



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
612 EAST LAMAR BLVD, SUITE 400  
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February 12, 2009

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Nuclear Officer  
Southern California Edison Company  
San Onofre Nuclear Generating Station  
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Subject: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INTEGRATED  
INSPECTION REPORT 05000361/2008005 and 05000362/2008005

Dear Mr. Ridenoure:

On December 31, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your San Onofre Nuclear Generating Station, Units 2 and 3 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on January 12, 2009, with Mr. M. Short, Vice President Engineering and Technical Services, 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.

This report documents one NRC-identified and two self-revealing findings of very low safety significance (Green). Two of these findings were determined to be violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations, consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the violations or the significance of the non-cited 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 San Onofre Nuclear Generating Station facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS).

ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Michael C. Hay, Chief  
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Division of Reactor Projects

Docket Nos. 50-361  
50-362

License Nos. NPF-10 NPF-15

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NRC Inspection Report 05000361/2008005 and 05000362/2008005  
w/Attachment: Supplemental Information

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File located: R:\ REACTORS\ SO\2008\SO2008-005RP-GGW.doc ML#090430443

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RIV:RI:DRP/D	SRI:DRP/D	SPE:DRP/D	C:DRS/PSB2	C:DRS/PSB
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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 50-361, 50-362

License: NPF-10, NPF-15

Report: 05000361/2008005 and 05000362/2008005

Licensee: Southern California Edison Co.

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

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

Dates: September 27 through December 31, 2008

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## SUMMARY OF FINDINGS

IR 05000361/2008005, 05000362/2008005; September 27, 2008 – December 31, 2008; San Onofre Nuclear Generating Station, Units 2 and 3; Integrated Resident and Regional Report; Maint. Effect.; Refueling Outage; Event Follow-up.

The report covered a 3-month period of inspection by resident inspectors and an announced baseline inspections by regional based inspectors. Three Green findings 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." 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: Initiating Events

- Green. A self-revealing finding was identified for the failure to perform an adequate inspection of a main generator stator water pump discharge check valve in accordance with maintenance procedures. The inadequate inspection allowed an unrecognized degraded condition to exist that resulted in the main generator tripping from a "Rectifier Low Flow," signal and a subsequent reactor trip. This finding was entered into the licensee's corrective action program as Nuclear Notification 200006446.

This finding is more than minor because it is associated with the human performance attribute of the initiating events cornerstone and affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Phase 1 of Manual Chapter 0609, Attachment 4, "Initial Screening and Characterization of Findings," the finding is determined to have very low safety significance because the issue did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program because maintenance personnel did not perform the required inspections with a low enough threshold for identifying issues. Consequently, the licensee did not identify a degraded condition completely, accurately, and in a timely manner commensurate with the safety significance of the issue [P.1(a)] (Section 1R12).

#### Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure of work control personnel to resolve degraded or nonconforming conditions at the first available opportunity or appropriately justify a longer completion schedule, as required by procedure. Specifically, work control personnel failed to follow their process to provide documented justification for equipment related degraded

conditions not resolved within the current refueling cycle. After the conclusion of the Unit 3 refueling outage, the licensee completed the documentation to justify longer completion schedules for the degraded or nonconforming conditions. This finding was entered into the licensee's corrective action program as Nuclear Notification 200247395.

The finding is greater than minor because routinely failing to implement timely corrective actions for degraded safety-related equipment would result in more significant safety consequences. The finding affected the mitigating systems cornerstone. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding is determined to have very low safety significance because it was not a design or qualification deficiency, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events. The finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program because work control personnel failed to thoroughly evaluate problems, including classifying and prioritizing conditions adverse to quality [P.1(c)] (Section 1R20).

Cornerstone: Barrier Integrity

- Green. A self-revealing Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because Nuclear Fuel Services personnel did not properly implement procedural controls to adequately evaluate or repair a degraded source handling tool used in the spent fuel pool. An approved work plan was not used to modify the tool and the tool was returned to service in a degraded condition. Subsequently, on November 7, 2008, while moving a source element to its designated storage location, the neutron source slipped out of the tool and fell such that the bottom of the source element contacted the top of a spent fuel assembly. This finding was entered into the licensee's corrective action program as Nuclear Notification 200204667.

The finding is more than minor because if left uncorrected the performance of repairs without proper procedures or evaluations has the potential to lead to a more significant safety concern when critical tools are returned to service in a degraded condition. Degraded tools used in the spent fuel pool have the potential to adversely impact reactor safety barrier integrity because of potential damage to spent fuel assemblies or radioactive neutron source elements. Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," is used since the Significance Determination Process Appendix G methods and tools are not adequate to determine the significance of fuel handling findings. This finding affects the barrier integrity cornerstone and was determined to have very low safety significance by NRC management review because the deficiency did not cause actual degradation of fuel. The finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program because Nuclear Fuel Services personnel did not thoroughly evaluate problems such that the resolution address causes and extent of condition associated with a degraded source handling tool [P.1(c)] (Section 4OA3).

**B. Licensee-Identified Violations**

A violation of very low safety significance which was identified by the licensee, was reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7.



## REPORT DETAILS

### Summary of Plant Status

Unit 2 operated at essentially full power until shutdown for scheduled mid-cycle Outage U2M15 on December 28, 2008.

Unit 3 began the inspection period at a reduced power of 75 percent due to a damaged extraction steam line bellows and repair of main condenser tube leaks. The unit was shutdown on October 12, 2008, for refueling Outage U3R15. The unit was started up on December 15, and reached 20 percent on December 18, and 65 percent on December 20. The unit remained at 65 percent power due to restrictions caused by main feedwater Pump P063 being out of service. Following repairs to the feedwater pump, the unit reached essentially full power on December 24, 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 for Impending Adverse Weather Conditions

##### a. Inspection Scope

Since storm conditions were forecast in the vicinity of the facility for November 4, 2008, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On November 4, 2008, the inspectors walked down Units 2 and 3, main, reserve and auxiliary transformer area systems because their safety-related functions could be affected or required as a result of high winds or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during high winds. The inspectors evaluated the operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. The inspectors also reviewed a sample of corrective action program items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the corrective action program in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one readiness for impending adverse weather condition sample as defined in Inspection Procedure 71111.01-05.

##### b. Findings

No findings of significance were identified.

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

### **.1 Partial Walkdowns**

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

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

- October 19, 2008, Unit 3, shutdown cooling system Trains A and B
- November 10, 2008, Unit 3, component cooling water cooling system Trains A and B
- December 6, 2008, Unit 3, containment spray system Train B

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, Updated Final Safety Analysis Report, 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 walked down 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 by Inspection Procedure 71111.04-05.

#### **b. Findings**

No findings of significance were identified.

### **.2 Semi-Annual Complete Walkdowns**

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

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

- December 10, 2008, Unit 3, component cooling water system
- December 18, 2008, Unit 3, saltwater cooling system

The inspectors selected these systems because they were considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the systems 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 systems' functions. 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 two complete system walkdown samples as defined by Inspection Procedure 71111.04-05.

b. Findings

No findings of significance 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:

- October 9, 2008, Units 2 and 3, fire water storage tank and pump area
- October 14, 2008, Unit 3, containment Elevations 63', 45', and 30' during refueling Outage U3C15
- October 21, 2008, Unit 2, saltwater cooling pump room and pipe tunnel
- December 8, 2008, Unit 3, safety equipment building Rooms 6 through 14 and 16 through 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 four quarterly fire-protection inspection samples as defined by Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

**1R08 In-service Inspection Activities (71111.08)**

.1 Inspection Activities Other Than Steam Generator Tube Inspection, Pressurized Water Reactor Vessel Upper Head Penetration Inspections, Boric Acid Corrosion Control (71111.08-02.01)

a. Inspection Scope

The inspection procedure requires review of two or three types of nondestructive examination activities and, if performed, one to three welds on the reactor coolant system pressure boundary. Inspectors are also guided to review one or two examinations with recordable indications that have been accepted by the licensee for continued service.

The inspectors directly observed the following nondestructive examinations which included eddy current testing (ET), ultrasonic testing (UT), penetrant testing (PT) and visual testing (VT):

<u>System</u>	<u>Component/Weld ID</u>	<u>Exam Type</u>
Residual Heat Removal	Snubber, 03-021-600	VT3
Residual Heat Removal	10" Reducing Tee to Pipe, 03-021-320	UT
Residual Heat Removal	16" Pipe to Reducing Tee, 03-021-230	UT
Reactor Coolant System	RCP Vertical Support, 03-038-004	VT3
Reactor Coolant System	RCP Vertical Support, 03-038-005	VT3
Reactor Coolant System	RCP Vertical Support, 03-038-006	VT3
Reactor Coolant System	RCP Vertical Support, 03-038-007	VT3
Reactor Coolant System	Variable Spring, 03-059-650	VT3
Reactor Coolant System	12" Schedule 160 Pipe-to-Elbow, 03-016-015	UT
Reactor Coolant System	Hot Leg Surge Line, WOL-101	PT

The inspectors reviewed the following nondestructive examinations through record review:

<u>System</u>	<u>Component/Weld ID</u>	<u>Exam Type</u>
Reactor Coolant System	Shutdown Cooling Nozzle to Safe-End, 03-007-009	UT
Reactor Coolant System	Surge Nozzle to Safe-End, 03-006-010	UT
Reactor Coolant System	Drain Nozzle to Safe-End, 03-006-011	UT
Reactor Coolant System	Hot Leg Drain Nozzle Weld Overlay (Final)	UT

The inspectors observed the initial ultrasonic examination system calibration for the Panametrics, EPOCH 4, serial number 061503112 and reviewed the nondestructive examination personnel qualification records for those contractor personnel performing American Society of Mechanical Engineers Code Section XI inservice inspections.

The inspection procedure further required verification of one to three welds on Class 1 or 2 pressure boundary piping to ensure that the welding process and welding examinations were performed in accordance with the American Society of Mechanical Engineers Code. The inspectors observed portions of the preemptive structural weld overlay on the American Society of Mechanical Engineers Code Class 1 hot leg shutdown cooling, hot leg drain, and hot leg surge line:

<u>System</u>	<u>Component/Weld Identification</u>
Reactor Coolant System	Shutdown Cooling DM Weld 03-006-009
Reactor Coolant System	Drain DM Weld 03-006-011
Reactor Coolant System	Surge Line DM Weld 03-006-010

Welding procedures and nondestructive examination of the welding repair conformed to American Society of Mechanical Engineers Code requirements and licensee commitments.

