

Hope Creek 1

4Q/2009 Plant Inspection Findings

Initiating Events

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: FIN Finding

AUTOMATIC REACTOR SCRAM DUE TO LEAK ON SCRAM AIR HEADER

A finding was self-revealed because PSEG discovered an air leak at a soldered joint on the scram air header in September 2008, but did not enter the degraded condition in the corrective action program. As a result, PSEG did not evaluate the leak or take corrective actions prior to the joint separating, causing an automatic reactor scram. Following the event, PSEG repaired the affected joint, performed an extent-of-condition inspection of the corresponding joints on all other hydraulic control units, and placed this issue in the corrective action program.

This issue was more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions. Specifically, by not identifying the air leak in the corrective action program, PSEG did not evaluate the degraded condition and its impact on the reliability of the scram air header. The inspectors determined that the finding was of very low safety significance (Green) based on a Phase I analysis. The finding increased the likelihood of a reactor scram, but did not contribute to the likelihood that mitigating equipment would not be available. The finding had a cross-cutting aspect in the area of problem identification and resolution because the station did not identify the scram air header leak completely, accurately, and in a timely manner commensurate with its safety significance. (P.1(a))

Inspection Report# : [2009003](#) (*pdf*)

Mitigating Systems

Significance:  Oct 09, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

NON-CONSERVATIVE INPUT USED IN DESIGN CALCULATION FOR DC CONTROL VOLTAGE FOR 4KV SWITCHGEAR

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50 Appendix B Criterion III, Design Control, in that PSEG had not properly verified that the safety-related 'B' 4 kV switchgear had adequate DC control voltage to operate under all design conditions. Specifically, PSEG did not use the maximum DC control current to the 'B' 4 kV switchgear to calculate the worst case voltage drop between the battery and the switchgear. PSEG relied on this calculation to verify the adequacy of their design and ensure the minimum voltage at the switchgear satisfied design requirements. In response, PSEG entered the issue into their corrective action program and performed a calculation to ensure that there was sufficient margin to assure operability of the 4kV switchgear.

The finding was more than minor because it was associated with the design control 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 to prevent undesirable consequences. The team determined the finding was of very low safety significance (Green) because it was a design deficiency subsequently confirmed not to result in a loss of operability or functionality. This finding did not have a cross-cutting aspect because the issue was not considered to be indicative of current licensee performance.

Inspection Report# : [2009007](#) (pdf)

Significance:  Oct 09, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

EDG OVERHEAD CRANES NOT SEISMICALLY RESTRAINED

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50 Appendix B Criterion III, Design Control, in that PSEG design control measures had not verified the adequacy of design with respect to ensuring adequate two-over-one seismic protection existed for the emergency diesel generators (EDG). Specifically, PSEG had not performed design reviews, calculations or testing to ensure the existing field crane configuration would not adversely impact the EDG function for a design basis safe shutdown earthquake (SSE) event. PSEG entered this issue into their corrective action program, performed Technical Evaluation (TE) 70102445-0050, Diesel Generator Underhung Crane Seismic II/I Evaluation, to calculate the seismic response of the diesel cranes and assess the as-found condition (e.g., crane seismic restraints not installed) and implemented appropriate compensatory measures.

The finding was more than minor because it was associated with the design control 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 to prevent undesirable consequences. The team determined the finding was of very low safety significance (Green) because it was a design deficiency subsequently confirmed not to result in a loss of operability or functionality. This finding did not have a cross-cutting aspect because the issue was not considered to be indicative of current licensee performance.

Inspection Report# : [2009007](#) (pdf)

Significance:  Oct 09, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE DESIGN CONTROL FOR 4KV BUS DEGRADED VOLTAGE RELAY BASES

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, in that PSEG had not verified the adequacy of design with respect to establishing the bases for the degraded voltage relay (DVR) setpoint. Specifically, PSEG's calculation to verify the DVR setpoint utilized a non-conservative voltage input to analyze motor starting during accident load sequencing and assumed an inappropriate modeling technique for running motors that minimized the voltage dips during motor starting. Additionally, PSEG's analyses had not analyzed the capability of motor starting during steady state conditions following load sequencing. PSEG entered the issue into their corrective action program and prepared preliminary calculations to assess the cumulative effect of the non-conservative assumptions on the voltage available to motors starting during load sequencing. The calculations showed that although margins were substantially reduced, the motors would still be afforded their minimum required starting voltage.

The finding was more than minor because it was associated with the design control 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 to prevent undesirable consequences. The team determined the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in a loss of the electrical distribution system operability or functionality. This finding did not have a cross-cutting aspect because the issue was not considered to be indicative of current licensee performance.

Inspection Report# : [2009007](#) (pdf)

Significance:  Jun 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE WORK INSTRUCTIONS FOR IMPAIRING THE FLOOD PROTECTION FUNCTION OF THE SAFETY AUXILIARY COOLING SYSTEM WATER-TIGHT DOOR

The inspectors identified a non-cited violation of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because safety auxiliary cooling system (SACS) water-tight door 4309A was blocked open without necessary compensatory measures, as a result of inadequate work instructions. Consequently, flood protection measures for the SACS system were degraded, which affected the capability of both SACS trains to perform their safety function during a flooding event. PSEG entered this issue into the corrective action program and promptly closed the water-tight door.

