



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 E. LAMAR BLVD.  
ARLINGTON, TX 76011-4511

March 2, 2017

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

**SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INSPECTION  
REPORT 05000361/2017-001 AND 05000362/2017-001**

Dear Mr. Palmisano:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on January 30 – February 2, 2017, at the San Onofre Nuclear Generating Station, Units 2 and 3. The NRC inspector discussed the results of this inspection with you and other members of your staff during an onsite final exit meeting conducted on February 2, 2017. The inspection results are documented in the enclosure to this inspection report.

The NRC inspection 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. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, the inspector reviewed the synchronous condenser activities, Unit 2 and 3 spent fuel safety, management of the organization, and maintenance and surveillance activities. No violations were identified and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

If you have any questions regarding this inspection report, please contact Rachel Browder at 817-200-1452, or the undersigned at 817-200-1549.

Sincerely,

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Lee E. Brookhart, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Docket Nos. 50-361; 50-362  
License Nos. NPF-10; NPF-15

Enclosure:  
Inspection Report 05000361/2017-001;  
05000362/2017-001  
w/Attachment: Supplemental Information

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket Nos. 05000361; 05000362  
License Nos. NPF-10; NPF-15  
Report Nos. 05000361/2017-001; 05000362/2017-001  
Licensee: Southern California Edison Company  
Facility: San Onofre Nuclear Generating Station, Units 2 and 3  
Location: 5000 South Pacific Coast Highway, San Clemente, California  
Dates: January 30 – February 2, 2017  
Inspector: Rachel S. Browder, C.H.P., Senior Health Physicist  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety  
Approved By: Lee E. Brookhart, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Enclosure

## EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3  
NRC Inspection Report 05000361/2017-001; 05000362/2017-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3. In summary, the licensee was conducting these activities in accordance with site procedures, license requirements, and applicable NRC regulations.

### Decommissioning Performance

- The licensee had initiated excavation activities in the southern portion of the switchyard and initiated construction of the soil nail wall, in support of the synchronous condenser construction. The licensee's survey results and the NRC composite soil sample confirmatory data indicated that the excavated soil was indistinguishable from background and therefore met the unrestricted use criteria established under 10 CFR 20.1402. Based on the survey results, the excavated soil was being transported to Camp Pendleton. (Section 1.2)

### Spent Fuel Pool Safety

- The SONGS Units 2 and 3 spent fuel pools were being maintained in accordance with technical specifications and procedural requirements. The licensee was safely storing spent fuel in wet storage. (Section 2.2)

### Organization and Management

- The licensee's organization was being implemented in accordance with regulatory and license requirements. The licensee continued to implement an employee concerns program in which individuals could raise concerns without fear of retaliation. (Section 3.2)

### Maintenance and Surveillance

- The licensee implemented its maintenance program consistently with procedures and regulatory requirements. Plant systems were maintained in accordance with technical specifications requirements. The licensee appropriately implemented the maintenance rule to ensure compliance with the requirements of 10 CFR 50.65 for structures, systems, and components associated with the storage, control, and maintenance of spent fuel. (Section 4.2)

## **REPORT DETAILS**

### **Site Status**

On June 12, 2013, Southern California Edison (SCE), the licensee, formally notified the NRC by letter that it had permanently ceased power operations at Units 2 and 3, effective June 7, 2013, (ML131640201). By letters dated June 28, 2013, (ML13183A391) and July 22, 2013, (ML13204A304) the licensee informed the NRC that the reactor fuel had been permanently removed from Units 3 and 2, respectively. The licensee submitted its PSDAR on September 23, 2014, (ML14269A033). In response to the licensee's amendment request, the NRC issued the Permanently Defueled Technical Specifications on July 17, 2015, (ML15139A390) along with revised facility operating licenses to reflect the permanent cessation of operations at SONGS Units 2 and 3.

On March 11, 2016, (ML16055A522) the NRC issued two revised facility operating licenses for SONGS Units 2 and 3, in response to the licensee's amendment request dated August 20, 2015, (ML15236A018). The license amendment allowed for the licensee to revise its Updated Final Safety Analysis Report (UFSAR) to reflect the significant reduction of decay heat loads in the SONGS Units 2 and 3 spent fuel pools (SFPs) resulting from the elapsed time since the permanent shutdown of the units in 2012. The revisions support design basis changes made by the licensee associated with implementing the "cold and dark" plant status described in the PSDAR.

