

# Hope Creek 1

## 3Q/2011 Plant Inspection Findings

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### Initiating Events

**Significance:**  Sep 30, 2011

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Inadequate Corrective Actions Associated with a Known Degraded Condition of the 00-K-107 Service Air Compressor Outlet Check Valve (H0KA-0KAV-004)**

A self-revealing finding was identified because the PMOC did not drive sustainable improvements in the 00-K-107 service air compressor's reliability as required by PM program procedure WC-AA-111. Specifically, PSEG did not change the PM frequency of the degraded compressor outlet check valve (H0KA-0KAV-004) nor evaluate the use of materials less susceptible to corrosion after several recent performances of the 18-month PM found excessive corrosion and rust on the valve internals. Consequently, this check valve failed closed due to corrosion, tripped the air compressor, and caused a service and instrument air headers pressure transients followed by an automatic start of the EIAC. After the May 12, 2011, failure, PSEG refurbished H0KA-0KAV-004's internals with new carbon steel components and plans to replace the 00-K-107 and 10-K-107 compressors' outlet check valves with stainless steel valves that are less susceptible to corrosion (Orders 60097323 and 60097371).

This finding is 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 at power. Specifically, the failure to adequately maintain the degraded compressor outlet check valve in the service air header increased the likelihood of a plant trip. The inspectors evaluated this finding using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a, and determined the finding to be of very low safety significance (Green) because the finding does not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available. The finding has a cross-cutting aspect in the area of human performance, work control component, because PSEG did not appropriately coordinate work activities by incorporating actions to ensure that maintenance scheduling is more preventive than reactive. Specifically, PSEG did not implement a recommended increase (PCR 80101517) in the frequency of a PM for H0KA-0KAV-004 before the valve failed shut and required reactive maintenance following a trip of the 00-K-107 air compressor. (H.3(b))

Inspection Report# : [2011004](#) (pdf)

**Significance:**  Jan 28, 2011

Identified By: NRC

Item Type: FIN Finding

#### **INADEQUATE CORRECTIVE ACTIONS FOR EHC TURBINE VALVE PROCEDURES**

The inspectors identified a finding of very low safety significance (Green) because PSEG did not correct turbine valve test and maintenance procedure deficiencies. Specifically, PSEG closed out notification 20413100 within their corrective action program without performing the actions to resolve the procedure deficiencies as required by PSEG corrective action procedures. PSEG entered this issue into their corrective action program as notifications 20494248 and 20495156 to evaluate the corrective actions needed to address the issue.

The finding was determined to be more than minor because the deficiency was associated with the procedure quality attribute of the Initiating Events cornerstone and adversely impacted the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors evaluated the finding using IMC 0609, "Significance Determination Process", Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings", Table 4a, for the Initiating Event cornerstone. Specifically, because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available, the finding was determined to be of very low safety significance (Green).

This finding had a cross-cutting aspect in the area of problem identification and resolution because PSEG did not take appropriate corrective actions to address safety issues in a timely manner, commensurate with their safety significance and complexity. Specifically, corrective actions outlined in notification 20413100 to resolve procedural deficiencies were not completed.

Inspection Report# : [2011008](#) (pdf)

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## Mitigating Systems

**Significance:**  Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **HPCI Operability during SBLOCA/LOOP with the A EDG Failure**

The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that, PSEG did not ensure the adequacy of the high pressure coolant injection (HPCI) design under post-accident conditions. Specifically, PSEG did not evaluate the impact of elevated temperature in the HPCI room on the operability of the HPCI system during a postulated design basis small break loss of coolant accident (SBLOCA) coincident with a loss of offsite power (LOOP) and a single failure of the A emergency diesel generator (EDG). PSEG determined through subsequent evaluation that HPCI was operable but non-conforming because there was a potential for HPCI system to isolate unnecessarily on high differential temperature during the extreme winter low temperatures. PSEG plans to implement a design change to reduce the setpoints of the HPCI room coolers so that the initial HPCI room temperature is maintained at a lower temperature before extreme winter conditions. The violation was entered into the CAP as notifications 20518124 and 20520106.

The performance deficiency 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 reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, PSEG had not evaluated HPCI operability using actual HPCI room temperatures during normal operating conditions, and as a result, HPCI's reliability during the most limiting accident conditions was not assured during extreme winter low temperatures. The inspectors reviewed this condition using IMC 0609, Attachment 4, and in consultation with a Region I senior reactor analyst (SRA), concluded that this issue screened to very low safety significance (Green). The finding had a cross-cutting aspect in the area of problem identification and resolution, corrective action component, because PSEG did not thoroughly evaluate a prior problem such that the problem resolution addressed the causes and the extent of condition. Specifically, PSEG's evaluation for notification 20381041, HPCI Operability During Station Blackout (SBO) Conditions, did not identify the impact of the actual initial HPCI room temperature on other accident conditions, such as a SBLOCA and LOOP with the single failure of an EDG and, therefore, did not identify that the actual HPCI room temperature was beyond the HPCI design document assumption that temperature should be between 60°F and 100°F. (P.1(c))

Inspection Report# : [2011004](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **RCIC TURBINE BEARING HIGH OIL LEVEL**

The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions", because PSEG failed to identify and correct a condition adverse to quality. Specifically, PSEG did not identify that the reactor core isolation cooling (RCIC) turbine oil level was above the maximum level mark. Corrective actions performed by PSEG included restoring the proper oil level, revising the RCIC quarterly oil sample procedure, conducting training for equipment operators, and reinforcing to senior reactor operators the significance of the oil levels on RCIC operability. The violation was entered into the CAP as notifications 20490150 and 20490446.

