

Salem 2

2Q/2009 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Jun 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

IMPROPER MAINTENANCE RULE SCOPING OF THE SERVICE WATER INTAKE STRUCTURE SUMP SYSTEM

The NRC identified a NCV of 10 CFR 50.65 because PSEG did not include the service water intake structure (SWIS) sump within the scope of the Salem maintenance rule program and consequently did not recognize that preventive maintenance on the SWIS sump was not effective. Failure to perform preventive maintenance on the SWIS sump led to an accumulation of water in the number 2 SWIS bay and adversely affected operability and reliability of the 22 service water strainer and pump.

The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and because it affects the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. On April 12, 2009, bay 2 of the SWIS sump failed and allowed water accumulation to a depth of 21-inches, adversely affecting the reliability of the SW pump and strainer. The inspectors determined that the finding was of very low safety significance (Green) per Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings" (IMC 0609.04). The performance deficiency has a cross-cutting aspect in the area of problem identification and resolution because PSEG did not thoroughly evaluate SWIS sump failures such that the resolutions address causes and extent of conditions [P.1(c)]. PSEG had ten SWIS sump pump failures since January 2008. The evaluation of those events did not recognize that the SWIS sump is relied upon to protect the SWPs from flooding.

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

Significance:  Feb 13, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO EVALUATE SPURIOUS OPERATION OF SAFETY INJECTION SIGNAL

The team identified that PSEG failed to evaluate a single spurious operation of a safety injection signal during a main control room fire and its impact on the ability to achieve and maintain hot standby conditions. This finding was determined to be of very low safety significance (Green) and a NCV of the Salem Nuclear Generating Station, Unit Nos. 1 and 2 Operating License conditions 2.C.(5) and 2.C.(10) respectively, Fire Protection.

The team determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, PSEG did not ensure that post-fire operator manual actions subsequent to a single spurious operation of the safety injection signal during a main control room fire could be performed within sufficient time to achieve and maintain hot standby conditions. The team assessed this finding in accordance with NRC IMC 0609, Appendix F, Fire Protection Significance Determination Process (SDP). This finding affected the completeness of the post-fire safe shutdown

analysis. This finding screened to very low safety significance (Green) in phase 1 of the SDP because it was assigned a low degradation rating. A low degradation rating was assigned because a technical evaluation of pressurizer level response to a spurious safety injection signal from a main control room fire concluded that pressurizer level would remain in the indicating range. The team determined that this finding had a cross cutting aspect in the area of problem identification and resolution because PSEG identified the issue on February 15, 2006 but never thoroughly evaluated the issue and its potential impact on the ability to achieve and maintain post-fire hot standby conditions. (P.1(c))

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

Significance:  Dec 30, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

SALEM UNIT 2 HIGH STEAM FLOW PROTECTION CHANNELS INOPERABLE

A self-revealing NCV of 10 CFR 50, Appendix B, Criteria XI, "Test Control," was identified because all Unit 2 high steam flow protection channels were discovered inoperable on May 12, 2008. Specifically, following steam generator replacement on Unit 2, PSEG did not perform adequate post-modification acceptance testing and, as a result, did not maintain Technical Specification (TS) required steam flow instrumentation operable. PSEG entered this issue into the corrective action program and implemented corrective actions that included specifying testing requirements and acceptance criteria for the steam line instrumentation, enforcing procedure use standards and heightened managerial oversight of power ascension testing.

The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and because it affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, all channels of the Unit 2 engineered safety feature actuation system (ESFAS) high steam flow protective function were not correctly calibrated after completion of steam generator replacement. As a result, operators declared the affected ESFAS channels inoperable and shutdown the plant in accordance with TS requirements. Per Inspection Manual Chapter (IMC) 0609.04, "Initial Screening and Characterization of Findings," the inspectors conducted a Phase 1 screen and determined the finding to be of very low safety significance (Green) because the performance deficiency was a qualification deficiency confirmed to result in loss of operability that did not result in an actual loss of safety function and did not screen as potentially risk significant due to external initiating events. This finding had a cross-cutting aspect in the area of human performance because PSEG did not provide complete, accurate and up-to-date design documentation, procedures, and work packages [H.2(c)]. Specifically, PSEG did not specify adequate testing requirements and acceptance criteria for steam flow instrumentation in the design change package 80083522, Supplement 12 as required by PSEG design change implementation procedure guidance.

Inspection Report# : [2008005](#) (pdf)

Significance:  Dec 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE IMPLEMENTATION OF RISK MANAGEMENT ACTIONS ASSOCIATED WITH PLANNED MAINTENANCE ON THE UNIT 2 PRESSURIZER POWER OPERATED RELIEF VALVES

The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) because PSEG did not implement prescribed risk management actions (RMA) while both Unit 2 pressurizer (PZR) power operated relief valves (PORV) were isolated. PSEG's corrective actions included adding the requirement for operators to record protected SSCs in the control room narrative log and training operators on the risk assessment process.