The NRC approved exemptions from certain emergency planning requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2) and 10 CFR Part 50, Appendix E, Section IV, which became effective on June 4, 2015, (ML15082A204). The licensee submitted a license amendment request dated December 15, 2016, (ML16355A015) to revise the Permanently Defueled Emergency Plan (PDEP) into an ISFSI-Only Emergency Plan, and to revise the Emergency Action Level (EAL) scheme into an ISFSI-only EAL for the SONGS Units 1, 2, and 3. The proposed changes were submitted to the NRC for approval prior to implementation, as required under 10 CFR 50.54(q)(4) and 10 CFR 72.44(f). The license amendment request is under review by the NRC's Office of Nuclear Security and Incident Response.

The spent fuel was being safely stored in the two spent fuel pools. The licensee had completed the installation of the 12-kilovolt, non-safety and seismic Category III, electrical ring bus and associated equipment that will facilitate decommissioning of various plant systems. The excavation and removal of soil from the southern portion of the electrical switchyard to support the San Diego Gas and Electric synchronous condenser was being conducted during the on-site inspection. In addition, the licensee was constructing the independent spent fuel storage installation expansion, which is inspected by the regional NRC office under a separate program.

## **1 Decommissioning Performance (71801)**

### **1.1 Inspection Scope**

The inspector evaluated whether the licensee and its contracted workforce were conducting decommissioning activities in accordance with the license and regulatory requirements.

### **1.2 Observations and Findings**

The licensee notified the NRC by letter dated March 3, 2015, (ML15071A018) of its proposed plans to construct the San Diego Gas and Electric synchronous condenser in the southern portion of the electrical switchyard to compensate for the elimination of SONGS power generation. Since that time, the licensee had performed a radiological characterization survey and the NRC collected split soil samples in the switchyard for confirmatory measurements. The results from those surveys and analyses were documented in previous inspection reports issued between July 2015 and October 2016, which supported the conclusion that the underlying soil was not radioactively contaminated at detectable levels due to deposition.

In addition, the NRC had previously reviewed the licensee's "Material Release Work Plan" for the excavation and soil release project and concluded it was acceptable as documented in a previous inspection report dated December 16, 2015, (ML15350A205). During this inspection, the NRC inspector observed the licensee's implementation of the material release work plan and determined that the excavation was being conducted in accordance with the work plan and licensee procedures, SO123-VII 20.9.2, "Material Release Surveys" and SO123-VII-20.9.3, "Surveys for Release of Liquids, Sludges, Slurries, and Sands."

The licensee had started excavation and construction activities of a soil nail wall in the southern portion of the electrical switchyard to support installation of the San Diego Gas and Electric synchronous condenser. The design and construction of the soil nail wall is similar to permanent retaining wall construction used in roadway projects. The NRC inspector received a thorough safety brief by the licensee prior to entering the switchyard. The inspector observed the licensee install one of the 35-foot tendons into a corresponding drill-hole located in the 5<sup>th</sup> row from the top of the wall. The licensee explained that the soil nail wall design would contain a total of 11 horizontal rows of tendons. The licensee stated that the nail spacing was 5.0 feet on center, across the vertical and horizontal grid. The tendons used were reinforcing bars that contained spacers or centralizers at various locations along the length of the bar. The spacers allowed the tendon to remain in the center of the drill-hole and allowed grout to freely flow up the drill hole so that it completely covered the tendon.

The soil was being excavated by the licensee, as the construction of the soil nail wall progressed from the top to the bottom of the wall. The licensee installed wire mesh as part of the soil wall initial facing and applied shotcrete on each row for erosion protection. In addition, the design specified that a soldier pile wall would be constructed on the north side of the soil nail wall. The soldier pile would assist in the transition from the flat road to the construction pad.

The licensee had developed a Radiological Characterization Plan that described the scanning and soil sampling to be performed at various stages of the soil excavation work to ensure that the excavated soil did not contain licensed material in quantities distinguishable from background levels. In addition to scanning and soil sample analyses performed by the licensee, composite soil samples were also analyzed by NRC's contract laboratory for verification. Currently, three composite soil samples have been collected during the construction of the soil nail wall. The composite soil samples were provided through chain-of-custody to the NRC's contractor laboratory, Oak Ridge Institute for Science and Education (ORISE) for analysis. The samples were analyzed by gamma spectroscopy for the radionuclides of concern, which were cobalt-60 (Co-60) and cesium-137 (Cs-137). All sample results were reported in pico-Curies per gram (pCi/g) and were determined to be less than the minimum detectable concentration limit for the measuring equipment. Following are the specific sample results, with the corresponding ADAMS accession number for the respective ORISE report.

