

Hope Creek 1

4Q/2006 Plant Inspection Findings

Initiating Events

Significance:  Sep 30, 2006

Identified By: Self-Revealing

Item Type: FIN Finding

INADVERTENT INSTRUMENT AIR COMPRESSOR TRIP

A self-revealing finding was identified when an operations work control supervisor caused an inadvertent trip of the 10K107 instrument air compressor. During a tagging operation on the 00K107 air compressor, the supervisor verified that a key would fit properly in the 00K107 air compressor uninterruptible power supply (UPS) by testing it in the in-service 10K107 air compressor UPS. When the supervisor removed the key, the 10K107 air compressor tripped resulting in an instrument air system transient. PSEG stopped all work activities to brief crews on the transient, proper use of human performance tools, and site procedures.

This performance deficiency is more than minor because it is associated with the configuration control and human performance attributes of the Initiating Events Cornerstone and affected the cornerstone's objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors completed a Phase 1 screening of the finding using Appendix A of Inspection Manual Chapter 0609, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and determined that a more detailed Phase 2 evaluation was required to assess the safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available. The finding was determined to be of very low safety significance based upon a Significance Determination Process Phase 2 evaluation. The performance deficiency had cross-cutting aspect in the area of human performance related to the work practices component in that the individual did not use human performance error prevention techniques and proceeded in the face of uncertainty.

Inspection Report# : [2006004](#) (*pdf*)

Mitigating Systems

Significance:  Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

UNPLANNED TRIP OF THE 'B' CONTROL ROOM CHILLER AND VENTILATION TRAIN

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

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

Inspection Report# : [2006005](#) (*pdf*)

G**Significance:** Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

MISPOSITIONED VALVE RESULTS IN REDUCED COOLING FLOW TO THE 'C' EMERGENCY DIESEL GENERATOR

A self-revealing non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the safety auxiliaries cooling system (SACS) throttle valve to the 'C' emergency diesel generator (EDG) was found out of its required position on August 11, 2006. PSEG's corrective actions included performing a flow balance on the EDG to correct SACS valve positions and implementing a modification to the SACS to increase available cooling flow to the EDGs. The finding is self-revealing, rather than licensee-identified, because the inspectors communicated concerns of unusually high lube oil temperatures during summer conditions to PSEG personnel that were not confirmed by PSEG for several months due to repetitive deferrals of corrective action orders to evaluate the condition. PSEG had surveillance test data that demonstrated that all of the EDGs were exhibiting higher than normal lube oil temperatures during summer months and thus could reasonably have discovered the configuration control error before high summer temperatures challenged the capability of the EDG.

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

Inspection Report# : [2006005](#) (*pdf*)**G****Significance:** Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

HIGH TEMPERATURE CONDITION ON 'B' EMERGENCY DIESEL GENERATOR NOT FULLY IDENTIFIED IN A TIMELY MANNER

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

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

Inspection Report# : [2006005](#) (*pdf*)**G****Significance:** Dec 08, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE STRAINER DIFFERENTIAL PRESSURE DESIGN CONTROL TO ENSURE ADEQUATE SERVICE WATER FLOW

The team identified a non-cited violation of 10CFR50, Appendix B, Criterion III, "Design Control," for a failure to correctly translate the design basis into procedures in that measures were not established to verify the adequacy of the

service water (SW) cooling water design flow. Specifically, the SW abnormal operating procedure allowed for continued SW pump operation (up to 12 hours) without declaring the pump inoperable, when SW strainer differential pressure exceeded the SW system hydraulic calculation assumptions. Operation in this condition did not ensure the design basis minimum flowrate would be provided to the safety auxiliaries cooling system, which in turn cools the emergency diesel generators and other safety-related equipment, under the most limiting conditions. PSEG performed a review of past operability, and initiated a notification to change the SW abnormal operating procedure to declare the SW pump inoperable when a SW strainer differential pressure exceeds the appropriate setpoint.

The finding is more than minor because it is associated with the design control attribute of the mitigating systems cornerstone and affected the cornerstone's objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The finding also is associated with the initiating events cornerstone because unavailability of one service water pump increases the likelihood of loss of service water events. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the team conducted a Phase 1 SDP screening and determined a more detailed Phase 2 SDP evaluation was required to assess the safety significance because the finding affected two cornerstones. The finding was determined to be of very low safety significance (Green) based upon the Phase 2 SDP evaluation. The finding has a cross-cutting aspect in the area of human performance because the SW abnormal operating procedure was inappropriately revised in May 2006 to remove acceptance criteria for pump operability with elevated strainer differential pressure.