The performance deficiency was more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed a Phase I screening of the finding using IMC 0609, Attachment 0609.04, Table 4a, Mitigating Systems cornerstone. The inspectors determined the issue was of very low safety significance (Green) because the finding was not a design or qualification deficiency, did not result in an actual loss of safety function, and was not potentially risk significant for external events. The finding had a cross-cutting aspect in the area of problem identification and resolution, because PSEG did not identify the RCIC turbine high oil level condition completely, accurately, and in a timely manner commensurate with safety significance.

Inspection Report# : [2010005](#) (pdf)

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## Barrier Integrity

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: FIN Finding

### **RHR HEAT EXCHANGER DEFICIENT OPERABILITY EVALUATION**

The inspectors identified a finding for a deficient operability evaluation involving leakage from the residual heat removal (RHR) system into the reactor building through a degraded gasket on the B RHR heat exchanger (HX). PSEG's operability evaluation did not fully account for the continuing degradation of the condition, and would have allowed the leakage rate from the HX to exceed the value analyzed in a supporting technical evaluation. Consequently, during the assumed mission time for the HX following a postulated accident, the post-accident control room dose could have exceeded the regulatory limit of 5 Rem. PSEG's corrective actions included revising both the operability and technical evaluations, and completing repairs to the RHR HX.

This finding is associated with the structure, system, and component (SSC) and barrier performance (Containment) attributes of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency is similar to IMC 0612, Appendix E, Example 3i, that states an issue with accident analysis calculations is more than minor if the calculations needed to be re-performed to assure accident analysis requirements were met. In this case, accident analysis calculations were re-performed to assure control room dose requirements were met. The inspectors determined that the finding was Green, based on a Phase 2 SDP review using Appendix H, "Containment Integrity". The finding had a cross-cutting aspect in the area of problem identification and resolution, because PSEG did not thoroughly evaluate the degraded condition on the B RHR HX, including classifying, prioritizing, and evaluating for operability. Specifically, PSEG's operability evaluation did not fully account for the dose impact of increased leakage during the post-accident mission time of the RHR HX.

Inspection Report# : [2010005](#) (pdf)

**Significance:** SL-IV Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **INADEQUATE 10 CFR 50.59 SAFETY EVALUATION**

The inspectors identified a NCV of 10 CFR 50.59, "Changes, Tests, and Experiments", for PSEG's failure to perform an adequate safety evaluation for an approved design change involving primary containment isolation valves (PCIVs). Specifically, the safety evaluation did not identify the impact of a design change that increased the allowable closing stroke times of several PCIVs, which resulted in more than a minimal increase in the potential radiological consequences of an accident. PSEG's corrective actions included blocking procedure changes that incorporated the design change and implementing a new design change to return the PCIV stroke times back to their original design values.

Violations of 10 CFR 50.59 potentially impede or impact the regulatory process and are, therefore, dispositioned

using the NRC Enforcement Policy. In accordance with the Enforcement Policy, the performance deficiency was more than minor because it is associated with the design control attribute of the Barrier Integrity cornerstone, and it adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors performed a Phase I screening of the finding using IMC 0609, Attachment 0609.04, Table 4a, Barrier Integrity cornerstone. The issue screened as Green, because there was no actual open pathway in the physical integrity of the primary containment and because the design change, although approved for implementation, was not actually incorporated into station procedures. Therefore, the violation is categorized as Severity Level IV in accordance with Section 6.1.d of the NRC Enforcement Policy. The underlying finding had a cross-cutting aspect in the area of human performance, because the station did not provide proper supervisory and management oversight of work activities, including contractors. Specifically, engineers, supervisors, and managers did not properly oversee contractor engineering products, including performing a rigorous technical review of the products for a design change, that resulted in an inadequate 10 CFR 50.59 safety evaluation.

Inspection Report# : [2010005](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## 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.

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## Miscellaneous

**Significance:** N/A Jan 28, 2011

Identified By: NRC

Item Type: FIN Finding

### **Hope Creek Biennial PI&R Inspection Summary**

The inspectors concluded that Public Service Enterprise Group, Nuclear, LLC (PSEG) was generally effective in identifying, evaluating, and resolving problems. PSEG personnel identified problems, entered them into the corrective action program at a low threshold, and prioritized issues commensurate with their safety significance. In general, PSEG appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that PSEG typically implemented corrective actions to address the problems identified in the corrective action program in a timely manner. However, the inspectors identified one finding which was not a violation of regulatory requirements, in the area of implementation of corrective actions and several weaknesses of minor safety significance in the area of evaluation and prioritization of issues.

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 employee concerns program issues, the inspectors did not identify any indications that site personnel were unwilling 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# : [2011008](#) (*pdf*)

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