

Palisades

4Q/2007 Plant Inspection Findings

Initiating Events

Significance:  Jun 30, 2007

Identified By: Self-Revealing

Item Type: FIN Finding

Reactor Trip Caused by Human Performance Error

A self-revealing finding was identified for the licensee's failure to follow work order instructions when performing maintenance on a main feedwater regulating valve position indicator. As a result, an automatic reactor trip occurred on a Reactor Protection System (RPS) actuation for steam generator low feedwater level. The licensee performed a cause analysis for the event and entered the event into their corrective action program.

The finding was more than minor because the failure to follow instructions caused an actual transient (i.e., reactor trip). This finding did not constitute a violation of NRC requirements and is considered very low safety significance (Green) since there was no impact on safety-related equipment or mitigation function and availability. The finding also has a cross-cutting aspect in the area of human performance, because the licensee failed to use adequate human error prevention techniques. (H.4(a))

Inspection Report# : [2007004](#) (*pdf*)

Mitigating Systems

Significance:  Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Plant Radiation Monitors Not Fully Scoped into the Maintenance Rule

The inspectors identified a Green NCV of 10 CFR 50.65(b)(2) because the licensee did not scope all plant radiation monitors used in site emergency operating procedures into the maintenance rule monitoring program. The licensee entered the item into their corrective action program and placed the radiation monitoring system in the a(1) status.

The finding was more than minor because it impacted the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding was considered to have very low safety significance (Green) because the finding did not cause a loss of mitigation equipment functions and did not increase the likelihood of a fire or flooding event.

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

Significance:  Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Risk Assessment for Safety Injection Actuation Test

The inspectors identified a Green NCV of 10 CFR Part 50.65(a)(4), because the licensee did not adequately assess and manage online risk while performing a safety injection system actuation test. Specifically, prior to performance of the safety injection test, the inspectors identified that the test did not account for unavailability of a high pressure safety injection (HPSI) train. Accounting for the HPSI unavailability resulted in yellow risk. The licensee implemented appropriate risk mitigation actions prior to entering yellow risk. The licensee entered the item into their corrective action process and updated the risk assessment.

The finding was more than minor because it impacted the mitigating systems cornerstone objective to ensure availability of systems and the risk assessment failed to consider risk-significant systems, structures, components (i.e., high pressure safety injection pumps) which were unavailable during on-line maintenance. The inspectors concluded that the finding was of very low safety significance because the incremental core damage probability deficit was less than $1 \times 10E-6$ (green) in accordance with IMC 0609, Appendix K. The finding included a cross-cutting aspect in the area of human performance, work controls, in that the licensee failed to incorporate appropriate risk insights when coordinating work activities.

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

Significance: SL-IV Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform a 10 CFR 50.59 Evaluation for a Temporary Modification for Augmented Cooling of SW

The inspectors identified a severity level (SL) IV NCV of 10 CFR 50.59, "Changes, Tests, and Experiments" for the licensee's failure to perform a written evaluation prior to implementing a temporary modification to compensate for the absence of containment air cooler VHX-4. Specifically the modification adversely impacted the service water (SW) system and this was not evaluated in accordance with 10 CFR 50.59. The licensee entered the item into their corrective action process, added structural elements to minimize fouling of the service water system, evaluated the change in accordance with 10 CFR 50.59, and performed a written evaluation. The revised modification did not require prior NRC approval.