Inspection Report# : [2006015](#) (pdf)

G

Significance: Dec 08, 2006

Identified By: NRC

Item Type: FIN Finding

INADEQUATE CONTAINMENT VENT VALVE BACKUP PNEUMATIC SUPPLY

The team identified a finding for the failure to correctly translate the design basis of the containment ventilation backup nitrogen bottles into procedures. Specifically, the operator rounds log was revised to allow the two backup nitrogen bottles, which operate containment vent valve 1GSHV-4964, to decrease to 200 psig each. The nitrogen capacity calculation assumed a minimum of 800 psig per bottle to ensure sufficient nitrogen to stroke the containment vent valve as needed in beyond design basis events. Operation below 800 psig did not ensure the containment vent valve could be used according to emergency operating procedures to protect containment against overpressurization. PSEG raised the minimum backup nitrogen bottle pressure to 800 psig per bottle, performed a review of past bottle pressures, and initiated a notification to change the operator rounds log to allow a minimum of 800 psig per bottle.

This finding is more than minor because it is associated with the design control attribute of the mitigating systems cornerstone, and affected the cornerstone's objective to ensure the availability and reliability of the containment vent to respond to initiating events to prevent undesirable consequences. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined the finding was of very low safety significance (Green) since it did not result in a loss of safety system function because the vent valve local hand-jack was available to open the containment vent. There were no violations of NRC requirements because the containment vent function is not covered by Technical Specifications, is not a part of Hope Creek's licensing basis, and is only credited in beyond design basis events.

Inspection Report# : [2006015](#) (pdf)

G

Significance: Sep 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

'A' CORE SPRAY MINIMUM FLOW CHECK VALVE FAILURE

A self-revealing, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the 'A' core spray pump minimum flow check valve remained open, resulting in 56 hours of unplanned unavailability of the 'A' core spray loop. PSEG did not implement corrective actions developed following a similar condition on the 'C' core spray check valve on November 12, 2004. PSEG's corrective actions included repairing the check valve, updating the check valve maintenance procedure, and creation of periodic preventative maintenance tasks to internally inspect the core spray pump minimum flow check valve.

This performance deficiency is more than minor because it is associated with the equipment performance attribute of the

Mitigating Systems Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined the finding to be of very low safety significance (Green), based on a Phase 1 SDP screening. The performance deficiency had a cross-cutting aspect in the area of problem identification and resolution in the corrective action program component in that the appropriate corrective actions to address the missing pin on the 'C' core spray minimum flow check valve were not implemented in a timely manner to prevent a similar failure in the 'A' core spray minimum flow check valve.

Inspection Report# : [2006004](#) (*pdf*)

Significance:  Jun 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

CORRECTIVE ACTIONS TO PREVENT REPEAT FAILURES OF SERVICE WATER STRAINER OVERLOADS NOT IMPLEMENTED

Inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," when the 'A' service water strainer was rendered unavailable on April 18, 2006. On November 25, 2004, the 'C' service water strainer backwash arm motor experienced elevated running current and multiple thermal overload trips. PSEG performed design change and corrective maintenance activities to increase the size of the thermal overloads for the 'C' strainer motor. This condition adverse to quality was not entered into PSEG's corrective action program (CAP) for evaluation and extent of condition review. On April 18, 2006, PSEG experienced elevated running current and multiple thermal overload trips on the 'A' strainer motor which resulted in unplanned unavailability. PSEG's corrective actions included corrective maintenance to increase the size of the thermal overloads on the 'A', 'B', and 'D' strainer motors and evaluations of the elevated motor currents and the CAP oversight issue.

This performance deficiency is more than minor because it is associated with the equipment performance attribute and affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with NRC Inspection Manual Chapter 0609, Appendix G, "Shutdown Operation Significance Determination Process," the inspectors conducted a Phase 1 SDP screening and determined that, since adequate mitigation capability was maintained and a quantitative assessment was not required, the finding was of very low safety significance (Green). The performance deficiency had a cross-cutting aspect in the area of problem identification and resolution because PSEG did not evaluate and implement corrective action for a condition adverse to quality.

Inspection Report# : [2006003](#) (*pdf*)

Significance:  Jun 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

LOSS OF SHUTDOWN REACTOR PRESSURE VESSEL LEVEL INDICATION

A self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the single source of shutdown reactor water level indication was rendered inaccurate during reactor vessel reassembly. PSEG's refueling maintenance procedure directed the installation of blank flanges on all reactor vessel head penetrations during reactor disassembly. This resulted in the reactor being placed in an unvented condition when the head was reinstalled on the vessel which caused the shutdown reactor water level indication to be inaccurate and invalid. PSEG's corrective actions included changes to the refueling maintenance procedures to install vented flanges and changes to the integrated operations procedures to ensure that the reactor is vented prior to changing vessel level in Operational Condition 4 or 5.

This performance deficiency is more than minor because it is associated with the equipment performance attribute and affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with NRC Inspection Manual Chapter 0609, Appendix G, "Shutdown Operation Significance Determination Process," the inspectors conducted a Phase 1 SDP screening and determined that, since adequate mitigation capability was maintained and a quantitative assessment was not required, the finding was of very low safety significance (Green). The performance deficiency had a cross-cutting aspect in the area of human performance because PSEG did not provide adequate procedure resources to prevent the loss of all shutdown range reactor water level indication.

