



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
612 EAST LAMAR BLVD, SUITE 400  
ARLINGTON, TEXAS 76011-4125

May 5, 2011

EA-10-246

Mr. Peter Dietrich  
Senior Vice President and  
Chief Nuclear Officer  
Southern California Edison Company  
San Onofre Nuclear Generating Station  
P.O. Box 128  
San Clemente, CA 92674-0128

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INTEGRATED  
INSPECTION REPORT 05000361/2011002 and 05000362/2011002

Dear Mr. Dietrich:

On March 24, 2011, 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 inspection report documents the inspection findings, which were discussed on April 19, 2011, with Mr. Tom McCool, Plant Manager, and other members of your staff.

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

Based on the results of this inspection, the NRC has identified three issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that violations are associated with two of these issues. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. 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 noncited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the violations or the significance of the noncited violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the facility. In addition, if you disagree with the crosscutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date

Southern California Edison Company - 2 -

of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the 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 you choose to provide one will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Sincerely,

**/RA/**

Ryan E. Lantz, Chief  
Project Branch D  
Division of Reactor Projects

Docket Nos. 50-361, 50-362

License Nos. NPF-10, NPF-15

Enclosure:  
NRC Inspection Report 05000361/2011002 and 05000362/2011002  
w/Attachment: Supplemental Information

cc w/Enclosure:

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 50-361, 50-362

License: NPF-10, NPF-15

Report: 05000361/2011002 and 05000362/2011002

Licensee: Southern California Edison Co. (SCE)

Facility: San Onofre Nuclear Generating Station, Units 2 and 3

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

Dates: January 1, 2011 through March 24, 2011

Inspectors: P. Elkmann, Senior Emergency Preparedness Inspector  
S. Garchow, Senior Operations Engineer  
G. Guerra, Emergency Preparedness Inspector  
B. Hagar, Senior Project Engineer  
Z. Hollcraft, Resident Inspector  
R. Kellar, Senior Enforcement Specialist  
C. Osterholtz, Senior Operations Engineer  
J. Reynoso, Acting Senior Resident Inspector  
G. Tutak, Resident Inspector  
G. Warnick, Senior Resident Inspector  
M. Young, Reactor Inspector

Approved By: Ryan E. Lantz, Chief, Project Branch D  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000361/2011002, 05000362/2011002; 01/01/2011 – 03/24/2011; San Onofre Nuclear Generating Station, Units 2 and 3, Integrated Resident and Regional Report; Adverse Weather, Operability Evaluation

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. One Green finding and two Green noncited violations of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

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

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding for the failure of license personnel to follow procedure SO23-XX-29.1, "Seasonal Readiness." Specifically, licensee personnel failed to implement, as seasonal weather conditions dictated, the appropriate preventative maintenance program for roof drains associated with the emergency diesel generator buildings. As a result of the recurring degraded and clogged roof drains, rainwater was allowed to accumulate on the roof which resulted in water intrusion into the Unit 2 building and over energized electrical equipment. A plastic tent was installed by maintenance personnel to protect the electrical equipment. Based on the inspectors' concerns, licensee personnel completed a walkdown of the other emergency diesel building to identify whether similar rainwater intrusion was occurring. Maintenance personnel corrected the condition by removing debris which had clogged the Unit 2 roof drains. This issue was entered into the licensee's corrective action program as Nuclear Notifications NN 201393414 and NN 201174566.

The performance deficiency was more than minor and is therefore a finding because it was associated with the protection against external events attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because it did not represent a loss of system safety function, nor actual loss of safety function of a single train, and it did not screen as potentially risk significant due to flooding or severe weather because the potentially degraded equipment was not specifically

designed to mitigate flooding or severe weather nor would it contribute to external event initiated accident sequences. The finding was determined to have a crosscutting aspect in the area of human performance associated with the component of work control because the licensee did not plan and coordinate work activities consistent with nuclear safety. Specifically, the licensee did not plan or implement preventative maintenance for roof drains to support long-term equipment reliability by limiting reliance on manual actions, such as plastic tents to protect plant equipment during the rain events. Maintenance scheduling was more reactive than preventative [H.3(b)](Section 1R01).

- Green. The Inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawing," for the failure of operations personnel to follow the operability determination procedure and establish compensatory measures associated with an emergency diesel generator. Specifically, on February 23, 2011, operations personnel failed to establish temporary procedures as compensatory measures associated with an emergency diesel generator when an immersion heater was removed from service. On March 18, interim corrective actions were taken that included operator required reading (priority 2 reading) to ensure that on-shift licensed operators use conservative decision making regarding compensatory measures. Planned corrective actions will be part of a root cause evaluation. These issues have been entered into the licensee's corrective action program as Nuclear Notifications NNs 201365616, 201348283 and 201378245.

The performance deficiency was more than minor and is therefore a finding because it was associated with the Mitigating Systems Cornerstone attribute of procedure quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding is determined to have very low safety significance because it did not result in the loss of safety function of any technical specification required equipment. The finding was determined to have a crosscutting aspect in the area of human performance associated with the decision-making component because the licensee failed to verify the validity of underlying assumptions for operability decision-making [H.1(b)](Section 1R15).

- Green. The inspectors identified a noncited violation of Technical Specification 3.5.4, "Refueling Water Storage Tank," for the failure of licensee personnel to comply with the technical specification. Specifically, the licensee did not enter the appropriate technical specification for an inoperable refueling water storage tank when it was potentially not capable of performing its specified safety function while aligned to the non-seismic spent fuel pool cooling and purification system for cleanup. On October 8, 2010, operations personnel placed administrative controls on system isolation valves to prevent the refueling water storage tank from being aligned to non-seismic systems. This issue was entered into the licensee's

corrective action program as Nuclear Notifications NN 201133936 and NN 201135761.

The performance deficiency was determined to be more than minor and is therefore a finding because it is associated with the design control attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the NRC Inspection Manual 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that a Phase 2 evaluation was required because the finding involved the potential loss of a safety function. A Phase 2 significance determination was performed using the pre-solved worksheet from the "Risk Informed Inspection Notebook for the San Onofre Nuclear Generating Station," Revision 2.01a. Assuming both trains of high pressure injection were inoperable, the finding was Yellow, which warranted further review. Therefore, the analyst performed a bounding Phase 3 significance determination. Based on the licensee's PRA calculation, consultation with licensee PRA personnel, and an understanding of the bounding and conservative assumptions incorporated in the analysis, the analyst determined that the licensee's delta-CDF result of  $7.6E-7/\text{yr}$  was clearly bounding, that the large early release frequency was negligible, and that the significance of the issue was very low. Since the apparent root cause determined the cause was due to weaknesses in the design change processes early in plant operations (between 1982 and 1995), and the licensee's program has improved with respect to performing design changes, the inspectors determined that this finding was not reflective of current performance and therefore did not have a crosscutting aspect (Section 1R15).

**B. Licensee-Identified Violations**

Violations of very low safety significance or severity level IV that were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 2 began the inspection period at essentially full power. On January 14, 2011, power was reduced to 89 percent due to a heavy influx of seaweed into the circulating water system. The plant was returned to full power on January 15, 2011, and remained there for the duration of the inspection period.

Unit 3 began the inspection period in a scheduled outage (U3C16) for refueling and steam generator replacement. On February 18, 2011, the Unit 3 main turbine generator output breakers were synchronized and closed. The plant was returned to full power on February 21, 2011, and remained there for the duration of the inspection period.