Soil Sample	Results (pCi/g)		Collection Date	Report Date	ADAMS Accession No.
	Co-60	Cs-137			
1	< 0.033	< 0.030	December 7, 2016	January 12, 2017	ML17012A407
2	< 0.034	< 0.028	January 5, 2017	February 1, 2017	ML17038A437

The excavated soil was being surveyed and unconditionally released from the license and transported to Camp Pendleton in accordance with the licensee's procedures SO123-VII-20.9.2, "Material Release Surveys" and SO123-VII-20.9.3, "Surveys for Release of Liquids, Sludges, Slurries, and Sands" and the Radiological Characterization Plan. The licensee's survey results demonstrated that the excavated soils in the southern portion of the switchyard met the unrestricted use criteria established under 10 CFR 20.1402.

The licensee is continuing to store liquids in tanks at the site until a processing skid is obtained and placed in service to allow more routine processing as specified in the UFSAR, Section 11.1. The licensee was implementing the liquid waste system as specified in the UFSAR, in that they were collecting any liquid wastes that may be generated during plant shutdown. Operations tracked the amount of liquids being held in the tanks and could move water to different storage tanks and processing paths, as needed. For example, Operations recently pumped the radwaste sump to tank T-064, which increased the respective tank level from 54 percent to 86 percent. The UFSAR specified the following liquid waste tanks and each one's capacity. The licensee provided the current percent (%) capacity of each tank.

Component	Identifier	Capacity (gallons)	Percent Capacity (%)
Chemical Waste Tank	T-064	25,000	85%
Radwaste Primary Tank	T-065	60,000	86%
Radwaste Primary Tank	T-066	60,000	83%
Radwaste Primary Tank	T-067	60,000	87%
Radwaste Primary Tank	T-068	60,000	0%

Component	Identifier	Capacity (gallons)	Percent Capacity (%)
Miscellaneous Wastes Evaporator Condensate Monitor Tank	T-075	25,000	23%
Miscellaneous Wastes Evaporator Condensate Monitor Tank	T-076	25,000	24%

### 1.3 Conclusion

The licensee had initiated excavation activities in the southern portion of the switchyard and initiated construction of the soil nail wall, in support of the synchronous condenser construction. The licensee's survey results and the NRC composite soil sample confirmatory data indicated that the excavated soil was indistinguishable from background and therefore met the unrestricted use criteria established under 10 CFR 20.1402. Based on the survey results, the excavated soil was being transported to Camp Pendleton. The inspector concluded that the licensee was monitoring and maintaining liquids at the site in accordance with UFSAR.

## 2 **Spent Fuel Pool Safety (60801)**

### 2.1 Inspection Scope

The inspector conducted a review of the spent fuel pools for SONGS Units 2 and 3, specifically the pool water level, chemistry, and associated cooling systems to ensure that the licensee was maintaining the two pools in accordance with technical specifications and procedural requirements.

### 2.2 Observations and Findings

Technical Specifications 3.1.1 and 3.1.2 requires the spent fuel pool water level be maintained greater than or equal to 23 feet over the top of the irradiated fuel assemblies seated in storage racks, and the spent fuel pool boron concentration be maintained greater than or equal to 2000 parts per million (ppm), respectively. In addition, SONGS UFSAR, Section 9.1.2.3, Safety Evaluation required the spent fuel pool coolant temperature be maintained between 50°Fahrenheit (°F) to 160°F.

The SONGS Units 2 and 3 spent fuel pools were approximately 27 feet above the top of the irradiated fuel assemblies, based on the licensee's surveillance performed January 29, 2017. The boron concentration was 2777 ppm for Unit 2 and 2758 ppm for Unit 3, based on the pool samples collected on January 25, 2017. The inspector reviewed the chemistry analysis results since the last inspection on September 15, 2016, and concluded that each surveillance had been completed as required by Technical Specification 3.1.2.1. The water level and boron concentration were not below the technical specification requirements.

The licensee indicated that the new spent fuel pool cooling system was holding the temperature of the spent fuel pools in steady temperature conditions. The Unit 2 spent fuel pool was 69°F and Unit 3 was 68°F, which was within the range specified in the UFSAR.