Inspection Report# : [2006003](#) (*pdf*)

G**Significance:** Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IMPLEMENT CORRECTIVE ACTIONS FOR SERVICE WATER PUMP PACKING

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PSEG's failure to implement corrective actions for a condition adverse to quality involving inadequate procedure guidance for service water pump packing replacement. This resulted in a degraded condition on the 'B' service water pump packing assembly that was identified by the inspectors on February 13, 2006. PSEG's corrective actions included tightening the packing and revising maintenance procedures.

The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined the finding to be of very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as risk significant due to external events. The finding had a cross-cutting aspect in the area of problem identification and resolution because PSEG did not identify that corrective actions were not implemented correctly during a corrective action effectiveness review.

Inspection Report# : [2006002 \(pdf\)](#)**G****Significance:** Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IDENTIFY CONDITIONS ADVERSE TO QUALITY ON 'D' SERVICE WATER STRAINER

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," when the 'D' service water strainer was rendered unavailable for 49 hours on November 6, 2005. On May 23, 2005, PSEG technicians reassembled the 'D' service water strainer with the backwash arm off-center and a packing gland machined from its original size to allow assembly. The resulting non-conforming condition was not entered into PSEG's corrective action program. The absence of this documentation and evaluation led to the reuse of the machined gland, which resulted in a packing leak and the unavailability of the 'D' service water strainer in November 2005. PSEG initiated actions to address the problem associated with not entering the non-conforming condition into the corrective action program.

This performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems and Initiating Events cornerstone objectives and affected both cornerstone objectives. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined a more detailed Phase 2 evaluation was required to assess the safety significance, because the finding affected two cornerstones. The inspectors determined that the finding was of very low safety significance (Green). The performance deficiency had a cross-cutting aspect in the area of problem identification and resolution because PSEG did not identify a condition adverse to quality by entering the issue into the corrective action program.

Inspection Report# : [2006002 \(pdf\)](#)**G****Significance:** Mar 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INADEQUATE CORRECTIVE ACTION RESULTS IN UNAVAILABILITY OF THE 1AK400 CONTROL ROOM CHILLER

A self-revealing, non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action," was identified when the guide vane pivot arm on the 'A' control room chiller was discovered to be operating incorrectly in May 2005, rendering the chiller unable to perform its design function. PSEG corrective actions included modifying applicable procedures and providing training to maintenance technicians.

This finding was more than minor because it was associated with the equipment performance attribute of the Mitigating

Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. The improper use of setscrews on the 'A' control room chiller guide vane arms resulted in the chiller not being able to perform its design function and unplanned unavailability of the chiller for about 85 hours to implement repairs. The inspectors completed a Phase 1 screening using Appendix A of Inspection Manual Chapter (IMC) 0609, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and determined that the performance deficiency was of very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train greater than its technical specification allowed outage time, and did not screen as risk significant due to external events.

Inspection Report# : [2006002](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Significance:  Jun 30, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

DEFICIENCY IN ACCESS CONTROL TO RADIOLOGICAL AREAS

A self-revealing non-cited violation of 10 CFR 20.1501, "Surveys and Monitoring: General", was identified when a worker's electronic dosimeter alarmed due to dose rates in the 'A' steam jet air ejector (SJAE) room exceeding the preset alarm setpoint. During power ascension at the end of the refueling outage, the worker entered the 'A' SJAE room and received a dose rate alarm due to the presence of dose rates in excess of 100 millirem per hour measured 30 centimeters from the source of radiation although the rooms were not identified, posted or controlled as a high radiation area. Changing radiological conditions caused by changes in reactor power level and increased steam flow in the plant required that a new radiological survey of the 'A' SJAE room be conducted in accordance with 10 CFR 20.1501 to support compliance with 10 CFR 20.1201, "Occupational Dose Limits for Adults," and plant technical specification 6.12.1, prior to personnel entry. PSEG's corrective actions included implementing process controls requiring the posting of select steam affected areas upon reactor criticality.

The failure to survey an area subject to changing radiological conditions in accordance with 10 CFR 20.1501 to ensure compliance with the requirements of 10 CFR 20.1201, and to accurately brief workers entering a posted high radiation area (Plant Technical Specification 6.12) on the radiological conditions was determined to be a performance deficiency and a finding. The finding is more than minor because it is associated with the occupational radiation safety cornerstone attribute of exposure control and affected the cornerstone objective of providing adequate protection of workers from exposure to radiation. Because the performance deficiency involved a worker entering an uncontrolled high radiation area, the finding was evaluated using Inspection Manual Chapter (IMC) 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process." The inspectors determined that the finding was of very low safety significance (Green), because it did not involve (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for an overexposure, or (4) an impaired ability to assess dose. The performance deficiency had a cross-cutting aspect related to human performance. Specifically, PSEG did not correctly coordinate surveys and postings of the 'A' SJAE rooms following reactor criticality and startup.

Inspection Report# : [2006003](#) (*pdf*)

Public Radiation Safety

Physical Protection

[Physical Protection](#) information not publicly available.

Miscellaneous

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