



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-4005

April 27, 2007

Richard M. Rosenblum  
Senior Vice President and  
Chief Nuclear Officer  
Southern California Edison Company  
San Onofre Nuclear Generating Station  
P.O. Box 128  
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SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000361/2007002; 05000362/2007002 and  
07200041/2007001

Dear Mr. Rosenblum:

On March 31, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your San Onofre Nuclear Generating Station, Units 2 and 3 facility. The enclosed integrated report documents the inspection findings, which were discussed on March 1, March 9, March 22 and March 30, 2007, with Dr. R. Waldo and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents three NRC identified and self-revealing findings of very low safety significance (Green). These findings were determined to involve violations of NRC requirements; however, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at San Onofre Nuclear Generating Station, Units 2 and 3, facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Rebecca L. Nease, Chief  
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Division of Reactor Projects

Dockets: 50-361  
50-362  
72-041  
Licenses: NPF-10  
NPF-15

Enclosure:  
NRC Inspection Report 05000361/2007002; 05000362/2007002; 07200041/2007001  
w/Attachment: Supplemental Information

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 SO Site Secretary (vacant)

SUNSI Review Completed: RLN ADAMS:  Yes  No Initials: RLN  
 Publicly Available  Non-Publicly Available  Sensitive  Non-Sensitive  
 R:\ REACTORS\ SO23\2007\SO2007-02RP-CCO.wpd

RIV:RI:DRP/D	SRI:DRP/D	C:DRS/PSB	C:DRS/OB
MASitek	CCOsterholtz	MPShannon	ATGody
<i>/RA elect. concur/</i>	<i>/RA elect. concur/</i>	<i>/RA elect. concur/</i>	<i>TStetka for</i>
04/26/07	04/26/07	04/25/07	04/26/07
C:DRS/EB	C:DRS/PEB	C:DNMS/FCD	C:DRP/D
WBJones	LJSmith	DBSpitzberg	RLNease
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04/25/07	04/24/07	04/26/07	04/27/07

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U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket: 50-361, 50-362

Licenses: NPF-10, NPF-15

Report No.: 05000361/2007002; 5000362/2007002; and 07200041/2007001

Licensee: Southern California Edison Co. (SCE)

Facility: San Onofre Nuclear Generating Station, Units 2, 3, and Independent Spent Fuel Storage Installation

Location: 5000 S. Pacific Coast Hwy.  
San Clemente, California

Dates: January 1 to March 31, 2007

Inspectors: C. C. Osterholtz, Senior Resident Inspector, Project Branch D, DRP  
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Approved By: Rebecca L. Nease, Chief  
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Division of Reactor Projects

## SUMMARY OF FINDINGS

IR05000361/2007002, 05000362/2007002, 07200041/2007001; 01/01/07 - 03/31/07; San Onofre Nuclear Generating Station, Units 2, 3, and Independent Spent Fuel Storage Installation; Integrated Resident and Regional Report; Operability Evaluations and Access Control to Radiologically Significant Areas.

This report covered a 3-month period of inspection by resident inspectors and Regional office inspectors. The inspection identified three Green findings, all of which were non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management's review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. 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. (Section 1R15).

#### Cornerstone: Barrier Integrity

- Green. 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 (Section 1R15).

#### Cornerstone: Occupational Radiation Safety

- Green. A self-revealing, non-cited 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 Requests 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. (Section 2OS1)

#### B. Licensee-Identified Violations

- None



## REPORT DETAILS

### Summary of Plant Status

Unit 2 began the inspection period at approximately 99 percent reactor power. On January 28, 2007, reactor power was reduced to approximately 84 percent in order to repair a tube leak in the southwest main condenser. Unit 2 was returned to approximately 99 percent reactor power on January 30, 2007, and remained there to the end of the inspection period.

Unit 3 began the inspection period at approximately 100 percent reactor power. From January 21 to 23, 2007, reactor power was reduced to approximately 65 percent in order to repair a feedwater pump minimum flow valve and to repair a tube leak in the northwest main condenser. Unit 3 ended the inspection period at approximately 100 percent reactor power.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R04 Equipment Alignment (71111.04)

##### .1 Partial System Walkdowns

###### a. Inspection Scope

The inspectors: (1) walked down portions of the three listed risk important systems and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned; and (2) compared deficiencies identified during the walk down to the licensee's Updated Final Safety Analysis Report (UFSAR) and corrective action program (CAP) to ensure problems were being identified and corrected.

- January 26, 2007, Unit 3, Train B low pressure safety injection system while the Train A system was out of service for planned maintenance
- January 29, 2007, Unit 2, high pressure safety injection system swing Pump 2P018 aligned to Train B while Pump 2P019 was out of service for planned maintenance
- February 27, 2007, Unit 2, Train A component cooling water and saltwater cooling systems while the Train B component cooling water heat Exchanger 2ME002 was out of service for planned maintenance

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

###### b. Findings

No findings of significance were identified.

## .2 Complete System Walkdown

### a. Inspection Scope

The inspectors: (1) reviewed plant procedures, drawings, the UFSAR, Technical Specifications (TS), and vendor manuals to determine the correct alignment of the Units 2 and 3 component cooling water systems; (2) reviewed outstanding design issues, operator workarounds, and UFSAR documents to determine if open issues affected the functionality of the Units 2 and 3 component cooling water systems; and (3) verified that the licensee was identifying and resolving equipment alignment problems. Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

### b. Findings

No findings of significance were identified.