The inspectors concluded this finding was more than minor since it impacted the NRC's ability to perform its regulatory function and resulted in a condition which reduced the reliability of the SW system, a mitigating system. The inspectors concluded the original modification may have required prior NRC approval. The issue screened green in the phase 3 assessment for the equipment degradation and therefore was of very low safety significance, and therefore, SLIV. The finding has a cross-cutting aspect in the area of human performance in that the licensee failed to use conservative assumptions in decision making and failed to identify possible unintended consequences when implementing the augmented cooling for service water modification. (H.1.(b))

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

Significance:  Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

AFW Pumps Inoperable Due to High Energy Line Breaks in the Turbine Building

The inspectors identified a Green non-cited violation NCV of 10 CFR 50, Appendix B, Criteria III, "Design Control" for failing to adequately translate the design and licensing basis requirements into equipment specifications for the 8A and 8B Auxiliary Feedwater (AFW) pumps and controls. Specifically, the 8A and 8B pumps have a licensing basis to be operable during a High Energy Line Break (HELB) event in the turbine building; however, in some HELB scenarios the pumps would experience a harsh environment. The licensee did not qualify the pumps and associated equipment for a harsh environment. The licensee wrote a condition report and an operability recommendation (OPR) with compensatory actions to address the issue.

The finding was more than minor because it impacted the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of the AFW system to respond to initiating events. A phase 2 screening was required since the design qualification deficiency resulted in a loss of function for one train of AFW per Generic Letter 91-18. The SRA concluded in a phase 3 evaluation, which included external events, that the finding was of very low safety significance (Green).

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

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to preclude Water Hammer in HPSI Injection Piping

The inspectors identified a Green NCV of 10 CFR 50 Appendix B, Criterion III for failing to control system parameters in the HPSI system injection lines to preclude water hammer from occurring during either routine or accident conditions. As a result, the injection lines experienced water hammer on multiple occasions. The licensee has

entered the condition into the corrective action program and changed procedures to limit the potential for water hammer.

The inspectors concluded that the condition is more than minor, because if left uncorrected, the finding would become a more significant safety concern. Specifically, the cause of the water hammer would continue to worsen without additional action. Also, the periodic water hammering of the injection line could weaken piping supports. The finding included a cross-cutting aspect in the area of problem identification and resolution in that the licensee failed to thoroughly evaluate the problem such that the resolution addressed causes and the extent of condition prior to the NRC raising concerns. (P.1(c))

Inspection Report# : [2007004](#) (*pdf*)

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Service Water Pump 7A Shaft Degraded

The inspectors identified a Green NCV of 10 CFR 50 Appendix B, Criterion III for failing to establish adequate measures to ensure suitability of the application of the material for the 7A Service Water (SW) pump. Specifically the shaft for the A SW pump was constructed of carbon steel and was susceptible to wear due to sand and silt from the ultimate heat sink. The licensee has entered the condition into the corrective action program and has replaced the shaft with a stainless steel shaft.

The inspectors concluded that the condition is more than minor, because if left uncorrected the finding would become a more significant safety concern. Specifically, without prompting by the NRC, the wear on the 'A' SW pump shaft would have continued and would have reduced the margin of safety for the allowable stresses on the pump shaft. The finding was not of more than very low safety significance because in the current condition the 'A' SW pump remained operable, although degraded. The finding included a cross-cutting aspect in the area of problem identification and resolution in that the licensee failed to implement a corrective action program with a low threshold for identifying issues. (P.1(a))

Inspection Report# : [2007004](#) (*pdf*)

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Defective Part Installed on 1-2 EDG

A self-revealing NCV of 10 CFR 50, Appendix B, Criterion VIII, "Identification and Control of Materials, Parts and Components" was identified for failing to have adequate control measures to prevent the use of defective parts. Specifically, a fuel leak developed due to failure of a defective part on the 1-2 emergency diesel generator (EDG) on February 22, 2007. In 2005, a snubber on the same EDG had failed in the same manner. The failed part has been replaced, and there are no other suspect snubbers in the diesel engines on site.

