

Salem 2

2Q/2007 Plant Inspection Findings

Initiating Events

Significance:  May 12, 2007

Identified By: Self-Revealing

Item Type: FIN Finding

SALEM UNIT 2 AUTOMATIC REACTOR TRIP

A self-revealing finding for improper maintenance on a demineralizer sight glass was identified when the sight glass catastrophically failed and initiated a condensate system transient that resulted in a reactor trip. Contrary to vendor recommendations that each sight glass be installed and torqued in place only one time, maintenance technicians had re-installed the sight glass on the demineralizer following vessel maintenance. PSEG replaced all Unit 2 demineralizer sight glasses before the subsequent Unit 2 startup. The finding is greater than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone, and because it adversely affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors conducted a Phase 1 SDP screening in accordance with IMC 0609 and determined that the finding is of very low safety significance.

The finding has a cross-cutting aspect in the area of human performance because PSEG did not ensure that complete, accurate, and up to date design documentation, procedures, and work packages were available (H.2.c). Specifically, vendor documentation for the demineralizer sight glass was not available on site, and as a result, PSEG did not incorporate appropriate vendor guidance regarding reinstallation and torque requirements for the sight glass into plant procedures.

Inspection Report# : [2007003](#) (*pdf*)

Significance:  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IMPLEMENT EFFECTIVE CORRECTIVE ACTIONS FOR REACTOR COOLANT SYSTEM TUBING LEAKS

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," in that corrective actions established in 1998 to identify, clean, and inspect Unit 2 reactor coolant system (RCS) instrument tubing were not implemented. Because these corrective actions were not implemented, three through-wall cracks were identified in RCS instrument tubing in October 2006.

This finding is more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shut down as well as power operations. The inspectors determined that the finding was of very low safety significance (Green) using a Phase 1 screening in Appendix A of Inspection Manual Chapter 0609, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." Assuming worst case degradation, the finding would not result in exceeding the Technical Specification limit for identified RCS leakage and would not have likely affected other mitigation systems resulting in a total loss of their safety function. The finding has a cross-cutting aspect in area of problem identification and resolution, because PSEG did not take appropriate corrective actions, in 1998 and 2005, to address these safety issues in a timely manner, commensurate with their safety significance and complexity.

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

Significance:  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

22 SERVICE WATER STRAINER TRIP

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to accomplish maintenance in accordance with procedures. PSEG maintenance personnel omitted procedure steps to adequately tighten or properly lock a locknut on the 22 service water strainer during preventive maintenance. Consequently, the 22 service water strainer motor tripped due to increased strainer basket internal interference after it was returned to service.

The finding is more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone, and it affected the cornerstone objective. Unavailability of the 22 SWS and SWP increased the likelihood of a loss of service water. This finding also impacted the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, incorrectly performed maintenance degraded both availability and reliability of the 22 SWS and SWP. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 SDP screening and determined that a more detailed Phase 2 evaluation was required to assess the safety significance because the performance deficiency affected two cornerstones. However, the Risk-Informed Inspection Notebook for Salem Nuclear Generating Station does not evaluate loss of service water initiating events. Therefore, an NRC Region 1 Senior Reactor Analyst (SRA) conducted a Phase 3 analysis and determined the finding was of very low safety significance (Green). The performance deficiency has a cross-cutting aspect in the area of human performance related to the work practices component, because PSEG did not effectively communicate expectations regarding procedure compliance and personnel did not follow procedures.

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

Significance:  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

REACTOR COOLANT SYSTEM TUBING STRUCTURAL INTEGRITY

The inspectors identified a non-cited violation for PSEG's failure to follow Salem Technical Specification 3.4.11.1.b., Structural Integrity. PSEG discovered a leak on the instrument tubing for reactor coolant system loop flow transmitter 2FT416 and did not properly classify and evaluate the leak for operability or structural integrity, or alternatively isolate the affected tubing.