Welder qualification documentation packages and welder maintenance logs were reviewed for contract welders performing welding activities on the hot leg shutdown cooling, hot leg drain, and hot leg surge lines. The documentation packages and logs were in accordance with Article III, QW-300 "Welding Performance Qualification" in Section IX of the American Society of Mechanical Engineers Code.

The inspectors verified, by review, that the welding procedure specification and the welders had been properly qualified in accordance with American Society of Mechanical Engineers Code, Section IX, requirements. The inspectors also verified, through

observation and record review, that essential variables for the gas tungsten arc welding process (machine and manual) and the shielded metal arc welding process were identified, recorded in the qualification record, and formed the basis for qualification of the welding procedure specification.

These activities constitute completion of one sample as defined by Inspection Procedure 71111.08-05 under Section 02.01.

b. Findings

No findings of significance were identified.

.2 Vessel Upper Head Penetration Inspection Activities (71111.08-02.02)

a. Inspection Scope

The inspection procedure requires observation or review of the reactor head bare metal visual examinations, or review the post examination videotape and examination procedures. In particular, review licensee criteria for confirming visual examination quality and instructions resolving interference or masking issues. Also, if the licensee is performing non-visual non-destructive examination of the reactor vessel head, review a sample of these examinations.

The licensee performed nondestructive examinations of 100% of reactor vessel upper head penetrations (RPV Head). The inspectors directly observed a sample of the examinations performed on the Control Element Drive Mechanism Element (CEDM) and Incore Instrumentation (ICI) as listed below:

<u>System</u>	<u>Component/Weld Identification</u>	<u>Examination Method</u>
RPV Head	CEDM #13, 21, 58	ET, UT
RPV Head	ICI #92, 101	ET, UT
RPV Head	CEDM & ICI (Bare Metal Visual)	VT3

The nondestructive examinations were performed in accordance with the requirements of NRC Order EA-03-009. Qualifications of non-destructive examination personnel were reviewed and verified to be current.

The inspectors also reviewed ultrasonic and eddy current inspection data for the following control element drive mechanisms:

<u>System</u>	<u>Component/Weld Identification</u>	<u>Examination Method</u>
RPV Head	CEDM #2, 41, 56, 57, 64	ET, UT

Analysis was performed in accordance with American Society of Mechanical Engineers Code and local procedures.

The licensee was also required to inspect an embedded flaw repair weld that was applied to SONGS Unit-3 control element drive Mechanism 64 on the vessel upper head during October 2004. The repair weld was installed during the SONGS-3 cycle-13 refueling outage to address a crack like indication in control element drive Mechanism 64 penetration base material at the downhill side, near the toe of the J-weld. Southern California Edison employed Third Ten-Year Inservice Inspection Interval Relief Request ISI-3-8, Request to Use Alternative to American Society of Mechanical Engineers Code Rules for the Embedded Flaw Repair Process San Onofre Nuclear Generating Station Units 2 and 3 to support this repair activity in accordance with Westinghouse embedded flaw repair topical report WCAP-15987-P.

The NRC approval of Relief Request ISI-3-8 and the applicable NRC Order EA-03-009 require that embedded flaw repair weld surfaces are examined each refueling outage. In accordance with those requirements, the repair weld of control element drive Mechanism 64 was examined prior to returning to service after the repair, and again during the cycle-14 refueling outage two years later (11/1/06). No defects were observed in either of those inspections.

The dye penetrant examination performed on October 31, 2008, on control element drive Mechanism 64 during the current cycle-15 refueling outage revealed a rejectable, rounded indication with a "bleed out" of approximately ½ inch in diameter (actual defect being much smaller). The relatively large diameter and rapid development of this penetrant indication was not consistent with expectations for dye penetrant detection of a primary-water-stress-corrosion-crack defect.

The dye penetrant indication was located on the surface of the Alloy 52 repair weld, at the uphill side of penetration 64. This location is roughly 180 degrees away from the ultrasonic indication that originally lead to the repair weld. The 180 degree separation between the dye penetrant indication and the base metal flaw is sufficient to rule out any interaction.

Also, most surfaces of the overlay weld were not ground after welding. Inspection revealed that weld bead start and stop points are evident in the defect area both in the circumferential J-weld overlay as well as the vertical penetration overlay. Weld bead start and stop points have increased potential for fusion defects, voids, etcetera which can result in dye penetrant rejections and repair grinding.

Westinghouse has identified field service logs which record grinding repair of dye penetrant indications at the 0 and 180 degree locations of the control element drive Mechanism 64 overlay during its original fabrication. These records support a likelihood that the current dye penetrant indication is related to a pre-existing fabrication flaw at weld bead interfaces.

On November 13, 2008, the licensee removed the defect through extraction of a boat sample using remotely controlled electric discharge machining equipment. The resultant cavity was examined by dye penetrant testing and found to be free of indications. One American Society of Mechanical Engineers Boiler and Pressure Vessel Code acceptable rounded indication was discovered slightly outside the boundary of the cavity. A weld repair of the cavity was then performed under the licensee's American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI repair program to restore the embedded flaw seal weld to the requirements of Relief Request ISI-3-8. The post repair weld surface was examined by dye penetrant testing and met the acceptance

standards form American Society of Mechanical Engineers NB-5352 as required by the safety evaluation for WCAP-15987-P.

The boat sample was sent to a laboratory for analysis to determine the cause of the relevant indication.

These activities constitute completion of one sample as defined by Inspection Procedure 71111.08-05 under Section 02.02.

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control Inspection Activities (71111.08-02.03)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be affected by boric acid corrosion.

The inspection procedure required review of a sample of boric acid corrosion control walkdown visual examination activities through record review. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedure SO23-XV-85, "Boric Acid Corrosion Control Program (BACCP)," Revision 3. Visual records of the components and equipment were also reviewed by the inspectors.

The inspection procedure required verification that visual inspections emphasize locations where boric acid leaks can cause degradation of safety significant components. The inspectors verified through program/record review that the licensee's boric acid corrosion control inspection efforts are directed towards locations where boric acid leaks can cause degradation of safety-related components. On those components where boric acid was identified, the engineering evaluations gave assurance that the American Society of Mechanical Engineers Code wall thickness limits were properly maintained. The evaluations also confirmed that the corrective actions performed for evidence of boric acid leaks were consistent with requirements of the American Society of Mechanical Engineers Code.

The inspection procedure required both a review of one to three engineering evaluations performed for boric acid leaks found on reactor coolant system piping and components, and one to three corrective actions performed for identified boric acid leaks.

No engineering evaluations were performed for boric acid leaks during this outage. Corrective actions were limited to cleaning and inspecting in accordance with American Society of Mechanical Engineers Code and licensee's procedures.

These activities constitute completion of one sample as defined by Inspection Procedure 71111.08-05 under Section 02.03.

b. Findings

No findings of significance were identified.



.4 Steam Generator Tube Inspection Activities (71111.08-02.04)

a. Inspection Scope

The inspection procedure specified performance of an assessment of in-situ screening criteria to assure consistency between assumed nondestructive examination flaw sizing accuracy and data from the Electric Power Research Institute examination technique specification sheets. It further specified assessment of the appropriateness of tubes selected for in situ pressure testing, observation of in situ pressure testing, and review of in situ pressure test results. At the time of this inspection, no conditions had been identified that warranted in-situ pressure testing.

In addition, the inspectors reviewed both the licensee site-validated and qualified acquisition and analysis technique sheets used during this refueling outage and the qualifying Electric Power Research Institute examination technique specification sheets to verify that the essential variables regarding flaw sizing accuracy, tubing, equipment, technique, and analysis had been identified and qualified through demonstration. The inspectors reviewed acquisition technique and analysis technique sheets are identified in the attachment.

The inspection procedure specified comparing the estimated size and number of tube flaws detected during the current outage against the previous outage operational assessment predictions to assess the licensee's prediction capability. Compared to the projected damage mechanisms identified by the licensee, the number of identified indications fell within the range of prediction and was quite consistent with predictions. No new damage mechanisms had been identified during this inspection.

The inspection procedure specified confirmation that the steam generator tube eddy current test scope and expansion criteria meet Technical Specification requirements, Electric Power Research Institute guidelines, and commitments made to the NRC. The inspectors evaluated the recommended steam generator tube eddy current test scope established by Technical Specification requirements and the licensee's degradation assessment report. The inspectors compared the recommended test scope to the actual test scope and found that the licensee had accounted for all known flaws and had, as a minimum, established a test scope that met Technical Specification requirements, Electric Power Research Institute guidelines, and commitments made to the NRC.

The inspection procedure specified if new degradation mechanisms were identified, to verify that the licensee fully enveloped the problem in its analysis of extended conditions including operating concerns and had taken appropriate corrective actions before plant startup. To date, the eddy current test results had not identified any new degradation mechanisms.

The inspection procedure requires confirmation that the licensee inspected all areas of potential degradation, especially areas that were known to represent potential eddy current test challenges (e.g., top-of-tubesheet, tube support plates, and U-bends). The inspectors confirmed that all known areas of potential degradation were included in the scope of inspection and were being inspected.

The inspection procedure further requires verification that repair processes being used were approved in the Technical Specifications. The inspectors verified that the

mechanical expansion plugging process to be used was an NRC-approved repair process.

The inspection procedure also requires confirmation of adherence to the Technical Specification plugging limit, unless alternate repair criteria have been approved. The inspection procedure further requires determination whether depth sizing repair criteria were being applied for indications other than wear or axial primary water stress corrosion cracking in dented tube support plate intersections. The inspectors determined that the Technical Specification plugging limits were being adhered to (i.e., 40 percent maximum through-wall indication).

If steam generator leakage greater than 3 gallons per day was identified during operations or during post shutdown visual inspections of the tubesheet face, the inspection procedure requires verification that the licensee had identified a reasonable cause based on inspection results and that corrective actions were taken or planned to address the cause for the leakage. The inspectors did not conduct any assessment because this condition did not exist.

The inspection procedure requires confirmation that the eddy current test probes and equipment were qualified for the expected types of tube degradation and an assessment of the site-specific qualification of one or more techniques. The inspectors observed portions of eddy current tests performed on the tubes in all four Steam Generators. During these examinations, the inspectors verified that: (1) the probes appropriate for identifying the expected types of indications were being used, (2) probe position location verification was performed, (3) calibration requirements were adhered, and (4) probe travel speed was in accordance with procedural requirements. The inspectors performed a review of site-specific qualifications of the techniques being used. These are identified in the attachment.