## 1R05 Fire Protection (71111.05)

### a. Inspection Scope

#### Quarterly Inspection

The inspectors walked down the six listed plant areas to assess the material condition of active and passive fire protection features and their operational lineup and readiness. The inspectors: (1) verified that transient combustibles and hot work activities were controlled in accordance with plant procedures; (2) observed the condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional and that access to manual actuators was unobstructed; (4) verified that fire extinguishers and hose stations were provided at their designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers, steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified that adequate compensatory measures were established for degraded or inoperable fire protection features and that the compensatory measures were commensurate with the significance of the deficiency; and (7) reviewed the UFSAR to determine if the licensee identified and corrected fire protection problems.

- January 6, 2007, Unit 2, cable spreading room, 9' elevation auxiliary control building
- January 6, 2007, Unit 3, cable spreading room, 9' elevation auxiliary control building
- February 8, 2007, Unit 2, component cooling water pump rooms
- February 9, 2007, Unit 3, component cooling water pump rooms
- February 22, 2007, Unit 2, -15' elevation safety equipment building
- February 22, 2007, Unit 2, 45' elevation penetration building

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

## Annual Inspection

On January 23, 2007, the inspectors observed a fire department drill to evaluate the readiness of licensee personnel to prevent and fight fires, including the following aspects: (1) the number of personnel assigned to the fire department; (2) use of protective clothing; (3) use of breathing apparatuses; (4) use of fire procedures and declarations of emergency action levels; (5) command of the fire department; (6) implementation of pre-fire strategies and briefs; (7) access routes to the fire and the timeliness of the fire department response; (8) establishment of communications; (9) effectiveness of radio communications; (10) placement and use of fire hoses; (11) entry into the fire area; (12) use of fire fighting equipment; (13) searches for fire victims and fire propagation; (14) smoke removal; (15) use of pre-fire plans; (16) adherence to the drill scenario; (17) performance of the post-drill critique; and (18) restoration from the fire drill. The licensee simulated a fire in the electrical raceway on the 50' elevation of the radioactive waste building. Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

### b. Findings

No findings of significance were identified.

## 1R07 Biennial Heat Sink Performance

### .1 Performance of Testing, Maintenance, and Inspection Activities

#### a. Inspection Scope

Inspection Module 71111.07, "Heat Sink Performance," requires on a biennial basis that a sample of two or three heat exchangers are reviewed. The inspector selected three heat exchangers that were directly or indirectly connected to the safety-related service water system. The inspector reviewed the licensee's testing and/or cleaning methodology for the following heat exchangers:

- Shutdown Cooling Heat Exchangers
- ECCS Pump Room Coolers
- Emergency Chilled Water Heat Exchangers

Specifically, the inspector verified proper extrapolation of test conditions to design conditions, appropriate use of test instrumentation, and appropriate accounting for instrument inaccuracies. The inspectors discussed chemical controls used to avoid fouling and heat exchanger test, inspection, and cleaning results. The inspector reviewed the methods and results of heat exchanger inspection and cleaning, verified that the methods used to inspect and clean were consistent with industry standards, and ensured that the as-found results were appropriately dispositioned such that the final conditions were acceptable. Additionally, the inspector verified that the licensee

appropriately trended these inspection and cleaning results, assessed the causes of the trends, and took necessary actions for any step changes in these trends.

The inspector completed three inspection samples.

b. Findings

No findings of significance were identified.

.2 Verification of Conditions and Operations Consistent with Design Bases

a. Inspection Scope

For the selected heat exchangers, the inspector verified that the licensee established heat sink and heat exchanger condition and operation and test criteria that were consistent with the design assumptions. Specifically, the inspector reviewed the applicable calculations to ensure that the thermal performance test acceptance criteria for the heat exchangers were being applied consistently throughout the calculations. In addition, the inspector reviewed test data for the heat exchangers and design along with vendor-supplied information to ensure that the heat exchangers were performing within their design bases.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspector verified that the licensee had entered significant heat exchanger/heat sink performance problems into the Corrective Action Program. The inspector reviewed 16 condition reports listed in the attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

The inspectors observed testing and training of senior reactor operators and reactor operators to identify deficiencies and discrepancies in the training, to assess operator performance, and to assess the evaluator's critique. The training scenario on February 1, 2007, involved practicing the use of revised emergency operating instructions for standard post trip actions and excess steam demand events. Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

Maintenance Effectiveness Baseline Review

a. Inspection Scope

The inspectors reviewed the two listed maintenance activities to: (1) verify the appropriate handling of structure, system, and component (SSC) performance or condition problems; (2) verify the appropriate handling of degraded SSC functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of SSC issues reviewed under the requirements of the maintenance rule, 10 CFR Part 50 Appendix B, and the TS.

- March 15, 2007, Units 2 and 3, main steam isolation valve, main feed isolation valve, and main feed block valve maintenance upgrades to prevent hydraulic leaks
- March 20-23, 2007, Units 2 and 3, Square D 480V breaker refurbishment

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

Emergent Work Control

a. Inspection Scope

The inspectors: (1) verified that the licensee performed actions to minimize the probability of initiating events and maintained the functional capability of mitigating systems and barrier integrity systems; (2) verified that emergent work-related activities such as troubleshooting, work planning/scheduling, establishing plant conditions, aligning equipment, tagging, temporary modifications, and equipment restoration did not place the plant in an unacceptable configuration; and (3) reviewed the UFSAR to determine if the licensee identified and corrected risk assessment and emergent work control problems.

