

Salem 2

3Q/2004 Plant Inspection Findings

Initiating Events

Significance:  Jun 30, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

21 CONTROL ROOM VENTILATION CHILLER REPETITIVE FAILURE

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to implement corrective actions and preclude service water flow control valve 21SW102 failure. In December 2003, PSEG developed corrective actions to improve the reliability of the SW102 valves. The corrective actions were not effectively implemented and did not prevent the recurring failure of 21SW102 on May 17, 2004.

This finding was more than minor because it was associated with the equipment performance attribute, and it affected the initiating event cornerstone objective. In accordance with Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 2 SDP evaluation of the significance of the performance deficiency and determined the finding was of very low safety significance (Green). In this evaluation, the inspectors assumed an exposure period of less than three days, the likelihood of a loss of control room ventilation event was increased by one order of magnitude, all mitigating equipment for a loss of control room ventilation event was unaffected by the finding, and operator recovery actions were feasible.

Inspection Report# : [2004003\(pdf\)](#)

Significance:  Dec 27, 2003

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY CORRECT A CONTROL ROD POWER SUPPLY DEFICIENCY

Deferral of vendor recommended design changes (fuse uprating) on the control drive mechanisms led to a November 23, 2003, manual reactor trip due to a dropped rod during startup physics testing. A self-revealing NCV was identified for ineffective corrective actions.

This finding is greater than minor, because it caused an actual plant transient. The finding is of very low safety significance, because all mitigation systems were unaffected.

Inspection Report# : [2003009\(pdf\)](#)

Significance:  Dec 16, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IMPLEMENT ADEQUATE DESIGN CONTROL MEASURES

The team identified a violation of 10 CFR 50, Appendix B, Criterion III, Design Control, for design control inadequacies during plant modifications, setpoint changes and revisions of calculations associated with the 4160 volt electrical power system. These electrical system design deficiencies caused the two offsite power sources not to be independent of each other as required by 10 CFR 50, Appendix A, Criterion 17, Electric Power Systems.

The finding was more than minor because it affected the design control attribute of the Initiating Events Cornerstone objective and resulted in an increased likelihood of a loss of offsite power (LOOP) event. The finding was determined to be of very low safety significance (Green) based on the results of a phase 3 SDP analysis which evaluated the increase in core damage frequency (CDF) due to the increased likelihood of a LOOP caused by the design deficiencies.

Inspection Report# : [2003008\(pdf\)](#)

Significance:  Dec 16, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IMPLEMENT ADEQUATE CORRECTIVE ACTIONS

The team identified a violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the failure of the licensee to implement adequate corrective actions to address design issues identified following the July 29, 2003, loss of offsite power event. When performing an operability evaluation to support plant restart, the licensee failed to identify that the lower operating voltage limit for the 4.16 kV buses needed to be increased to prevent recurrence of a similar event. The plant was restarted and operated from August 4 to August 22, 2003, until the issue was identified by the NRC and corrected by the licensee.

The finding was more than minor because it affected the design control attribute of the Initiating Events Cornerstone objective and resulted in an increased likelihood of a loss of offsite power event (LOOP). The finding was determined to be of very low safety significance (Green) based on the results of a phase 3 SDP analysis which evaluated the increase in core damage frequency (CDF) due to the increased likelihood of a LOOP caused by the failure to take appropriate corrective actions prior to plant restart.

Inspection Report# : [2003008\(pdf\)](#)

Mitigating Systems

Significance:  Sep 30, 2004

Identified By: NRC

Item Type: FIN Finding

SALEM UNIT 2 MANUAL REACTOR TRIP ON JULY 15, 2004

A self-revealing finding was made apparent when Salem Unit 2 was manually tripped on July 15, 2004, by control room operators for a 23 steam generator feedwater regulating valve malfunction. The reactor trip was preceded by a low steam generator water level automatic reactor trip on July 13, 2004, for the same equipment malfunction. Corrective actions prior to the July 15, 2004, trip were not adequate to prevent recurrence of this problem. The finding was not a violation of NRC requirements, in that the performance deficiencies occurred on non-safety related systems.

Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function and was not the result of any willful violation of NRC requirements. The finding is greater than minor because it affected the equipment reliability attribute and had an impact on the objective of the Initiating Events and Mitigating Systems Cornerstones. In accordance with Inspection Manual 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 2 SDP evaluation of the significance of the performance deficiency and determined the finding was of very low safety significance.

