

# Hope Creek 1

## 3Q/2008 Plant Inspection Findings

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### Initiating Events

**Significance:**  Dec 29, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **INADVERTENT LOSS OF REACTOR COOLANT SYSTEM INVENTORY DUE TO INADEQUATE TEST PROCEDURE**

A self-revealing non-cited violation of Technical Specification 6.8.1, "Procedures and Programs," was identified when control room operators inadvertently drained water from the reactor pressure vessel (RPV) during safety relief valve solenoid testing. PSEG determined that the work order and procedure used for the test did not establish the plant conditions necessary to test ADS SRV logic without causing an inadvertent opening of an SRV. PSEG's corrective actions included changing the associated work order to contain specific instructions for the system alignments required prior to performing the test. Additionally, PSEG planned to enhance the surveillance procedure to include precautions and instructions to prevent inadvertent draining of the reactor vessel.

The finding was greater than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone and impacted the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the inadequate procedure resulted in an unexpected loss of RPV water inventory of approximately 2100 gallons. Using IMC 0609 Appendix G for shutdown operations, the inspectors determined that the finding was of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, resources, because the controlling work order and surveillance test procedure were inadequate. Specifically, these documents did not establish appropriate plant conditions for testing a valve capable of rapidly draining RPV inventory. H.2(c)

Inspection Report# : [2007005](#) (*pdf*)

**Significance:**  Dec 29, 2007

Identified By: Self-Revealing

Item Type: FIN Finding

#### **REACTOR WATER LEVEL TRANSIENT DUE TO DIGITAL FEEDWATER CONTROL SYSTEM TROUBLESHOOTING**

A self-revealing finding was identified when PSEG did not provide adequate work instructions for complex troubleshooting activities associated with the digital feedwater control system (DFCS) that subsequently caused a reactor level transient during plant startup. PSEG's immediate corrective actions included restoring reactor water level and suspending troubleshooting activities. PSEG is conducting a root cause evaluation of the entire DFCS modification implementation activity to identify additional corrective actions for this and other problems encountered during testing.

The finding was determined to be greater than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, inadequate troubleshooting instructions resulted in an unanticipated overfeeding condition requiring prompt operator action to prevent a high reactor water level trip of the feed pumps and a subsequent reactor scram. Using IMC 0609 Appendix A for power operations, the inspectors determined that the finding was of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, resources, because PSEG did not provide complete, accurate and up-to-date procedures and work packages. Specifically, PSEG did not develop adequate troubleshooting instructions in accordance with their troubleshooting procedure to limit plant impact. H.2(c)

Inspection Report# : [2007005](#) (*pdf*)

**Significance:**  Dec 29, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **INADVERTENT LOSS OF REACTOR COOLANT SYSTEM INVENTORY DUE TO LOSS OF CONFIGURATION CONTROL**

A self-revealing non-cited violation of Technical Specification 6.8.1, "Procedures and Processes," was identified when PSEG did not include special instructions in three related work clearance documents. As a result, PSEG inadvertently drained reactor vessel water inventory through reactor core isolation cooling (RCIC) steam line drains to the primary containment. PSEG's immediate corrective actions included stopping the leak by closing the RCIC steam line drains. PSEG entered this problem into their corrective action program.

The finding was greater than minor because it was associated with the configuration control attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the loss of configuration control resulted in the inadvertent draining of

reactor vessel water inventory from the reactor pressure vessel. Using IMC 0609 Appendix G for shutdown operations, the inspectors determined the finding was of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, work practices, because workers did not adequately follow the safety tagging operations procedure in the development of a main steam line plug clearance. H.4(b)

Inspection Report# : [2007005](#) (*pdf*)

**G**

**Significance:** Dec 29, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO PROMPTLY IDENTIFY AND CORRECT INTER GRANULAR STRESS CORROSION CRACKING IN DISSIMILAR METAL WELDS IN REACTOR VESSEL NOZZLE N2A**

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because PSEG did not promptly identify and correct an 89% through wall circumferential flaw in a dissimilar metal weld in reactor recirculation system nozzle N2A. This nozzle is directly connected to the reactor vessel. PSEG entered this issue into their corrective action program.