If loose parts or foreign material on the secondary side were identified, the inspection procedure specified confirmation that the licensee had taken or planned appropriate repairs of affected steam generator tubes and that they inspected the secondary side to either remove the accessible foreign objects or perform an evaluation of the potential effects of inaccessible object migration and tube fretting damage. At this time of the inspection, one foreign material had been identified on the top-of-tubesheet in the steam generator 89 cold leg stay cylinder region and appeared to be an approximately 1.25 inch diameter round washer between two tubes.

Finally, the inspection procedure specified review of one to five samples of eddy current test data if questions arose regarding the adequacy of eddy current test data analyses. The inspectors did not identify any results where eddy current test data analyses adequacy was questionable.

These activities constitute completion of one sample as defined by Inspection Procedure 71111.08-05 under Section 02.04.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspection procedure required review of a sample of problems associated with inservice inspections documented by the licensee in the corrective action program for appropriateness of the corrective actions.

The inspectors reviewed sixteen action requests and nuclear notifications, which dealt with inservice inspection activities, and found that the corrective actions were appropriate. From this review, the inspectors concluded that the licensee had an appropriate threshold for entering issues into the corrective action program and had procedures that direct a root cause evaluation when necessary. The licensee also had an effective program for applying industry operating experience.

b. Findings

No findings of significance were identified.

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

.1 Biennial Review

a. Inspection Scope

To assess the performance effectiveness of the licensed operator requalification program, the inspectors conducted personnel interviews, reviewed both the operating tests and written examinations, reviewed randomly selected medical and watchstanding proficiency records, and observed ongoing operating test activities.

The inspectors interviewed licensee personnel to determine their understanding of the policies and practices for administering requalification examinations. The inspectors also reviewed operator performance on the written exams and operating tests. These reviews included observations of portions of the operating tests by the inspectors. The operating tests observed included two scenarios that were used in the current biennial requalification cycle. These observations allowed the inspectors to assess the licensee's effectiveness in conducting the operating test to ensure operator mastery of the training program content.

The results of these examinations were reviewed to determine the effectiveness of the licensee's appraisal of operator performance and to determine if feedback of performance analyses into the requalification training program was being accomplished. The inspectors interviewed members of the training department and reviewed minutes of training review group meetings to assess the responsiveness of the licensed operator requalification program to incorporate the lessons learned from both plant and industry events. The inspector also reviewed a sample of licensed operator annual medical forms and procedures governing the medical examination process for conformance to 10 CFR 55.53, and a sampling of the licensed requalification program feedback system, and the remediation process records.

In addition to the above, the inspectors reviewed examination security measures, simulator fidelity and existing logs of simulator deficiencies.

At the conclusion of the testing cycle, the inspector reviewed the overall pass/fail results of the individual job performance measure operating tests, simulator operating tests, and written examinations administered by the licensee during the operator licensing requalification cycles and biennial examination. Final examination results were assessed to determine if they were consistent with the guidance contained in NUREG- 021, "Operator Licensing Examination Standards for Power Reactors", Revision 9, Supplement 1, and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process." Fifteen separate crews participated in simulator operating tests, written examinations, and job performance measure operating tests, totaling 81 licensed operators, (39 Reactor Operators and 42 Senior Reactor Operators). All operators passed the biennial licensed operator requalification examination.

The inspectors completed one inspection sample of the biennial licensed operator requalification program as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

.2 Requalification Activities Review

a. Inspection Scope

On December 3, 2008, the inspectors observed a crew of licensed operators in the plant's simulator 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 actions in the conservative direction
- 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 one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

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

- October 23, 2008, Unit 2, stator water cooling pump discharge check valve
- December 18, 2008, Units 2 and 3, saltwater cooling pumps

The inspectors reviewed events such as 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 two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

Introduction. A self-revealing Green finding was identified for the failure to perform an adequate inspection of a main generator stator water pump discharge check valve in accordance with maintenance procedures. The inadequate inspection allowed an unrecognized degraded condition to exist that resulted in the main generator tripping from a "Rectifier Low Flow," signal and a subsequent reactor trip.

Description. On June 5, 2008, with Unit 2 at approximately 97 percent power, plant personnel began a monthly test of the stator water cooling system. In accordance with the test procedure, operators swapped the stator water pumps by starting the pump that was in standby and then stopping the operating pump. Three alarms were received in quick succession indicating a reduction in stator water flow. Approximately two minutes later, the main generator tripped from a "Rectifier Low Flow" signal. At approximately 2256 PCT, the Unit 2 reactor automatically tripped on a "Loss of Load" signal.

Troubleshooting of the stator water system revealed that a pump discharge check valve momentarily remained open following the stator water pump swap and then slammed shut. The resulting pressure spike was sufficient to lift one or both of the relief valves on the stator water heat exchangers. The discharge from the relief valve(s) reduced stator water cooling flow, which reduced flow to the stator windings and the main exciter static rectifiers. A sustained decrease in either rate results in an automatic main generator trip. Inspection of check Valve S21413MUO55 revealed that the disc was contacting the valve body on the sides instead of the backstop per design. Over time, this contact between the disc and valve body resulted in the disc briefly becoming stuck and then slamming closed on reverse flow during system testing.

Visual inspections were conducted on the discharge check valve prior to the reactor trip on December 08, 2007, under Maintenance Order 06121745000. The maintenance order contained instructions to "Inspect check valve internals for wear," and also "Notify maintenance supervisor if any parts need to be replaced." Interviews with licensee personnel revealed that the valve degradation should have been identified and corrected in the December 2007 inspection. Inspectors' review of Unit 2 post-trip pictures of this check valve also supported the conclusion that the degradation should have been identified prior to the June 5 reactor trip.

Analysis. The failure to perform an adequate inspection of the stator water check valve in accordance with maintenance procedures was a performance deficiency. The finding is more than minor because it is associated with the human performance attribute of the initiating events cornerstone and affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding is determined to have very low safety significance because the issue did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program because maintenance personnel did not perform the required inspections with a low enough threshold for identifying issues. Consequently, the licensee did not identify the check valve degraded condition completely, accurately, and in a timely manner commensurate with the safety significance of the issue [P.1(a)].

Enforcement. No violation of regulatory requirements occurred because the finding occurred on nonsafety, but risk significant secondary plant equipment. The licensee entered the finding into the corrective action program as Action Request 080600212 and Nuclear Notification 200006446: FIN 05000361/2008005-01, "Inadequate Inspection of Stator Water Discharge Check Valve."

### **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:

- October 23, 2008, Unit 3, determine as-found condition and tighten loose electrical connections identified in engineered safety features actuation system Train A Cabinet 3L034
- December 2, 2008, Unit 3, auxiliary feedwater Pump P504 removed from service due to increasing vibration trends

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 by Inspection Procedure 71111.13-05.

#### **b. Findings**

No findings of significance were identified.

### **1R15 Operability Evaluations (71111.15)**

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

The inspectors reviewed the following issues:

- October 16, 2008, Unit 3, emergency diesel Generator 3G003 integrated engineering safeguard features system test

- October 17, 2008, Unit 3, emergency diesel Generator 3G003 operable with compensatory measures after increase in start time
- November 7, 2008, Unit 3, loose electrical connections identified in engineered safety features actuation system Train B Cabinet 3L035
- November 10, 2008, Unit 3, containment emergency sump Train A 3LI9386 total loop uncertainty used in post accident monitoring instruments
- December 19, 2008, Units 2 and 3, increased pump differential pressure for saltwater cooling pumps located in the Unit 2 intake as described in Nuclear Notification 200253740

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 Updated Safety Analysis Report to the licensee'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 five operability evaluations inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

No findings of significance were identified.

**1R18 Plant Modifications (71111.18)**

a. Inspection Scope

The inspectors reviewed the following permanent plant modification to verify that the safety functions of important safety systems were not degraded:

- October 23, 2008, Unit 3, auxiliary feedwater pump inboard bearing fan housing modification to facilitate easy access of pump inboard fan and oil deflector

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 modification listed above. 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 appropriateness of modification design assumptions, and 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 one sample for permanent plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings of significance 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:

- November 2, 2008, Unit 3, component cooling water Pump 3P024 breaker post maintenance test following replacement
- November 6, 2008, Unit 3, saltwater cooling Train A return to service following train outage work per Maintenance Order 800049554
- November 7, 2008, Unit 3, auxiliary feedwater system isolation Valve HV-4713 return to service following electrical volt bus outage per Maintenance Order 800187988
- November 28, 2008, Unit 2, review of inservice testing per Procedure SO23-3-3.60.4, "Saltwater Cooling Pump and Valve Testing," Revision 11, performed following pump replacement
- December 1, 2008, Unit 3, testing to verify restoration of Battery B010 cell parameters as required by Technical Specification 3.8.6
- December 12, 2008, Unit 3, auxiliary feedwater system Pump P140 return to service testing following maintenance outage

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 Updated Final Safety Analysis Report, 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 six postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the Unit 3 refueling outage, conducted October 18, 2008, through December 15, 2008, and the Unit 2 mid-cycle outage which began on December 28, 2008, 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 Unit 3 refueling outage and Unit 2 mid-cycle outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- 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 secondary containment 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 drywell (primary 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 samples as defined in Inspection Procedure 71111.20-05.

b. Findings

Introduction. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the failure of work control personnel to resolve degraded or nonconforming conditions at the first available opportunity or appropriately justify a longer completion schedule, as required by procedure.

Description. At the conclusion of the Unit 3 refueling outage, the inspectors requested a listing of all degraded or nonconforming conditions that were not corrected during the scheduled outage. The inspectors requested the information to determine whether the licensee had implemented a timely schedule for completing corrective actions for structures, systems, and components, that were determined to be degraded or nonconforming. Inspection Manual Part 9900: Technical Guidance, "Operability Determinations and Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety," dated April 16, 2008, describes the appropriate time frame for correcting degraded or nonconforming conditions as the first available opportunity. If corrective actions cannot be implemented at the first available opportunity, then the licensee should appropriately justify a longer completion schedule.

The licensee identified four degraded or nonconforming conditions, following the inspectors' prompting, that were not corrected during the refueling outage, and recognized that no documented justification for a longer completion schedule had been performed. Procedure SO123-XX-1 ISS2, "Notification Initiation and Processing,"

Revision 21, Step 6.6.1.3, required documented justification for equipment related degraded conditions not resolved within the current refueling cycle. This procedure defined the process for ensuring that timely corrective actions are taken commensurate with the safety significance of the reported problem. On December 15, 2008, the licensee documented the issue in Nuclear Notification 200247395 to evaluate the failure of work control personnel to follow the requirements of Procedure SO123-XX-1 ISS2 and to document the required justifications. On January 2, 2009, after the conclusion of the Unit 3 refueling outage, the licensee completed the documentation to justify longer completion schedules for the four degraded or nonconforming conditions.