The finding is more than minor because it affects the Initiating Events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and at power. The inspectors determined that the finding was of very low safety significance (Green) using a Phase 1 screening in Appendix A of Inspection Manual Chapter 0609, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." It is expected that a tubing crack would result in an increase in reactor coolant system (RCS) leakage, and operators would take action prior to exceeding Technical Specification limits for RCS leakage. Therefore, assuming worst case degradation, the finding would not result in exceeding the Technical Specification limit for identified RCS leakage and would not have likely affected other mitigation systems resulting in a total loss of their safety function. The performance deficiency has a cross-cutting aspect in the area of problem identification and resolution, related to the corrective action program component, because PSEG did not thoroughly evaluate the condition.

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

Mitigating Systems

Significance:  Jun 29, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

FAILURE TO INSPECT TUBING ON THE 22 CONTROL AREA CHILLER

A self-revealing NCV for failure to comply with 10 CFR, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," was identified when operators discovered a significant leak in the copper oil filter tubing on the 22 CAC

on May 1, 2007, that made the 22 CAC inoperable. PSEG had not inspected or replaced the affected tubing as specified in the maintenance procedure. PSEG replaced the tubing and returned the 22 CAC to service. This resulted in ten hours of unplanned unavailability on the 22 CAC. The finding is greater than minor because it is 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 to prevent undesirable consequences. The inspectors conducted a Phase 1 SDP screening in accordance with IMC 0609 and determined that the finding is of very low safety significance.

The 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 and adverse trends in a timely manner commensurate with their safety significance (P.1.d). Specifically, corrective actions to prevent CAC tubing failures were ineffective because the visual inspections required by the procedure revision incorporated after previous CAC oil tubing failures, may not have identified degraded copper tubing in time to prevent tubing failure.

Inspection Report# : [2007003](#) (*pdf*)

Significance:  May 01, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

21 CONTROL AREA CHILLER INOPERABLE DUE TO OPERATOR PROCEDURAL ERROR

A self-revealing NCV for failure to comply with 10 CFR 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," was identified when operators discovered the 21 CAC in an inoperable condition on May 1, 2007. In accordance with post-maintenance testing procedures for the 22 CAC, operators placed the 21 CAC in the pump down mode. When the test of the 22 CAC was aborted, operators did not return the 21 CAC to operable status in accordance with procedures. The 21 CAC was inoperable for approximately six hours. PSEG restored the 21 CAC to operable status and entered the issue into the corrective action program (CAP) as notifications 20322784 and 20322793. This finding is greater than minor because the performance deficiency is associated with the equipment performance attribute of the Mitigating Systems cornerstone, and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. The inspectors conducted a Phase 1 SDP screening in accordance with IMC 0609, and determined the finding is of very low risk significance.

The finding has a cross-cutting aspect in the area of human performance because PSEG personnel did not use human error prevention techniques (H.4.a). Specifically, an operator did not identify an incorrect switch position because the operator did not verify the expected system response when placing the 21 CAC switch to run.

Inspection Report# : [2007003](#) (*pdf*)

Significance:  May 01, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IMPLEMENT STEP 3.6.2 OF THE COMPONENT FOULING PROCEDURE

The inspectors identified an NCV for failure to comply with 10 CFR 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," when operators did not implement additional log readings for service water (SW) heat exchangers (HXs) as specified by plant procedures during extended periods of high river detritus from March through May of 2007. This required PSEG to take the 12 CC HX out of service for 45 hours to complete system flushes in May and June 2007 to restore full operability. The finding is more than minor because it is 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 to prevent undesirable consequences. The inspectors conducted a Phase 1 SDP screening in accordance with IMC 0609 and determined that the finding is of very low safety significance.

The finding has a cross-cutting aspect in the area of human performance because PSEG personnel did not follow plant procedures (H.4.b). Specifically, operators did not implement additional log readings for SW HXs as specified by plant procedures during extended periods of high river detritus from March through May of 2007.