This finding was greater than minor because it was associated with the equipment performance attribute 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 shutdown as well as power operations. Using IMC 0609 Appendix A for power operations, the inspectors determined the finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the area of problem identification and resolution, corrective action program, because PSEG did not take appropriate corrective actions to address safety issues in a timely manner commensurate with their safety significance. Specifically, PSEG did not implement corrective actions specified by its corrective action program and deferred recirculation nozzle inspections originally scheduled for April 2006 to October 2007 without adequate technical justification. P.1(d)

Inspection Report# : [2007005](#) (*pdf*)

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## Mitigating Systems

**G**

**Significance:** Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE CORRECTIVE ACTIONS FOR TRAVELING WATER SCREEN SUPPORT STRUCTURE**

The inspectors identified a non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, for inadequate corrective actions to address previously identified corrosion of service water traveling screen seismic class 1 support structures. The actions were insufficient to address the corrosion on the D traveling water screen support structure, such that a seismic support I-beam was determined to be inoperable in May 2008. PSEG's corrective actions included replacing corroded I-beams and inspecting other support structure components.

The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone, and it affected the cornerstone objective of ensuring the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the corrective actions did not assure operability of a seismic support for the D service water traveling water screen. The inspectors determined that the finding was of very low safety significance (Green). This finding has 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 (P.1.(d)). Specifically, PSEG did not take adequate corrective actions to ensure that the operability of the degraded D TWS structural support steel was maintained.

Inspection Report# : [2008003](#) (*pdf*)

**G**

**Significance:** Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **IMPROPER MANAGEMENT OF WORKING HOURS DURING REFUELING OUTAGE**

The inspectors identified a non-cited violation of Technical Specification (TS) 6.2.2.d, "Unit Staff," because four individuals worked beyond the TS limit of 72 hours in a 7-day period without proper authorization. Additionally, PSEG did not approve the work hour deviations of 20 individuals prior to them working the hours. PSEG entered this issue into their corrective action program in notification 20357323.

The finding was determined to be more than minor because, if left uncorrected, exceeding TS work hour limits would increase the likelihood of a fatigue-related human performance error during normal plant operations or plant events. The inspectors used Inspection Manual Chapter 0609 Appendix M, "Significance Determination Process Using Qualitative Criteria," because other significance determination process guidance was not suited to provide reasonable estimates of the significance of this inspection finding. With the assistance of Region 1 management and a Senior Risk Analyst, the inspectors determined that the finding was of very low safety significance (Green) because there

were no human performance issues that were linked directly to worker fatigue. The finding had a cross-cutting aspect in the area of human performance because PSEG did not follow procedure LS-AA-119 to authorize deviations from working hour limits described in Technical Specification 6.2.2.d. H.4(b)

Inspection Report# : [2008002](#) (*pdf*)

**G**

**Significance:** Dec 29, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE RISK ASSESSMENT FOR MAINTENANCE ON A WATERTIGHT DOOR**

The inspectors identified a non-cited violation of 10 CFR 50.65 (a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," when PSEG disassembled a water-tight door in the reactor building without assessing the resulting increase in risk to safety-related systems due to internal flooding. Following identification, PSEG assessed the condition and implemented compensatory measures to mitigate internal flooding risk. PSEG entered the problem into their corrective action program.

The finding was greater than minor because PSEG's risk assessment did not consider the uncompensated removal of plant internal flood barriers. Using IMC 0609 Appendix M, "SDP Process Using Qualitative Criteria," the inspectors and a Region 1 Senior Risk Analyst determined the finding to be of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, work control, because PSEG did not plan work activities on door 4302 using risk insights associated with internal flooding and they did not identify the need for planned contingencies or compensatory actions. H.3(a)

Inspection Report# : [2007005](#) (*pdf*)

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## **Barrier Integrity**

**G**

**Significance:** Dec 29, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE DESIGN CONTROL OF SAFETY RELIEF VALVE DISCHARGE PIPING**

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," when a pipe support was found disconnected from safety relief valve (SRV) piping during a drywell inspection. PSEG determined that the pipe support was likely disassembled during a previous refueling outage but not reassembled following the deferral of the remaining work to the next refueling outage. PSEG restored the pipe support to its proper configuration. PSEG entered this problem into their corrective action program.