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### Readiness to Cope with External Flooding

##### a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The inspectors conducted walk downs of the emergency diesel generator buildings during the winter rainy season in December 2010 and January 2011. The inspectors completed reviews of preventive maintenance activities to evaluate licensee readiness to cope with heavy rains. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external events. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains, and determined that barriers required to mitigate flooding were in place and operable. Additionally, the inspectors evaluated the protected area to identify any modification to the site that would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one external flooding sample as defined in Inspection Procedure 71111.01-05.



b. Findings

Introduction. The inspectors identified a finding of very low safety significance for the failure of license personnel to follow procedure SO23-XX-29.1, "Seasonal Readiness", Revision 1. Specifically, licensee personnel failed to implement, as seasonal weather conditions dictated, the appropriate preventative maintenance program for roof drains associated with safety-related emergency diesel generator buildings. As a result of recurring degraded and clogged roof drains, rainwater was allowed to accumulate on the roof which resulted in water intrusion into the Unit 2 building and over energized electrical equipment.

Description. On December 21, 2010, while on a plant tour and near the outside of Unit 2 emergency diesel building, the inspectors heard an alarm. The inspectors discovered the alarm was due to high water level in the Unit 2 diesel building sump. Because the rains were heavy at the time the inspectors began a survey of the outside perimeter of Unit 2 diesel building. The inspectors noted some of the roof drain scuppers were obstructed. Because of the heavy rains, which had been occurring that morning and the previous week, the inspectors suspected the heavy rains were causing the high water level in the diesel building sump. The inspectors entered the Unit 2 emergency diesel building to perform an internal survey of the building. The inspectors found rainwater entering the Train A compartment of the diesel building, and pouring over non-safety related 480V motor control center 2BDX.

The inspectors noted that a large protective plastic tent was in position to help divert rainwater away from the motor control center enclosure and into the sump. The inspectors called the control room by telephone and informed the shift manager of the diesel building sump alarm. The inspectors also asked about the temporary protective tent covering the motor control center. The inspectors were informed that this condition had been documented in the corrective action program. Nuclear Notification NN 201250862 was initiated on December 19, 2010, by operations personnel who had observed rainwater collection on top of the motor control center 2BDX. The nuclear notification also noted this same condition had been observed in December 2008. As a result of the inspectors' concerns regarding the potential exposure of energized components to rainwater, maintenance and operations personnel performed an inspection of the Unit 2 and 3 emergency diesel buildings. The results of the walk downs are documented in Nuclear Notification NN 201253497.

Between January and February 2011, the inspectors discussed the planning and implementation of maintenance programs associated with the degraded roof drains with the licensee. The inspectors were informed that the Unit 2 emergency generator diesel building roof drains had been identified as degraded in October 2010 by engineering personnel performing a maintenance rule inspection and documented in Nuclear Notification NN 201174566. Because of scheduling issues, maintenance personnel did not inspect and clean the emergency diesel generator roof drains until January 2011. During this activity, maintenance personnel removed over two hundred pounds of debris from the clogged drains.

The inspectors noted Procedure SO23-XX-29.1, "Seasonal Readiness," Revision 1, Section 6.3.2.1, required, in part, that "challenge board meetings SHALL be completed by August 1<sup>st</sup> for winter reviews." The licensee informed the inspectors that challenge board meetings were not conducted in 2010. Furthermore, Attachment 1, "Winter Readiness," required, in part, that maintenance personnel "operationally check existing roof drains." Maintenance personnel had developed a repetitive maintenance program including operational checks of the roof drains, but these actions were not planned and implemented in 2010. The inspectors concluded the required seasonal readiness reviews and preparations were not implemented in 2010. As a result of the inspectors' prompting, on February 14, 2011, Nuclear Notification NN 201335914 was written to document the licensee's failure to review seasonal readiness.

The inspectors also identified internal operating experience from an earlier site incident, involving a clogged protected area building roof drain. The cause evaluation documented in apparent cause evaluation ACE 200697485, "Missed Opportunity to Prevent Water Intrusion into Load Center Panel 3B11," described a catastrophic failure of a step-down transformer located in the Unit 3 turbine building. Specifically, in December 2009, a Unit 3 turbine building drain, which had a long history of being degraded and clogged, allowed rainwater, over a period of time, to enter into a non-safety related load center. The resulting rainwater intrusion and exposure caused extensive fire damage to the cabinet and electrical damage to the transformers. Ultimately, this event resulted in a functional failure of the bus and extensive repairs. As a result of the licensee apparent cause evaluation, several corrective actions were initiated to prevent building roof drains from impacting electrical equipment housed inside protected area buildings. One of the corrective actions included development and implementation of Procedure SO23-XX-29.1, "Seasonal Readiness", to prepare the site for the winter weather months and to consider actions necessary to prevent water intrusion into plant components and spaces. Specifically, these corrective actions included a seasonal review or challenge board meetings and implementation of a preventative maintenance program to perform operational testing of roof drains for buildings located inside the protected area, prior to the 2010 rainy season.

Analysis. The failure of licensee personnel to follow the station procedure for seasonal readiness was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using the NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because it did not represent a loss of system safety function, nor actual loss of safety function of a single train, and it did not screen as potentially risk significant due to flooding or severe weather because the potentially degraded equipment was not specifically designed to mitigate flooding or severe weather nor would it contribute to external event initiated accident sequences. This finding was determined to have a crosscutting aspect in the area of human performance, associated with the component of work control, because

licensee did not plan and coordinate work activities, consistent with nuclear safety. Specifically, the licensee did not plan or implement preventative maintenance for roof drains to support long-term equipment reliability by limiting reliance on manual actions, such as plastic tents to protect plant equipment during rain events. Maintenance scheduling was more reactive than preventative [H.3(b)].

Enforcement. No violation of regulatory requirements occurred. The licensee entered the finding into the corrective action program as Nuclear Notifications NNs 201393414 and 201174566 to evaluate the issue and identify corrective actions. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as FIN 05000361/2011002-01, "Failure to Follow Station Procedures for Seasonal Readiness."

#### **1R04 Equipment Alignments (71111.04)**

##### **.1 Partial Walkdown**

###### **a. Inspection Scope**

The inspectors performed partial system walkdowns of the following risk-significant systems:

- January 26, 2011, Unit 3, containment integrated leakage rate test valve alignment
- March 3, 2011, Unit 2, train B emergency diesel generator system
- March 16, 2011, Units 2 and 3, train B emergency chilled water system

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On March 2, 2011, the inspectors performed a complete system alignment inspection of the Unit 3 containment spray system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- January 19, 2011, Units 2 and 3, 85 foot auxiliary control building and 85 foot auxiliary radwaste building
- January 19, 2011, Unit 2, auxiliary feedwater pump room, refueling water and condensate storage tanks

- February 9, 2011, Unit 2, auxiliary control and turbine building at elevation 30 foot
- February 12-14, 2011, Unit 3, containment building elevation fire protection walkdown 15 foot to 80 foot elevation
- February 23, 2011, Unit 3, safety equipment building rooms 6-14 and 16-26

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

**1R11 Licensed Operator Qualification Program (71111.11)**

a. Inspection Scope

On February 14, 2011, inspectors observed a crew of control room licensed operators perform just in time training for reactor startup following refueling and on March 14, 2011, inspectors observed a crew of control room licensed operators in the plant's simulator during licensed operator requalification examinations. The inspector's objective was to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance

- Crew's clarity and formality of communications
- Crew's ability to take timely, conservative actions
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two quarterly licensed-operator requalification program samples as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- February 16-17, 2011, Unit 3, turbine driven auxiliary feedwater pump electronic governor failure
- March 1-3, 2011, Units 2 and 3, emergency diesel generator building roof drains preventative maintenance
- March 23, 2011, Unit 3, chemical and volume control system

The inspectors reviewed events where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices

- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- January 18, 2011, Unit 2, 6.9 kV reserve transformer breaker interlock modification
- March 2, 2011, Unit 2, train A emergency diesel generator planned maintenance outage

