

San Onofre 2

2Q/2007 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Jun 15, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Fire Separation in Fire Area 2/3-AC-50-29 Did Not Comply With Deviation Request.

A noncited violation of License Condition 2.C.(14), "Fire Protection," was identified for failure to ensure that redundant trains of safe shutdown equipment would remain free of fire damage in Fire Area 2-AC-50-29. Specifically, the cables for redundant trains of safe shutdown equipment in both units were not separated by at least 10 feet as described in Deviation Number 8, and they also failed to meet Section III.G.2 of Appendix R to 10 CFR 50. Four Train B cables in conduits were found to be located within 10 feet of the Train A switchgear room cooling units in both plants. The concern was that a single fire could cause loss of Train B 120V vital ac power and battery charger, as well as cause loss of Train A ac and dc power due to the loss of room cooling. This issue was entered into the corrective action program under Action Requests 070400873 and 070400998.

Failure to ensure that redundant trains of safe shutdown equipment would remain free of fire damage in accordance with the license basis was a performance deficiency. This finding was more than minor because it affected the protection against external factors attribute of the Mitigating Systems cornerstone. The significance of this finding was assessed using Appendix F of Manual Chapter 0609, "Fire Protection Significance Determination Process." This finding was categorized as a localized cable/component protection issue with high degradation rating. The evaluation of the potential fire sources and fire targets indicated that the finding had very low safety significance because none of the potential fire sources were expected to damage all four Train B cables or cause the loss of function in both trains. Inspection Report# : [2007008](#) (*pdf*)

Significance:  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow an Abnormal Operating Instruction in Response to High Offsite Power Grid Voltage

The inspectors identified a Green NCV of Technical Specification 5.5.1.1 for the failure of operations personnel to enter and implement abnormal operating Instruction SO23-13-4, "Operation During Major System Disturbances," on multiple occasions from 2004 to 2006 to address high offsite power voltage. On November 22, 2006, the inspectors discovered through review of historical data that the action limit for high offsite grid voltage (234 kV) had been briefly exceeded multiple times since August 2004. The inspectors further identified that there was no provision in place to alert control room operators to take appropriate actions should the high grid voltage limit be reached. This issue was entered into the licensee's corrective action program as Action Request 061101250.

The finding was determined to be more than minor because if left uncorrected it could result in a more significant safety concern due to potential long-term degradation of vital equipment. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance (Green), because it did not result in a loss of safety function and did not affect the risk of external initiators. The finding has a crosscutting aspect in the area of human performance associated with resources, in that there was no provision in place to alert control room operators to take appropriate actions should the high grid voltage limit be reached. Inspection Report# : [2007002](#) (*pdf*)

G**Significance:** Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PREVENT RECURRENCE OF PREMATURE TRIPPING OF SQUARE D THERMAL OVERLOADS

The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to prevent recurrence of a significant condition adverse to quality involving the premature tripping of Square D thermal overloads used for equipment protection on safety-related equipment. This deficiency had not been properly evaluated or corrected since 2001. This issue was entered into the licensee's corrective action program as Action Request 061000859.

The finding was determined to be more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and it affected the cornerstone objective by challenging the availability and capability of safety-related components. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance because it did not result in an actual loss of safety function for affected systems. This finding also had crosscutting aspects in the area of problem identification and resolution associated with the corrective action program because the licensee failed to thoroughly evaluate and correct the problem in a timely manner

Inspection Report# : [2006005](#) (*pdf*)**G****Significance:** Nov 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Diesel Ground Alarm Procedure

The team identified a noncited violation of Technical Specification 5.5.1.a for an inadequate emergency diesel generator ground fault alarm response procedure. Specifically, the procedure had operators check for grounds associated with the emergency diesel generator itself but did not specify actions to address the more likely ground locations, which included components on the 4.16kV bus. Since other plant procedures permit cross-tying the safety-related buses on the opposite unit in the event of a loss of an emergency diesel generator, the failure to properly consider grounds in other locations could result in additional equipment failures. The licensee captured this finding in their corrective action program as Action Request 060700753.

The failure to provide an adequate alarm response procedure was a performance deficiency. This issue was more than minor because the procedure deficiency affected the mitigating system cornerstone objective (procedure quality attribute) of ensuring availability, reliability, and capability of systems needed to respond to initiating events to prevent undesired consequences. Specifically, under certain circumstances, the emergency diesel generators may not have functioned following a seismic event. Using the Manual Chapter 0609, Significance Determination Process, Phase 1 screening worksheet, the issue screened as having very low safety significance because the finding was not a design or qualification deficiency, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events.