Inspection Report# : [2007003](#) (*pdf*)

Significance:  Mar 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

REPETITIVE TRIPS OF 22 SERVICE WATER STRAINER

The NRC identified a non-cited violation of 10 CFR 50, Appendix B, criterion XVI, 'Corrective Action', when the 22 service water (SW) suction strainer tripped on February 24, 2007, rendering the 22 service water pump unavailable for 44 hours to repair the strainer. PSEG did not identify or correct deficiencies that caused five trips of the 22 SW strainer since March 2006. PSEG replaced the 22 service water strainer assembly on March 23, 2007.

The performance deficiency was determined to be more than minor because it rendered the 22 service water pump unavailable for use. The finding was determined to be of very low safety significance (Green) based on a Phase 3 analysis by the regional Senior Risk Analyst. The finding had a cross-cutting aspect in the area of Problem Identification and Resolution in that PSEG did not thoroughly evaluate a problem such that resolutions addressed causes and extent of condition.

Inspection Report# : [2007006](#) (*pdf*)

Significance:  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE PROCEDURE IMPLEMENTATION FOR SCAFFOLD CONSTRUCTION

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because PSEG did not adequately implement procedural controls for scaffold construction in safety-related areas. This performance deficiency had the potential to adversely impact the upper bearing cooling supply to five of the six Unit 2 service water (SW) pumps and three of the six Unit 1 SW pumps. Once identified, PSEG corrected the scaffold deficiencies.

The issue screened as more than minor based on NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues and Cross-Cutting Aspects," Example 4.a, because the inspectors identified multiple examples where there was not an engineering seismic impact evaluation to demonstrate no adverse effect on safety-related SW equipment. The finding was determined to be of very low safety significance (Green) because the performance deficiency was not a design deficiency or qualification deficiency; did not represent an actual loss of safety function of a system; did not represent an actual loss of safety function of a single train for greater than the Technical Specification allowed outage time; did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment; and did not screen as potentially risk significant due to seismic, flooding or a severe weather initiating event. This finding has a cross-cutting aspect in the area of human performance because PSEG personnel did not follow procedures.

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

Barrier Integrity

Significance:  Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INCORRECTLY POSITIONED FUEL ASSEMBLY

A self-revealing non-cited violation of Salem Technical Specification 6.8.1.b, "Procedures and Programs" was identified when PSEG discovered that an irradiated fuel assembly was incorrectly positioned into the spent fuel pool (SFP) and subsequently transferred without authorization during the reactor core offload of Salem Unit 2's fifteenth refueling outage. Contrary to procedural requirements, PSEG did not ensure that the SFP crane operator used a working copy of the applicable transfer sheets, fuel handling technicians did not properly document a fuel movement irregularity and then transferred a fuel assembly within the SFP without fully apprising the fuel handling senior reactor operator (SRO) or reactor engineer (RE) of the circumstances and, finally, PSEG did not ensure that spent fuel manipulations in the SFP were supervised by a qualified SRO or RE.

This finding is more than minor because it affected the configuration control attribute of the barrier integrity

cornerstone. Specifically, mispositioned fuel in the SFP increases the likelihood of an unanalyzed condition in the SFP and a potential impact on the fuel cladding barrier. An increased likelihood of an unanalyzed condition existed because SFP activities were conducted such that more than one fuel assembly could have been incorrectly positioned. This finding was evaluated by the significance determination process of Inspection Manual Chapter (IMC) 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria" because neither IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations"; nor IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," apply to the spent fuel pool. NRC management determined the finding was of very low safety significance because the deficiency did not cause actual degradation of plant systems, structures or components. Specifically, PSEG analysis demonstrated that the incorrectly positioned fuel assembly was in an acceptably safe location for each move. This finding has a cross-cutting aspect in the area of human performance because PSEG did not ensure supervisory and management oversight of work activities, including contractors, such that nuclear safety was supported.

