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Hope Creek 1 – Quarterly Plant Inspection Findings

2Q/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*)

Significance: **G** Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Inadequate Procedure Adherence Resulted In a Loss of Shutdown Cooling

A self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred when PSEG did not follow procedure during the transition from Cold Shutdown to refueling operations while filling up the reactor pressure vessel (RPV) to support RPV head cooling in preparation for reactor disassembly. This resulted in an automatic isolation of the operating residual heat removal (RHR) pump while it was providing decay heat removal in shutdown cooling. PSEG has entered this issue into their corrective action program (CAP) in notification (NOTF) 20684861, and corrective actions included performing a root cause evaluation for the event, revising the operating procedures to provide clarity, and conducting training with all operators on the lessons learned from the event.

This issue was evaluated in accordance with IMC 0612, Appendix B, and determined to be more than minor since it was associated with the human performance attribute of the Initiating Events cornerstone and adversely affected its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations. The finding was evaluated using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process (SDP)," and per Attachment 1, Exhibit 2, required a Phase 2 risk evaluation which determined the safety significance of this performance deficiency to be in the mid E-8 range, or of very low safety significance (Green).

The inspectors determined this finding has a cross-cutting aspect in the area of Human Performance, Conservative Bias, in that the operator did not use decision-making practices that emphasized prudent choices over those that are simply allowable, and the operator's proposed action was not determined to be safe prior to proceeding with the action.

Specifically, the operator did not ensure his actions were safe prior to aligning and operating the feedwater system to fill the RPV during plant cooldown using an uncommon method.

Inspection Report# : 2016003 (*pdf*)

Mitigating Systems

Significance: **G** 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*)



Significance: Sep 30, 2016

Identified By: NRC

Item Type: VIO Violation

Inadequate Implementation of Adverse Condition Monitoring Actions for the High Pressure Coolant Injection System

NOTICE OF VIOLATION

PSEG Nuclear, LLC

Hope Creek Generating Station

Docket No. 50-354 License No. NPF-57 EA-16-184

During an NRC inspection conducted from July 1, 2016 through September 30, 2016, and for which an inspection exit meeting was conducted on October 27, 2016, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

PSEG Nuclear, LLC (PSEG) procedure OP-AA-108-111, "Adverse Condition Monitoring and Contingency Planning," describes the process for creating a formal plan to monitor significant plant conditions and parameters outside of normal operating bands that have not yet reached plant operating procedure action levels. Section 3.3.2 requires that PSEG Operations Shift Management review the current levels and trends of parameters associated with the components being monitored under the Adverse Condition Monitoring (ACM) process to ensure all required actions are being met, and identify any adverse trends before they reach ACM threshold values for action.

PSEG established Adverse Condition Monitoring and Contingency Plan HC 15-008 in response to the identification, in 2015, of steam leak-by through the HPCI steam admission valve (FD-F001). The ACM required PSEG staff to perform monthly HPCI turbine oil sampling and analysis for water contamination and, upon identification of a specified amount of contamination, to inspect and flush the turbine oil system.

Hope Creek Technical Specification 3.5.1.c requires that if the High Pressure Coolant Injection (HPCI) system becomes inoperable during power operation, the reactor may remain in operation for a period not to exceed 14 days.

Contrary to the above, from May 20, 2015, to August 7, 2016, PSEG did not appropriately accomplish activities affecting quality in accordance with a prescribed instruction. Specifically, PSEG did not review the current levels and trends of HPCI parameters being monitored under the ACM process to ensure all required actions were being met, and to identify any adverse trends before they reached ACM threshold values for action. In particular, PSEG did not perform monthly HPCI turbine oil sampling and analysis for water contamination. As a result, PSEG did not identify moisture contamination in the HPCI turbine oil system, and did not take the necessary response actions. Consequently, moisture intrusion degraded the hydraulic actuator such that, on July 3 and August 7, 2016, during HPCI valve functional testing, the HPCI governor control valve (FV-4879) failed to stroke open as required. As a consequence of this failure, PSEG also violated TS 3.5.1.c because based on analysis of the HPCI governor control valve and hydraulic actuator failures, the NRC determined that the HPCI system was inoperable for a period greater than its technical specification allowed outage time of 14 days.