The inspector reviewed the chemistry analysis results between January 2016 and January 2017, for each spent fuel pool and compared the results against the criteria established in the licensee's Procedure SO123-III-1.1.23, "Chemistry Procedure," Revision 66. The primary focus of the spent fuel pool chemistry program is to prevent accelerated degradation of the spent fuel and the pool liner integrity. The licensee maintained trends of the chemistry and radioactivity levels for both spent fuel pools, and was tracking a steady increase in radioactivity in both spent fuel pools. The licensee's procedure specified that the normal range may be exceeded following fuel movement, and to check other parameters for upward trends, when this occurred. The chemistry procedure specified 1.0E-3 microCurie per milliliter (uCi/ml) as the normal range for the gamma isotopic activity parameter. The Unit 2 activity was approximately 2.4 E-3 uCi/ml and Unit 3 activity was approximately 9.7E-4 uCi/ml. The licensee was monitoring for any trends and had not identified any upward trend of other spent fuel pool parameters, besides the gamma isotopic activity in the Unit 2 spent fuel pool. The licensee stated that they will continue to monitor and trend the radioactivity of the spent fuel pool as specified by Procedure SO123-III-1.1.23.

The inspector observed the area radiation monitor, Ludlum Model 375, located in the fuel handling building that indicated 0.0 milliRoentgen per hour (mR/hr). The annual calibration was due on December 21, 2017. The inspector performed independent gamma radiation measurements in the fuel handling building, specifically around the spent fuel pool, using a Ludlum Model 2401-S survey meter (NRC No. 079765, calibration due date of 08/01/17). The inspector measured approximately 150 – 400 microRoentgen per hour (µR/hr) at various locations in the fuel handling buildings. The inspector's survey measurements were comparable to the survey results as presented on area survey maps created by the licensee's health physics staff. In the areas toured, the licensee had implemented radiation protection controls, including postings and labeling, that were in compliance with regulatory and procedure requirements. The inspector also observed the status of boundaries, postings, and labeling to ensure compliance with regulatory and procedural requirements.

### 2.3 Conclusion

The SONGS Units 2 and 3 spent fuel pools were being maintained in accordance with technical specifications and procedural requirements. The licensee was safely storing spent fuel in wet storage.

## **3 Organization and Management (36801)**

### 3.1 Inspection Scope

The inspector reviewed the licensee's management organization to ensure it reflected regulatory requirements, and the implementation of an employee concerns program.

### 3.2 Observations and Findings

The PSDAR described the selection of the decommissioning general contractor (DGC) for managing the decommissioning activities as one of the licensee's activities to be performed under Period 2 of the Decommissioning Planning and Site Modification process. The licensee announced on December 20, 2016, that it had selected AECOM and EnergySolutions as the decommissioning general contractor for SONGS. The licensee stated that the joint venture

between the two companies will be known as SONGS Decommissioning Solutions (SDS). The DGC had already started mobilizing, with approximately 40 individuals onsite at the time of the inspection. The DGC was initiating plans to transition work from the licensee to the SDS.

The licensee was working under a transitional organizational chart, until the DGC completely mobilized and the site transitioned to the decommissioning agent organization chart. The inspector reviewed both organizational charts and determined that required positions of the organizational structure as specified in the Figure 13.1-2, Nuclear Site Management, from the UFSAR and in the Decommissioning Quality Assurance Program (DQAP), Appendix A, were identified in both charts. The licensee was currently implementing an organization that met these licensing documents.

The licensee's chief nuclear officer remained responsible for regulatory affairs, emergency preparedness, decommissioning projects, nuclear oversight and safety culture, as well as overall plant management of SONGS Units 1, 2, 3, and the Independent Spent Fuel Storage Installation (ISFSI). The management of nuclear oversight maintained independence from other line management in order to provide the necessary freedom to identify any quality problems and to verify implementation of corrective actions. The plant manager continued to have responsibility for operations, training, maintenance, work control, radiation protection, chemistry, environmental, emergency preparedness, and security as required by the UFSAR.