- December 18, 2006, to January 5, 2007, Unit 3, letdown line vent Valve 3MR025 leakage
- December 24, 2006, to January 5, 2007, Unit 3, minimum flow isolation Valve 3MU204 repair for Pump 3P063
- December 27, 2006, to January 10, 2007, Unit 3, low pressure safety injection line vent Valve 3MR457 repair
- January 5-11, 2007, Unit 3, control element drive mechanism control system troubleshooting and power supply replacement
- February 6, 2007, Units 2 and 3, emergency chilled water Transformer Q035 operability with foreign material
- March 2-15, 2007, Unit 2, fuel handling building pump room emergency air conditioning fan Motor 2ME441 loose connection between the motor starter and thermal overload relay block

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors: (1) reviewed plants status documents such as operator shift logs, emergent work documentation, deferred modifications, and standing orders to determine if an operability evaluation was warranted for degraded components; (2) referred to the UFSAR and design basis documents to review the technical adequacy of licensee operability evaluations; (3) evaluated compensatory measures associated with operability evaluations; (4) determined degraded component impact on any TS; (5) used the Significance Determination Process to evaluate the risk significance of degraded or inoperable equipment; and (6) verified that the licensee has identified and implemented appropriate corrective actions associated with degraded components.

- January 17, 2007, Units 2 and 3, offsite power operability with high grid voltage
- February 12, 2007, Unit 2, indication of failed fuel
- February 13, 2007, Unit 2, spent fuel pool cooling Pump 2P010 thermal overload trip
- February 21, 2007, Units 2 and 3, safety-related battery operability with escalated

post to post resistance

- March 7 to 27, 2007, Units 2 and 3, Trains A and B component cooling water system immediate operability following discovery of gas in portions of the critical and non-critical loops
- March 14, 2007, Unit 2, spent fuel pool operability following introduction of foreign material

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

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

Introduction. The inspectors identified a Green NCV of TS 5.5.1.1 for the failure of operations personnel to enter and implement abnormal operating instruction (AOI) SO23-13-4, "Operation During Major System Disturbances," Revision 9, on multiple occasions from 2004 to 2006 to address high offsite power voltage.

Description. 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 operations personnel did not have a procedure in place to establish expectations for monitoring and identifying high grid voltage. Operations personnel had relied on offsite organizations, specifically the grid control center, to inform them if grid voltage exceeded the action limit. San Onofre System Operating Bulletin 17, dated May 30, 2006, provided for the grid control center to initiate corrective measures with the San Onofre control room whenever the San Onofre 220 kV bus voltage met the action limit. The licensee was unaware that the high voltage action limit had been exceeded until they were informed by the inspectors.

The licensee contacted the grid control center to inform them that the high grid voltage action limit had been exceeded approximately 32 times between August 2004 and July 2006, with time periods varying from a few minutes to 140 minutes. The licensee reinforced that there was an agreement in place of being notified for specific grid conditions, and maintained routine communications with the grid control center to ensure grid voltage limits were satisfied. Additionally, the licensee installed a permanent plant modification to provide for a control room plant computer alarm to alert operators when offsite voltage reached 231 kV, eliminating the need to rely on the grid control center to ensure grid voltage was maintained below its high limit. Control room operators are directed to enter AOI SO23-13-4, "Operation During Major System Disturbances," Revision 9, should a high grid voltage (234 kV) condition occur.

The inspectors reviewed the licensee's operability assessment for the periods the offsite grid voltage action limit was exceeded. TS 3.8.1 requires that offsite power be

declared inoperable within 12 hours if the high voltage limit of 234 kV is exceeded. The licensee determined that although the TS limit had been reached on multiple occasions, there were no occasions when the high grid voltage exceeded the 12 hour time limit for declaration of inoperability. Therefore, the licensee concluded that TS 3.8.1 had not been violated. The inspectors considered the evaluation adequate.

Analysis. 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.

The cause of 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.

Enforcement. TS 5.5.1.1 requires that written procedures be established, implemented, and maintained for activities specified in Appendix A, "Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors," of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operations)," dated February 1978. Regulatory Guide 1.33, Appendix A, Section 6.c, requires procedures for identifying and combating degraded electrical power systems. Contrary to this requirement, operations personnel failed to implement AOI SO23-13-4, "Operation During Major System Disturbances," Revision 9, on multiple occasions between 2004 and 2006 prior to NRC identification. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as AR 061101250, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000361; 362/2007002-01, "Failure to Follow an Abnormal Operating Instruction in Response to High Offsite Power Grid Voltage."

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

Introduction. The inspectors identified a Green NCV of TS 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 (SFP) for approximately 68 minutes.

Description. On February 13, 2007, Unit 2 Train B SFP cooling Pump 2P010 was in service while the Train B SFP cooling Pump 2P009 was out of service for scheduled maintenance. Additionally, the normal ventilation for the Unit 2 safety-related switchgear room (affecting both trains of SFP cooling) was also out of service for scheduled maintenance. Temporary ventilation for the Unit 2 safety-related switchgear rooms was placed in service using Procedure SO23-1-5, "Auxiliary Building Normal HVAC System Operation," Revision 16.



At 12:49 p.m. on February 13, the motor control center (MCC) for SFP cooling Pump 2P010 tripped on a Phase B thermal overload. A subsequent licensee investigation revealed that the MCC for SFP cooling Pump 2P010 had tripped on an actual high temperature condition. The licensee recorded temperatures in the vicinity of the MCC of 105 °F. The licensee further discovered that the thermostat for the MCC heaters had not de-energized the heaters on high temperature as required by design. The measured temperature between the MCC's space heaters and the thermal overload was approximately 133°F.

The inspectors concluded that Procedure SO23-1-5 was inadequate, in that it did not provide appropriate direction to fully compensate for normal switchgear room ventilation. Specifically, Procedure SO23-1-5 provided instructions for the temporary installation of barrel fans that could not compensate for temperature excursions comparable to normal ventilation.

Operations personnel entered abnormal operating Instruction SO23-13-23, "Loss of Spent Fuel Pool Cooling," Revision 8. Additional barrel fans were placed in the vicinity of the MCC, and SFP cooling Pump 2P010 was successfully restarted after approximately 68 minutes. SFP cooling was restored and operations personnel exited Instruction SO23-13-23. SFP temperature increased from approximately 72°F to 73.4°F during the loss of SFP cooling. As part of long term corrective actions, the licensee revised Instruction SO23-13-23 to provide for enhanced ventilation, and was evaluating removal of the heaters installed in the safety-related switchgear room breakers.