Analysis. The failure of work control personnel to follow the work process procedures to ensure that timely corrective actions are taken was a performance deficiency. The finding is greater than minor because routinely failing to implement timely corrective actions for degraded safety-related equipment would result in more significant consequences. The finding affected the mitigating systems cornerstone. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding is determined to have very low safety significance because it was not a design or qualification deficiency, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events. The finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program because work control personnel failed to thoroughly evaluate problems, including classifying and prioritizing conditions adverse to quality [P.1(c)].

Enforcement. As required by 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," 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-XX-1 ISS2, "Notification Initiation and Processing," Revision 21, defined the process for ensuring that timely corrective actions are taken commensurate with the safety significance of the reported problem. Contrary to the above, on December 15, 2008, work control personnel failed to resolve degraded or nonconforming conditions at the first available opportunity or appropriately justify a longer completion schedule. Specifically, work control personnel failed to provide documented justification, as required by Procedure SO123-XX-1 ISS2, Step 6.6.1.3, for equipment related degraded conditions not resolved within the current refueling cycle. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Nuclear Notification 200247395, this violation is being treated as a non-cited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000362/2008005-02, "Failure to Justify Longer Completion Schedule for Degraded Equipment."

## **1R22 Surveillance Testing (71111.22)**

### **a. Inspection Scope**

The inspectors reviewed the Updated Final Safety Analysis Report, procedure requirements, and technical specifications to ensure that the five 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 American Society of Mechanical Engineers 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.

- October 20, 2008, Unit 3, local leak rate testing of reactor coolant drain tank and quench tank gas sample interior containment isolation valve for Penetration 30C
- November 10, 2008, Unit 3, emergency diesel Generator 3G003 monthly surveillance testing
- November 13, 2008, Unit 2, control room emergency air cleanup system Train B monthly surveillance
- November 13, 2008, Unit 2, engineering feature safeguard subgroup Relay K311B surveillance of safety injection actuation signal
- December 8, 2008, Unit 3, auxiliary feedwater turbine steam supply throttle Valve 3HV4716 inservice test

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

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

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

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

a. Inspection Scope

The inspector performed an in-office review of revisions to Sections 5 through 9, and Appendices A, B, F, G and H, to the San Onofre Nuclear Generating Station Emergency Plan, received June 3, 2008, and Revision 27 to Emergency Plan Implementing Procedure SO123-VIII-1, "Recognition and Classification of Emergencies," received June 24, 2008. The emergency plan revision deleted descriptions of specific seismic instrumentation found in Updated Final Safety Analysis Report, Section 3.7.4, from the emergency plan, removed a commitment for a part time on-site physician and nurse, deleted references to removed Unit 1 equipment, extended letters of agreement with offsite agencies through 2008, removed the licensee's Evacuation Time Estimate Study from the emergency plan, updated organizational titles, and made other minor editorial corrections.

These revisions were compared to their previous revisions, to 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 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 an approval of the licensee's changes; therefore, the revisions are subject to future inspection.

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

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

**2OS1 Access Control to Radiologically Significant Areas (71121.01)**

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls. The inspector used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance.

During the inspection, the inspector interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation packages reported by the licensee in the Occupational Radiation Safety Cornerstone
- Controls (surveys, posting, and barricades) of three radiation, high radiation, or airborne radioactivity areas
- Radiation exposure permits procedures, engineering controls, and air sampler locations
- Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms
- Barrier integrity and performance of engineering controls in two airborne radioactivity areas
- Physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools
- Self-assessments, audits, and special reports related to the access control program since the last inspection
- Corrective action documents related to access controls
- Licensee actions in cases of repetitive deficiencies or significant individual deficiencies
- Radiation exposure permit briefings and worker instructions
- Adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination control during job performance
- Dosimetry placement in high radiation work areas with significant dose rate gradients
- Changes in licensee procedural controls of high dose rate - high radiation areas and very high radiation areas
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas

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

These activities constitute completion of eighteen of the required twenty one samples as defined in Inspection Procedure 71121.01-05.

b. Findings

No findings of significance were identified.

**2OS2 ALARA Planning and Controls (71121.02)**

a. Inspection Scope

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

- Current 3-year rolling average collective exposure
- Nine outage work activities scheduled during the inspection period and associated work activity exposure estimates which were likely to result in the highest personnel collective exposures
- Workers' use of the low dose waiting areas
- Exposures of individuals from selected work groups
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Source-term control strategy or justifications for not pursuing such exposure reduction initiatives
- Specific sources identified by the licensee for exposure reduction actions, priorities established for these actions, and results achieved since the last refueling cycle
- Declared pregnant workers during the current assessment period, monitoring controls, and the exposure results

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

These activities constitute completion of four of the required fifteen samples and four of the optional samples as defined in Inspection Procedure 71121.02-05.

b. Findings

No findings of significance were identified.



#### **4. OTHER ACTIVITIES**

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

###### **.1 Data Submission Issue**

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

The inspectors performed a review of the data submitted by the licensee for the 3rd Quarter 2008 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 of significance were identified.

###### **.2 Safety System Functional Failures**

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

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator, for Units 2 and 3, for the period from the 4<sup>th</sup> quarter 2007 through the 3<sup>rd</sup> quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance were used. The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC integrated inspection reports for the period of October 2007 through September 2008, 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 safety system functional failures samples as defined by Inspection Procedure 71151-05.

###### **b. Findings**

No findings of significance were identified.

###### **.3 Mitigating Systems Performance Index - Residual Heat Removal System**

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

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index - Residual Heat Removal System performance, for Units 2 and 3, for the period from the 3<sup>rd</sup> quarter 2007 through the 2<sup>nd</sup> quarter 2008. To determine the accuracy of the

performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports and NRC integrated inspection reports for the period of July 2007 through June 2008, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable Nuclear Energy Institute guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two mitigating systems performance index residual heat removal system samples as defined by Inspection Procedure 71151-05.

b. Findings

The inspectors identified that the licensee had made changes to the risk (Birmbaum) coefficients over several quarters and had failed to report these changes as required by Nuclear Energy Institute Document 99-02. The NRC is reviewing the bases for the changes and the effect the changes have had on the reported Performance Indicator data. The licensee documented this issue in Nuclear Notification 200255473. The failure to include a comment that provided a summary of any changes to the Mitigating Systems Performance Index coefficients with the quarterly data submittals is being considered an unresolved item pending further NRC review: URI 05000361; 05000362/2008005-03, "Failure to Report Changes to Mitigating Systems Performance Index Risk Coefficients."

.4 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index - Cooling Water Systems performance indicator, for Units 2 and 3, for the period from the 3<sup>rd</sup> quarter 2007 through the 2<sup>nd</sup> quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports and NRC integrated inspection reports for the period of July 2007 through June 2008, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable Nuclear Energy Institute guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two mitigating systems performance index cooling water system samples as defined by Inspection Procedure 71151-05.

b. Findings

Refer to Findings Section in 40A1.3.

.5 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Specific Activity performance indicator, for Units 2 and 3, for the period from the 4<sup>th</sup> quarter 2007 through the 3<sup>rd</sup> quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's reactor coolant system chemistry samples, technical specification requirements, issue reports, event reports and NRC integrated inspection reports for the period of October 2007 through September 2008, 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 reactor coolant system specific activity samples as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.6 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Leakage performance indicator, for Units 2 and 3, for the period from the 4<sup>th</sup> quarter 2007 through the 3<sup>rd</sup> quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports and NRC integrated inspection reports for the period of October 2007 through September 2008, 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 reactor coolant system leakage samples as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.7 Occupational Radiological Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences performance indicator for the period from the first quarter 2008 through third quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's assessment of the performance indicator for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's performance indicator data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review, and the results of those reviews. The inspectors independently reviewed electronic dosimetry dose rate and accumulated dose alarm and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

These activities constitute completion of the occupational radiological occurrences sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.8 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences performance indicator for the period from the first quarter 2008 through third quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's issue report database and selected individual reports since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. Additionally, the inspectors reviewed the licensee's historical 10 CFR 50.75(g) file and selectively reviewed the licensee's analysis for discharge pathways resulting from a spill, leak, or unexpected liquid discharge focusing on those incidents which occurred over the last few years.

These activities constitute completion of the radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

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

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

.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 of significance 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 of significance 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 the work hours for operations personnel, 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 July 1, 2008, through December 19, 2008, although a focused sample was performed for the period of October 12 through November 1, 2008.

The inspectors also reviewed the results of an operator overtime review performed by the licensee. The licensee's review evaluated work hours for 32 operations personnel for a period from September 28, 2008, through December 7, 2008, in support of Surveillance SOS-035-08, "Operations Work Hour Restrictions."

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. Observations and Findings

The inspectors performed a review of operator overtime due to an increasing trend in hours worked by operations personnel during the Unit 3 refueling outage. The inspectors reviewed the overtime deviation forms that had been approved during the refueling outage, reviewed operator shift schedules. Based on this review, the inspectors selected a three week period, from October 12 through November 1, 2008, where it appeared that approximately 16 licensed operators may have exceeded work hour requirements without proper authorization. The inspectors identified three potential issues that appeared to be contrary to the requirements of Procedure SO123-XV-60.2, "Implementation of Overtime Restrictions," Revision 7. Specifically, the issues were: 1) two individuals worked for more than 72 hours in a 7 day period; 2) two individuals worked more than 16 hours in a 24 hour period; and 3) two individuals did not have a break of at least 8 hours between work periods. Further, none of the individuals were granted an overtime deviation for exceeding the overtime guidelines.

The inspectors described the potential overtime issues to the licensee to obtain their assessment of the hours worked and whether the hours complied with the overtime

requirements contained in Procedure SO123-XV-60.2. The inspectors asked for the licensee's assessment since the three potential issues exceeded the requirements by small margins. The inspectors determined that some portion of the work hours may be excluded per Procedure SO123-XV-60.2, such as lunch or turnover time, that the inspectors were unable to distinguish from the records reviewed. The inspectors concluded, through further evaluation with the licensee, that some time could be excluded such that the hours worked did not exceed requirements of Procedure SO123-XV-60.2. Further, the inspectors did not identify any human performance errors that could be attributed to operator fatigue.