The inspectors concluded the finding was more than minor because the EDG was inoperable for greater than the Technical Specification allowed outage time. The finding was not of more than very low safety significance because, while the EDG was inoperable, it did not represent an actual loss of safety function for greater than the Technical Specification allowed outage time. In addition, the inspectors concluded this finding had an associated cross cutting aspect in the area of problem identification and resolution in that the licensee failed to thoroughly evaluate the 2005 snubber failure such that the resolution addressed the extent of condition. (P.1(c))

Inspection Report# : [2007004](#) (*pdf*)

Significance:  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

CV-0821 Corrective Actions Not Effective to Prevent Repeat Failure

The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI for failing to take adequate corrective action to prevent recurrence of a significant condition adverse to quality. Specifically, valve CV-0821, a safety-related valve which positions automatically on a

safety actuation signal, would not position on demand. The licensee discovered sand and silt had caused the valve to stick in a non-safety position. The same condition occurred less than a year ago. This latest issue was entered into the licensee's corrective action system as AR 01080435 and an Operability Evaluation was completed with compensatory actions to maintain component operability.

The finding is more than minor because it is related to the equipment performance attribute of the mitigating system cornerstone and the cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Both trains are potentially impacted since the valve arrangement is similar and susceptible to sand and silt. The finding screened as very low safety significance, using the Phase 1 worksheet of IMC 0609, Appendix A, since the actual loss of function was less than the allowed outage time. The inspectors also determined that this finding has a cross-cutting aspect in the area of Problem Identification and Resolution, because the licensee failed to take the appropriate corrective actions to address safety issues. (IMC 0305, P.1.(d))

Inspection Report# : [2007002](#) (*pdf*)

Significance:  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Control Rod Drive Mechanism Testing Practice Violates TS 3.1.4

The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of Technical Specifications for the failure to take actions for the appropriate Limiting Condition for Operation (LCO) not being met when surveillance testing exceeded the allowed interval. Specifically, the failure to verify control rod freedom of movement every 92 days (plus a 25 percent grace period) required entry into the Actions of LCO 3.1.4 Condition E, which stipulated the shutdown of the plant within six hours. This was not done on several occasions in the last three years. This issue was entered into the licensee's corrective action system as Action Request 01072543 and the inspectors verified that the rods subsequently had freedom of movement.

The finding is more than minor because, if left uncorrected, the finding could become a more significant safety concern; namely, the inability to detect rod binding could impact reactor shutdown margin in certain events. The finding screened as very low safety significance, Green, using the Phase 1 worksheet of Inspection Manual Chapter 0609, Appendix A, since no actual cases were found where the rods were bound after subsequent cycling.

Inspection Report# : [2007002](#) (*pdf*)

Significance:  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure To Comply with Technical Specification 3.9.5

The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of Technical Specification 3.9.5 for removing a train of safety equipment without complying with the required action and completion time when the Limiting Condition for Operability was not met. Specifically, the licensee removed one train of shutdown cooling (by removing one shutdown cooling heat exchanger - (SDCHX)) for planned maintenance while the reactor was in Mode 6 with cavity level below 647 feet. The Action required was to "immediately" initiate action to restore the train to Operable. The train was inoperable for over four days. This issue was entered into the licensee's corrective action system as Action Request 01082854.

The finding is more than minor since it affected the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. The finding is associated with the cornerstone attribute of equipment performance (unavailability of the SDCHX). The inspectors evaluated this finding in accordance with Appendix G, "Shutdown Operations Significance Determination Process" to IMC 0609. Although only one Decay Heat Removal (DHR) train was operable, other items for defense in depth including backup injection flowpaths, pump sources, vent paths and water sources were available for use. The inspectors completed a Phase 2 assessment and determined that a loss of DHR had a low frequency. The finding is of very low safety significance.

Inspection Report# : [2007002](#) (*pdf*)

Significance: SL-IV Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Comply with Technical Specification 5.5.12 TS Basis Control Program

The inspectors identified a Severity Level IV Non-Cited Violation of Technical Specification (TS) 5.5.12 for the failure to comply with the TS Basis Control Program. Specifically, the licensee made a change to the TS bases for TS 3.9.5 which altered the TS definition of "two SDC trains" described in TS 3.9.5. The licensee changed the bases to allow a single SDC to be a member of two trains with cavity level less than 647 feet. A distinct SDCHX is required for each train. This change required prior NRC approval as a change to the TS. This issue was entered into the licensee's corrective action system.