Analysis. The failure of operations personnel to have adequate procedures in place to establish temporary ventilation in the safety-related switchgear rooms was considered a performance deficiency. 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 SFP. 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 SFP water level, multiple sources of makeup water were available, and SFP temperature experienced only a nominal increase during the loss of SFP 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.

Enforcement. TS 5.5.1.1 requires that written procedures be established, implemented, and maintained for activities specified in Appendix A, "Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors," of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operations)," dated February 1978. Regulatory Guide 1.33, Appendix A, Section 3.o, requires procedures for ensuring

auxiliary building heating and ventilation be adequately maintained. Contrary to this requirement, on February 13, 2007, operations personnel had inadequate procedures in place to establish temporary ventilation in the safety-related switchgear rooms to prevent SFP cooling Pump 2P010 from tripping on high breaker temperature. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as AR 070200583, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 5000361/2007002-02, "Loss of Spent Fuel Pool Cooling due to Inadequate Temporary Ventilation Procedure."

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

Annual Review

The inspectors reviewed key affected parameters associated with energy needs, materials/replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flowpaths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the modification listed below. The inspectors verified that: (1) modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; (2) post-modification testing maintained the plant in a safe configuration during testing by verifying that unintended system interactions will not occur, SSC performance characteristics still meet the design basis, the appropriateness of modification design assumptions, and the modification test acceptance criteria has been met; and (3) the licensee has identified and implemented appropriate corrective actions associated with permanent plant modifications.

- March 31, 2007, Units 2 and 3, installation of a control room computer alarm to detect high offsite grid voltage

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the five listed postmaintenance test activities of risk significant systems or components. For each item, the inspectors: (1) reviewed the applicable licensing basis and/or design-basis documents to determine the safety functions;

(2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly re-aligned, and deficiencies during testing were documented. The inspectors also reviewed the UFSAR to determine if the licensee identified and corrected problems related to postmaintenance testing.

- January 11, 2007, Unit 2, turbine driven auxiliary feedwater Pump 2P140 postmaintenance test following scheduled routine maintenance
- January 19, 2007, Unit 3, turbine driven auxiliary feedwater Pump 3P140 postmaintenance test following scheduled routine maintenance
- January 27, 2007, Unit 3, Train A component cooling water Pump 3P024 postmaintenance test following mechanical seal replacement
- February 14, 2007, Unit 2, Train A high pressure safety injection Pump 2P019 postmaintenance test following replacement of the pump internals
- March 10, 2007, Unit 3, instrument rack Channel A postmaintenance test following power supply replacement

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and TS to ensure that the four listed surveillance activities demonstrated that the SSC's tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated TS operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of ASME Code requirements; (12) updating of performance indicator data; (13) engineering evaluations, root causes, and bases for returning tested SSC's not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciators and

alarms set points. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing.

- January 10, 2007, Unit 2, turbine driven auxiliary feedwater Pump 2P140 overspeed trip inservice test
- February 1-6, 2007, Unit 2, reactor coolant system leak rate calculations
- February 3, 2007, Unit 3, loss of voltage surveillance test on the Train B engineered safety feature bus
- March 3, 2007, Unit 3, emergency diesel Generator 3G003 monthly surveillance test

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the UFSAR, plant drawings, procedure requirements, and TS to ensure that the listed temporary modifications were properly implemented. The inspectors: (1) verified that the modifications did not have an affect on system operability/availability; (2) verified that the installation was consistent with modification documents; (3) ensured that the post-installation test results were satisfactory and that the impact of the temporary modifications on permanently installed SSC's were supported by the test; (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings; and (5) verified that appropriate safety evaluations were completed. The inspectors verified that licensee identified and implemented any needed corrective actions associated with temporary modifications.

- January 22, 2007, Unit 2, temporary battery installation while replacing safety-related battery Bank 2B008

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance was identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

For the listed drill and simulator-based training evolution contributing to Drill/Exercise Performance and Emergency Response Organization Performance Indicators, the inspectors: (1) observed the training evolution to identify any weaknesses and deficiencies in classification, notification, and Protective Action Requirements development activities; (2) compared the identified weaknesses and deficiencies against licensee identified findings to determine whether the licensee is properly identifying failures; and (3) determined whether licensee performance is in accordance with the guidance of the NEI 99-02, "Voluntary Submission of Performance Indicator Data," acceptance criteria.

- March 14, 2007, Units 2 and 3 Technical Support Center, multiple seismic events coupled with a steam generator tube rupture and a main steam line break

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas (71121.01)

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls. The inspector used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspector interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspector performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation packages reported by the licensee in the Occupational Radiation Safety Cornerstone
- Controls (surveys, posting, and barricades) of radiation and high radiation areas
- Radiation exposure permits, procedures, and engineering controls

- Self-assessments, audits, licensee event reports, and special reports related to the access control program since the last inspection
- Corrective action documents related to access controls
- Changes in licensee procedural controls of high dose rate - high radiation areas and very high radiation areas
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas

The inspector completed 9 of the required 21 samples.

b. Findings

Introduction. A self-revealing, non-cited violation of TS 5.5.1 was processed regarding the failure to follow written instructions in a radiation exposure permit (REP). The violation had very low safety significance.

Description. On December 3, 2006, 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 been informed on the dose rates for the area entered because the worker had not notified radiation protection technicians that the area would be entered. This action was contrary to licensee procedures and REP instructions. Although the worker was authorized to enter high radiation areas on the REP, the worker was instructed by the REP 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 Requests 061200747 and 070100370.

Analysis. The failure to follow procedures is a performance deficiency. 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.