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

**1R15 Operability Evaluations (71111.15)**

a. Inspection Scope

The inspectors reviewed the following issues:

- September 29, 2010 through January 25, 2011, Units 2 and 3, refueling water storage tank (RWST) alignment to non-seismic piping while in cleanup operations
- November 3, 2010 through January 10, 2011, Unit 3, erected scaffolding with lead shielding installed near safety-related equipment
- February 1, 2010, Units 2 and 3, fire tank auto makeup failure
- February 7-8, 2011, Units 2 and 3, evaluation of conductor seal assembly insulation to steam generator differential pressure transmitters
- February 10, 2011, Unit 3, shutdown cooling suction isolation valve minimum seat leakage test failure
- February 22, 2011, Unit 2, auxiliary feed water system vent cap leak in containment
- February 23-24, 2011, Unit 2, train B emergency diesel generator compensatory measures to maintain lube oil temperature



- March 8-10, 2011, Unit 3, invalid inservice testing surveillances of both trains of containment spray and low pressure safety injection pumps due to improperly calibrated meter

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of eight operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04.

b. Findings

1. Inadequate Operability Determination

Introduction. The Inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, for the failure of operations personnel to follow the operability determination procedure and establish compensatory measures associated with an emergency diesel generator when an immersion heater was removed from service.

Description. On February 23, 2011, one of two immersion heaters on Unit 2 train B emergency diesel generator failed to de-energize as expected during the semi-annual safety injection actuation system sub group relay (K-401B) surveillance. Subsequently, operations personnel declared the emergency diesel generator inoperable and entered Technical Specification 3.8.1 limiting condition for operation action. Preliminary troubleshooting determined immersion heater E-657 relay had failed closed which prevented the breaker from opening and resulted in a non-qualified load attached to the safety related electrical bus during a safety injection actuation signal. Operations personnel de-energized immersion heater E-657 by opening the associated power supply breaker 2BH23. Since the non-qualified load was removed from the bus, operations personnel declared the emergency diesel generator operable and exited the technical specification limiting condition for operation action. Nuclear Notification NN 201344602 was initiated to document the relay failure and perform an immediate operability determination for the degraded immersion heater condition. The immersion

heaters maintain the lube oil temperature in a required range to ensure the emergency diesel generator is capable of performing its specified safety function when required.

The immediate operability determination concluded that emergency diesel generator operability could be maintained per Procedure SO23-3-3.23, "Diesel Generator Monthly and Semi-Annual Testing," Revision 51, by monitoring lube oil temperature and periodically running the diesel to ensure lube oil temperature is maintained above 85°F. Based on this information, operations personnel implemented actions to monitor the lube oil temperature and manually start the emergency diesel generator when lube oil temperature approached the lower limit.

On February 24, 2011, the emergency diesel lube oil temperatures approached the lower limit of 85°F. The operators manually started the emergency diesel generator and ran the engines in idle speed for about an hour to warm the lube oil and maintain the lube oil within normal range. Afterwards, maintenance completed repairs to the relay and the immersion heater was returned to service.

The inspectors reviewed the immediate operability determination and questioned the operability conclusions which were based on operator actions identified in Procedure SO23-3-3.23. In particular, the inspectors were concerned that the actions necessary to maintain the emergency diesel generator in a degraded but operable condition constituted compensatory measures as defined in Procedure SO123-XV-52, "Operability Determination and Functionality Assessments," Revision 18. Operations personnel informed the inspectors that the operator actions were not considered compensatory measures because the actions were contained in existing procedures.

The inspectors reviewed Procedure SO23-3-3.23, and identified steps to monitor lube oil temperatures to determine engine operability; however, no steps were identified to provide guidance for periodically running the emergency diesel generator to ensure lube oil temperature was maintained in the required range. The inspectors noted that Procedure SO123-XV-52, described a compensatory measure as, "An interim action to maintain, enhance or restore Operability of a SSC until final corrective action is complete." Further, Procedure SO123-XV-52, Attachment 9, required, in part, that a 10 CFR 50.59 review be conducted for temporary procedure changes. On February 25, 2011, the inspectors communicated their concerns regarding the failure to establish compensatory measures as required in Procedure SO123-XV-52. Nuclear Notification NN 201348283 was initiated to document the inspectors' concerns.

Between February 25 and March 9, 2011, the inspectors had numerous discussions with the licensee regarding the requirements for using compensatory measures to maintain operability of safety-related equipment. Based on the discussions, on March 9, 2011, operations personnel agreed procedural guidance was not adequate to perform the operator actions identified in the immediate operability determination. On March 18, 2011, interim corrective actions were taken which included operator required reading (priority 2 reading) to ensure that on-shift licensed operators use conservative decision making regarding compensatory measures. Planned corrective actions will be part of the root cause evaluation NN 201378245. These issues have been entered into

the licensee's corrective action program as Nuclear Notifications NNs 201365616, 201348283 and 201378245.

Analysis. The failure of operations personnel to follow procedures to establish compensatory measures for maintaining operability of safety-related equipment was a performance deficiency. The performance deficiency is more than minor because it was associated with the Mitigating Systems Cornerstone attribute of procedure quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the NRC Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because it did not result in the loss of safety function of any technical specification required equipment. This finding was determined to have a crosscutting aspect in the area of human performance associated with the decision-making component because the licensee failed to verify the validity of underlying assumptions for operability decision-making [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Procedure SO123-XV-52, "Operability Determination and Functionality Assessments," Revision 18, contained the requirements for performing operability determinations and establishing compensatory measures as interim actions to maintain, enhance or restore operability of safety-related equipment until final corrective action are completed. Contrary to the above, on February 23, 2011, operations personnel failed to follow Procedure SO123-XV-52. Specifically, operations personnel failed to established temporary procedures as compensatory measures associated with an emergency diesel generator when an immersion heater was removed from service. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Nuclear Notifications NNs 201365616, 201348283, and 201378245, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000361/2011002-02, "Failure to Follow Procedures to Establish Compensatory Measures."

## 2. Failure to Comply with Refueling Water Storage Tank Technical Specifications

Introduction. The inspectors identified a Green noncited violation of Technical Specification 3.5.4, "Refueling Water Storage Tank," for the failure of licensee personnel to comply with the technical specification. Specifically, the licensee did not enter the appropriate technical specification for an inoperable RWST when it was potentially not capable of performing its specified safety function while aligned to the non-seismic spent fuel pool cooling and purification (SFPCP) system for cleanup.

Description. On September 29, 2010, the inspectors were provided industry operating experience on practices that could adversely impact seismic design basis, such as the

alignment of non-seismic piping during cleanup operations to the safety-related RWST. The inspectors noted similarities to operating practices at San Onofre and questioned the licensee about the basis of the safety evaluation for cleanup operations of the RWST in Modes 1 through 4. Based on the inspectors' questions, engineering personnel initiated Nuclear Notifications NNs 201133936 and 201135761 to evaluate the inspectors' concerns. On October 8, 2010, operations personnel placed administrative controls on system isolation valves to prevent the RWST from being aligned to non-seismic systems.

On October 13, 2010, the licensee's engineering evaluation determined that since 1982, the safety-related seismic qualified RWST was periodically aligned to the nonsafety-related non-seismic SFPCP system piping in Modes 1 through 4. This alignment could result in a loss of the RWST safety function. The SFPCP non-seismic piping is isolated from the RWST by normally closed manually-operated isolation valves. However, during periods when RWST cleanup was in operation these normally closed isolation valves were opened. As a result, the seismic qualification of the RWST was adversely impacted and the safety analysis assumptions used in the design basis were invalid. Consequently, the RWST was potentially not capable of performing its specified safety function following a design basis event and therefore was inoperable. On December 10, 2010, the licensee reported this condition in Licensee Event Report 2010-005, "Refueling Water Storage Tank Alignment to Non-Seismic Piping Results in Potential Loss of Safety Function." The licensee's apparent cause evaluation determined that, during the time period from 1982 through 1995, there were weaknesses in the processes for revising procedures and drawings and performing design changes. The evaluation also noted there were examples of inadequate understanding, assessment, and documentation of the impact of the SFPCP system alignment changes on licensing and design basis requirements.