The inspectors concluded this finding is more than minor since it impacted the NRC's ability to perform its regulatory function and resulted in a condition having a very low safety significance (i.e., green). Specifically, the licensee changed the TS bases in a manner that required prior NRC approval. The finding is a Severity Level IV violation consistent with the NRC Enforcement Policy. The inspectors also determined that this finding has a cross-cutting aspect in the area of human performance, because the licensee failed to use conservative assumptions in changing the TS bases. (IMC 0305 H.1(b))

Inspection Report# : [2007002](#) (*pdf*)

G

Significance: Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Incorrect Auxiliary Feedwater Vortex Limit Calculation

The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to use a conservative value for auxiliary pump air entrainment in vortex limit calculations. Specifically, the licensee misinterpreted a graph used to determine the percent air ingestion as a function of the Froude number, which resulted in a pump air entrainment value above a value supported by the vendor. This issue was entered into the licensee's corrective action system and the licensee made procedure changes and provided operator training to ensure that the auxiliary pumps were tripped prior to entraining excessive air.

This issue was more than minor because the calculational error was significant enough to require reanalysis of the pumps' ability to perform their design function and because changes to plant procedures were necessary in order to ensure pump operability. The error also appeared to be programmatic as a similar error was made in calculating the air entrainment to the high pressure safety injection pumps. The issue was of very low safety significance because although it was a design issue, there was not a loss of function of the auxiliary feedwater pumps.

Inspection Report# : [2007002](#) (*pdf*)

Significance: SL-IV Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Addition of Manual Operator Action Not Evaluated in Accordance with 10 CFR 50.59

The inspectors identified a finding having very low safety significance and an associated Non-Cited Violation of 10 CFR 50.59, "Changes, Tests, and Experiments," for a failure to seek a license amendment. Specifically, when Setpoint Change 96-012 involving the low suction pressure trip of the auxiliary feedwater pumps was implemented, no safety evaluation was performed. When the evaluation was performed in December 2006 the licensee failed to evaluate known deficiencies.

Because violations of 10 CFR 50.59 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process instead of the significance determination process. The performance deficiency met Supplement I.D.5, "Violations of 10 CFR 50.59 that result in conditions evaluated as having very low safety significance by the SDP," for a Severity Level IV Violation.

Inspection Report# : [2007002](#) (*pdf*)

G

Significance: Feb 27, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Valve Body Inadvertently Discarded Due to Ineffective Quarantine

The inspectors identified an Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to adequately quarantine a component for failure analysis as required by the licensee's procedures. The licensee discarded a valve body, which resulted in the failure to complete a corrective action assigned in an associated root cause evaluation. The finding was associated with the work practices component of the human performance cross-cutting area because licensee personnel failed to use appropriate human error prevention techniques to ensure the valve body was effectively quarantined. After the issue was identified by the NRC, the licensee entered the issue into their corrective action program as Action Requests 01076153 and 01076213.

This finding was determined to be more than minor based on a review of the list of more than minor issues in Inspection Manual Chapter 0612, Appendix E, in that the valve body was irretrievably lost. Additionally, if left uncorrected, the failure to quarantine items could become a more significant safety concern since the failure to do so could impede the identification of root and/or contributing causes for conditions adverse to quality and prevent the implementation of appropriate corrective actions. The finding was of very low safety significance because the finding was not a design or qualification deficiency resulting in a loss of function per Generic Letter 91-18; did not represent an actual loss of safety function of a system or the loss of safety function of a train of equipment; and was not potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event.