Enforcement. Technical Specification 5.5.1 states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.

Section 7(e) of the regulatory guide requires procedures for access control to radiation areas including a radiation work permit system. Procedure SO123-VII-20.11, "Access Control Program," Section 4.5 states that on REP sign-up, the individual agrees to comply with REP instructions, postings, and health physics field instructions. REP 200119 required that individuals "see the containment control point for any changes in radiological conditions." Contrary to the above, a licensee worker did not contact the containment control point and receive an additional briefing before entering a high radiation area and receiving a dosimeter alarm on high dose rate. Because this finding is of very low safety significance and has been entered into the licensee corrective action program (Action Request 061200747 and 070100370), this violation is being treated as a non-cited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000362/2007002-03, "Failure to Follow Instructions Results in Dose Rate Alarm."

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspector assessed licensee performance with respect to maintaining individual and collective radiation exposures as low as reasonably achievable (ALARA). The inspector used the requirements in 10 CFR Part 20 and the licensee's procedures required by Technical Specifications as criteria for determining compliance. The inspector interviewed licensee personnel and reviewed:

- Current 3-year rolling average collective exposure
- Ten work activities completed during the last outage which resulted in the highest personnel collective exposures
- Site-specific trends in collective exposures, plant historical data, and source-term measurements
- Site-specific ALARA procedures
- ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements
- Intended versus actual work activity doses and the reasons for any inconsistencies
- Integration of ALARA requirements into work procedure and radiation exposure permit documents
- Shielding requests and dose/benefit analyses
- Assumptions and basis for the current annual collective exposure estimate, the methodology for estimating work activity exposures, the intended dose outcome, and the accuracy of dose rate and man-hour estimates
- Exposure tracking system

- Use of engineering controls to achieve dose reductions and dose reduction benefits afforded by shielding
- Exposures of individuals from selected work groups
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Source-term control strategy or justifications for not pursuing such exposure reduction initiatives
- Specific sources identified by the licensee for exposure reduction actions, priorities established for these actions, and results achieved since the last refueling cycle
- Declared pregnant workers during the current assessment period, monitoring controls, and the exposure results
- Self-assessments, audits, and special reports related to the ALARA program since the last inspection
- Resolution through the corrective action process of problems identified through post-job reviews and post-outage ALARA report critiques
- Corrective action documents related to the ALARA program and follow-up activities, such as initial problem identification, characterization, and tracking

The inspector completed 20 of the required 29 samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151)

a. Inspection Scope

Cornerstone: Initiating Events

The inspectors sampled licensee submittals for the three performance indicators listed below for the period January 2006 through December 2006, for Units 2 and 3. The definitions and guidance of Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4, were used to verify the licensee's basis for reporting each data element in order to verify the accuracy of Performance Indicator (PI) data reported during the assessment period. The inspectors reviewed licensee event reports, monthly operating reports, and operating logs as part of the assessment. Licensee performance indicator data were also reviewed against the requirements of "Operations 2/3 NEI-PI 99-02 Desktop Guide for Regulatory Assessment Performance



Indicators," Revision 2; Procedure SO23-XV-24, "Quarterly NRC Performance Indicator (PI) Process," Revision 5; and Procedure SO23-NI-1, "NRC Performance Indicator (PI) Program," Revision 6.

- Unplanned Scrams Per 7,000 Critical Hours (IE1)
- Unplanned Scrams With Loss Of Normal Heat Removal (IE2)
- Unplanned Power Changes Per 7,000 Critical Hours (IE3)

The inspectors completed six samples.

Cornerstone: Occupational Radiation Safety

The inspector reviewed licensee documents from October 2006, through February 2007. The review included corrective action documentation that identified occurrences in locked high radiation areas (as defined in the licensee's technical specifications), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 4). Additional records reviewed included ALARA records and whole body counts of selected individual exposures. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. In addition, the inspector toured plant areas to verify that high radiation, locked high radiation, and very high radiation areas were properly controlled. Performance indicator definitions and guidance contained in NEI 99-02, Revision 4, were used to verify the basis in reporting for each data element.

The inspectors completed one sample.

Cornerstone: Public Radiation Safety

Radiological Effluent Technical Specification/Offsite Dose Calculation Manual  
Radiological Effluent Occurrences

The inspector reviewed licensee documents from October 2006 through February 2007. Licensee records reviewed included corrective action documentation that identified occurrences for liquid or gaseous effluent releases that exceeded performance indicator thresholds and those reported to the NRC. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. Performance indicator definitions and guidance contained in NEI 99-02, Revision 4, were used to verify the basis in reporting for each data element.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

## 4OA2 Identification and Resolution of Problems (71152)

### .1 Routine Review of Identification and Resolution of Problems

#### a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's corrective action program. This assessment was accomplished by reviewing maintenance orders, action requests, the management focus list, and attending corrective action review and work control meetings. The inspectors: (1) verified that equipment, human performance, and program issues were being identified by the licensee at an appropriate threshold and that the issues were entered into the corrective action program; (2) verified that corrective actions were commensurate with the significance of the issue; and (3) identified conditions that might warrant additional follow-up through other baseline inspection procedures.

#### b. Findings

No findings of significance were identified.

### .2 Selected Issue Follow-up Inspection

#### a. Inspection Scope

In addition to the routine review, the inspectors selected the listed issue for a more in-depth review. The inspectors considered the following during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

- December 11, 2006, Unit 3, reactivity addition event

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

#### b. Findings and Observations

The inspectors reviewed the root cause analysis performed by the licensee in AR 061200640 and found it met minimum requirements (see inspection Report 05000361/2006005; 05000362/2006005 Section 1R22 for event details). However, the inspectors considered the final root cause statement to be very broad and convoluted. The inspectors considered the root cause of the event to be poor oversight of the evolution by the operations shift manager. The licensee's root cause statement read:

“Reactivity Management rules have not been clearly established and reinforced such that, at all times, plant operations are conducted in accordance with the Reactivity Management programmatic requirements and safe operating philosophies.”