This finding was more than minor because PSEG did not implement a prescribed significant compensatory measure for an identified yellow risk condition. Specifically, PSEG did not implement equipment risk awareness and control measures while both PZR PORVs were isolated, and conducted testing on a protected component without the required written authorization and supervision. The inspectors completed a Phase 1 screening of the finding per Appendix K of Inspection Manual Chapter (IMC) 0609, "Maintenance Risk Assessment and Risk Management Significance Determination Process." The inspector determined that the incremental core damage probability (ICDP), based on

PSEG's risk analysis of the event, was 5.6E-8. Therefore, the inspectors determined the finding to be of very low safety significance (Green) because the ICDP for the event did not exceed 1.0E-6. The 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 personnel did not follow procedures [H.4(b)]. Specifically, operators did not implement the RMAs specified by an approved risk assessment per PSEG work management and operations procedures.

Inspection Report# : [2008005](#) (pdf)

Significance:  Dec 30, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INADEQUATE DESIGN CONTROL FOR NO. 22 COMPONENT COOLING WATER HEAT EXCHANGER SERVICE WATER OUTLET TEMPERATURE CONTROL VALVE

The inspectors identified a self-revealing NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, because the No. 22 component cooling water heat exchanger (CCWHX) service water (SW) outlet temperature control valve (22SW127) did not stroke open when the 22 CCWHX was placed in service following a high flow flush on November 18, 2008. Specifically, PSEG did not ensure that the design basis was correctly translated into valve set-up instructions for the 22SW127 valve. PSEG's corrective actions included mechanical adjustment to the valve's stroke, revising the valve's set-up instructions, and an extent of condition review.

The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the improper valve set-up instructions caused the 22SW127 to operate not as expected resulting in an unexpected rise in component cooling water (CCW) system temperatures after the 22CCWHX was placed in service on November 18, 2008. As a result operators declared the 22CCWHX inoperable and documented the condition in the corrective action program. In accordance with NRC IMC 0609 the inspectors determined the finding was of very low safety significance (Green) because it was a design deficiency that was confirmed not to result in a loss of CCW train operability. The finding has a cross-cutting aspect in the area of human performance, resources, because PSEG did not ensure that adequate resources were available to maintain complete, accurate and up-to-date design documentation, procedures, and work packages [H.2(c)]. Specifically, PSEG did not maintain the 22SW127 ICD card and valve set-up work order up-to-date in accordance with the valve's design basis documentation.

Inspection Report# : [2008005](#) (pdf)

Significance:  Aug 08, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE DESIGN CONTROL FOR MOTOR OPERATED VALVE CAPABILITY ASSESSMENTS

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 used non-conservative inputs and methodologies in calculating terminal voltages to safety related motor operated valve (MOV) motors during design basis events. Specifically, PSEG had not evaluated the effect of lower transient voltages which would exist for safety injection (SI) actuated MOVs prior to voltage recovery on the upstream 4Kv buses. PSEG entered the issue into their corrective action program and performed a review of all SI actuated valves to determine the impact on their margin to operate when considering transient voltage conditions.

The finding is more than minor because the deficiency represented reasonable doubt on the operability of several charging safety injection system valves which had minimal margin. The finding 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 the loss of the charging system safety function.

Inspection Report# : [2008007](#) (pdf)

Significance:  Aug 08, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE DESIGN CONTROL FOR MOTOR OPERATED VALVE THERMAL OVERLOAD PROTECTION DEVICES

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 implemented measures to verify that thermal overloads (TOLs) on safety-related MOV circuits were sized properly and periodically tested to verify the adequacy of the design. PSEG entered the issue into their corrective action program, completed an operability assessment for the affected equipment and will evaluate implementing testing or bypassing the TOLs during accident conditions to verify the adequacy of the design.

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The finding is more than minor because it is 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 that the failure to assure that TOLs would not needlessly prevent safety related valves from performing their function, could affect the ability of MOVs to respond to initiating events. 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 safety related valve operability.

Inspection Report# : [2008007](#) (pdf)

Significance:  Aug 08, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE DESIGN CONTROL FOR UNIT 2 CONTAINMENT SUMP VALVE DESIGN DP DETERMINATION

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 validated a key design input regarding the assumed RHR pump operation time during a small break loss of coolant accident (SBLOCA) scenario. This design input was used to establish a new design basis differential pressure for the Unit 2 containment sump suction valves. PSEG entered the issue into the corrective action program, completed an operability assessment for the sump valves, and will evaluate long term actions to further evaluate design margin for the valves.

The finding is more than minor because the deficiency represented reasonable doubt on the operability of the containment sump valves with respect to a SBLOCA scenario. The finding is 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 that was confirmed not to result in a loss of containment sump suction valve operability. The finding had a cross-cutting aspect in the area of Human Performance, Resources, which requires licensees to ensure personnel, equipment, procedures, and other resources are available and adequate to assure nuclear safety. This issue is related to a design calculation not being complete in that PSEG had not verified that design inputs were conservative when establishing a revised design differential pressure for the Unit 2 containment sump suction valves.

Inspection Report# : [2008007](#) (pdf)

Barrier Integrity

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

Last modified : August 31, 2009