Inspection Report# : [2004004\(pdf\)](#)

Significance:  Jun 24, 2004

Identified By: NRC

Item Type: FIN Finding

FAILURE TO CONDUCT SALEM SIMULATOR TESTING IN ACCORDANCE WITH ANSI/ANS 3.5-1993

The inspectors identified that simulator performance testing on the Salem simulator did not meet the standards as specified in ANSI/ANS 3.5-1993 in that: (1) "best estimate" data for the simulator testing was not used; (2) some (4 of the 11 required) annual simulator transient tests were not performed and; (3) simulator test documentation did not include an evaluation and validation of test results.

This finding is more than minor because it affects the human performance (human error) attribute of the mitigating systems cornerstone. Improperly conducted simulator testing brings simulator fidelity into question. The finding is of very low safety significance (Green) because the discrepancy did not have an adverse impact on operator actions such that safety related equipment was made inoperable during normal operations or in response to a plant transient.

Inspection Report# : [2004007\(pdf\)](#)

Significance:  Mar 30, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

IMPROPER REPAIR TO SAFETY-RELATED COMPONENT

The inspectors identified a non-cited violation of Technical Specification 6.8.1 for failure to properly plan and perform maintenance in accordance with written procedures for an auxiliary building high energy line break (HELB) blowout panel. The HELB panel was reattached with hardened fasteners disabling its ability to blowout at a sufficiently low building pressure.

This finding is greater than minor, because it affected the Mitigating System Cornerstone objective of equipment capability, in that equipment necessary to establish cold shutdown conditions during a HELB, could be subjected to a steam plume without proper venting. This finding is of very low safety significance, because redundant blowout panels were unaffected.

Inspection Report# : [2004002\(pdf\)](#)

Significance:  Mar 12, 2004

Identified By: NRC

Item Type: FIN Finding

INEFFECTIVE CONTROL AIR QUALITY TESTING

A finding of very low safety significance was identified in that the Control Air (CA) quality test program was inadequate. The test program did not verify the quality of air meets standards specified in ANSI/ISA S7.3-1975, Quality Standard for Instrument Air, as delivered to safety-related air loads.

This finding is greater than minor because it is associated with the Procedure Quality attribute for the CA mitigating system function and, if left uncorrected, could become a more significant safety concern. The finding is of very low safety significance because it did not render the CA system inoperable and because of the CA system redundancy

Inspection Report# : [2004006\(pdf\)](#)

Significance:  Mar 12, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

INEFFECTIVE DESIGN CONTROL ASSOCIATED WITH SERVICE WATER DESIGN CHANGE AND INEFFECTIVE CORRECTIVE ACTIONS RELATIVE TO SW HIGH PRESSURE CONDITIONS

A finding of very low safety significance (Green), that is also a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, was identified regarding an inadequate design analysis for a service water system modification performed on both units. The modification had changed the service water recirculation valve operating characteristics and installed orifices in the line without adequately evaluating the effect of an increase in system pressure, impact on pump margin to minimum flow requirements during transients, and impact to the service water high pressure alarm design function.

The finding is greater than minor because it was associated with the mitigating system cornerstone attributes of design control and equipment performance and affected the capability of the system to ensure service water pressure would be maintained within previously evaluated design parameters. Based on a review of PSE&G's analyses of the issue, the team concluded that the finding was a design deficiency which was confirmed not to result in the loss of any mitigating system function. Therefore, in accordance with the SDP Phase I screening worksheet, the issue was determined to be of very low safety significance (Green).

The team identified that a contributing cause of the finding was related to the cross-cutting area of Problem Identification and Resolution. PSEG had not fully evaluated and corrected this issue after several previous opportunities had existed to do so.

Inspection Report# : [2004006\(pdf\)](#)

Significance:  Dec 27, 2003

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY CORRECT AN EMERGENCY DIESEL GENERATOR DEFICIENCY

A compressor air leak on the starting air system for the Unit 2 A EDG was not properly evaluated and corrected, such that the removal of the other compressor for maintenance resulted in the 2A EDG being inoperable. This resulted in a Green self-revealing NCV for ineffective corrective actions.