The inspectors concluded that the root cause statement, although satisfactory, could have been more direct and to the point of the problem.

.3 Occupational Radiation Safety Inspection

a. Inspection Scope

The inspector evaluated the effectiveness of the licensee’s problem identification and resolution process with respect to the following inspection areas:

- Access Control to Radiologically Significant Areas (Section 2OS1)
- ALARA Planning and Controls (Section 2OS2)

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153)

.1 (Closed) Licensee Event Report 05000362/2006-005-01, “Dilution Error Results in Exceeding 20 Percent Power Prior to Completion of Required Surveillances”

The inspectors determined that a Green non-cited violation occurred. This issue is documented in Section 1R22 of San Onofre Nuclear Generating Station - NRC Integrated Inspection Report 05000361/2006005; 05000362/2006005. This licensee event report is closed.

4OA5 Other Activities

.1 Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855)

a. Inspection Scope

On February 27 through March 1, 2007, an ISFSI inspection was performed using Inspection Procedure 60855. The inspection scope included direct observation of selected operations during the first loading of Combustion Engineering (CE) fuel into the new Advanced NUHOMS 24PT4 canister, and a review of routine ISFSI operations. In addition the inspection included:

- Observations of the changes in canister welding configuration caused by joining the shield plug with the inner top cover plate
- Reviewing the time-to-boil limit used during loading of the first canister of CE fuel and found it consistent with the decay heat loading

- Reviewing a sampling of completed Technical Specification surveillances for the Advanced Horizontal Storage Module temperature monitoring and screen inspections
- Reviewing a sampling of ISFSI related maintenance activities
- Reviewing the design change package and the supporting 10 CFR 72.48 safety reviews for machining the bottom of the top shield plug assembly
- Reviewing the quality assurance readiness review for the first loading of CE fuel and included ensuring that the personnel, procedures and equipment were adequate to safely move spent fuel from the Unit 2 spent fuel pool to the ISFSI
- Reviewing the changes made to the FSAR and drawings as a result of placing the new Advanced NUHOMS 24PT4 canister into service

b. Findings

No findings of significance were identified.

40A6 Meetings, Including Exit

On March 1, 2007, the inspectors presented the results of the independent spent fuel storage installation inspection to Mr. J. Morales, Unit 1 Decommissioning Manager, and other members of his staff who acknowledged the findings.

On March 9, 2007, the inspectors presented the access controls inspection results to Dr. R. Waldo, Vice President Nuclear Generation, and other members of his staff who acknowledged the findings.

On March 22, 2007, the inspectors presented the heat exchanger inspection results to Mr. B. Katz, Vice President, Nuclear Oversight and Regulatory Affairs, and other members of licensee management at the conclusion of the onsite inspection.

On March 30, 2007, the inspectors presented the inspection results to Dr. R. Waldo and others who acknowledged the findings.

The inspectors determined that propriety information had been reviewed and returned it to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

T. Adler, Manager, Work Control  
L. Allen, System Engineering Program Manager  
B. Ashe-Everest, Nuclear Fuel Services Supervisor, Maintenance Engineering  
J. Barrow, ALARA Supervisor, Health Physics  
D. Breig, Station Manager  
R. Corbett, Manager, Health Physics  
V. Herrera, Mechanical Engineer, Maintenance Engineering  
K. Johnson, Manager, Design Engineering  
B. Katz, Vice President, Nuclear Oversight and Regulatory Affairs  
L. Kelly, Engineer, Nuclear Regulatory Affairs  
J. Klante, Training Officer, Fire Department  
M. Love, Manager, Maintenance  
A. Martinez, Manager, Health Physics Operations  
C. McAndrews, Manager, Nuclear Oversight and Assessment  
J. Morales, Manager, Unit 1 Decommissioning  
N. Quigley, Manager, Mechanical/Nuclear Maintenance Engineering  
L. Rafmer, Supervisor Balance of Plant  
A. Scherer, Manager, Nuclear Regulatory Affairs  
P. Schofield, System Maintenance Engineer Supervisor  
M. Short, Manager, Systems Engineering  
J. Summy, System Engineering Manager  
T. Vogt, Manager, Operations  
R. Waldo, Vice President, Nuclear Generation  
D. Wilcockson, Manager, Plant Operations  
C. Williams, Manager, Compliance  
T. Yackle, Manager, Maintenance Engineering

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened

None

#### Opened and Closed

05000361; 362/2007002-01	NCV	Failure to Follow an Abnormal Operating Instruction in Response to High Offsite Power Grid Voltage (Section 1R15)
05000361/2007002-02	NCV	Loss of Spent Fuel Pool Cooling due to Inadequate Temporary Ventilation Procedure (Section 1R15)

05000362/2007002-03    NCV    Failure to Follow Instructions Results in Dose Rate Alarm (Section 2OS1)

Closed

05000362/2006-005-01    LER    Dilution Error Results in Exceeding 20 Percent Power Prior to Completion of Required Surveillances

Discussed

None

**LIST OF DOCUMENTS REVIEWED**

In addition to the documents called out in the inspection report, the following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