During the review, the inspectors identified that the monthly operations overtime reports have not been supplied to a company corporate officer since December 2007, as required by Technical Specification 5.2.2.e. Technical Specification 5.2.2.e, states, in part, that controls shall be included in the procedures such that individual overtime shall be reviewed monthly by the cognizant corporate officer, or designees, to ensure that excessive hours have not been assigned. This issue was documented in Nuclear Notification 200253802. The inspectors determined that this performance deficiency constituted a violation of minor significance based on the fact that the issue was administrative in nature since no violations of operator work hour requirements were identified. This failure to comply with a technical specification requirement constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

The inspectors observed that the licensee conducted interviews and reviewed payroll records for 32 operators between the dates of September 29, 2008, to December 7, 2008. The licensee identified four examples where individuals exceeded the work hour limits of Procedure SO123-XV-60.2. Specifically, there were three occasions where an employee's break between work periods was 7 hours, 45 minutes, instead of the required 8 hours. One other example was discovered where an employee worked 24 hours and 30 minutes in a 48 hour period, which exceeded the maximum limit of working 24 hours in a 48 hour period. The issues were entered into the licensee's corrective action program as Nuclear Notifications 200256607, 200257547, and 200257544. Because of the very short duration in time that the procedural limits were exceeded, the inspectors considered these four examples to be minor violations of technical specification requirements, and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

#### .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 corrective action items documenting the issues 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.

- October 31, 2008, Unit 3, increased motor vibrations on containment spray Pump P012 as described in Nuclear Notification 200189729
- December 4, 2008, Units 2 and 3, equipment tagging issues that resulted in the issuance of multiple stop work orders as documented in Corrective Action Order 800205636

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

b. Assessment and Observations

There were no findings of significance identified. The inspectors reviewed licensee actions to resolve problems with equipment tagging during the Unit 3 refueling outage. Five equipment tagging incidents occurred resulting in various stop work orders, which impacted the refueling outage schedule. The stop work orders were issued to ensure that the problems were understood and corrected to avoid personnel injury or equipment damage. None of the equipment tagging incidents resulted in personnel injury or equipment damage. The inspectors performed a more in-depth inspection following the 5th equipment tagging incident that occurred on December 4, 2008, and was documented in Nuclear Notification 200235512. The inspectors performed the inspection to understand why the equipment tagging problems continued, and why the previous actions taken had been ineffective in correcting the problems.

The inspectors reviewed the causes identified for the various errors and the actions that had been taken to correct the conditions. The inspectors observed that the previous attempts to correct the errors, although good intentioned, lacked the formality required by the corrective action program as contained in Procedure SO123-XV-50, "Corrective Action Process," Revision 19, and consequently, were ineffective. The licensee's evaluations of the previous issues were lacking, in that the underlying causes were not adequately identified resulting in ineffective corrective actions. Additionally, several key corrective actions lacked the necessary formality to ensure they were tracked to completion to preclude repetition of additional tagging errors. The inspectors observed that the organization's approach to the equipment tagging errors was to have a group of managers and supervisors informally identify the causes of the individual tagging incidents, identify the actions necessary to correct those conditions, then informally assign and complete those actions via verbal and email direction. The organization's approach was informal, in that, the level of evaluation, the documented evidence, and corrective action identification and tracking was not in accordance with the formal corrective action program requirements described in Procedure SO123-XV-50. In fact, the inspectors were told during briefings received following the previous equipment tagging incidents, that the review of the causes and actions taken were intended to be "stop-gap" measures to get through the end of the refueling outage, and that a more formal evaluation would take place at some point in the future. The inspectors concluded that this was an inappropriate approach for the equipment tagging problems that had such potential significance.

In conclusion, the inspectors' observations related to the licensee's failure to thoroughly evaluate the equipment tagging problems were similar to past NRC observations and findings that have resulted in the substantive crosscutting issue in the area of problem



identification and resolution described in NRC Assessment Letters dated March 3, 2008, and September 2, 2008.

#### **4OA3 Event Follow-up (71153)**

##### **.1 Event Report Review**

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

The inspectors reviewed the two 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 05000361/2008-004-00, "Malfunctioning Stator Water Cooling System Check Valve Causes Reactor Trip"**

On June 05, 2008, with Unit 2 at approximately 97 percent power, plant personnel began a monthly test of the stator water cooling system. In accordance with the test procedure, operators swapped the stator water pumps by starting the pump that was in standby and then stopping the operating pump. Three alarms were received in quick succession indicating a reduction in stator water flow. Approximately two minutes later, the main generator tripped from a "rectifier low flow," which subsequently resulted in a reactor trip. The cause of the stator water flow reduction was a pump discharge check valve which momentarily remained open following the stator water pump swap and then slammed shut. The resulting pressure spike was sufficient to lift one or both of the relief valves on the stator water heat exchangers, which resulted in reduced stator cooling water flow. The licensee documented this issue in AR 080600212. Licensee corrective actions included repairing the check valve, inspecting the check valve on the parallel pump, and replacing the heat exchanger relief valves. See Section 1R12 for findings associated with this Licensee Event Report review. This Licensee Event Report is closed.

###### **2. (Closed) Licensee Event Report 05000361;05000362/2006-004-00, "Late Surveillances on Loss of Voltage Relays Results in Surveillance Requirement 3.0.4 Violation"**

The inspector reviewed the information the licensee provided to describe and analyze this event. On January 29, 2008, the licensee determined during a 3 year period, between January 29, 2005, and January 29, 2008, Units 2 and 3 Surveillance Requirements 3.3.7.2, 3.3.7.3, 3.3.5.6 and 3.8.18, had not been appropriately tested within the required frequency. The cause of the missed surveillances was attributed to inadequate change management of the process used to schedule and track the completion of the loss of voltage signal and engineered safety feature relays. The process used to schedule and track the completion of the relays surveillances was revised from outage-based to test-on-line. The process change that occurred in 2005 was not properly implemented, and subsequently, allowed components to exceed the Surveillance Requirement frequency. The safety significance of the error was determined to be minimal since all missed relay surveillances have been reported completed with all response times within limits designated by technical specifications. Therefore, the relays remained capable of performing their intended safety function. The failure to meet surveillance test frequency is being treated as a minor violation because

there was no impact on plant safety and the item was entered in the corrective action program as Action Request 080101726. This failure to comply with technical specification requirement constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This Licensee Event Report is closed.

## .2 Personnel Performance

### a. Inspection Scope

The inspectors: (1) interviewed workers and outage management involved in the event below to evaluate licensee performance in coping with non-routine events; (2) verified that licensee actions were in accordance with the response required by plant procedures and training; and (3) verified that the licensee has identified and implemented appropriate corrective actions associated with personnel performance problems that occurred during the non-routine event. Following review of photographs, and discussions with operations personnel, the inspectors were reasonably satisfied that no damage to fuel assemblies or neutron source had occurred. The inspectors also reviewed the event for reportability in accordance with NUREG 1022, Event Reporting Guidelines.

- November 7, 2008, Unit 3, dropped neutron source S1 in spent fuel pool

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

These activities constitute completion of one inspection sample as defined in Inspection Procedure 71153-05.

### b. Findings

Introduction. A Green self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the failure of Nuclear Fuel Services personnel to properly implement procedural controls to adequately evaluate or repair a degraded source handling tool used in the spent fuel pool. An approved work plan was not used to modify a critical tool and the tool was returned to service in a degraded condition.

Description. During the Unit 3 refueling outage, Nuclear Fuels Services personnel removed the neutron sources from fuel assemblies that would be reloaded into the reactor core. The spent neutron sources were stored in spent fuel assemblies that were located in the spent fuel pool. Neutron sources contain radioactive elements and are approximately 10 feet long. A special source handling tool was used to handle and move the neutron source rods in the spent fuel pool. The source handling tool was about 35 feet long, was hand operated, and maneuvered using underwater cameras. The design of the tool grapple device consisted of two concentric hemispheres made of light aluminum tubing. When the grapple is closed the inner hemisphere (inner tube) surrounds the top hat of the source rod to hold it firmly. At the bottoms of the inner and outer tubes were lips, or cams, used to engage the top hat of the neutron source rod. A locking pin, inserted at the top of the tool, prevented inadvertent movement of the inner hemisphere.

On November 3, 2008, Nuclear Fuels Services personnel identified a grappling problem with the Unit 3 source handling tool, and documented the condition on Nuclear Notification 200201738. Nuclear Fuels Services personnel observed that the tool would not securely hold the neutron source rod while grappled. On November 4, 2008, Nuclear Fuels Services personnel inspected the source handling tool and incorrectly concluded that the outer tube assembly was damaged. As a result, the outer tube of the source handling tool was inappropriately modified to tighten the tool clearances. The modification was completed without proper work control authorization or engineering evaluation. The modification failed to correct an unknown degraded condition, but compensated for the condition that was preventing the source from being securely grappled. The unknown degraded condition was that the source handling tool inner tube was missing its bottom lip, such that the tool would not securely hold the neutron source rod while grappled. Since the inappropriate modification appeared to have corrected the grappling problem, Nuclear Fuels Services personnel returned the tool to service and recommenced neutron source movements within the spent fuel pool.

On November 6, 2008, a day after the unauthorized modification, Maintenance Order 800190668 was generated from Nuclear Notification 200201738 to repair and retest the degraded source handling tool in accordance with Maintenance Procedure SO23-I-3.48. However, Maintenance Order 800190668 was not completed since Nuclear Fuels Services personnel believed that the condition had been corrected by their modification. On November 7, 2008, neutron Source S1 was being moved with the source handling tool in Unit 3 spent fuel pool. The tool was properly pinned such that the grappling device was locked in place and as a precaution the tool was shaken to ensure the source was secure. The neutron source was then moved from the fuel assembly in storage Cell AA12 to storage Cell AA18. However, during peer checks it was identified that the source rod was incorrectly lowered into the wrong storage location. After adjustment of the underwater camera, an attempt was made to move the source to the correct storage cell. During this process, the source rod disengaged from the tool since it was not securely grappled due to the degraded condition that still existed. The neutron source fell, the bottom of the rod contacted the top of the fuel assembly in storage Cell AA18, and the source came to rest against the side of the spent fuel pool.

This event resulted in a stop work order by the shift manager to determine the cause of the event, and to evaluate the potential impact to the spent fuel assemblies and neutron source rod. Following the event, engineering visually verified that no damage to the spent fuel assembly or the neutron source rod had occurred. On November 8, 2008, Nuclear Fuels Services personnel implemented an approved work plan to recover the dropped neutron source using air-operated underwater vice-grips. Neutron Source S1 was successfully retrieved and moved to the proper storage location. Subsequent evaluation and testing of the source handling tool determined that the tool was missing the bottom lip on the inner tube, and that the neutron source was easily disengaged by hand from the grappling device.