Analysis. The failure of the licensee to enter the appropriate technical specification or complete the associated required action prior to the appropriate completion time when the RWST was inoperable was a performance deficiency. The performance deficiency was more than minor and is therefore a finding because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The resident inspector performed the initial significance determination for the non-seismic piping concern. During a seismic event, draining of the RWST could render safety injection inoperable. The inspector used the NRC Inspection Manual 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." The finding screened to a Phase 2 significance determination because it involved a potential loss of safety function. A Region IV senior reactor analyst performed a Phase 2 significance determination using the pre-solved worksheet from the "Risk Informed Inspection Notebook for the San Onofre Nuclear Generating Station," Revision 2.01a. Assuming both trains of high pressure injection were inoperable, the finding was Yellow, which warranted further review. Therefore, the analyst performed a bounding Phase 3 significance determination.

The analyst determined that the change in risk was dependent on a seismic event of sufficient strength to cause a failure of the spent fuel pool ion exchanger as well as a loss of coolant accident that would deplete the contents of the reactor coolant system. This set of circumstances would result in the need to pump borated water from the RWST to the reactor coolant system while at the same time diverting inventory to an unrecoverable location. The analyst reviewed Licensee PRA Report PRA-10-013 (December 2010) and discussed the assumptions and results with licensee PRA personnel. This was done in lieu of an independent evaluation using the San Onofre SPAR model because several aspects of this scenario are not well modeled by the SPAR for which the licensee PRA is much more adept to evaluate. The result of Report PRA-10-103 was a delta-CDF of  $7.6E-7$ /yr. Several conservatisms were evident, including (1) the exposure time of 41.2 days in one year was the longest time in the subject configuration for either unit over the past 5 years, whereas 23 days/year was average, (2) credit was not applied for securing the residual heat removal pump following the seismic event, which would lessen the diversion flow rate, (3) ATWS sequences were included even though the RWST would retain enough inventory for reactivity control, and (4) the failure to discover and correct the problem by operators using a post-seismic walkdown procedure was given a bounding value of 0.5, whereas it was confirmed by the resident inspector that within the timeframe required it was much more likely that the operator would be successful to identify and terminate the flow diversion. The analyst judged that a full-scope human reliability analysis would likely set this failure probability at less than 0.1. The large early release fraction of the core damage result was less than 0.1; therefore the delta-CDF result controlled the significance. Based on these facts, the analyst determined that the significance of the finding was very low. The inspectors did not identify a crosscutting aspect with this finding because this was a performance issue which occurred in an early period of plant operations (between 1982 and 1995) and therefore is not reflective of current performance.

Enforcement. Technical Specifications 3.5.4, "Refueling Water Storage Tank," limiting condition for operation requires that the RWST shall be operable in Modes 1,2,3 and 4. If the RWST is inoperable for greater than 1 hour, the required action is to place the unit in Mode 3 within 6 hours and Mode 5 within 36 hours. Contrary to the required action statement, between 1982 and October 8, 2010, the RWST should have been declared inoperable during RWST cleanup operations due to being potentially incapable of performing its specified safety function while aligned to the non-seismic spent fuel pool cooling and purification system. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Nuclear Notifications NNs 201133936 and 201135761, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000361; 05000362/2011002-03, "Failure to Comply with Technical Specifications."

## **1R18 Plant Modifications (71111.18)**

### **.1 Temporary Modifications**

#### **a. Inspection Scope**

To verify that the safety functions of important safety systems were not degraded, the inspectors reviewed the temporary modification identified as excore and wide range channel 2, 3JE0005-2 input removal for the Unit 3, Channel 2 startup and wide range nuclear power instrument (NECP 800631897).

The inspectors reviewed the temporary modification and the associated safety-evaluation screening against the system design bases documentation, including the UFSAR and the technical specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers.

These activities constitute completion of one sample for temporary plant modifications as defined in Inspection Procedure 71111.18-05.

#### **b. Findings**

No findings were identified.

### **.2 Permanent Modifications**

The inspectors reviewed key affected parameters associated with energy needs, materials, replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flow paths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the permanent modifications listed below.

- November 7, 2010 - January 12, 2011, Unit 3, emergency core cooling system schedule 10 piping replacement
- November 23, 2010 - January 18, 2011, Unit 2, letdown temperature probe

The inspectors verified that 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; postmodification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur; systems, structures and components' performance characteristics still meet the design basis; the modification design assumptions were

appropriate; the modification test acceptance criteria will be met; and licensee personnel identified and implemented appropriate corrective actions associated with permanent plant modifications. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two samples for permanent plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings were identified.

**1R19 Postmaintenance Testing (71111.19)**

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- January 25 - 28, 2011, Unit 3, containment integrated leakage rate test
- January 28, 2011, Unit 3, motor driven auxiliary feedwater pump 3MP-504 post maintenance test
- February 1-3, 2011, Unit 3, train A component cooling water surge tank back up nitrogen pressure regulator PCV 6414
- February 2-6, 2011, Unit 3, response time testing of reactor coolant system primary resistive thermal device element 3TE9178, after steam generator replacement
- February 2-6, 2011, Unit 3, steam generator wide range level transmitter testing and calibration after steam generator replacement
- March 8, 2011, Unit 2, train B emergency diesel generator post maintenance test
- March 22, 2011, Unit 3, salt water cooling valve 3HV6495 post maintenance test

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of seven postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

**1R20 Refueling and Other Outage Activities (71111.20)**

a. Inspection Scope

The inspectors completed a review of the outage related activities for the Unit 3 refueling outage (U3R16) and steam generator replacement. The outage was completed on February 18, 2011. The inspectors performed the review to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the refueling outage, the inspectors monitored licensee controls over the outage activities listed below. Portions of this inspection that were charged to this inspection report were documented in NRC Inspection Report 05000362/2010009.

- Configuration management, including maintenance of defense in depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities
- Monitoring of decay heat removal processes, systems, and components



- Verification that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss
- Controls over activities that could affect reactivity
- Maintenance of containment penetrations as required by the technical specifications
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the containment to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing
- Licensee identification and resolution of problems related to refueling outage activities

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one refueling outage and other outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings were identified.

**1R22 Surveillance Testing (71111.22)**

.1 Routine Surveillance Activities

a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant

- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

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

- January 11, 2011, Unit 3, train A high pressure safety injection fill and vent
- February 9, 2011, Unit 3, temperature over pressurization relief isolation valves (HV9337 and HV9377) inservice leak test
- February 23, 2011, Unit 3, auxiliary feedwater pump MP141 inservice surveillance testing
- March 15, 2011, Unit 3, train A emergency diesel generator semi-annual surveillance

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

.2 Surveillance Testing associated with Temporary Instruction (TI) 2515/177, "Managing gas accumulation in emergency core cooling, decay heat removal, and containment spray systems."

a. Inspection Scope

During review of Procedure SO23-3-3.8, "Safety Injection Monthly Tests - HPSI Charged Piping Monthly Verification," Revision 26, inspectors verified that the procedure was acceptable for (1) testing the Unit 2 high pressure safety injection, Unit 2 low pressure safety injection, and Unit 3 high pressure safety injection with power operation, shutdown operation, maintenance, and subject system modifications; (2) void determination and elimination methods; and (3) post-event evaluation.