The licensee continued to implement its employee concerns program and decommissioning safety culture program under procedure SO123-XV-50.2, Revision 28. The procedure addressed the continuing operation of a safety conscious work environment at SONGS, in which workers felt free to raise concerns to either the licensee or the NRC without fear of retaliation. In addition, the procedure established a program for maintaining anonymity, established timeliness goals for processing concerns, and had a provision for feedback to the concerned individual. The inspector reviewed the types of concerns submitted to the program over the past year and discussed the overall cases with the investigator. The inspector concluded that the investigator was knowledgeable of the types of concerns raised at the facility and was involved in reaching out to individuals from the different line organizations to ensure concerns were addressed. The inspector observed that posters regarding the employee concerns program were prominently displayed across the site.

### 3.3 Conclusions

The licensee's organization was being implemented in accordance with regulatory and license requirements. The licensee continued to implement an employee concerns program in which individuals could raise concerns without fear of retaliation.

## **4 Maintenance and Surveillance (62801)**

### 4.1 Inspection Scope

The inspector evaluated the licensee's implementation of its maintenance oversight and maintenance rule programs.

## 4.2 Observations and Findings

### a. Maintenance Work Orders

The administrative controls established in Section 5.0 of the licensee's Technical Specifications states, in part, that the onsite organization lines of authority, responsibility, and communication shall be established and defined for each level of management and all operating organizational positions. The UFSAR described the responsibilities of the Maintenance and Work Control Manager. In addition, the licensee's DQAP satisfied 10 CFR Part 50, Appendix B quality assurance requirements for those activities affecting safety-related functions of the specified structures, systems, and components (SSCs). The licensee's procedure SO123-MA-1, "Maintenance Division," Revision 10, provided the implementing programs and procedures of the maintenance organization that implemented the maintenance program as required by these documents and requirements. The inspector also reviewed other licensee procedures that implemented the maintenance program, including SO23-XX-37, "Work Management Process," Revision 7, SO123-XX-5, "Work Authorizations and Tagging," Revision 55, and SO123-V-19, "SONGS Preventive Maintenance (PM) Program," Revision 6, and SO123-TS-2, "Technical Specification/Licensee Controlled Specification Surveillance Requirements," Revision 8.

Based on a list generated from the licensee's nuclear notification (NN) tracking system and the new action request (AR) tracking system, there were 10 backlogged maintenance items. None of the backlogged maintenance items affected the spent fuel pool system's SSCs.

The NRC inspector observed a preventive maintenance task for a non-1E, uninterruptible power supply (UPS) inverter designated as 2Y012. The task was conducted weekly to ensure the operational conditions of the UPS system were normal as required by the physical security plan, in accordance with 10 CFR 73.55(g). The routine preventive maintenance activity was generated under work order NRME-801546576. During the maintenance pre-job brief, the supervisor used the "Decommissioning SONGS Safety and Human Performance Tools Handbook" as a guide for the pre-job brief, with special attention to the safety hazards in the area. The two electrical technicians met the qualifications required to perform the preventive maintenance activity on the energized electrical equipment.

The inspector observed the technicians implementing the work activity in accordance with the "Security UPS Alignment Verification" instruction, as required by NRME-801546576. The technicians used positive component verification and three-way communication during the course of the activity. The technicians had a questioning attitude when they identified an unexpected response from the blower fans located on the top of the 2Y012 inverter, as compared to the work activity instructions. The technicians identified that 3 of the 22 fans were blowing inward rather than outward, as specified in the work instruction. Upon completion of the activity, the technicians informed their supervisor and briefed Operations of the preventive maintenance activity and the identification of three fans apparently running in the opposite direction. The licensee generated a corrective action under AR 0217-36527 to evaluate and provide guidance regarding the fans. The licensee determined that two of the fan positions in question did not have fans installed in accordance with vendor specifications, and that the third fan in question was defective. A work order was subsequently generated to replace the degraded cooling fan. The

licensee determined that the degraded cooling fan had minimal impact to the heat dissipation rate from the inverter cabinet.

The NRC inspector reviewed several maintenance activity packages, including:

#### Surveillances and Preventive Maintenance

- NN 203388089 (NSVO 801550378) – Dated 12/12/16 - Post Maintenance Testing for plant vent stack waste gas holdup radiation monitor, 92-day channel functional test (2/3RIC7808G).
- NN 203327301 (NRME 801482634) – Dated 9/14/16 – Quarterly Inspection and Maintenance (Vendor) Cooling Water Chiller, Unit IFPC CH-3B
- NN 203327299 (NRME 801482632) – Dated 9/14/16 – Quarterly Inspection and Maintenance (Vendor) Cooling Water Chiller, Unit IFPC CH-3A