Analysis. The inspectors determined that the unauthorized modification to the source handling tool and subsequent return to service of the source handling tool was a performance deficiency. The finding is more than minor because if left uncorrected the performance of repairs without proper procedures or evaluations has the potential to lead to a more significant safety concern when critical tools are returned to service in a degraded condition. Degraded tools used in the spent fuel pool have the potential to

adversely impact reactor safety barrier integrity because of potential damage to spent fuel assemblies or radioactive neutron source elements. Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," was used since the Significance Determination Process Appendix G methods and tools are not adequate to determine the significance of fuel handling findings. This finding affects the barrier integrity cornerstone and is determined to have very low safety significance by NRC management review because the deficiency did not cause actual degradation of fuel. The finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program because Nuclear Fuel Services personnel did not thoroughly evaluate problems such that the resolution address the causes and extent of conditions for a degraded source handling tool [P.1(c)].

Enforcement. As required by 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," 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. Contrary to this, on November 4, 2008, Nuclear Fuel Services personnel performed corrective maintenance on equipment used for activities affecting quality without documented instructions, procedures, or drawings, to ensure maintenance activities were satisfactorily completed. Specifically, Nuclear Fuel Services personnel performed an unauthorized modification to a degraded source handling tool and failed to adequately evaluate this critical tool used in the spent fuel pool. As a result, the source handling tool grappling problem was not fully understood such that the degraded condition was not corrected prior to returning the source handling tool to service. Consequently, on November 7, 2008, a neutron source rod was dropped when the source handling tool failed to securely grapple the rod during movement in the spent fuel pool and above spent fuel assemblies. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Nuclear Notification 200204667, this violation is being treated as a non-cited violation consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000362/2008005-04, "Inadequate Procedure Implementation for Corrective Action on Degraded Source Handling Tool."

#### **40A5 Other Activities**

##### **.1 Quarterly Resident Inspector Observations of Security Personnel and Activities**

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

During the inspection period, the inspectors performed observations of security force personnel and activities to ensure that the activities were consistent with San Onofre Nuclear Generation Station security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

###### **b. Findings**

No findings of significance were identified.

.2 Implementation of Temporary Instruction 2515/176, "Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing"

a. Inspection Scope

The objective of Temporary Instruction 2515/176 was to gather information to assess the adequacy of nuclear power plant emergency diesel generator endurance and margin testing as prescribed in plant-specific technical specifications. The inspectors reviewed the licensee's technical specifications, procedures, and calculations and interviewed licensee personnel to complete the temporary instruction. The information gathered while completing this temporary instruction was forwarded to the Office of Nuclear Reactor Regulation for further review and evaluation on December 31, 2008.

b. Findings

No findings of significance were identified.

.3 Temporary Instruction 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds", San Onofre Nuclear Generating Station, Unit 3

03.01 Licensee's Implementation of the MRP-139 Baseline Inspections

a. MRP-139 baseline inspections:

The inspectors observed performance and reviewed records of structural weld overlays and nondestructive examination activities associated with the San Onofre Unit 3 hot leg shut down cooling, hot leg drain, and hot leg surge line weld overlay mitigation effort. The baseline inspections of the pressurizer dissimilar metal butt welds were completed during the fall 2008 refueling outage.

To implement the inspections of MRP-139 at San Onofre, two procedures have been developed. Procedure SO23-XXXIII-8.16, "Reactor Coolant System Alloy 600 Inspection," is the program procedure further amplifying the aspects of the program, and 9022, "Reactor Coolant System Alloy 600 Materials Management Program," is a station administrative procedure detailing the administration of the San Onofre program plan.

To implement the program a detailed spread sheet with the frequencies and basis of the required inspections has been prepared. Both procedures and the spread sheet have been included. The Alloy 600 program does exist separately, but has not had a self assessment.

b. At the present time, the licensee is not planning to take any deviations from the baseline inspection requirements of MRP-139, and all other applicable dissimilar metal butt welds are scheduled in accordance with MRP-139 guidelines.

03.02 Volumetric Examinations

a. There were no inspections of unmitigated pressurizer dissimilar metal butt welds performed during this outage.

- b. Inspectors directly observed and/or reviewed records of non-destructive examination performed on pressurizer weld overlays. This effort is documented in Section 1R08 of this inspection report.

For each weld overlay inspected the licensee submitted and received NRC approval by letter dated February 21, 2007, "Third Ten-Year Inservice (ISI) Interval Relief Request ISI-3-27 Use of Structural Weld Overlay and Associated Alternative Repair Techniques".

Inspection coverage met requirements of MRP-139.

No relevant conditions were identified.

- c. The certification records of ultrasonic examination personnel used in the examination of the unmitigated hot legs dissimilar metal butt welds, and the mitigated pressurizer dissimilar metal butt welds were reviewed. All personnel records showed that they were qualified under the Electric Power Research Institute Performance Demonstration Initiative.
- d. No deficiencies were identified during the non-destructive examination.

#### 03.03 Weld Overlays

- a. The inspectors observed structural weld overlay welding, and reviewed records pertaining to the hot leg shutdown cooling, hot leg surge, and hot leg drain lines. The inspectors determined that welding was performed in accordance with American Society of Mechanical Engineers Code Section IX requirements. Welding inspections were documented in Section 1R08 of this inspection report.
- b. The licensee submitted and received NRC approval by letter dated February 21, 2007, "Third Ten-Year Inservice (ISI) Interval Relief Request ISI-3-27 Use of Structural Weld Overlay and Associated Alternative Repair Techniques".
- c. The qualification records of welders were reviewed and all qualifications were current.
- d. No relevant conditions were identified.

#### 03.04 Mechanical Stress Improvement

This item is not applicable because the licensee did not employ a mechanical stress improvement process.

During the upcoming San Onofre refueling outage there are no stress improvement activities planned. As part of the hot leg and cold leg bare metal visual inspection an assessment is planned to determine the feasibility of future stress improvement activities.

There have been no prior stress improvement activities at San Onofre, therefore there are no prior qualification reports available for review.

### 03.05 Inservice inspection program

The licensee MRP-139 inservice inspection program has been controlled through the designated procedures and the corrective action program to assure that requirements identified in the MRP-139 guidelines are not inadvertently missed. As such, the MRP-139 inservice inspection program is in-process, although it was recognized that this may not be the most appropriate way to control dissimilar metal butt weld locations and scheduling requirements. This item will receive further in-office inspection at a later date.

The inspectors' review determined that the hot leg weld overlay on the dissimilar metal butt welds nozzles are appropriately categorized in accordance with MRP-139 requirements. The categorization of all other dissimilar metal butt welds will receive further in-office inspection at a later date. Additionally, the licensee's MRP-139 inservice inspection program will receive additional in-office review at a later date.

## **40A6 Meetings, Including Exit**

### Exit Meeting Summary

On October 30, 2008, the inspectors presented the results of the inservice inspection to Mr. M. Short, Vice President, Engineering and Technical Services, and other members of licensee management. The inspectors returned proprietary material examined during the inspection.

On November 3, 2008, a Division of Reactor Safety inspector presented the occupational radiation safety inspection results to Mr. J. Madigan, Manager, Health Physics 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 November 3, 2008, the inspector conducted a telephonic exit meeting to present the results of the in-office inspection of changes to the licensee's emergency plan and emergency plan implementing procedure to Mr. B. Ashbrook, Manager, Onsite Emergency Preparedness, who acknowledged the findings.

On November 6, 2008, the inspectors briefed Mr. A. Hochevar, Plant Manager, and other members of the licensee's staff, on the results of the licensed operator requalification program inspection. The licensee acknowledged the findings presented.

On January 5, 2009, after review of the complete biennial requalification cycle examination results, the inspector conducted a telephonic exit with Mr. B. Arbour, Simulator Support and Exam Development Supervisor. The licensee acknowledged the results as presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 12, 2009, the resident inspectors presented the inspection results to Mr. M. Short, Vice President, Engineering and Technical Services, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors

asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

#### **4OA7 Licensee-Identified Violations**

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a non-cited violation.

- Technical Specification 5.5.1.1 requires, in part, that written procedures be established, implemented, and maintained covering the activities specified in Appendix A, "Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors," of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operations)," dated February 1978. Appendix A, Section 3.f, requires procedures for maintaining containment integrity. Procedure SO23-5-1.8.1, "Shutdown Nuclear Safety," Revision 19, documented the containment closure crew responsibilities to maintain containment integrity for various reactor coolant system conditions. Contrary to the above, on November, 23, 2008, a dedicated containment closure crew was not onsite for approximately 55 minutes when Unit 3 was in Mode 5, and reactor coolant system conditions required that containment integrity was maintained. This issue is documented in the licensee's corrective action program as Nuclear Notification 200224995. The finding is of very low safety significance because the finding does not increase the likelihood of a loss of reactor coolant system inventory, degrade the licensee's ability to terminate a leak path, add reactor coolant system inventory, or recover decay heat removal once it is lost.