This finding is greater than minor, because it affected the Mitigating System Cornerstone objective of equipment reliability, in that the 2A EDG was rendered inoperable due to a support system failure. The finding is of very low safety significance, because other EDGs remained unaffected and shutdown risk was not significantly affected.

Inspection Report# : [2003009\(pdf\)](#)

Significance:  Dec 27, 2003

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY CORRECT A RHR WATER HAMMER CONDITION (UNIT 2 CONTAINMENT SPRAY WATER HAMMER)

Ineffective problem evaluation regarding a known air pocket in the Unit 2 residual heat removal (RHR) system resulted in a waterhammer on the RHR and containment spray (CS) systems during a CS full flow test. This self-revealing finding represented an NCV for corrective actions.

This finding is greater than minor, because it affected the Mitigating System Cornerstone objective of equipment reliability, in that the RHR system was unnecessarily subjected to an additional waterhammer and the associated hydraulic stresses and strains. The finding is of very low safety significance, because it did not render the RHR system inoperable.

Inspection Report# : [2003009\(pdf\)](#)

Significance:  Dec 27, 2003

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO PRECLUDE STEAM VOID CONDITIONS IN THE RESIDUAL HEAT REMOVAL SYSTEM

Ineffective corrective actions existed regarding an identified problem, in that the RHR system operating procedure had an insufficient cooldown period to preclude steam void conditions from developing after RHR flow was secured and this error was not corrected prior to its use. PSEG calculations in May 2003 had identified that the cooldown period should be increased from 15 minutes to 21 minutes. Operators restarted the Unit 2 RHR system on November 19, 2003, after cooling it down for less than 21 minutes, and a waterhammer occurred.

This finding is greater than minor, because it affected the Mitigating System Cornerstone objective of equipment reliability, in that the residual heat removal system was started with potential steam void conditions present. The finding is of very low safety significance, because it did not render the RHR system inoperable.

Inspection Report# : [2003009\(pdf\)](#)

G

Significance: Dec 27, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY PERFORM RESIDUAL HEAT REMOVAL WATER HAMMER CORRECTIVE ACTIONS

Corrective actions were untimely, in that analyses to determine the stresses on the Unit 2 RHR system from repeated waterhammers were not completed until November 25, 2003. The waterhammer had been first identified on May 10, 2002. The inspectors also identified loose RHR pipe support hangers, which had not been identified by PSEG during system walkdowns in support of the waterhammer issue. This represented an NCV for ineffective corrective actions.

This finding is greater than minor, because it affected the Mitigating System Cornerstone objective of equipment reliability, in that the RHR system was operated with unevaluated conditions due to repeated waterhammers and degraded pipe supports. The finding is of very low safety significance, because it did not render the RHR system inoperable.

Inspection Report# : [2003009\(pdf\)](#)

G

Significance: Dec 16, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROPERLY TRANSLATE DESIGN INTO PLANT PROCEDURES

The team identified a violation of 10 CFR 50, Appendix B, Criterion III, Design Control, for failure of the licensee to translate design change information into plant procedures. Following the installation of a plant modification to provide a cross connect between the Unit 1 and 2 chemical and volume control systems (CVCS), instructions for utilizing the cross connect feature were not included at the appropriate steps in the associated procedures.

The finding was more than minor because it affected the design control attribute of the Mitigating Systems Cornerstone objective. The issue was not a design or qualification deficiency that the licensee had evaluated in accordance with GL 91-18, and was determined to be of very low safety significance (Green) because it did not result in an actual loss of safety function of a single train for internal or external event initiated core damage sequences.

Inspection Report# : [2003008\(pdf\)](#)

Barrier Integrity

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Significance: Jun 30, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

REPETITIVE 25 CONTAINMENT FAN COIL UNIT FAILURE

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to implement corrective actions and preclude service water flow control valve 25SW223 failure and inoperability of its associated containment fan coil unit (CFCU). In October 2000, PSEG assigned corrective actions to improve the reliability of control air to all Unit 1 and Unit 2 SW223 valves in order to address a known design deficiency. The corrective actions were not implemented on the 25SW223 valve prior to its failure on April 18, 2004, due to the same cause.