#### Work Orders

- NN 203407242 (NMO 801576763) – Dated 12/13/16 – Plant Vent Stack wide range effluent radiation monitor 3RE7865, high range detector failure (replaced detector).
- NN 203401220 – Dated 11/21/16 - Load Center 4 main breaker from PME02, LDC42B lockout relay tripped causing no flow from U3 salt water dilution pump (replaced all insulators in all load center cabinets).
- NN 203408062 – Dated 12/15/16 – Condition Adverse to Quality - Identified hot connection on load center 2, section 8 (replaced the connector and performed extent of condition via comprehensive visual and thermography on LDC01, LDC02, and LDC04, and identified no additional deficiencies).
- NN 203385785 – Dated 9/26/16 – IFPC primary pump and piping contributed to condensation on the floor
- NN 203413717 (NMO 801579614) – Dated 1/9/17 - U2 IFPC Primary pump 22 tripped FIN Work Process (uncoupled motor, pump frozen, replace oil sight glass).
- NMO 801580616 – Dated 1/17/17 (overhaul IFPC pump 22)
- NN 203372595 (NMO 801532916) – Dated 8/5/16 - IFPC Chiller 3B (replaced evaporator liquid level sensor).
- NN 203379748 (NMO 801541067) – Dated 9/1/16 – IFPC Chiller 3B (replaced failed condenser motor and three 30-amp fuses).
- NN 203405772 – Dated 12/8/16 (trending IFPC Chiller 3A performance).

The inspector determined that when the licensee identified deficiencies, the deficiencies were placed into the nuclear notification or action request tracking system in accordance with site procedures. Based on a review of the selected work activities, the documentation was completed in accordance with the licensee's work management process procedure, SO23-XX-37, and the work authorization and tagging process procedure, SO123-XX-5. As applicable, the packages contained a level of detail that sufficiently met the expectations in the procedures. For example, the packages contained Operations review, detail of the work plan, coded to reflect the component category and classification, work authorization record, tag-out process, radiological controls, operating experience, and post-maintenance testing, as required. The inspector was informed that since the licensee was no longer an operational facility, it was no longer a member of the Institute for Nuclear Power Operations (INPO), which has the largest and most populace database to query operating experience. However, the licensee indicated that it still maintained its own database, and had access to vendors and the NRC, although these entities may not have as comprehensive and searchable databases as INPO.

The licensee continued to monitor the plant vent stack radiation monitor (3RE7865) and had recently installed a new detector on the high range monitor. The licensee was tracking the performance of the high-range radiation monitor since it was required by the Offsite Dose Calculation Manual to meet Technical Specifications 5.0.103. Another example of conservative decision making occurred in December when a certified fuel handler identified small changes in the spent fuel pool temperature and initiated notification (NN 203405772) to specifically trend the chiller output temperature. The inspector observed that the licensee had initiated sixteen nuclear notifications on the new electrical ring bus system between May 2016 and December 2016. The majority of the notifications were for minor activities and an improvement modification for the capability to add oil to the diesel generator while it was operating.

Based on the work orders reviewed, the inspector concluded that the licensee performed extent of condition reviews when applicable and used operational experience when it was available. Based on a review of the corrective actions and interviews with licensee staff, the inspector concluded that the identification and placement of deficiencies into the maintenance program was being performed at a threshold that ensured those deficiencies and conditions adverse to quality would be identified, evaluated, and corrected.

b. Maintenance Rule

The regulations under 10 CFR 50.65(a)(1) require in part, that licensees monitor the performance or condition of all SSCs associated with the storage, control, and maintenance of spent fuel in a safe condition in a manner sufficient to provide reasonable assurance that such SSCs were capable of performing their intended functions. The licensee was implementing the maintenance rule under 10 CFR 50.65 as required for decommissioning SSCs and was adequately evaluating the maintenance monitoring during decommissioning. The licensee's procedures SO123-XV-5.3, "Maintenance Rule" and SO123-XXIV-20.2, "Maintenance Rule for Structures" implemented the program requirements. The licensee identified fifteen SSCs that were scoped into the SONGS maintenance rule. The structures included the auxiliary building and the Unit 2 and Unit 3 fuel handling buildings.

The licensee had identified those SSCs associated with the storage, control, or maintenance of spent fuel in a safe condition, as well as those SSCs relied upon to remain functional during or following design basis events associated with spent fuel storage, as defined in 10 CFR 50.65. The licensee maintained a maintenance rule functional record for each SSC identified, which specified the acceptable functions of the SSC in order to determine its success during the monitoring period. The NRC inspector concluded that the licensee had conservatively identified those SSCs under the maintenance rule program and was monitoring them sufficiently.