ATTACHMENT: SUPPLEMENTAL INFORMATION



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

B. Arbour, Supervisor, Simulator Support and Exam Development  
J. Armas, Supervisor, Maintenance Engineering Fluid Process  
M. Arun, ISI Engineer, Maintenance Engineering  
B. Ashbrook, Manager, Onsite Emergency Preparedness  
D. Axline, Technical Specialist, Nuclear Regulatory Affairs  
P. Blakeslee, Supervisor, Mechanical Auxiliary Systems  
S. Chun, Supervisor, Electrical/I&C Systems  
B. Corbett, Manager, Performance Improvement  
L. Conklin, Manager, Nuclear Regulatory Affairs  
B. Culverhouse, Manager, Site Support Services/Offsite of Emergency Preparedness  
R. Elsasser, Manager Training  
S. Gardner, Engineer, Nuclear Regulatory Affairs  
S. Genshaw, Manager, Maintenance Engineering Electrical/Controls  
M. Graham, Manager, Plant Operations  
D. Hansford, Manager, Staff Support  
A. Hochevar, Manager, Plant Operations  
R. Holmes, Technical Specialist/Scientist, Maintenance/Systems Engineering  
G. Johnson, Jr., Supervisor, Valves  
K. Johnson, Manager, Design Engineering  
M. Johnson, Manager, Support Services  
L. Kelly, Engineer, Nuclear Regulatory Affairs  
D. Legere, Director, Work Control  
R. Nielsen, Supervisor, Nuclear Oversight  
J. Madigan, Manager, Health Physics  
A. Martinez, Manager, Health Physics Operational Support  
C. McAndrews, Manager, Nuclear Oversight and Assessment  
M. McDevitt, Senior Nuclear Engineer, Maintenance/Systems Engineering  
A. Meichler, Supervisor, American Society of Mechanical Engineers Programs  
J. Mosier, Technical Specialist/Scientist, Maintenance & Construction Services  
M. Orewyler, Manager, Production Support  
N. Quigley, Manager, Mechanical/Nuclear Maintenance Engineering  
T. Remick, Fuels Engineer  
R. Ridenoure, Vice President, Nuclear Generation  
T. Raidy, Technical Specialist/Scientist, Nuclear Regulatory Affairs  
C. Ryan, Manager, Maintenance & Construction Services  
A. Scherer, Manager, Nuclear Regulatory Affairs  
S. Sewell, Technical Specialist, DWP Program, Health Physics  
A. Shean, Manager, Nuclear Oversight  
M. Short, Vice President, Engineering and Technical Services  
A. R. Shean, Manager, Nuclear Oversight  
J. Todd, Manager, Security  
R. St. Onge, Director, Maintenance and Systems Engineering  
G. Vechinski, Supervisor, Maintenance & Construction Services  
T. Vogt, Manager, Systems Engineering  
M. Wade, Manager, Maintenance & Construction Services

D. Wilcockson, Manager of Operations Training  
C. Williams, Manager, Compliance  
T. Yackle, Director, Operations

NRC Personnel

D. Loveless, Senior Reactor Analyst  
M. Runyan, Senior Reactor Analyst

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

Opened

05000361;05000362/ 2008005-03	URI	Failure to Report Changes to Mitigating Systems Performance Index Risk Coefficients. (Section 4OA1)
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Opened and Closed

05000361/2008005-01	FIN	Inadequate Inspection of Stator Water Discharge Check Valve (Section 1R12)
05000362/2008005-02	NCV	Failure to Justify Longer Completion Schedule for Degraded Equipment (Section 1R20)
05000362/2008005-04	NCV	Inadequate Procedure Implementation for Corrective Action on Degraded Source Handling Tool (Section 4OA3)

Closed

05000361/2008-004-00	LER	Malfunctioning Stator Water Cooling System Check Valve Causes Reactor Trip (Section 4OA3)
05000361; 05000362/2006-004-00	LER	Late Surveillances on Loss of Voltage Relays Results in SR 3.0.4 Violation (Section 4OA3)

Discussed

None

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Conditions

#### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-13-8	Severe Weather	6
SO123-IX-7	Storm Water Monitoring	7
SO23-XV-4.13	Control of Work and Storage Areas within the Protected Area	3

### Section 1R04: Equipment Alignment

#### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-3.26	Shutdown Cooling System Operations	25
SO23-2-17.2	Component Cooling Water System Outage Evolutions	7
SO23-13-7	Loss of Component Cooling Water/Saltwater Cooling	13
SD-SO23-740	Safety Injection, Containment Spray and Shutdown Cooling System	8
SO23-3-2.9	Containment Spray System Operation	24
SD-SO23-400	Component Cooling Water System	6
SO23-2-17	Component Cooling Water System Operation	26
SO23-2-17.1	Component Cooling Water System Alignments	14
SD-SO23-410	Saltwater Cooling System	7
SO-23-2-8.1	Saltwater Cooling System Alignments and Infrequent/Outage Operations	7

Nuclear Notifications

NUMBER

200241461

Drawings

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
40127AS03	Component Cooling Water System (Pumps)	24
40127BS03	Component Cooling Water System (Tanks)	28
40127CS03	Component Cooling Water System (Heat Exchangers)	33
40127DS03	Component Cooling Water System (Supply Headers)	18
40127ES03	Component Cooling Water System (Return Headers)	26
40127HS03	Component Cooling Water System Backup Nitrogen	9
40127JS03	Component Cooling Water System Safety Related Make Up System	3
40126AS03	Component Cooling Water System (Salt Water Pumps)	20
40126BS03	Component Cooling Water System (Salt Water Pumps)	25
40114BS03	Containment Spray System Unit 3	15
40114AS03	Containment Spray System Unit 3	15
40112XS03	Process Key Plan Safety Injection System No. 1204	3
40112BS03	Safety Injection System	37
DBD-SO23-410 Figure D-4	Plan Intake Structure Units 2 & 3	8

40126ASO3	Component Cooling Water System (Salt Water Pumps) System 1203	21
40126BSO3	Component Cooling Water System (Salt Water Pumps) System 1203	25

## **Section 1R05: Fire Protection**

### Procedures

<u>TITLE</u>	<u>REVISION / DATE</u>
SONGS pre-fire plans Units 2 and 3	1995
Updated Fire Hazards Analysis, Unit 3 Containment Areas	2001 August 2,
SONGS Pre-Fire Plans, Area 3-CO-033, and 33A	5

### Drawings

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
2/3-019	Pre-Fire Plans, Saltwater Pipe Tunnel, Saltwater Cooling Pump Room, Saltwater Intake Area	0
3SE38.DWG (3-038)	Pre-Fire Plan for Safety Equipment Elevation (-)15'-6" to 8'-0"	10/19/2007

### Miscellaneous

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
Evaluation Number 102	Piping and Heat Exchanger Room/Surge Tank Room Evaluation of Fire Boundary	0

## **Section 1R08: Inservice Inspections Activities**

### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-XV-85	Boric Acid Corrosion Control Program (BACCP)	3
SO23-V-8.15	Containment Boric Acid Leak Inspection	2

SO23-XXVII-3.51.1	IntraSpect Eddy Current Inspection of Vessel Head Penetration J-Welds and Tube OD Surfaces	6
SO23-XXVII-3.51.9	IntraSpect Ultrasonic Analysis Guidelines	6
SO23-XXVII-30.13	Risk-Informed Ultrasonic Examination of Class 1 Austenitic Piping Welds	0
SO23-XXVII-20.51	Visual Examination Procedure for Operability of Nuclear Components and Supports and Conditions Relating to their Functional Adequacy	2
SO23-I-1.8	Piping and Component Stress Controls	8
SO23-XXVII-30.9	Ultrasonic Examination of Dissimilar Metal Piping Welds	2
PDI-UT-2	PI Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	March 27, 2007
SO23-XXXIII-8.16	Reactor Coolant System Alloy 600 Inspection	5
9022	Reactor Coolant System Alloy 600 Material Management Program	5
GQP-9.7	Solvent Liquid Penetrant Examinations and Acceptance	12
PI-901115-03	Standards for Welds, Base Metals, and Claddings San Onofre (SONGS) Unit 3 EDM Boat Sampling and Weld Repair - Operations	1

#### Action Requests

070201271	070100948	200183373
071200751	061001105	200183553
071200826	061100541	800166195
070600436	070500982	800083097
061101043	071200830	200189925
080401360		

#### Calculations

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
0800692.337	Consolidation Calculation for Hot Leg Drain Nozzle Weld Overlay Repair	0

0800692.317	Consolidation Calculation for Hot Leg Shutdown Cooling Nozzle Weld Overlay Repair	0
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0800692.327	Consolidation Calculation for Hot Leg Surge Nozzle Weld Overlay Repair	0
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Drawings

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
406955	Construction Drawing Hot Leg Surge, SONGS Unit 3	2
406956	Construction Drawing Hot Leg SDC, SONGS Unit 2, 3	1
406957	Construction Drawing Hot Leg Drain, SONGS Unit 2, 3	1

Miscellaneous

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Data Analysis Reference Manual San Onofre Nuclear Generating Station (SONGS) Units 2 & 3	15
	Steam Generator Tube Integrity Preliminary Operational Assessment	7/12/07
DEI-884	Tube Degradation Predictions for the San Onofre Nuclear Generating Station Unit 3 Steam Generators – 2005 Update	0
308-15PT-014	Liquid Penetrant Examination	10/30/08
Daniel Granados	NDE Personnel Certification	03/02/07
Michael Baughn	NDE Personnel Certification	01/17/06
CMTR-07678201	Certified Material Test Report – Weld Wire	08/20/08
Batch - 07J09K	Spotcheck – Cleaner/Remover, Type SKC-S	09/25/07
Batch - 04B013K	Spotcheck – Penetrant, Type SKL-SP1	02/27/04
Batch - 08J21K	Spotcheck – Remover, Type SKD-S2	09/19/08
WPS-43MN-GTAW/SMAW	Inconel to Inconel with Inconel Filler	12/18/07
WPQ Record # – V1299	ASME Section IX - Welder Performance Qualification	11/03/08

Examination Technique Sheets (ETSS)

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
ETSS Bobbin Coil Exam	ETSS#1	6
ETSS Bobbin Coil Exam	ETSS#2	7
ETSS Bobbin Coil Exam	ETSS#3	7
ETSS Bobbin Coil Exam	ETSS#4	7
ETSS Bobbin Coil Exam	ETSS#5	6

Welding Procedure Specifications and Corresponding Procedure Qualifications Reports

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
WPS 01-08-T-804-Bottom	WPS	2
WPS 01-08-T-804-2G(20),	WPS	1
WPS 08-08-T-001-Buffer SS	WPS	5
01-08-T-032	PQR	
01-01-T-802	PQR	
A843256	PQR	
08-08-T-009,	PQR	
08-08-TS-001	PQR	
8.8.6-OKG	PQR	
08-08-TS-002	PQR	

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

Miscellaneous

<u>NUMBER</u>		<u>REVISION</u> <u>DATE</u>
Scenario Dynamic No. 55	Loss of Coolant Accident with an Excessive Steam Demand Event	0



TITLE

All scenarios used during the 2008 biennial requalification exams

All job performance measures used during the 2008 biennial requalification exams

Simulator Discrepancy Report

Licensed Operator Proficiency Status Report

Six randomly selected licensed operator medical records

Thirty licensed operator human performance related condition reports

Licensed Operator Training Review Committee meeting minutes for the last two years

All procedures governing licensed operator requalification training

**Section 1R12: Maintenance Effectiveness**

Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION DATE</u>
SO123-XV-5.3	Maintenance Rule Program	11
SD-SO23-410	Saltwater Cooling System	4
SO23-3-3.60.4	Saltwater Cooling Pump 2MP-112 and Valve Testing	11
SO23-3-3.60.4	Saltwater Cooling Pump 2MP-113 and Valve Testing	11
SO23-3-3.60.4	Saltwater Cooling Pump 3MP-114 and Valve Testing	11
SO23-3-3.60.4	Saltwater Cooling Pump 3MP-114 and Valve Testing	10
SO23-3-3.60.4	Saltwater Cooling Pump 3MP-114 and Valve Testing	9
SO23-405-33-M96	Flowserve TM-0387	2