Inspectors reviewed procedures used for conducting surveillances and determination of void volumes to ensure that the void criteria was satisfied and would be reasonably ensured to be satisfied until the next scheduled void surveillance (TI 2515/177, Section 04.03.a). Inspectors also reviewed procedures used for filling and venting following conditions which may have introduced voids into the subject systems to verify that the procedures acceptably addressed testing for such voids and provided acceptable processes for their reduction or elimination (TI 2515/177, Section 04.03.b). Specifically, the inspectors verified that:

- Gas intrusion prevention, refill, venting, monitoring, trending, evaluation, and void correction activities were acceptably controlled by approved operating procedures (TI 2515/177, Section 04.03.c.1).
- The procedure ensured the system did not contain voids that would jeopardize operability (TI 2515/177, Section 04.03.c.2).
- The procedure established that void criteria were satisfied and would be reasonably ensured to be satisfied until the next scheduled void surveillance (TI 2515/177, Section 04.03.c.3).
- The licensee entered changes into the corrective action program as needed to ensure acceptable response to issues. In addition, the inspectors confirmed that a clear schedule for completion was included for corrective action program entries that were not yet completed (TI 2515/177, Section 04.03.c.5).
- Procedure included independent verification that critical steps were completed (TI 2515/177, Section 04.03.c.6).

The inspectors verified the following with respect to surveillance and void detection:

- The specified surveillance frequency was consistent with technical specification surveillance requirements (TI 2515/177, Section 04.03.d.1).
- The surveillance frequencies were stated or, when conducted more often than required by technical specifications, the process for their determination was described (TI 2515/177, Section 04.03.d.2).
- The surveillance method was acceptably established to achieve the needed accuracy (TI 2515/177, Section 04.03.d.3).
- The surveillance procedure included up-to-date acceptance criteria (TI 2515/177, Section 04.03.d.4).
- The procedure included effective follow-up actions when acceptance criteria were exceeded or when trending indicated that criteria may have been approached before the next scheduled surveillance (TI 2515/177, Section 04.03.d.5).
- Venting procedure and practice utilized criteria such as adequate venting durations and observing a steady stream of water (TI 2515/177, Section 04.03.d.7).
- An effective sequencing of void removal steps was followed to ensure that gas did not move into previously filled system volumes (TI 2515/177, Section 04.03.d.8).
- Qualitative void assessment methods included expectations that the void would be significantly less than that allowed by acceptance criteria (TI 2515/177, Section 04.03.d.9).
- Venting results were trended periodically to confirm that the systems were sufficiently full of water and that the venting frequencies were adequate. The inspectors also verified that records on the quantity of gas at each location were maintained and trended as a means of preemptively identifying degrading gas accumulations (TI 2515/177, Section 04.03.d.10).
- Surveillances were conducted at any location where a void may have formed, including high points, dead legs, and locations under closed valves in vertical pipes (TI 2515/177, Section 04.03.d.11).
- The licensee ensured that systems were not pre-conditioned by other procedures that may cause a system to be filled, such as by testing, prior to the void surveillance (TI 2515/177, Section 04.03.d.12).

The inspectors verified the following with respect to filling and venting:

- Revisions to the fill and vent procedure to address new vents or different venting sequences were acceptably accomplished (TI 2515/177, Section 04.03.e.1).

- The fill and vent procedure provided instructions to modify restoration guidance to address changes in maintenance work scope or to reflect different boundaries from those assumed in the procedure (TI 2515/177, Section 04.03.e.2). The inspectors verified the following with respect to void control:
  - Void removal methods were acceptably addressed by approved procedures (TI 2515/177, Section 04.03.f.1).

Those documents reviewed by the inspectors are listed in the attachment to this report.

This inspection effort counts towards the completion of TI 2515/177 which will be closed in a later inspection report.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

**1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)**

a. Inspection Scope

1. The inspectors performed in-office and on-site reviews of the San Onofre Nuclear Generating Station emergency action level scheme approved by the NRC in a Safety Evaluation Report dated August 18, 1980, and the licensee's emergency action level scheme described in site Procedure SO123-VIII-1, "Recognition and Classification of Emergencies," Revision 30, dated March 31, 2010. The inspectors also reviewed a licensee gap analysis completed September 19, 2010, and a licensee assessment of the Revision 30 emergency action level scheme using NUMARC/NESP-007, "Methodology for the Development of Emergency Action Levels," Revision 2, completed October 10, 2010.

Procedure SO123-VIII-1, "Recognition and Classification of Emergencies," Revision 30, was compared to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the standards in 10 CFR 50.47(b) to determine if licensee changes to their emergency action level scheme made between 1995 and March 2010, adequately implemented the requirements of 10 CFR 50.54(q).

2. The inspector performed an in-office review of the San Onofre Nuclear Generating Station emergency plan implementing procedure SO23-VIII-1, "Recognition and Classification of Emergencies," Revisions 32 and 33, and the Emergency Action Level Technical Bases, Revisions 0 and 1.
  - SO23-VIII-1 Revision 32 and associated Technical Bases Revision 0 revised the basis for the licensee's emergency action level scheme from NUREG-0654,

“Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” Revision 1, Appendix 1, to Nuclear Energy Institute Report 99-01, “Methodology for Development of Emergency Action Levels,” Revision 5. The NRC approved the licensee’s implementation of an NEI 99-01 Revision 5 emergency action level scheme in a Safety Evaluation Report, dated March 22, 2010, (ML100620983) and,

- SO23-VIII-1 Revision 33 and associated Technical Bases Revision 1 made format changes to relocate explanatory notes within the emergency action level reference matrices

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, Revision 1, to Nuclear Energy Institute Report 99-01, Revision 5, and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q). This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

3. The inspector performed an in-office review of Procedures SO123-VIII-1, “Recognition and Classification of Emergencies,” Revision 34, and ESPD-1, “Emergency Action Level Technical Bases,” Revision 2. These revisions,

- Clarified the use of effluent monitor 2/3RE7808G in classifying events as described on Table A-1;
- Clarified the use of effluent monitor 2/3RE7808G in classifying events in basis document section 5.4.1 and in the individual bases for emergency action levels AU1.1 and AA1.1;
- Added a note to emergency action levels CA3.1 and SS1.1, directing reference to the Technical Basis document if any electrical load necessary to remove decay heat or provide makeup of reactor coolant becomes unavailable; and,
- Revised Table H-1, emergency action levels HU2.1, HA1.2, HA1.4, HA1.5, HA1.6, HA2.1, and HA3.1, and their associated technical bases, to clarify that some equipment required for safe shutdown of the plant is located outside of plant ‘vital areas’ as defined in the site Security Plan.

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” Revision 1, to NEI Report 99-01, “Methodology for Development of Emergency Action Levels,” Revision 5, and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q). These reviews were not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of five samples as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

**1EP6 Drill Evaluation (71114.06)**

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on March 8, 2011, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in both the Technical Support Center and Emergency Operations Facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

**4OA1 Performance Indicator Verification (71151)**

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the 4th Quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams per 7000 critical hours performance indicator Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports for the period of January 1, 2010, through December 31, 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two unplanned scrams per 7000 critical hours samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE02)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams with complications performance indicator Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports for the period of January 1, 2010, through December 31, 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two unplanned scrams with complications samples as defined in Inspection Procedure 71151-05.



b. Findings

No findings were identified.

4. Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned power changes per 7000 critical hours performance indicator Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports, and NRC integrated inspection reports for the period of January 1, 2010, through December 31, 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two unplanned transients per 7000 critical hours samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection**

**40A2 Identification and Resolution of Problems (71152)**

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness

of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of August 2010 through January 2011 although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with

a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting the issue listed below. 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.

January 14, 2011, Safety Conscious Work Environment Concerns, as documented in Nuclear Notification NN 200709479, Revision 1.

