Salem 1
2Q/2009 Plant Inspection Findings

Initiating Events

Significance: G Dec 12, 2008
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
INADEQUATE PROCEDURE FOR PRESSURIZER DRAINING EVOLUTION
The inspectors identified a self-revealing Green non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" because PSEG did not provide operators with a procedure that contained appropriate quantitative and qualitative information to ensure that activities affecting safety can be satisfactorily accomplished. PSEG did not maintain an adequate procedure for draining the Unit 1 pressurizer. Due to the inadequate procedure, operators unintentionally drained the reactor coolant system (RCS) to the top of the RCS hot leg without the appropriate controls in place.

This performance deficiency was greater than minor because it was associated with the procedure quality 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 during shutdown conditions. Specifically, the pressurizer draining procedure did not include the guidance necessary to ensure that operators used diverse and redundant indications to control RCS inventory during pressurizer drain down. This affected the shutdown critical safety function of maintaining adequate reactor inventory, and potentially affected the decay heat removal shutdown critical safety function by approaching mid-loop operations without the appropriate controls. If operators had not recognized the faulty cold-calibrated pressurizer level indication, continued draining would have adversely impacted operation of the RHR system that was providing decay heat removal for the reactor coolant system. This finding has a cross-cutting aspect in the area of human performance, resources, because PSEG did not ensure that complete accurate and up-to-date procedures were adequate to assure nuclear safety. [H.2(c)] Specifically, PSEG did not incorporate lessons learned from the substantial amount of industry operating experience regarding recurring inadvertent reductions of reactor coolant system inventory into procedure IOP-6.

Inspection Report# : 2008009 *(pdf)*

Significance: G Dec 12, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO IMPLEMENT ACTIONS FOR A PRESSURIZER LEVEL ALARM
The inspectors identified a green non-cited violation of Technical Specification 6.8.1, "Procedures and Programs," because operators did not implement actions required per procedure S1.OP-AR.ZZ-0005(Q), "Overhead Annunciators Window E," in response to a "Pressurizer Heater Off Level Low" alarm. This contributed to PSEG not promptly recognizing an inaccurate cold-calibrated level instrument during the pressurizer draining evolution and over-draining the pressurizer.

This performance deficiency was greater than minor because it affected the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown. Implementation of actions in S1.OP-AR.ZZ-0005(Q) in response to the "Pressurizer Heater Off Level Low" alarm would have aided the operators in discovering the inaccurate cold-calibrated pressurizer level instrument sooner and likely prevented over-draining the pressurizer. This finding had a human performance cross-cutting aspect in the area of work practices in that PSEG did not follow procedure OP-AA-103-102, "Watchstanding Practices." Specifically, during this event, PSEG did not use diverse indications, maintain a questioning attitude, and properly implement alarm response procedures in accordance with OP-AA-103-102, "Watchstanding Practices." (H.4(b))

Inspection Report# : 2008009 *(pdf)*

Significance: G Dec 12, 2008
Identified By: Self-Revealing
Item Type: FIN Finding
FAILURE TO IMPLEMENT CORRECTIVE ACTIONS FOR OPERATING EXPERIENCE APPLICALBE TO STATION OPERATIONS
The inspectors identified a self-revealing Green finding because on October 15, 2008, operators drained the RCS to the top of the reactor vessel hot leg without implementing the controls required to protect the source of decay heat removal for the plant. PSEG did not complete corrective actions that it had identified for industry operating experience in accordance with the requirements of PSEG procedure NC.NA-AP.ZZ-0006(Q), "Corrective Action Program." Specifically, PSEG did not complete corrective actions deemed necessary based on a review of the circumstances surrounding the March 1997 Sequoyah loss of control of pressurizer inventory event.

This performance deficiency was greater than minor because it affected the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown. Specifically, not completing corrective actions specified as a result of PSEG's review of the 1997 Sequoyah event contributed to the loss of control of inventory in the pressurizer on October 15, 2008. This affected the shutdown critical safety function of maintaining adequate reactor inventory and potentially affected the decay heat removal shutdown critical safety function by entering mid-loop operations without the appropriate controls.