Nuclear Notifications

NUMBER

200242328                      200242903                      200225920

Work Orders

NUMBER

06121745000                      800066049

Drawings

NUMBER

TITLE

REVISION  
DATE

0520-SO23-401-H-26-0                      Swing Check Valve

0

Action Requests

NUMBER

080600212

Miscellaneous

NUMBER

TITLE

LER 2-2008-004                      Malfunctioning stator water cooling system check valve causes reactor trip

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

Nuclear Notifications

NUMBER

2001855                      200185675                      200185734                      200185731                      200229978

Work Orders

NUMBER

800183050                      800183051                      800203247

Miscellaneous

TITLE

REVISION / DATE

Unit 3 Control Room Logs

Dated December 1 and 2, 2008

**Section 1R15: Operability Evaluations**Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION DATE</u>
SO23-3-3.12	Integrated ESF System Refueling Test	23
SO23-3-3.23	Diesel Generator Monthly and Semi-Annual Testing	35
SO23-3-3.35	PAMI/SAFE Shutdown Monthly Checks	21

Nuclear Notifications

<u>NUMBER</u>					
200180393	200180393	200204486	200210899	200204653	200204664
200204665	200204668	200206360	200206932	200253740	

Calculations

<u>NUMBER</u>		
J-BHA-012	Containment emergency Sump High Level Setpoint	1
J-BHA-011	Containment Emergency Sump (wide range) Level Loop Uncertainties	0

Miscellaneous

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
Operating Experience Smart Sample (OpESS) FY2008-01	Negative Trend and Recurring Events Involving Emergency Diesel Generators	0

## Section 1R18: Plant Modifications

### Drawings

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-405-6-135	8 Stage - DVMX Pump Byron Jackson Pump DIV Borg -Warner Corp. IF - 8196	3

### Action Request

<u>NUMBER</u>
040500937--16

### Engineering Document

<u>NUMBER</u>
040500937-21

### Work Order

800077410	800077448
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## Section 1R19: Postmaintenance Testing

### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO123-II-11.152	Circuit Device Test and Overall Functional Test	10
SO23-2-8.1	Saltwater Cooling System Alignments and infrequent/Outage Operations	7
SO23-3-3.60.6	Auxiliary Feedwater Pump and Valve Testing	15
SO123-I-2.2	125 VDC Battery Inspection	10
SO123-I-2.3	125 VDC Pilot Cell Battery Inspection	10

### Nuclear Notifications

#### NUMBER

200241958      200230582      200200494

### Work Orders

#### NUMBER

800187988      800181944      800050486      800050921  
800049610      800077031      800039908      800053579

### Drawings

#### NUMBER

#### TITLE

SO23-302-2-442-2      Connection Diagram      3  
32701      Elementary line diagram      25

### Miscellaneous

#### TITLE

Inservice Pump Test Records

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

### Procedures

#### NUMBER

#### TITLE

#### REVISION / DATE

SO23-3-1.1      Reactor Startup      30  
SO23-13-11      Emergency Boration of the RCS/Inadvertent Dilution or  
Boration      13  
SO23-3-1.8      Draining the Reactor Coolant System to a Reduced  
Inventory Condition      26  
SO23-5-1.8.1      Shutdown Nuclear Safety      19  
SO23-XX-7      Shutdown Nuclear Safety Program      2

SSGRP Guideline	SONGS SG Replacement Project Containment Management Plan	0
SO23-XX-7.1	Defense in Depth Planning	2
DID Sheet #2	Defense in Depth Sheet R3C15	0
SO23-3-2.6	Shutdown Cooling System Operation	25
SO23-3-3.26.1	Once a Day Surveillance (Mode 5-6)	24
SO23-X-7	Nuclear Fuel Movement for Refueling Cycles	16
SO23-5-1.8	Shutdown Operations (Mode 5-6)	19
SO23-5-1.5	Plant Shutdown from Hot Stand-by to Cold Shutdown	29

#### Drawings

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/ DATE</u>
40012ASO3	Safety Injection P&I Drawings	35

#### Nuclear Notifications

<u>NUMBER</u>
800078383

#### Work Clearance Document

<u>NUMBER</u>			
30000099	30000079	30000119	30000547
30001037	30000286	30000553	30001037
30001024	70000256	70000447	70000796

## Section 1R22: Surveillance Testing

### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-3-3.51.4	Containment Penetration Leak Rate Testing Pressurizer and RCDT Penetrations	10
SO23-V-3.13	Containment Penetration Leak Rate Testing	18
SO3-15-63.c	Annunciator Response Instruction	9
SO23-3-3.20	Monthly control room emergency air cleanup system test, control room cooler exercise run and control room emergency air cleanup system minimum operability verification	22
SO23- 3.3.43.15	Engineering feature safeguard subgroup K-311B and k-206B Semiannual Test	7
SO123-I-1.43	Maintenance Procedure – Attachment 8	7
SO123-II-15.3	Instrumentation Procedure – Attachment 1	14
SO123-I-6.7.3	Maintenance Procedure – Disassembly, Inspection, Replacement of Parts and Assembly of Limitorque Valve Actuators	1
SO123-I-8.28	Maintenance Procedure – Lubrication Inspection of Limitorque Valve Actuators	3
SO123-I-9.5	Maintenance Procedure – Electrical Inspection of Limitorque Actuators	5
SO123-I-9.30	Maintenance Procedure – MOV Test - Data Record Form	5

### Nuclear Notifications

<u>NUMBER</u>	
200180393	200028261

Work Orders

NUMBER

800077149

Drawings

NUMBER

TITLE

REVISION/  
DATE

31357      Elementary Diagram; Auxiliary Building Emergency  
Chiller E335 Train B

35

**Section 20S1: Access Controls to Radiologically Significant Areas**

Procedures

NUMBER

TITLE

REVISION /  
DATE

SO123-VII-  
20.9.4      Survey and Release of Personnel

5

SO123-VII-  
20.9      Radiological Surveys

9

SO123-VII-  
20.11.1      Radiological Posting

9

SO123-VII-  
20.11      Access Control Program

10

SO123-VII-20      Health Physics Program

12

SO123-VII-8      Control of Radioactive Material

11

SO123-XII-  
13.1      SCE Radiography Process

7

SO123-VII-  
20.10.7      Radiography Health Physics Controls

6

SO23-XV-24      Quarterly NRC Performance Indicator Process

5



### Nuclear Notifications

#### NUMBER

200002932	200003110	200111143	200152779
200157346	200180007	200184023	200191493
200195857	200198262	200191493	200199621
200200483	200200484	200202651	200202651
800075026			

### Action Request

#### NUMBER

080300328

### Radiation Exposure Permits

#### NUMBER

#### TITLE

800063968	Low Pressure Safety Injection to RCS Loop 1B Check Valve
800174207	U3C15 Reactor Head Nozzle Inspection
800190787	U3C15 Reactor Head Nozzle Inspection
A0617080012	U3C15 Fuel Sipping/Fuel Moves
A0617080027	U3C15 Primary SG Maintenance
A0617080057	U3C15 Outage Related Radiography
A0617080070	U3C15 Manways and Nozzle Dams
A0617080073	U3C15 Hot Leg Weld Overlays
A0617080074	U3C15 Hot Leg Weld Overlays

## Section 20S2: ALARA Planning and Controls

### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
HPPG-SO123-G-1	SONGS ALARA Expectations	0
HPPG-SO123-G-2	SONGS ALARA Working Group and ALARA Committee	0
HP-S-1	Posting	22
HP-S-25	Radiological and Non-Radiological Hose Control	1
SO123-VII-20.4.1	ALARA Design Change Reviews	4

### Radiation Exposure Permits

<u>NUMBER</u>	<u>TITLE</u>
800063968	Low Pressure Safety Injection to RCS Loop 1B Check Valve
800174207	U3C15 Reactor Head Nozzle Inspection
800190787	U3C15 Reactor Head Nozzle Inspection
A0617080012	U3C15 Fuel Sipping/Fuel Moves
A0617080027	U3C15 Primary SG Maintenance
A0617080057	U3C15 Outage Related Radiography
A0617080070	U3C15 Manways and Nozzle Dams
A0617080073	U3C15 Hot Leg Weld Overlays
A0617080074	U3C15 Hot Leg Weld Overlays

### Miscellaneous

#### TITLE

ALARA Plan U3C15

One Declared Pregnant Worker records and dose evaluations

## **Section 4OA1: Performance Indicator Verification**

### Miscellaneous

<u>TITLE</u>	<u>REVISION / DATE</u>
MSPI Derivation Reports	
Control Room Logs	
Maintenance Rule Review of LCOARs/EDMRs	
Licensee Event Reports	2007-2008

### Audits, Self-Assessments, and Surveillances

<u>TITLE</u>	<u>REVISION / DATE</u>
SCES-009-08	07/18/08
SOS-026-08	09/04/08
SOS-017-08	05/30/08

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

### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-3-3.60.7	Containment Spray Pump and Valve Testing	11
SO123-XV-60.2	Implementation of Overtime Restrictions	7
OSM-109	Work Clearance Guidelines	2
OSM-109A	Work Clearance Checklist	1
OSM-109B	Work Clearance Definitions	1

### Nuclear Notifications

#### NUMBER

200243685	RCE 800217400	200213655	200229863
200235512	200253802		

### Work Orders

#### NUMBER

800185629	800187051	800205636	RCE 800217400
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### Miscellaneous

#### TITLE

#### REVISION / DATE

Inservice Pump Test Record	
Time records for operations personnel	October 12 - November 1, 2008
Operations Department Shift Schedules	
Priority 2 Reading 2-08-092	October 20, 2008
Summary of Work Time Exclusion Records	
Work Clearance Documents 30000060, 30000059, 30001403	
Stop Work Notification	November 21, 2008
Stop Work Notification	November 28, 2008
Stop Work Notification	December 5, 2008
Priority 1 Reading 1-08-008	November 21, 2008
Priority 1 Reading 1-08-008, Revision A	November 23, 2008
Pre-Shift Brief 08-069	November 16, 2008

## Section 4OA3: Event Follow-Up

### Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SO23-X-7.2	Nuclear Fuel Movement- Spent Fuel Pool	16

### Nuclear Notifications

<u>NUMBER</u>		
200208974	200204667	200201738

### Work Orders

<u>NUMBER</u>	
200204667	200208974