Inspection Report# : [2006009](#) (*pdf*)**G****Significance:** Nov 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Identify Air Voids in Safety Injection Suction Piping

The team identified a noncited violation of the Code of Federal Regulations, Title 10, Part 50, Appendix B, Criterion XVI, Corrective Actions, for the failure to promptly identify a condition adverse to quality (trapped air in the safety injection suction lines). Each suction line contained approximately 11.5 cubic feet of trapped air, but the licensee's official design calculations assumed the lines were full of water. Additionally, industry operating experience notified the licensee that air in the safety injection system suction lines could cause operational problems (a condition adverse to quality) but the licensee failed to promptly identify the condition at San Onofre Nuclear Generating Station. The licensee's engineering evaluation erroneously determined that San Onofre Nuclear Generating Station was not vulnerable to the condition identified in the operating experience. The licensee captured this finding in their corrective

action program as Action Request 060700747.

The failure to promptly identify and correct a condition adverse to quality in response to applicable operating experience was a performance deficiency. This finding was more than minor because it affected the mitigating system cornerstone objective (equipment performance attribute) to ensure the reliability and capability of equipment needed to respond to initiating events. Using the Manual Chapter 0609, Significance Determination Process, Phase 1 screening worksheet, the finding was of very low safety significance because it was a design deficiency confirmed not to result in loss-of-operability in accordance with NRC Manual Chapter Part 9900, Technical Guidance, Operability Determination Process for Operability and Functional Assessment. This finding has a cross-cutting aspect in the area of problem identification and resolution, in that the licensee failed to thoroughly evaluate applicable industry operating experience concerning air voids in recirculation piping suction lines.

Inspection Report# : [2006009](#) (*pdf*)

Significance:  Nov 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Identify Diesel Generator Seismic Nonconformance

The team identified a Code of Federal Regulations, Title 10, Part 50, Appendix B, Criterion XVI, Corrective Actions, violation for the failure to promptly identify a condition adverse to quality (Train A emergency diesel generators lost seismic qualification). The licensee had identified that a ground fault on a nonsafety-related uninterruptible power supply could cause the emergency diesel generator to trip during a fire but failed to further determine that the same scenario could occur during a seismic event. The licensee captured this finding in their corrective action program as Action Request 060600500.

The failure to promptly identify a condition adverse to quality was a performance deficiency. This finding is more than minor because it affected the mitigating system cornerstone objective (equipment performance attribute) of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Train A emergency diesel generator operability was not assured for seismic events. Using the Manual Chapter 0609, Significance Determination Process, Phase 1 screening worksheet, the internal events portion of the worksheet did not apply, because the finding only involved an external seismic event with a loss of offsite power. Additionally, for external events, the finding screened as have very low safety significance because it did not involve the loss or degradation of equipment or function specifically designed to mitigate an external event (e.g., seismic snubbers, flooding barriers, tornado doors) and the safety function was not considered completely failed or unavailable, as the Train B emergency diesel generators were unaffected by the issue. This finding has a cross-cutting aspect in the area of problem identification and resolution, in that engineers failed to perform an appropriate extent of condition review and promptly identify the nonconforming emergency diesel generators, a condition adverse to quality.

Inspection Report# : [2006009](#) (*pdf*)

Significance:  Jul 12, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedures Addressing Foreign Material Exclusion

The team identified a noncited violation of Part 50 of Title 10 of the Code of Federal Regulations, Appendix B, Criterion V, Procedures, for the failure to follow procedural requirements and establish the Units 2 and 3 CST-120 condensate storage tank enclosures as foreign material exclusion areas. The team found several pieces of foreign material in each enclosure. Foreign materials in these areas could have caused auxiliary feedwater system operational problems following a seismic event. In addition, the licensee failed to properly address industry operating experience related to foreign materials in auxiliary feedwater system water sources. Finally, a related condensate storage tank sizing calculation failed to consider the potential for reactor vessel head void formation during the cooldown to shutdown cooling conditions. The licensee captured this finding in their corrective action program as Action Requests 060700471 and 0601000172.

The failure to follow plant procedures was a performance deficiency. This finding is more than minor because it affected the mitigating system cornerstone objective (equipment performance attribute) of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The team

determined that a Phase 3 significance determination was required because the finding screened as potentially risk significant due to a seismic initiating event. Region IV senior risk analysts performed a Phase 3 significance determination and determined that the issue represents a finding of very low safety significance.