These activities constitute completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

**40A3 Event Follow-up (71153)**

Event Report Review

a. Inspection Scope

The inspectors reviewed the three below listed Licensee Event Reports and related documents to assess: (1) the accuracy of the Licensee Event Report; (2) the appropriateness of corrective actions; (3) violations of requirements; and (4) generic issues.

b. Observations and Findings

1. (Closed) Licensee Event Report 05000362/2009-001, "Component Declared Inoperable After LCO Time Limit"

This issue was reviewed by the inspectors and one associated licensee identified noncited violation is documented in Section 4OA7. No additional findings were identified during the review of this event as documented in the licensee event report. This licensee event report is closed.

2. (Closed) Licensee Event Report 05000361/2009-003, "Pressurizer Auxiliary Spray Failed Inservice Test"

On September 29, 2009, an Inservice Test (IST) found that flow leakage through a pressurizer spray check valve potentially prevented the pressurizer auxiliary spray depressurization rate from meeting its design basis described in the UFSAR. The licensee identified that the check valve bushing worked its way out of the valve body and interfered with the hinge arm, preventing free movement of the shaft. The licensee inspected the bushing and determined the cause of the failure to be a manufacturing defect. The check valve manufacturer installed a bushing that was smaller than required. The inspectors reviewed the licensee's submittal and determined that the report adequately documented the summary of the event including the potential safety consequences and corrective actions required to address the check valve deficiency.

No findings were identified and no violation of NRC requirements occurred. This licensee event report is closed.

3. (Closed) Licensee Event Report 05000361; 05000362/2010-005, "Refueling Water Storage Tank Alignment to Non-Seismic Purification Loop Results in Potential Loss of Safety Function"

This issue was reviewed by the inspectors and one associated finding was documented in Section 1R15. No additional findings were identified during the review of this event as documented in the licensee event report. This licensee event report is closed.

**4OA5 Other Activities**

(Open) NRC TI 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems (NRC Generic Letter 2008-01)"

As documented in Section 1R22 of Inspection Report 05000361;362/2010002 and 1R22 of Inspection Report 05000361;362/2011002, the inspectors confirmed the acceptability of the described licensee's actions for Unit 2 high pressure safety injection, Unit 2 low pressure safety injection, and Unit 3 high pressure safety injection. In addition, the inspectors performed a complete system alignment inspection of the Unit 3 containment spray system to verify the functional capability of the system in 1R04 of Inspection Report 05000362/2011002.

This inspection effort counts towards the completion of TI 2515/177 which will be closed in a later inspection report. The NRC staff (Office of Nuclear Reactor Regulation - NRR) completed their review of the licensee's GL 2008-01 responses as documented in letter dated October 14, 2008, accession number ML082950468. TI 2515/177 is intended to be confirmatory in nature.

#### **40A6 Meetings**

##### Exit Meeting Summary

On January 11, 2011, the inspector discussed the results of the in-office inspection of changes to emergency plan implementing procedures with Mr. S. Gianell, Onsite Emergency Preparedness Supervisor, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 14, 2011, the inspectors presented the results of in-office and on-site inspection of changes made to the licensee's emergency action level scheme between 1995 and March 2010 to Mr. D. Bauder, Vice President and Station Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On March 10, 2011, the inspectors discussed the results of in-office inspection of licensee changes to its emergency action level scheme with Ms. K. Gallion, Manager, Onsite Emergency Preparedness, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On March 25, 2011, the inspectors presented the integrated inspection results to Mr. Tom McCool, Plant Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On April 19, 2011, the inspectors presented the final integrated inspection results to Mr. Tom McCool, Plant Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

#### **40A7 Licensee-Identified Violations**

The following violations of very low safety significance (Green) and Severity Level IV were identified by the licensee and are violations of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as noncited violations.

1. Contrary to Technical Specification 5.5.1.1.a, and Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Procedure SO123-0-A1, "Conduct of Operations"; Procedure SO123-0-A2, "Operations Division Responsibilities"; and Procedure OSM-5, "Operator Rounds," a primary plant equipment operator failed to perform required rounds and failed to maintain logs that were complete and accurate. Specifically, on numerous occasions from September 26 to December 21, 2009, the primary plant equipment operator failed to enter the 85-foot elevation of the Radwaste Building to inspect the equipment and to remain cognizant of major plant evolutions and changes in the status of important-to-safety equipment such as the motor control center for the control element drive mechanism motor generator sets, and safety related equipment such as the emergency air conditioning units for the emergency battery rooms. This violation is being treated as a noncited violation because the licensee identified the violation and promptly reported it to the NRC, it was an isolated action of an employee without management involvement and not caused by a lack of management oversight, and the licensee took appropriate remedial action. In addition, the violation has very low safety significance because other operators toured the area during each shift.
  
2. On September 14, 2009, the licensee declared Unit 3 train A Qualified Safety Parameter Display System (QSPDS) inoperable for maintenance. Subsequently, the Unit 3 train B emergency diesel generator failed a surveillance test and was declared inoperable. T.S. LCO 3.8.1 Condition B.2 required, within 4 hours, declaring features supported by train B inoperable when its redundant feature is inoperable. The licensee failed to declare the train B QSPDS inoperable at that time which would have required Unit 3 to shutdown if one of the channels could not be restored to service within 7 days per T.S. 3.3.10. The licensee identified the failure to enter the action statement for T.S. 3.3.10 within 4 hours, restored train A QSPDS to service and exited the LCO. Corrective actions included procedure revisions and operator training. This violation is of very low safety significance because it was not a design or qualification issue, did not represent an actual loss system safety function, or loss of one or more trains on non-technical specification systems, and did not screen as risk significant for external events. This issue was entered into the licensee's corrective action program as NN 200599415.

**SUPPLEMENTAL INFORMATION**  
**KEY POINTS OF CONTACT**

Licensee Personnel

T. Adler, Manager, Maintenance/Systems Engineering  
B. Arbour, Manager, Operations Training  
J. Armas, Supervisor, Maintenance Engineering Fluid Process  
D. Axline, Project Manager, Nuclear Regulatory Affairs  
D. Bauder, Vice President, Station Manager  
C. Cates, Manager, Recovery  
B. Corbett, Director, Performance Improvement  
J. Davis, Manager, Plant Operations  
P. Dietrich, Senior Vice President  
R. Elsasser, Manager, Training  
G. Fausett, ALARA Coordinator, Health Physics  
O. Flores, Director, Nuclear Oversight  
T. Gallaher, Consultant, Performance Improvement  
K. Gallion, Manager, Onsite Emergency Preparedness  
S. Genschaw, Manager, Maintenance & Construction Services  
S. Giannell, Emergency Preparedness Supervisor  
C. Harberts, Special Project Manager  
E. Hubley, Director, Maintenance/Construction  
G. Johnson, Jr., Senior Nuclear Engineer, Maintenance/Systems Engineering  
L. Kelly, Engineer, Senior Nuclear Engineer, Nuclear Regulatory Affairs  
G. Kline, Senior Director Engineering and Technical Services  
M. Lewis, Manager, Health Physics  
J. Madigan, Director, Site Recovery  
A. Mahindrakar, ISI Manager, Maintenance Engineering  
A. Martinez, Manager, Corrective Action Program  
M. McBrearty, Project Manager, Nuclear Regulatory Affairs  
T. McCool, Plant Manager  
L. Pepple, ALARA General Foreman, Health Physics  
N. Quigley, Manager, Maintenance/System Engineering  
J. Raleigh, Consultant, Nuclear Regulatory Affairs  
M. Russell, Health Physicist, Health Physics  
C. Ryan, Manager, Maintenance  
M. Stevens, Engineer, Regulatory Affairs  
R. St. Onge, Director, Nuclear Regulatory Affairs  
R. Treadway, Manager, Compliance  
S. Vaughan, ALARA Manager, Health Physics  
D. Yarbrough, Director, Plant Operations  
K. Yhip, Environmental Engineer, Regulatory Affairs