**Section 1R04: Equipment Alignment**

Procedures

SO23-3-2.7	"Safety Injection System Operation"	Revision 21
SO23-3-2.7.2	"Safety Injection System Removal/Return to Service Operation"	Revision 13
SO23-3-3.8	"Safety Injection Monthly Tests"	Revision 19
SO23-2-17	"Component Cooling Water System Operation"	Revision 20
SO23-13-7	"Loss of Component Cooling Water (CCW)/Saltwater Cooling (SWC)"	Revision 8
SO23-12-1	"Standard Post Trip Actions"	Revision 20
SO23-13-2	"Shutdown from Outside the Control Room"	Revision 8
SO23-2-14	"Nitrogen System Operation"	Revision 2
SO23-2-8	"Saltwater Cooling System Operation"	Revision 26
SO23-2-8.1	"Saltwater Cooling System Alignments and Infrequent/Outage Operations"	Revision 4

Drawings and Calculations

40112BSO3	"Safety Injection System"	Revision 36
40112A	"Safety Injection System"	Revision 29
M-0026-002	"CCW System-Sizing of CCW Pumps"	Revision 1
M-0026-003	"Component Cooling Water Surge Tank Pressure"	Revision 0
M-0026-004	"Component Cooling Water Surge Tank Sizing and Critical Crack Loss"	Revision 3
M-0027-017	"Backup Nitrogen Supply for the CCW Surge Tank"	Revision 2
40127A	"Component Cooling Water System (Pumps)"	Revision 28
40127B	"Component Cooling Water System (Tanks)"	Revision 35
40127C	"Component Cooling Water System (Heat Exchangers)"	Revision 43
40127D	"Component Cooling Water System (Supply Headers)"	Revision 14
40126A	"Component Cooling Water System (Salt Water Pumps)"	Revision 26

Action Request

070100399

**Section 1R05: Fire Protection**

Procedures

SOG-AD-0007	"Fire Department Drill Process"	Revision 1
SO23-13-21	"Fire"	Revision 10

Drawings and Calculations

Pre-Fire Plan 2/3-028	"Unit 2/3 Auxiliary Radwaste Elevation 50'-0"	Revision 3
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Action Requests

061100802

## Miscellaneous

SOFD Fire Drill 2007-02-Unit 2/3 50' Radwaste Fire Drill "B" Shift dated January 23, 2007

San Onofre Fire Department Fire Drill 2007-02 Summary Report dated January 23, 2007

## **Section 1R07 Biennial Heat Sink Performance Inspection**

### Procedures

SO23-3-3.18, "Train A Component Cooling/Saltwater System Monthly Test," dated March 1, 2007

SO23-SPE-63, "Emergency Chilled Water System Train A Flow Verification," Revision 0

DBD-SO23-400, "Component Cooling Water," Revision 10

SO23-V-3.4, "Engineering Review of Pump Inservice Test," Revision 16

SO23-1-8.317.1, "HVAC Cooling Coil Cleaning and Inspection," Revision 0, TCN 0-1

SO23-2-17.1, "Component Cooling Water System Alignments," Revision 8, TCN 8-3

SO-SO23-800, "System Description Normal and Emergency Chilled Water System," Revision 1

### Calculations

M-0075-50, "SE building heat Loads - Emergency," Revision 1, CCN-1, CCN-2, CCN-3

M-0075-074, "ECCS and CCW Pump Rooms Temperature Rise Upon a Loss of Offsite Power," Revision 0, CCN 2, CCN 3

M-0075-052, "Unit 2&3 Trains A and B Emergency Room Cooler Capacity Verification," Revision 0

M-0073-088, "Evaluation of Emergency Chiller Performance," Revision 0

M-0027-029, "CCW/SWC Heat Exchanger Performance Tests," Revision 0

CDCC# 010073, "Sizing of Shutdown Cooling Heat Exchangers," dated September 28, 1970

M-0027-023, "CCW/SWC Heat Exchanger Operability,"

M-0027-028, "CCW Flow to the Shutdown Cooling Heat Exchanger," Revision 0



Action Requests

010300419	050700620	050801517	060201369
050400130	050701607	050801517	061001150
050400554	050801492	051000454	061200450
050700168	050801492	060200163	070110406

Testing and Maintenance Orders

20018094000, "CCW Heat Exchanger Cleaning and Inspection," dated December 30, 2006

SO23-SPE-63 "Emergency Chilled Water System Train A Flow Verification, Attachment I thru 15," dated April 19, 2002

SO23-SPE-62, "Emergency Chilled Water System Train B Flow Verification, Attachments 1 through 14" Dated March 29,2002

SO23-V-3.26, "Shutdown Cooling Heat Exchanger Testing," Tested January 5, 2006

SO23-V-3.26, "Shutdown Cooling Heat Exchanger Testing," Tested October 17, 2006

0701100406      10018317000      10028317000      20008317000      20048317000

Miscellaneous

Category: Secondary Support Systems 1/11/06 - 3/19/07 for the Emergency Chilled Water Maintenance Rule Summary for SSCs in (a)(1) Goal Setting for March 15,2007

SO23-932-15-0, "Technical Manual for Shutdown Cooling Heat Exchanger," May 24,1977

**Section 1R11: Licensed Operator Requalification**

Procedures

SO23-12-1	"Standard Post Trip Actions"	Revision 21
SO23-12-5	"Excess Steam Demand Event"	Revision 21
SO23-12-2	"Reactor Trip Recovery"	Revision 18

Miscellaneous

2007 Week 1 Simulator Requalification Training Summary, Revision 0

**Section 1R12: Maintenance Effectiveness**

Action Requests

061201047      070300407

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

SO23-3-3.51.9	"Containment Penetration Leak Rate Testing - Water Displacement Method Penetrations"	Revision 9
SO23-XV-85	"Boric Acid Corrosion Control Program (BACCP)"	Revision 1

Drawings and Calculations

40177B	"Misc. Ventilating System (Turbine & Diesel Generator Building)"	Revision 14
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Action Requests

061201041	061201265	070100071	070100858	070300033
061200464	061200294	070100375	070200268	

Maintenance Orders

07030123	07030132	07030126
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Miscellaneous