The finding was more than minor because it was associated with the design control attribute of the barrier integrity cornerstone and affected the cornerstone's objective to provide reasonable assurance that physical design barriers protect the public from radio-nuclide releases caused by accidents or events. Specifically, the missing pipe support resulted in the pipe not meeting design basis stress requirements under some transient conditions. Using IMC 0609 Appendix A for at power operations, the inspectors determined the finding to be of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, work control, because PSEG inadequately managed the impact of changes to work scope on the plant. Specifically, PSEG did not ensure that maintenance was completed properly on SRV piping and,

as a result, did not maintain adequate configuration control of the piping supports. H.3(b)

Inspection Report# : [2007005](#) (*pdf*)

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## **Emergency Preparedness**

**G**

**Significance:** Dec 29, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **TECHNICAL SUPPORT CENTER LOSS OF POWER WITHOUT COMPENSATORY ACTION**

A self-revealing non-cited violation of 10 CFR 50.47(b)(8), "Emergency Plans," was identified when power for the Hope Creek Technical Support Center (TSC) was inadvertently removed without compensatory actions for approximately three days. PSEG's corrective actions included designating use of the Salem TSC as an alternate facility and plans to revise the applicable electrical bus outage procedure to include information about the impact to the Hope Creek TSC.

This finding was greater than minor because it was associated with the facilities and equipment attribute of the Emergency Preparedness cornerstone and adversely affected the cornerstone objective to ensure the capability to implement adequate measures to protect public health

and safety in the event of a radiological emergency. Using IMC 0609 Appendix B, "Emergency Preparedness SDP," the inspectors determined the finding was of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, resources, because PSEG did not ensure that emergency facilities were available and adequate to assure nuclear safety. Specifically, the inadequate impact review of a temporary modification and associated procedure for conducting an electrical bus outage resulted in the loss of power to, and inoperability of, the Hope Creek TSC. H.2(d)

Inspection Report# : [2007005](#) (*pdf*)

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## Occupational Radiation Safety

**G**

**Significance:** Dec 29, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **INADEQUATE RADIOLOGICAL SURVEY OF A HIGH RADIATION AREA**

A self-revealing non-cited violation of 10 CFR 20.1501, "Surveys and Monitoring – General," was identified when PSEG did not adequately perform required radiological surveys in a High Radiation Area (HRA) prior to down-posting to a Radiation Area. Three workers' electronic dosimeters unexpectedly alarmed while in the main steam pipe chase while a reactor shutdown was in progress. PSEG's investigation determined that dose rates in excess of 100 millirem per hour were present at the work location and the room should not have been down-posted from a HRA. PSEG's corrective actions included procedure revisions to provide more specific instruction for de-posting HRA's, improvement of radiological survey completion tracking mechanisms, and requirement for shift radiation protection supervisor to contact Operations for shutdown status prior to de-posting HRA's that are affected by steam.

The finding was greater than minor because it was associated with the Occupational Radiation Safety cornerstone attribute of exposure control and adversely affected the cornerstone objective to provide adequate protection for workers from exposure to radiation. Specifically, because PSEG did not perform adequate radiological surveys, three workers received unplanned and unintended dose. Using IMC 0609 Appendix C, "Occupational Radiation Safety SDP," the finding was determined to be of very low safety significance. This finding had a cross-cutting aspect in the area of human performance, work control, because PSEG did not coordinate work activities with respect to job site conditions that affected radiological safety. H.3(a)

Inspection Report# : [2007005](#) (*pdf*)

**G**

**Significance:** Dec 29, 2007

Identified By: Self-Revealing

Item Type: FIN Finding

### **OCCUPATIONAL RADIATION EXPOSURE NOT AS LOW AS REASONABLY ACHIEVABLE DURING REFUELING OUTAGE**

A self-revealing finding was identified when PSEG did not maintain occupational radiation exposures as-low-as-reasonably-achievable (ALARA) for three different work activities during a refueling outage. Specifically, each job's total dose accumulated was greater than 150% of the originally planned dose. PSEG entered this problem into their corrective action program.

The finding was greater than minor because it was associated with the plant facilities, programs and processes, and human performance attributes of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Furthermore, each issue was comparable to the greater than minor ALARA example (6.a) described in MC 0612, Appendix E. The inspectors determined the finding to be of very low safety significance (Green). The finding had a cross-cutting aspect in the area of human performance, resources, because PSEG did not provide adequate resources in the form of plant equipment. Specifically, time delays caused by inadequate equipment provided to workers were the most significant contributors to the increased radiation dose received by plant workers. H.2(d)

Inspection Report# : [2007005](#) (*pdf*)

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## Public 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.

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## Miscellaneous

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