NRC Personnel

M. Runyan, Senior Reactor Analyst

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed

05000361/2011002-01	FIN	Failure to Follow Station Procedures for Seasonal Readiness (Section IR01)
05000361/2011002-02	NCV	Failure to Follow Procedures to Establish Compensatory Measures (Section IR15)
05000361/2011002-03 05000362/2011002-03	NCV	Failure to Comply with Technical Specifications (Section 1R15)

### Closed

05000362/2009-001	LER	Component Declared Inoperable After LCO Time Limit (Section 4OA3)
05000361/2009-003	LER	Pressurizer Auxiliary Spray Failed Inservice Test (Section 4OA3)
05000361/2010-005 05000361/2010-005	LER	Refueling Water Storage Tank Alignment to Non-Seismic Piping Results in Potential Loss of Safety Function (Section 4OA3)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### NUCLEAR NOTIFICATIONS

##### NUMBER

201335914	200251439	201174566	201253497	201250862
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#### CALCULATIONS

##### NUMBER

##### TITLE

##### REVISION

M-0120-015	Plant Flooding Analysis Review	8
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### **Section 1R04: Equipment Alignment**

#### PROCEDURES

##### NUMBER

##### TITLE

##### REVISION

SO3-V-3.12	Containment Integrated Leakage Rate Test	7
SD-SO23-400	Component Cooling Water System	20
SD-SO23-740	Safety Injection, Containment Spray and Shutdown Cooling System	19



SO23-3-2.9	Containment Spray System Operation	26
SO23-3-3.11.2	Containment Spray System Refueling Test	5
SO23-2-13.1	Diesel Generator Alignments	8
SO23-2-13	Diesel Generator Operation	47
SO23-1-3.1	Emergency Chilled Water System Operation	28
SO23-1-3.3	Emergency Chilled Water System Removal/Return to Service Evolutions (Online or Outage)	4
SO23-3-3.20	Monthly CREACUS Test, Control RM Cooler Exercise Run and ECWS Minimum Operability Verification	26
SD-SO-23-800	Normal and Emergency Chilled Water System	12

NUCLEAR NOTIFICATIONS

NUMBER

200743758	200004023	200835350	200895247	201354783
201334649	201285115			

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40114AS03	P & I Diagram Containment Spray System No. 1206 (Unit 3)	15
40114BS03	P & I Diagram Containment Spray System No. 1206 (Unit 3)	16
S3-1204-ML-004 Sheet 3	From: Containment Emergency Sump Sys. 1204, To: Containment Spray Pump P013 Sys. 1306	15
40180A	P&I Diagram Auxiliary Building Emergency Chilled Water System Loop B System No. 1513	33
40180B	P&I Diagram Auxiliary Building Emergency Chilled Water System, System No. 1513 Loop B	9

**Section 1R05: Fire Protection**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO23-I-8.29	Control Room Emergency Air Cleanup System Boundary Door Inspection	9
SO23-XIII-50	Fire Door Inspection	14
SO23-XX-9	Controlling CREACUS Breaches	2
3CO33	Unit 3 Building: Containment Elevation 15'-0' to 30'-0"	5

3CO33A Unit 3 Building: Containment Elevation 45'-0" to 80'-4" 5

NUCLEAR NOTIFICATIONS

NUMBER

200450368	201292393	201292670	201292631	201292706
201292864	201230873	201330877	201330878	

WORK ORDERS

NUMBER

800314709	800040089
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DRAWINGS

NUMBER

TITLE

REVISION

2/3-025	Pre-Fire Plan 85'-0" Auxiliary Control Building	5
2/3-026	Pre-Fire Plan 85'-0" Auxiliary Radwaste Building	3
2-011	Pre-Fire Plan - U2 AFW Pump Room, AFW Pipe Tunnel, Refueling Water and Condensate Storage Tanks(-)2'-6" to 30'-6"	5
3-038	Pre Fire Plan 3-038	6

MISCELLANEOUS

NUMBER

TITLE

REVISION / DATE

10090029-01	Fire Impairment	September 9, 2010
10070122	Fire Impairment barrier 50.59	2

**Section 1R11: Licensed Operator Requalification Program**

PROCEDURES

NUMBER

TITLE

REVISION

SO23-3-1.1	Reactor Startup	33
SO23-5-1.7	Power Acesion	45
SO23-5-1.3.1	Plant Startup from Hot standby to Minimum Load	32
SO23-12.1	Standard Post Trip Actions	24
SO23-12.2	Reactor Trip Recovery	19
SO23-12-10	Safety Function Status Checks	5
SO23-12-5	Excess Steam Demand Event	24

SO123-VIII-1 Recognition and Classification of Emergencies 34

MISCELLANEOUS

NUMBER TITLE

Scenario RZ1124 As Found 2011 Cycle 2

**Section 1R12: Maintenance Effectiveness**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO123-XXIV-20.2	Maintenance Rule for Structures	3
SO23-I-8.25	Charging Pump Repack, Lubrication, and Crosshead Adjustment	27
SO123-XV-5.3	Maintenance Rule Program	12
SO23-3-2.1	CVCS Operation	33

NUCLEAR NOTIFICATIONS

NUMBER

201317478	201315149	201336097	201063937	200150191
201068527	201330130			

WORK ORDERS

NUMBER

800659981	800571946	800563783
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MISCELLANEOUS

TITLE

SONGS System Health Report CVCS 4th Quarter-2010

**Section 1R13: Maintenance Risk Assessment and Emergent Work Controls**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO23-XX-8	Integrated Risk Management	8
SO23-XX-35	Protected Equipment	2
SO23-2-13	Diesel Generator Operation	47

NUCLEAR NOTIFICATIONS

NUMBER

201286253      201354763      201366172

WORK ORDERS

NUMBER

800572608      800413054

DRAWINGS

NUMBER

TITLE

REVISION

30202      6.9kV Elementary Diagram      23

MISCELLANEOUS

NUMBER

TITLE

REVISION

NECP800636071      U2 6.9 kV Reserve Auxiliary Transformer Breaker Interlock Modification      0

**Section 1R15: Operability Evaluations**

PROCEDURES

NUMBER

TITLE

REVISION

SO123-I-1.34	Scaffolding Erection	28 EC 1
SO123-XV-1.20	Seismic Controls	2
SO123-VII-20.4.2	Temporary and Permanent Shielding	14
SO23-7-1	Fire Suppression Water System Operations	38
SO23-3-3.31.9	RCS Pressure Isolation Valve Testing	14
SO123-XV-52	Operability Determinations and Functionality Assessments	18
SO23-3-3.23	Diesel Generator Monthly and Semi-annual Testing	51
SO23-3-3.60.2	Low Pressure Safety Injection Pump Testing	9
SO23-3-3.60.7	Containment Spray Pump and Valve Testing	13
SO123-XV-52	Operability Determinations and Functionality Assessments	19
SO23-13-3	Earthquake	13
SO23-15-15.A	Annunciator Panel 57A, Train "A" Safety Injection	9
SO23-3-2.11	Spent Fuel Pool Operations	28

SO123-XV-44.1	10 CFR 50.59 Program Resource Manual	5
SO23-0-A3	Procedure Use	12

NUCLEAR NOTIFICATIONS

<u>NUMBER</u>				
201186604	201305662	201295039	201325134	201325166
201325378	201325400	201348283	201340146	201360291
201181704	201135761	201268184	201181704	201133936
201348283	201365616	201344602		

WORK ORDERS

NUMBER

800671529

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-DSC-352	Seismic Evaluation of Temporary Lead Shield Fasteners	3