EPRI Boric Acid Corrosion Guidebook	"Managing Boric Acid Corrosion Issues at PWR Power Stations, Publication 1000975"	Revision 1
WCAP-15988-NP	"Generic Guidance to Best Practice 88-05 Boric Acid Inspection Program"	Revision 1
REP A1221060001	"Unit 3 Normal Sump In-leakage Inspection Plan"	

**Section 1R15: Operability Evaluations**

Procedures

SO23-2-17	"Component Cooling Water System Operation"	Revision 20
SO23-6-28	"Changing Switchyard Voltage or MVARs"	Revision 9
SO23-13-4	"Operation During Major System Disturbances"	Revision 9
System Operating Bulletin	"San Onofre Nuclear Generating Station Voltage Schedule"	January 15, 2007
SO123-I-2.4	"Physical Inspection of Batteries"	Revision 6

Drawings and Calculations

40127G	"Component Cooling Water System"	Revision 14
40127F	"Component Cooling Water System"	Revision 33
40127A	"Component Cooling Water System (Pumps)"	Revision 28

Action Requests

060900493	061001379	060901363	061200611	060300413	061101250
051200244	070200758	070100063	061101250	070200583	070200429

**Section 1R17: Permanent Plant Modifications**

Procedures

ECP 051200244-5	"Install Instrument Loop to Display Switchyard Voltage on Plant Computer"	Revision 0
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Action Requests

051200244	061101250
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Maintenance Orders

06121032	06080308	06090592	06120668	06080306	06061456
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**Section 1R19: Postmaintenance Testing**

Procedures

SO23-V-3.4	"Auxiliary Feedwater Pump 2P140 Inservice Test"	Revision 16
SO23-3-3.60.3	"Component Cooling Water and Seismic Makeup Pump Test"	Revision 8
SO123-XX-5	"Work Authorizations"	Revision 15
SO23-3-3.18	"Component Cooling/Saltwater System Tests"	Revision 13
SO23-3-3.60.1	"High Pressure Safety Injection Pump Testing"	Revision 7
SO23-2-4	"Auxiliary Feedwater System Operation"	Revision 21

Action Requests

050601301    061101624    070200054    060300479

Maintenance Orders

05062332000    06120291000    30601258    070321900

**Section 1R22: Surveillance Testing**

Procedures

SO23-2-4	"Auxiliary Feedwater System Operation"	Revision 21
SO23-II-11.172	"Auxiliary Feedwater Pump (Terry) Turbine Governor Calibration"	Revision 2
SO23-3-3.37	"Reactor Coolant System Water Inventory Balance"	Revision 22
SO3-II-11.1B-2	"Surveillance Requirement Unit 3 ESF Train B Channel (Online) Test of Loss of Voltage (LOVS), Degraded Voltage (SDVS, DGVSS) and Sequencing Relays and Circuits"	Revision 5
SO23-3-3.52	"LOVS Load Shedding Circuits Functional Testing"	Revision 3
SO23-3-3.23	"Diesel Generator Monthly Surveillance"	Revision 26

Action Requests

070200054    070300161

Maintenance Orders

06060814000 05100503000 05100504000

**Section 1R23: Temporary Plant Modifications**

Procedures

ECP- 051200026-12	“Temp ECP - Connect Battery B00X to Isolate Battery 2B008”	Revision 0
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**Section 1EP6: Drill Evaluation**

Procedures

07-E-AEV- 03002	2007 Emergency Preparedness Scenario	Revision 0
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**Section 2OS1 and 2OS2: Occupational Radiation Safety (71121.01 and 71121.02)**

Procedures

SO123-VII-20	“Health Physics Program”	Revision 11
SO123-VII-20.4	“ALARA Program”	Revision 3
SO123-VII-20.4.1	“ALARA Design Change Reviews”	Revision 3
SO123-VII-20.4.3	“ALARA Job Reviews”	Revision 4
SO123-VII-20.10	“Radiological Work Planning and Controls”	Revision 10
SO123-VII-20.11	“Access Control Program”	Revision 9
SO123-VII-20.15	“Radiation Protection for Unborn Children”	Revision 1
SO123-GHP-1	“Radiation Protection Program for Unborn Children”	Revision 7

Action Requests

060701066	060901130	061000585	061000608
061000609	061000610	061000615	061000617
061000651	061001170	061001369	061001749
061100791	061101141	061101213	061101585
061200064	061200747	061201447	070100370

Miscellaneous

SONGS Strategic Primary Water Chemistry Plan, Revision 2-1  
SONGS Five Year ALARA Plan - 2006 through 2010  
SONGS Source Term Reduction Strategy Outline, February 20, 2007  
Draft Unit 3 Cycle 14 Refueling Outage ALARA Report

ALARA Post Job Review

U3C14 ICI Thimble Replacement Project  
U3C14 Refueling Maintenance

Radiation Exposure Permits (Job Activities)

REP 200119		
A0808060002	A0808060004	A0808060012
A0808060020	A0808060025	A0925060003
A0925060010	A0925060012	A0925060016
A0927060001	05110803000	

Audits and Self-Assessments

Division Self-Assessment Report for the Third Quarter 2006  
Division Self-Assessment Report for the Fourth Quarter 2006

**Section 4OA2: Identification and Resolution of Problems**

Action Requests

061200640

## LIST OF ACRONYMS

ALARA	As Low As Is Reasonably Achievable
AOI	Abnormal Operating Instruction
AR	Action Request
CAP	Corrective Action Program
CE	Combustion Engineering
CFR	<i>Code of Federal Regulations</i>
ISFSI	Independent Spent Fuel Storage Installation
LER	Licensee Event Report
MCC	Motor Control Center
NCV	Non-cited Violation
REP	Radiation Exposure Permit
SFP	Spent Fuel Pool
SSC	Structure, System, and Component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report