or an actual loss of function for greater than its TS allowed outage time. This finding had a cross-cutting aspect in the area of Human Performance, Work Management, in that PSEG did not implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority. Specifically, PSEG did not ensure restoration activities for the completed DCP ensured the affected instrumentation was returned to an operable status.

Inspection Report# : 2016004 (*pdf*)

## Barrier Integrity

**Significance:** G Jul 06, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Secondary Containment Integrity Not Maintained Due to Door not Properly Dogged**

The team identified a Green, non-cited violation (NCV) of Technical Specification (TS) 3.6.5.1, for failure to maintain secondary containment integrity. Specifically, while Hope Creek station was operating in mode 1, PSEG personnel did not ensure secondary containment door R-4302 was properly latched (dogged) closed in accordance with procedure CC-AA-201, Plant Barrier Control Program. The licensee's failure to ensure the door was properly dogged closed was a performance deficiency and resulted in a degraded secondary containment barrier for approximately 44 hours. The team determined that PSEG operated in violation of the TS LCO which requires restoration of secondary containment integrity within 4 hours or be in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours. Following identification of the door condition by the team PSEG personnel properly dogged the door closed restoring secondary containment.

This finding was determined to be of more than minor significance because it is associated with the configuration control attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, in its un-dogged position the door would not have remained closed, as required to maintain secondary containment integrity, during all design basis accidents. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 3, "Barrier Integrity Screening Questions," the team determined that this finding was of very low safety significance (Green) because the finding did not represent an actual open pathway in the physical integrity of primary reactor containment (valves, airlocks, etc.), containment isolation system (logic and

instrumentation), and heat removal components. The finding was determined to be associated with the cross-cutting area of Human Performance - Procedure Adherence, in that, licensee personnel did not follow process, procedures, and work instructions which required the secondary containment door to be closed and dogged.

Inspection Report# : 2017007 (*pdf*)

**Significance:**  Feb 17, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Improper Preventive Maintenance Deletion Results in the Inoperability of the 'A' Control Room HVAC System**

A self-revealing Green non-cited violation (NCV) of Technical Specification (TS) 6.8.1, "Procedures and Programs," as described in Regulatory Guide (RG) 1.33, Revision 2, February 1978, was identified when PSEG did not maintain an appropriate preventive maintenance (PM) schedule for the 'A' control room heating, ventilation and air conditioning (HVAC) system. Specifically, PSEG inadvertently deactivated a PM activity to perform periodic cleaning of the 'A' control room return air fan (AVH-415) low flow switch pitot tubes that resulted in the 'A' train of the control room emergency filtration (CREF) to be unavailable on November 23, 2016. PSEG performed corrective actions to clean the clogged pitot tubes associated with the AH-415 flow switch, re-activate the inadvertently deleted PM, and identify the extent of condition in other systems.

This issue was more than minor because it was associated with the structures, systems and components (SSC) and barrier performance attribute of the Barrier Integrity Cornerstone (under the "areas to measure" associated with the radiological barrier function of the control room); and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors determined that the finding was of very low safety significance (Green) in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 3, because the finding only represented a degradation of the radiological barrier function for the control room. The inspectors determined that there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. Specifically, the causal factors associated with this finding occurred in 2010, which was outside the nominal three-year period of consideration and were not considered representative of present performance in accordance with IMC 0612.

Inspection Report# : 2017008 (*pdf*)

## **Emergency Preparedness**

### **Occupational Radiation Safety**

### **Public Radiation Safety**

### **Security**

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

## **Miscellaneous**

Current data as of : November 29, 2017

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