Inspection Report# : [2006009](#) (*pdf*)

Barrier Integrity

Significance:  Feb 13, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Loss of Spent Fuel Pool Cooling due to Inadequate Temporary Ventilation Procedure

The inspectors identified a Green NCV of Technical Specification 5.5.1.1 for the failure of operations personnel to have adequate procedures in place to establish temporary ventilation in the safety-related switchgear rooms when the normal ventilation system is out of service. This resulted in a loss of cooling to the Unit 2 spent fuel pool for approximately 68 minutes. This issue was entered into the licensee's corrective action program as Action Request 070200583.

The finding was determined to be more than minor because it affected the procedure quality attribute of the barrier integrity cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. This finding cannot be evaluated by the significance determination process because Manual Chapter 0609, "Significance Determination Process," Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and Appendix G, "Shutdown Operations Significance Determination Process," do not apply to the spent fuel pool. The resident inspectors in conjunction with the SRA performed a qualitative bounding evaluation. This finding is determined to be of very low safety significance by management review because radiation shielding was provided by the spent fuel pool water level, multiple sources of makeup water were available, and spent fuel pool temperature experienced only a nominal increase during the loss of spent fuel pool cooling. The cause of the finding has a crosscutting aspect in the area of human performance associated with resources in that procedural guidance was inadequate to ensure proper temporary ventilation was established in the safety-related switchgear rooms.

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

Emergency Preparedness

Occupational Radiation Safety

Significance:  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO ADEQUATELY LABEL A CONTAINER OF RADIOACTIVE MATERIAL

The inspector identified a noncited violation of 10 CFR 20.1904(a) because the licensee failed to adequately label a container of radioactive material. On August 4, 2006, a vial of spent resin that had a dose rate of 5 millirem per hour on contact and contained 14 microcuries of fission and activation products (primarily cesium-137 and cobalt-60) was found in the reactor chemistry lab trash can designated for "clean" non-radioactive waste. The health physics department had previously determined that when the vial was transferred to the reactor chemistry lab, the vial was in a plastic bag that was appropriately labeled with the words "Caution Radioactive Material" and sufficient information about the radiation hazards as required by 10 CFR 20.1904(a). However, when the inspector questioned whether the vial was adequately labeled, the licensee conducted an apparent cause evaluation and determined that the vial was found in the "clean" trash without an adequate label. The licensee's immediate corrective action was to place a

radioactive material label with dose rate information on the bag and store it in a lead pig. This issue was entered into the licensee's corrective action program as Action Request 060800249.

The finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Exposure Control, and affected the cornerstone objective to ensure the adequate protection of a worker's health and safety from exposure to radioactive materials because workers could have received additional exposure. The finding was processed through the Occupational Radiation Safety Significance Determination Process and was determined to be of very low safety significance because: (1) it was not an as low as reasonably achievable finding, (2) there was no personnel overexposure, (3) there was no substantial potential for personnel overexposure, and (4) the finding did not compromise licensee's ability to assess dose. Additionally, this finding had a crosscutting aspect in the area of human performance related to work practices because the licensee's staff did not perform self checking to ensure the container of radioactive material was adequately labeled

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

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 Sep 22, 2006

Identified By: NRC

Item Type: FIN Finding

Corrective Action Program Assessment

The inspectors reviewed 260 action requests, work orders, associated root and apparent cause evaluations, and other supporting documentation to assess problem identification and resolution activities. Overall, the team concluded that the licensee was effective in identifying, evaluating, and correcting problems. Corrective actions, when specified, were generally implemented in a timely manner. The licensee continued to be proactive in performing self-assessments which were probing and self-critical, and in addressing negative behavior trends at a low level. However, the team concluded that the licensee's efforts to address a longstanding trend in human performance errors has not been completely effective because workers were not consistently using the error prevention techniques. The team noted that the licensee used bench marking of industry best practices to make numerous improvements to the corrective action program since the last PI&R inspection. While some of the changes were too recent to evaluate, the team concluded that improvements in the quality of evaluations, documentation of the decision making process, and scope and timing of corrective actions showed improvement. The team identified that the quality and documentation for operability assessments and operational decision-making improved over the course of the evaluation period. The licensee expanded review of operating experience during cause evaluations, however several root cause evaluations identified instances where applicable operating experience had not been addressed sufficiently to prevent subsequent events. On the basis of 41 interviews conducted during this inspection, workers at the site felt free to input safety findings into the corrective action program, raise safety concerns to their supervision or bring concerns to the employee concerns program. The team concluded that a positive safety-conscious work environment exists at San Onofre Nuclear Generating Station.

Inspection Report# : [2006013](#) (*pdf*)

Last modified : August 24, 2007