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

Significance:  Feb 27, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Extent of Condition for High Pressure Safety Injection Valve Failure

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to assure that conditions adverse to quality were promptly corrected. Specifically, the inspectors concluded that the licensee failed to develop adequate actions to correct conditions adverse to quality identified during root cause evaluation activities for a valve failure on March 29, 2006. This finding had a cross-cutting aspect in the corrective action program component of the problem identification and resolution area because licensee personnel failed to promptly perform an adequate extent of condition for the valve failure. The licensee entered this performance deficiency into the corrective action program as AR 01076287 for resolution.

The finding was more than minor because, if left uncorrected, future conditions adverse to quality would not be fully evaluated or corrected. The inspectors assessed the significance of this finding as very low safety significance because, upon completing an adequate extent of condition review, no additional examples of improperly supported equipment were identified.

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

Barrier Integrity

Significance:  Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

LPSI Check Valve Unseated

A self-revealed finding and associated NCV of Technical Specification 5.4.1 was identified for failure by the licensee to follow procedural requirements. On May 13, 2007, the licensee failed to monitor for leakage across a Low Pressure Safety Injection (LPSI) check valve as required by procedure and a protective relief valve lifted. Following lifting of the relief valve, the licensee seated the check valve to prevent further back leakage and entered the deficiency onto their corrective action program.

In accordance with IMC 0612, the inspectors concluded that the issue was more than minor because the failure to limit pressure in the LPSI piping until a protective device actuated increased the likelihood of an initiating event. After consultation with the Senior Risk Analyst (SRA), the inspectors concluded that the finding was of very low safety significance because of the extremely low frequency of the Interfacing System Loss of Coolant Accident initiating

event. This finding included a cross-cutting aspect in the area of human performance in that human error prevention techniques (H.4(a)) were not effective in preventing lifting of the relief valve.

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

Emergency Preparedness

Significance:  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Properly Implement Approved EAL Scheme

The inspectors identified a Green NCV of 10 CFR 50.47 for failure to properly implement approved Emergency Action Levels (EAL). As a result of the improper EAL implementation, site personnel responsible for EAL declarations could improperly classify some Alerts as Site Area Emergencies (SAEs). The licensee has provided training to site personnel regarding correct declaration of this EAL.

The inspectors determined that the licensee's failure to properly implement the EALs represented a performance deficiency that warranted a significance determination. The inspectors concluded that the finding affected the Emergency Preparedness Cornerstone objective for the attribute of Emergency Response Organization (ERO) readiness in that the licensee improperly implemented an EAL. In addition, the finding had a cross-cutting aspect in the area of human performance, resource component. Specifically, the training of personnel resulted in improperly classifying the drill scenario. (H.2.(b))

Inspection Report# : [2007004](#) (*pdf*)

Occupational Radiation Safety

Public Radiation Safety

Significance:  Jun 30, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to effectively survey slings before granting unconditional release from the RCA

A self-revealed finding of very low safety significance and an associated violation of NRC requirements was identified for the failure to effectively survey slings before granting unconditional release from the Radiologically Controlled Area (RCA). This was first identified when a sling alarmed the PM-7 (portal radiation monitor) at the security building on October 13, 2006. A few days later, an individual working outside of the RCA became contaminated after handling a rigging/lifting sling. Extent of condition surveys identified 17 additional slings outside the RCA and/or Protected Area that alarmed the tool monitor. Radioactive material was also identified on two of these slings using a conventional hand-held frisker survey instrument.

The issue was more than minor because it was associated with the Program/Process attribute of the Public Radiation Safety Cornerstone and affected the cornerstone objective to ensure the adequate protection of the public domain as a result of routine civilian nuclear reactor operation. A Green NCV of 10 CFR 20.1501 was identified for the failure to adequately survey materials to evaluate the presence of radioactive material. The cause of this deficiency is a legacy issue and does not represent current licensee performance. Therefore, this deficiency does not have any cross-cutting aspects.

Inspection Report# : [2007004](#) (*pdf*)

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

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