The issue was more than minor because it is associated with the external factors attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective of ensuring the capability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, not having the required flooding compensatory measures in place when the water-tight door 4309A was open affected the reliability and capability of the SACS system during a postulated internal flooding event. The inspectors used Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," to determine the significance of the finding. Based upon the finding not involving a loss of control or thermal margin, this finding does not require a quantitative assessment and screens as having very low safety significance (Green). This finding had a cross-cutting aspect in the area of human performance because PSEG did not define and effectively communicate expectations regarding procedural compliance, and PSEG personnel did not follow procedures. Specifically, PSEG did not adequately follow PSEG procedure CC-AA-201, "Plant Barrier Control Program," to impair the water-tight door. (H.4(b))

Inspection Report# : [2009003](#) (pdf)

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

UNPLANNED HIGH PRESSURE COOLANT INJECTION UNAVAILABILITY DUE TO TROUBLESHOOTING

A self-revealing, non-cited violation of 10 CFR Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because technicians did not have adequate work instructions for troubleshooting a high pressure coolant injection (HPCI) system instrumentation drawer. The instructions did not include appropriate steps to prevent or bypass a HPCI turbine trip signal, thereby leading to an unplanned period of unavailability of the HPCI system. PSEG's corrective actions included providing communications to all supervisors on adequate technical rigor when preparing for troubleshooting and revising a reference document used for the work instructions.

The issue was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. Specifically, the inadequate work instructions resulted in unplanned unavailability of the HPCI system. The finding was of very low safety significance (Green) based on a Phase 2 analysis. The finding had a cross-cutting aspect in the area of human performance because PSEG did not appropriately plan work activities by incorporating the need for compensatory actions. Specifically, PSEG's work instructions did not incorporate the need for compensatory actions to preclude a HPCI turbine trip. (H.3(a))

Inspection Report# : [2009003](#) (pdf)

Significance:  Jan 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INADEQUATE CORRECTIVE ACTIONS FOR SUSCEPTIBILITY OF AIR ACCUMULATION IN THE A CONTROL AREA CHILL WATER SYSTEM

A self-revealing Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Actions," was identified for PSEG's failure to implement corrective actions to address an identified condition adverse to quality which resulted in multiple trips of the 'A' Control Area Chilled Water (CACW) pump. In December 2008, the 'A' CACW pump tripped due to loss of suction pressure due to air accumulation. The 'A' CACW pump has had historical issues with air accumulation resulting in pump trips resulting in a loss of the 'A' train of control room ventilation. In 2008, this pump tripped in February following maintenance, in July, and again in December. After each trip a significant amount of air was vented from the system. PSEG's apparent cause evaluation of the July 2008 trip appropriately identified

that the trip was due to air accumulation while the system was in a standby configuration. The evaluation also identified that PSEG did not have a program to monitor for air accumulation as it did for other susceptible systems. However, effective corrective actions were not developed to address the susceptibility, the condition adverse to quality, and as a result the pump tripped again in December 2008. Subsequently, PSEG developed corrective actions which included a periodic venting of the system and proposed modifications to add additional vents to the system.

This finding is more than minor because it affects the equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the 'A' train of Control Room Ventilation's reliability and availability were adversely impacted. This finding was determined to be of very low safety significance because the system was not unavailable for greater than its allowed TS outage time. The finding has a cross-cutting aspect in the area of problem identification & resolution (PI&R) and the aspect of problem evaluation (P.1.C) because PSEG did not thoroughly evaluate problems such that resolutions address causes and extent of conditions as necessary. Specifically, appropriate corrective actions were not developed to address system susceptibility to air accumulation, an identified condition adverse to quality.

Inspection Report# : [2009006](#) (pdf)

Significance:  Jan 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

NON-CONSERVATIVE EMERGENCY DIESEL GENERATOR TEST ACCEPTANCE CRITERIA

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for PSEG's failure to ensure that emergency diesel generator (EDG) surveillance test (ST) procedures had appropriate acceptance criteria that incorporated the limits from applicable design documents. Specifically, PSEG did not provide EDG ST acceptance criteria associated with the differential pressure (D/P) across the EDG lube oil strainers which would ensure the ability of the EDGs to provide their safety function for the duration of its designed 24-hour mission time when the procedure was changed in 2002. As a result, from October 2008 to January 2009, the 'B' EDG was declared operable when, in fact, operability was indeterminate. PSEG's corrective actions included declaring the 'B' EDG inoperable, replacing the EDG lube oil strainer, revising the EDG ST procedures, and performing an extent of condition review.

The finding is more than minor because the performance deficiency is associated with the procedure quality attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems (EDGs) that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance because it represented the loss of the safety function of a single train for less than the Technical Specification allowed outage time. This finding was not assigned a cross-cutting aspect because the underlying cause was not indicative of current performance.