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

Significance: SL-IV Nov 23, 2004

Identified By: NRC

Item Type: VIO Violation

FAILURE TO NOTIFY NRC OF INCOMPLETE WELD INSPECTIONS AND TO OBTAIN RELIEF REQUEST FOR INCOMPLETE INSPECTION OF WELDS FOR THE SECOND ISI INTERVAL WITHIN REQUIRED TIME PERIOD

The inspectors identified a Severity Level IV cited violation of 10 CFR 50.55a(g)(5)(iv) and 10 CFR 50.55a(g)(5)(iii). PSEG did not submit needed relief requests for ASME code required inspections for Salem Unit 2 within 12 months after the end of the second ten year inservice inspection (ISI) interval and when PSEG notified the Commission of its determination on March 21, 2006, 28 months after the end of ISI interval 2, it did not submit the information necessary to support the determinations. This finding is handled under traditional enforcement because PSEG's actions impacted the NRC regulatory process. The finding is of very low significance because no actual safety consequences occurred.

Inspection Report# : [2007003](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

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.

Miscellaneous

Significance: N/A Mar 23, 2007

Identified By: NRC

Item Type: FIN Finding

SALEM BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION

The inspectors concluded that the implementation of the corrective action program (CAP) at Salem was effective. Salem had a low threshold for identifying problems and entering them in the CAP. Once entered into the system, items were screened and prioritized in a timely manner using established criteria. Items entered into the CAP were properly evaluated commensurate with their safety significance. Corrective actions were implemented in a timely manner. PSEG's audits and self-assessments were adequate, however, some self-assessment recommendations were not entered into the CAP. The inspectors observed that PSEG adequately identified, reviewed, and applied relevant industry operating experience through station programs. Based on interviews conducted during the inspection, workers at the site expressed freedom to enter safety concerns into the CAP.

Inspection Report# : [2007006](#) (*pdf*)

G

Significance: Mar 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FITNESS-FOR-DUTY (FFD) COLLECTION PERSONNEL COLLECTING FFD SAMPLES FROM CO-WORKERS

The NRC identified a non-cited violation of 10 CFR 26, Appendix A, subpart B, 2.3 (1) when the inspectors observed PSEG's fitness-for-duty (FFD) collection technicians and security officers perform urine and breath collection on co-workers on March 21, 2007. PSEG implemented immediate corrective actions by stopping the practice of collection personnel performing urine and breath collections on other collection technicians, enhancing the station FFD procedures, and by conducting FFD testing of the affected individuals.

The performance deficiency was determined to be more than minor because, if left uncorrected, it would affect the integrity of the FFD program. The finding was determined to be of very low safety significance (Green) using the Physical Protection Significance Determination Process. The finding had a cross-cutting aspect in the area of Human Performance in that PSEG did not have FFD adequate procedures that ensured that the regulatory requirements prohibiting collectors from collecting samples from co-workers were followed.

Inspection Report# : [2007006](#) (*pdf*)

G

Significance: Mar 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FITNESS-FOR-DUTY (FFD) COLLECTORS LEAVING FFD SPECIMENS UNATTENDED

The NRC identified a non-cited violation of 10 CFR 26, Appendix A, Subpart B, 2.4 (g) (20) when the inspectors observed PSEG's fitness-for-duty (FFD) collection technicians leaving split FFD urine specimens in unsealed aliquot tubes and sealed specimen containers in unattended work areas on March 21, 2007. The licensee implemented immediate corrective measures by capping and sealing FFD aliquot specimens, requiring that FFD donors witness the transfer of their FFD urine specimen to a laboratory technician through a chain-of-custody form, and by sampling an additional 25 percent of PSEG employees for a FFD test.

The performance deficiency was determined to be more than minor because, if left uncorrected, it could affect the integrity of the FFD program. The inspector determined that the finding was of very low safety significance (Green) using the Physical Protection Significance Determination Process. The finding had a cross-cutting aspect in the area of Human Performance in that PSEG failed to effectively communicate expectations regarding procedural compliance and personnel did not follow procedures.

Inspection Report# : [2007006](#) (*pdf*)

Last modified : August 24, 2007