Inspection Report# : 2008009 *(pdf)*

Mitigating Systems

Significance: G Jun 30, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
INADEQUATE MAINTENANCE OF THE 13 AUXILIARY FEEDWATER PUMP GOVERNOR
A self-revealing finding of very low safety significance was identified because PSEG did not implement adequate preventive maintenance for the turbine driven auxiliary feedwater (AFW) pump speed governor. Consequently, the governor oil conditions degraded causing governor binding and speed oscillations that required the 13 AFW pump to be tripped during testing, resulting in unavailability of the 13 AFW pump. PSEG's corrective actions included replacement of the 13 AFW pump governor, increased oil sampling and oil replacement for the AFW pump governors, and a reduction in the governor replacement periodicity from 90 to 72 months.

This finding was more than minor because it was 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. Specifically, the 13 AFW pump was unavailable for 46 hours following the oscillations observed during the quarterly surveillance test. The inspectors conducted a Phase 1 screening of the finding in accordance with IMC 0609, Attachment 0609.04, "Initial Screening and Characterization of Findings", and determined that the finding was of very low safety significance (Green). The inspectors did not identify a cross-cutting aspect associated with this finding because decisions made associated with the preventive maintenance change occurred several years ago and were not reflective of current performance. The preventive maintenance change request process has been replaced with the equipment reliability process and the performance centered maintenance (PCM) process. PCM templates have operating experience and vendor recommendations integral to the template, not merely listed as procedure references, which was the case with previous equipment reliability procedures.

Inspection Report# : 2009003 *(pdf)*

Significance: G 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: G Dec 30, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
IMPROPER CONTROL OF TRANSIENT COMBUSTIBLE MATERIAL
The inspectors identified a non-cited violation (NCV) of Salem Operating License condition 2.C.5, that requires that PSEG implement all provisions of the Fire Protection Program as described in the Updated Final Safety Analysis Report (UFSAR). Specifically, PSEG strung nine temporary power cables through a combustible control zone without an engineering evaluation that assessed risk and established compensatory measures. PSEG corrective actions included: briefing all personnel involved with installation and removal of temporary power and light (TP&L) for S1R19; completing an immediate extent of condition review correcting the master work orders for staging TP&L by including steps for completing fire protection program requirements; and adding this issue to the scope of general employee training.

This finding was more than minor because it was associated with the external factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the identified transient combustibles were located in a combustible control zone (CCZ) that was required to maintain cable separation between service water trains A and B and to limit challenges to physical separation afforded by steel floor hatches above and below the CCZ. Using IMC 0609, Appendix F, “Fire Protection Significance Determination Process,” the inspectors determined the finding was of very low safety significance (Green). This finding has 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, WO 30156086 did not direct maintenance personnel to obtain a transient combustible permit (TCP) before staging combustible material in a CCZ.

Inspection Report# : 2008005 *(pdf)*

Significance: G Dec 30, 2008
Identified By: Self-Revealing

Item Type: FIN Finding
INADEQUATE IDENTIFICATION OF MIDLOOP LEVEL CALIBRATION ERROR
The inspectors identified a self-revealing finding because PSEG did not use the corrective action process (CAP) to identify and correct a recurring issue with the calibration of a narrow range mid loop level transmitter. This extended the time that the reactor was placed in a reduced reactor coolant (RC) inventory condition during the S1R19 refueling outage, which unnecessarily increased shutdown plant risk. Corrective actions taken by PSEG included correction of the surveillance data sheet for the narrow range level indication for the 11 RC loop. PSEG also entered the issue into the corrective action program as notification 20390640.

This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, not correcting the calculation error resulted in the inaccurate calibration procedure for the 11 RC loop narrow range level indication. This unnecessarily extended the time that the plant was operated in a reduced reactor coolant inventory condition which increased shutdown plant risk. The inspectors evaluated the significance of this finding using IMC 0609, Appendix G, “Shutdown Operations SDP,” Attachment 1, Checklist 6 and Figure 1. The inspectors determined that this finding was of very low safety significance (Green) because it did not require a quantitative assessment since two sources of level instrumentation remained available during the reduced inventory evolution. This finding had a cross-cutting aspect in the area of problem identification and resolution because PSEG did not identify the calculation error issue completely, accurately, and in a timely manner commensurate with the safety significance [P.1(a)]. Specifically, PSEG did not ensure that technician observations related to repeat calibration errors on the 11 RC loop level indicator, which were identified in 2007, were entered into the CAP.

Inspection Report# : 2008005 *(pdf)*

Significance: G 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: G 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.

ii
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)*

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