Inspection Report# : [2009006](#) (pdf)

Significance:  Jan 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO FOLLOW PROCEDURES CONTRIBUTES TO EMERGENCY DIESEL GENERATOR INOPERABILITY

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for PSEG's failure to adequately implement procedure requirements related to the maintenance and operation of the emergency diesel generators (EDGs). Specifically, between February 2008 and January 2009, operators repeatedly documented that the 'B' EDG LO strainer D/P was greater than 7 psid; however, they did not initiate a new notification (NOTF) as required by PSEG procedure HC.OP-ST-KJ-0002, "Emergency Diesel Generator 1BG400 Operability Test – Monthly." As a result, an out of specification system parameter was not re-screened for operability following a substantive change in this parameter resulting in the 'B' EDG being declared inoperable. PSEG's corrective actions included replacing the EDG lube oil strainer, revising procedures, and performing an extent of condition review.

The finding is more than minor because the performance deficiency is associated with the human performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems (EDGs) that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance based on a Phase 3 SDP evaluation based on a bounding case analysis considering the period of unavailability, a conservative estimate of time to failure, and operator recovery credit. The finding has a cross-cutting aspect in the area of Human Performance and the aspect of work practices, procedural compliance, in that PSEG personnel are to follow procedures [H.4.(b)]. Specifically, PSEG personnel did not follow procedure HC.OP-ST-KJ-0002, and write a NOTF each time EDG lube oil strainer D/P was greater than 7 psid.

Inspection Report# : [2009006](#) (*pdf*)

Barrier Integrity

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

TRAVERSING IN-CORE PROBE CONTAINMENT ISOLATION VALVES FOUND OPEN

The inspectors identified a non-cited violation of Technical Specification 3.6.3, "Primary Containment Isolation Valves," because PSEG did not properly secure the TIP system following a TIP system ST performed on May, 6, 2009; and the error was not identified until May 8, 2009. As a result between May 6 and 8, 2009, four TIP system containment isolation valves remained open without automatic closure capability for greater than the TS 3.6.3 allowed outage time (4 hours). In response to this discovery, operations promptly closed the valves to restore primary containment in accordance with TS 3.6.3, "Primary Containment Isolation Valves." PSEG entered this issue into their corrective action program and corrective actions included conducting a thorough extent of condition review related to the proper use of independent verification related to containment isolation valves and reactor engineering procedures.

This finding was more than minor because it was associated with the human performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers provided protection against radionuclide releases caused by accidents or events. Specifically, station personnel did not ensure that containment isolation valves of the TIP system were restored to their normal shut position after completion of a routine surveillance, which would have prevented fulfillment of the safety function for primary containment. The inspectors performed a Phase I Significance Determination Process (SDP) using IMC 0609, Appendix H, "Containment Integrity SDP," and determined that the finding was of very low risk significance because it would not contribute significantly to large early release frequency (LERF) because the TIP tubing penetrations were small lines (< 2 inches in diameter). The finding had a cross-cutting aspect in the area of human performance because PSEG did not provide a complete, accurate, and up-to-date procedure for operating the TIP system. Specifically, the procedure, TIP System Operation, did not contain steps for independent verification of the TIP containment isolation valves, contrary to a PSEG configuration control procedure. (H.2(c))

Inspection Report# : [2009004](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Significance: N/A Jan 30, 2009

Identified By: NRC

Item Type: FIN Finding

HOPE CREEK BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION

The inspectors concluded that Public Service Enterprise Group Nuclear, LLC (PSEG), in general, adequately identified, evaluated, and resolved problems; however, weaknesses were noted in the three areas of the corrective action program (CAP). Specifically, PSEG personnel typically identified problems, entered them into the corrective action program at a low threshold, and prioritized issues commensurate with the safety significance. However, for one issue reviewed, PSEG repeatedly failed to write notifications for conditions adverse to quality as required by the surveillance procedure, resulting in a NRC-identified NCV. For most cases, PSEG appropriately screened issues for operability and reportability and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. However, for one issue reviewed, the inspectors identified an inadequate evaluation of a Technical Specification (TS) acceptance criteria change, resulting in an NRC- identified NCV. Corrective actions taken to address the problems identified in PSEG's corrective action process were typically implemented in a timely manner. However, for one issue reviewed, PSEG did not establish appropriate corrective actions to address a condition adverse to quality, resulting in a self-revealing NCV. The inspectors also concluded that, in general, PSEG adequately identified, reviewed, and applied relevant industry operating experience to Hope Creek Generating Station operations. In addition, based on those items selected for review by the inspectors, PSEG's audits and self-assessments were thorough and probing. Based on the interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual corrective action program and employees concerns program issues, the inspectors did not identify any concerns that site personnel were not willing to raise safety issues nor did they identify conditions that could have had a negative impact on the site's safety conscious work environment.

Inspection Report# : [2009006](#) (*pdf*)

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