This finding was more than minor because it was associated with the structures, systems, or component performance attribute and it affected the barrier integrity cornerstone objective. The inspectors determined that the finding was of very low safety significance using Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," because the CFCUs are not important to large early release frequency, in that, the Salem units have large dry containments and the CFCUs only impact late containment failure and source terms.

Inspection Report# : [2004003\(pdf\)](#)

G**Significance:** Jun 30, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE TROUBLESHOOTING PROCEDURES CAUSE AN INADVERTENT SI SIGNAL

Green self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was made apparent for failure to provide maintenance instructions appropriate to the circumstances for troubleshooting activities on the solid state protection system which led to an invalid safety injection signal actuation and caused the control room emergency air conditioning system to be unable to meet General Design Criteria 19 for approximately 2 hours.

This finding was greater than minor because it resulted in the Unit 2 control room emergency air conditioning system being aligned such that it did not comply with its design basis for post loss of coolant accident mitigation. The inspectors determined that the finding was of very low safety significance (Green) using the Phase 1 SDP because the finding only represented a degradation of the radiological barrier function provided for the control room.

Inspection Report# : [2004003\(pdf\)](#)**G****Significance:** Jun 30, 2004

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE OF 11 TRAVELING WATER SCREEN DUE TO ICE BUILDUP

A self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was made apparent for failure to identify and correct a condition that rendered the 11 service water traveling water screen (TWS) unavailable.

This finding was more than minor because it was associated with the equipment performance attribute, and it affected the Initiating Event and Mitigating System Cornerstone objectives. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the Region I Senior Reactor Analyst (SRA) conducted a Phase 3 SDP analysis of the significance of the performance deficiency and determined the finding was of very low safety significance (Green). In this analysis, the SRA assumed that the 11 TWS was out-of-service for 68 hours and that the loss of service water (LOSW) initiating event frequency increased during this time because of lost redundancy in the service water trains as a result of the performance deficiency. The SRA determined that the increase in core damage frequency due to internally initiated events was in the low E-8 range.

Inspection Report# : [2004003\(pdf\)](#)**G****Significance:** Mar 12, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

CALCULATIONS OF CONTROL AIR ACCUMULATOR VOLUME WERE NON-CONSERVATIVE WITH RESPECT TO THE LTOP PORV ACCUMULATOR DESIGN BASES EVALUATION

The inspectors identified a finding of very low safety significance (Green), that is also a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control. Specifically, design calculations performed to verify adequate accumulator air pressure for Low Temperature Overpressure (LTOP) conditions and acceptable system leakage rates used incorrect design inputs. These non-conservative calculations were referenced during future system evaluations and also used as the basis for operability determinations and alarm set points.

This finding is greater than minor because it was associated with the design control attribute for the power operated relief valve (PORV) mitigating system function. The design calculations formed the bases for subsequent non-conservative operability reviews which affected the objective of adequately ensuring the capability of the PORV accumulators. Because the LTOP condition is only of concern during periods where the reactor is in cold shutdown, the inspectors evaluated the finding using Appendix G, Shutdown Operations to NRC IMC 0609, Significance Determination Process (SDP). The team concluded that this issue was of very low safety significance (Green) since the function had always been maintained.

The inspectors identified that a contributing cause of the finding was related to the cross-cutting area of Problem Identification and Resolution in that Design Engineering personnel had failed to identify and correct errors and discrepancies between design calculations of record.

Inspection Report# : [2004006\(pdf\)](#)**G****Significance:** Dec 27, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROPERLY IMPLEMENT REACTOR COOLANT SYSTEM INSPECTION PROCEDURES

Untimely placement of identified steam generator tube plug deficiencies into the corrective action program represented an NCV for TS procedure requirements.

This performance deficiency was more than minor, because if left uncorrected the degraded SG tube plugs could have led to a more significant problem such as a SG tube failure. The inspectors evaluated the significance of this issue using the guidance contained in the draft Appendix J to the Significance Determination Process, "Steam Generator Tube Integrity Findings." The inspectors determined that this condition was

bounded by the column in the SG Tube Integrity SDP matrix associated with "one or more tubes that should have been repaired as a result of previous inspection." As a result this condition was determined to be of very low risk.

Inspection Report# : [2003009\(pdf\)](#)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

[Physical Protection](#) information not publicly available.

Miscellaneous

Last modified : December 29, 2004