

# San Onofre 3

## 2Q/2007 Plant Inspection Findings

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### Initiating Events

**Significance:**  Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **UNPLANNED POWER INCREASE RESULTS IN VIOLATION OF TECHNICAL SPECIFICATIONS**

A self-revealing noncited violation of Technical Specification 5.5.1.1 was identified for the failure of operations personnel to follow procedures while diluting the reactor coolant system. This resulted in the Technical Specification required surveillances on the core operating limits supervisory system not being performed prior to exceeding 20 percent reactor power following a Unit 3 reactor startup. The issue was entered into the licensee's corrective action program as Action Request 061200640.

The finding was determined to be more than minor because unplanned reactivity excursions could be reasonably viewed as a precursor to a significant event, in that they could lead to more serious situations where reactor protection equipment may be required. 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 contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The core operating limits supervisory system was verified operable within approximately one hour after the event, and all other mitigating equipment and functions remained available. The finding had a crosscutting aspect in the area of human performance associated with work practices in that Unit 3 control room operators did not perform a controlled reactor power increase in accordance with established procedural requirements. In addition, supervisory oversight failed to ensure that the reactivity change was properly planned and briefed prior to execution

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

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### 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*)

**G****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*)

**Significance:**  Nov 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Incorrect Methodology for 125VDC Calculations**

The team identified a noncited violation of Part 50 of Title 10 of the Code of Federal Regulations, Appendix B, Criterion III, Design Control, for the failure to properly calculate control circuit voltages associated with the Unit 3 motor-driven auxiliary feedwater Pump 3P504 breaker. Correcting the error used approximately 1/3 of the available design margin. The licensee captured this finding in their corrective action program as Action Request 060700765.

The failure to properly implement proper design controls was a performance deficiency. This issue was more than minor because, if left uncorrected, it could become a more significant safety concern. Specifically, the noted calculations are used for operability determinations and plant modifications. Uncorrected errors could mask equipment operability issues. This issue was similar to non-minor violation Example 3.j in NRC Inspection Manual Chapter 0612, Appendix E, Examples of Minor Issues, because there was a reasonable doubt of the operability of the pump breaker. Using the Manual Chapter 0609, Significance Determination Process, Phase 1 screening worksheet, the issue screened as having 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.

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

**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*)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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# Occupational Radiation Safety

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

## **INADEQUATE CONTAINMENT AIRBORNE RADIOACTIVITY BRIEFING**

The inspectors identified a noncited violation of 10 CFR 19.12 for the failure of health physics personnel to adequately inform workers of the radiological conditions of the Unit 3 containment on October 23, 2006. A contract health physics technician and a health physics supervisor failed to inform workers of the airborne radiological conditions. This issue was entered into the licensee's corrective action program as Action Request 061001435.

The finding was determined to be more than minor because if left uncorrected it would become a more significant safety concern in that the failure to inform workers of radiological conditions could result in unintended exposures. The inspectors processed the finding through Appendix C, "Occupational Radiation Safety Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," and determined that the finding is of very low safety significance because it was not an ALARA issue; there was not an overexposure or substantial potential for an overexposure; and the ability to assess dose was not compromised. The cause of the finding has a crosscutting aspect in the area of human performance associated with work practices in that the contract health physics technician did not follow established health physics procedures for adequately informing workers of radiological conditions. In addition, supervisory oversight of the radiological condition briefings failed to ensure that nuclear safety was supported in that the airborne radioactivity component of the health physics briefings was being omitted and the supervisor was not cognizant of the airborne radioactivity levels

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

**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*)

**Significance:**  Dec 03, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

## Failure to Follow Instructions Results in Dose Rate Alarm

A self-revealing, noncited violation of Technical Specification 5.5.1 was processed regarding the failure to follow written instructions in a radiation exposure permit. A worker received an electronic dosimeter alarm on dose rate when the worker entered a radiation field of 226 mrem/hr. The electronic dosimeter was set to alarm at 200 mrem/hr. The worker had not notified radiation protection technicians that the area would be entered. This action was contrary to licensee procedures and radiation exposure permit instructions. Although the worker was authorized to enter high radiation areas on the radiation exposure permit, the worker was instructed to contact radiation protection prior to entering any high radiation area in which a briefing had not been received. This event is in the licensee corrective action program as Action Request 061200747 and 070100370.

The finding is greater than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of human performance, and the failure to follow written radiological safety instructions affects the cornerstone objective to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive materials during routine civilian nuclear reactor operation. The finding was processed through the Occupational Radiation Safety Significance Determination Process and determined to be of very low safety significance (Green) because it was not an ALARA finding, there was no overexposure or substantial potential for an overexposure, and the ability to assess dose was not compromised. Additionally, this finding had a human performance cross-cutting aspect associated with work practices because the worker failed to use human error prevention techniques such as self- and peer checking to ensure that work activities were performed safely.  
Inspection Report# : [2007002](#) (*pdf*)

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## Public Radiation Safety

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## 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.

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## 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