**Section 1R18: Plant Modifications**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO123-XXIV-10.1	Engineering Design Change Process – NECPs	24
SO23-XV-2	Troubleshooting Plant Equipment and Systems	9

NUCLEAR NOTIFICATIONS

<u>NUMBER</u>				
201212615	200753741	200745284	200714391	200726695
201192247				

WORK ORDERS

<u>NUMBER</u>				
800521183	800517039	800516738	800579807	800235289

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
S3-1204-ML-080 SH 1	Isometric Drawing S3-1204-ML-080-6"-C-LL0	9
S3-1204-ML-080 SH 2	Isometric Drawing S3-1204-ML-080-6"-C-LL0	3

S3-1204-ML-080 SH 3	Isometric Drawing S3-1204-ML-080-6"-C-LL0	7
S3-1219-ML-107 SH 1	Isometric Drawing S3-1219-ML-107-10"-C-LL0	7
S3-1204-ML-151 SH 1	Isometric Drawing S3-1204-ML-151-4"-C-LL0	4
S3-1204-ML-131 SH 1	Isometric Drawing S3-1204-ML-131-4"-C-LL0	4
S3-1204-ML-180 SH 1	Isometric Drawing S3-1204-ML-180-2 ½"-C-LL0	1
S3-1219-ML-057 SH 3	Isometric Drawing S3-1219-ML-057-6"-C-LL0 (21NB)	10
S3-1219-ML-057 SH 5	Isometric Drawing S3-1219-ML-057-6"-C-LL0	3
S3-1204-ML-001 SH 1	Isometric Drawing S3-1204-ML-001-24"-C-LL0 (21NB)	16
40123A	Reactor Coolant Chemical and Volume Control System	33
ECN D0043762	Loop Diagram Excore Startup and Wide Range Channel 2	6

**MISCELLANEOUS**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
RCE 200753741-CA-3	Visual Inspection Plan	
ECP 800516571	Unit 3 ECCS Piping ECP	0
ECP 800542134	Replace sections of S31219ML057 with Schedule 40S pipe	0
ECP 800500099	Sch. 10 Piping Replacement of 24" ECCS Line S3-1204-ML-001	0
ECP 070500869-5	Modification to Let Down Valve Control to Meet Appendix R Requirements Units 2HV9205	0
800631897	Temporary NECP: excore and wide range channel 2 3JE0005-2 Input removal	0
UFSAR Section 7.2	Reactor Protective System	Amended April 2009

**Section 1R19: Postmaintenance Testing**

**PROCEDURES**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO23-II-3.2	Response Time Testing	11
SO3-V-3.12	Containment Integrated Leakage Rate Test	7

SO23-2-13	Diesel Generator Operation	47
SO123-XV-HU-2	Human Performance Tools	5
SO23-I-6.150	Limiterorque manual Type HBC Actuator Overhaul	12
SO123-I-6.16	Valve Packing and Initial Adjustment	15
SO23-I-6.240	Fisher Model 7600 Series Butterfly Valve Overhaul	14
SO123-I-1.7	Work Order Preparation and Processing	42
SO123-I-1.45	Torque Manual	16
SO23-I-1.25	Post Maintenance Testing	0

**NUCLEAR NOTIFICATIONS**

**NUMBER**

201315278      201357122      201314250      201245488      201307048

**MAINTENANCE ORDERS**

**NUMBER**

800602645      800602770      800200530      800508668      70015875  
800533451      800533453

**MISCELLANEOUS**

**NUMBER**

**TITLE**

**DATE**

23485	Relative Humidity Element GP-0010 Calibration	November 29, 2010
20154	Rotameter GP-0085 Calibration	March 29, 2010
20155	Rotameter GP-0086 Calibration	March 29, 2010
0010622383	Pressure Indicator 760-100A (Serial #61734) Calibration	November 22, 2010
0010622384	Pressure Indicator 760-100A (Serial #60833) Calibration	November 22, 2010
20137	Temperature Element TE II-0046 Calibration	March 24, 2010
20143	Temperature Element TE II-0054 Calibration	March 24, 2010

**Section 1R20: Refueling and Other Outage Activities**

**PROCEDURES**

**NUMBER**

**TITLE**

**REVISION**

SO23-3-2.8.1	Refueling Cavity Draining Operations	18
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SO23-XV-23.1.1	Containment Cleanliness and Loose Debris Inspection	4
SO23-3-2.34	Containment Access Control and Inspections	26

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>
WCD 30018317	Tag out for Unit 3 Train B preventative maintenance
WCD 30006152	Reserve Auxiliary Transformer 3XR1 Boundary
WCD 30018227	Unit 3 saltwater cooling pump replacement 3MP307

NUCLEAR NOTIFICATIONS

<u>NUMBER</u>	<u>TITLE</u>
201262795	201262794

**Section 1R22: Surveillance Testing**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-XX-35	Protected Equipment	2
SO23-3-3.8	Safety Injection Monthly Tests - HPSI Charged Piping Monthly Verification	January 11, 2011
SO23-5-1.3	Plant Startup from Cold Shutdown to Hot Standby	38
DBD-SO23-740	Safety Injection, Containment Spray, and Shutdown Cooling System	10
SO23-3-3.31.9	Shutdown Cooling Suction Isolation Valve Leak Test	14
SO23-3-3.60.6	Auxiliary Feedwater Surveillance Procedure	20
SO23-3-3.23	Diesel Generator Monthly and Semi-Annual Testing	51

NUCLEAR NOTIFICATIONS

<u>NUMBER</u>	<u>TITLE</u>
201277982	201276282

WORK ORDERS

<u>NUMBER</u>	<u>TITLE</u>
800055219	800241530



DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40112BS03	Safety Injection System	38
40112AS03	Safety Injection System	41
40112CS03	Safety Injection System	23

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

NUCLEAR NOTIFICATIONS

<u>NUMBER</u>				
201061761	201068524	201088421	201122170	201140908
201154763	201165383	201196362		

**Section 1EP6: Drill Evaluation**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO123-VIII-1	Recognition and Classification of Emergencies	34
SO123-VIII-10.3	Protective Action Recommendations	12
SO123-VIII-30.7	Emergency Notifications	13
SO23-12-1	Standard Post Trip Actions	23

**Section 4OA1: Performance Indicator Verification**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO23-XV-24	Quarterly NRC Performance Indicator (PI) Process	9

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

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SO123-XV-50.2.2	Safety Conscious Work Environment Review Boards	0
SO123-XV-50	Corrective Action Program	23
SO123-XV-50.CAP-1	Writing Nuclear Notifications for Problem Identification and Resolution	5

SO123-XV-50.2	Employee Concerns Program And SONGS Safety Conscious Work Environment	23
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SO123-NSC-1	Nuclear Safety Culture Program	0
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NUCLEAR NOTIFICATIONS

NUMBER

201205500

CORRECTIVE ACTIONS

NUMBER

200709479	201261911	200625805	201038036	201301433
800480612	800480615	800482554		

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
D-008	SONGS Safety Conscious Work Environment and Resolution of Nuclear Safety Concerns	14
10-39-P	Minutes of Safety Conscious Work Environment Review Board meeting	October 2010
10-40-P	Minutes of Safety Conscious Work Environment Review Board meeting	November 2010
10-41-P	Minutes of Safety Conscious Work Environment Review Board meeting	November 2010
	Nuclear Safety Culture (NSC) Effectiveness Review Challenge Board (ERCB) Results	March 31, 2010
	Nuclear Safety Culture (NSC) Effectiveness Review Challenge Board (ERCB) Results	July 30, 2010
	Nuclear Safety Culture (NSC) Effectiveness Review Challenge Board (ERCB) Results	October 19, 2010