This violation is associated with a White Significance Determination Process finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved is already adequately addressed on the docket in NRC Inspection Report Number 05000354/2016003, in your letters dated December 14, 2016, and January 3, 2017, and in the summary of the December 21, 2016, telephone call. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation; EA-16-184," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406, and a copy to the NRC Resident Inspector at Hope Creek Generating Station, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, PSEG may be required to post this Notice within two working days of receipt. Dated this 6th day of February 2017.

Inspection Report# : 2016003 (*pdf*)

Inspection Report# : 2016008 (*pdf*)

Significance: N/A Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Untimely Submittal of an LER for a Condition that Could Have Prevented Fulfillment of a Safety Function

The Inspectors identified a Severity Level IV (SLIV) NCV of 10 CFR 50.73(a)(2)(v) for because PSEG did not submit a Licensee Event Report (LER) within 60 days of an event or condition that could have prevented the fulfillment of a safety function at any time within 3 years of the date of discovery. Specifically, while performing an in service retest of the HPCI system, the turbine tripped on overspeed shortly after startup due to low spring force on the overspeed assembly reset spring. This condition allowed the overspeed tappet to trip the turbine without an actual overspeed condition present, rendering the system inoperable and unable to automatically initiate and inject at rated flow within 35 seconds as required per TSs and the design basis, thus preventing the fulfillment of a safety function. PSEG's corrective actions included documenting the missed LER in the corrective action program (CAP) in notification (NOTF) 20741046, and submitted LER 05000354/2016001-00 under 10 CFR 50.73(a)(2)(v)(D) on October 04, 2016.

The inspectors evaluated this issue using the traditional enforcement process because the performance deficiency had the potential to impede or impact the NRC's regulatory process. Specifically, the failure to submit an LER under 10 CFR 50.73(a)(2)(v)(D) within 60 days of an event or condition that could have prevented the fulfillment of a safety function at any time within 3 years of the date of discovery could impact the NRC's regulatory process. The inspectors reviewed this issue in accordance with IMC 0612 and the Enforcement Manual; violations of 10 CFR 50.73 are dispositioned using the traditional enforcement process. The inspectors reviewed Section 6.9.d.9 of the NRC

Enforcement Policy and determined this violation was a Severity Level IV violation because PSEG did not submit the LER as required by 10 CFR 50.73 did not cause the NRC to reconsider a regulatory position or undertake substantial further inquiry. 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.

Inspection Report# : 2016003 (*pdf*)

Significance:  Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Inadequate Corrective Actions for Main Control Room Chiller Positioner Failure

A self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for PSEG's inadequate corrective actions to address a condition adverse to quality (CAQ). Specifically, PSEG's corrective actions to address a December 2013 failure of the 'A' main control room (MCR) chiller pressure control valve (PCV) positioner were inadequate and did not ensure that the component was appropriately managed in their shelf life program. As a result, PSEG restored the 'A' MCR chiller with a PCV positioner that exceeded its specified shelf life by 10 years, and ultimately failed due to its age. PSEG's corrective actions included conducting an extensive extent of condition (EOC) of similar positioners installed at the site (both Salem and Hope Creek), reviewing the shelf life program, and documenting an operability evaluation (70189201) for the currently installed positioners until they can be replaced.

This finding is 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 (i.e., core damage). The degraded positioners being installed in both MCR chillers affected the reliability and availability of the 'A' and 'B' MCR chillers, which provide cooling for the MCR, emergency switchgear rooms, and the safety auxiliaries cooling system pump rooms. Using Exhibit 2 of IMC 0609, Appendix A, the inspectors determined that this finding is of very low safety significance (Green) because, although the performance deficiency (PD) affected the design/qualification of the 'A' MCR chiller operability, it did not result in an actual loss of safety system function because the 'B' chiller was still available, and it did not represent a loss of function of one or more than one train for more than its TS allowed outage time or greater than 24 hrs. The 'B' MCR chiller remained available and the 'A' MCR chiller was restored to an operable status within 6 hours of failing.

This finding had a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because PSEG did not follow the process and procedure that ensures the shelf life program for safety-related components is properly maintained. Specifically, PSEG did not ensure that the shelf life of the MCR chiller PCV positioners were adequately managed in the shelf life program by verifying the correct shelf life of 14 years was correctly assigned.

Inspection Report# : 2016003 (*pdf*)

Barrier Integrity

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 : August 03, 2017

Page Last Reviewed/Updated Wednesday, August 10, 2016