The Maintenance Rule Expert Panel (MREP) met at least quarterly, as required by licensee procedure SO123-XV-5.3, "Maintenance Rule." In addition, the MREP met to review and approve changes to the SSCs under the maintenance rule. The panel met on October 5, 2016, and December 14, 2016, to approve those SSCs that were no longer under the maintenance rule due to either the function or structure no longer being required at a decommissioning facility. In addition, during the two panel meetings several new SSCs were added to the maintenance rule as a result of the cold and dark activities and as a result of modifications to the spent fuel pool makeup system. The inspector identified that licensee procedure SO123-XXIV-20.2, "Maintenance Rule for

Structures” did not reflect the latest changes to the program scope for structures. The licensee subsequently initiated AR 0117-94317 to modify the procedure to reflect the program change of scope as a result of the cold and dark changes.

The December 14, 2016, MREP meeting was also the quarterly performance review of the SSCs. The fire protection water system was approved to be removed from 10 CFR 50.65(a)(1) goal setting, by the panel. The fire pump (MP1065) was credited as the seismically qualified backup for spent fuel pool cooling for mitigating strategies. The fire pump had experienced engine starting issues as a result of drained batteries. The licensee installed a battery trickle charger to keep the batteries charged while the equipment was idle. The licensee performed monthly surveillance runs for a year to verify the effectiveness of this corrective action as part of its goal setting evaluation. The licensee provided reasonable assurance that the fire pump (MP1065) was capable of fulfilling its intended function within the time frame it was expected to support. The panel determined that the fire protection water system could be moved from (a)(1) goal setting to (a)(2) monitoring, in accordance with the licensee’s maintenance rule procedure.

The licensee continued to maintain the 120 volt power system in (a)(1) goal setting, to allow for continued monitoring of the inverters to ensure there were no failures or overloading issues. In addition, the licensee expressed that it had initiated an evaluation of the Unit 3 plant vent stack wide range effluent monitor (3RE7865) to consider moving the effluent monitor to (a)(1) goal setting because of the recent failure of the high range detector. The licensee defined the performance criteria exceedance for the radiation monitoring system as 2 functional failures per Unit or 1 repeat functional failure over the 36-month monitoring period.

The regulations under 10 CFR 50.65, requires in part, that the performance and condition monitoring activities and associated goals and preventive maintenance activities shall be evaluated by the licensee at least every 24 months. The NRC inspector reviewed the last evaluation report performed for the assessment period July 2013 through June 2015. During the assessment period, the licensee transitioned to a permanently defueled facility, so there were a number of changes to the maintenance rule program, primarily involving the scope of the program. The inspector concluded that the assessment report was a thorough and candid evaluation of the program and that the assessment tool was being used appropriately.

In addition, the licensee determined to continue to monitor one identified opportunity for improvement through the next 24-month assessment period. Specifically, there were not enough opportunities to demonstrate that the maintenance rule (a)(1) goal setting timeliness had been improved, because there were only two data points to evaluate during the assessment period. The NRC inspector concluded that the licensee made a conservative decision to continue evaluating the timeliness of (a)(1) goal setting through the next 24-month assessment period.

On February 4, 2016, the licensee’s nuclear oversight department performed an assessment of SONG’s compliance with 10 CFR 50.65, maintenance rule while in decommissioning. The auditor identified two issues, which included updating procedure references and ensuring maintenance rule documents that were being stored on the Engineering server as specified by procedure, were also properly identified, stored, maintained, retained, and retrievable as required by the DQAP. The inspector noted that Revision 17 of procedure SO123-XV-5.3, Maintenance Rule Program” required that copies

of the most recent Maintenance Rule Performance Data Report, and Maintenance Rule Scoping Survey Matrix be submitted annually to Records Management for retention.

Besides the documentation controls and quality assurance of records, the assessment reviewed the equipment reliability program and administration of the program, conduct of engineering, as well as the overall maintenance rule program. The assessment determined that the licensee was implementing its maintenance rule program satisfactorily.

Based on the documents reviewed, interviews with licensee personnel, and review of the monthly maintenance condition monitoring report, MREP meeting minutes, periodic assessment of the maintenance rule program, the NRC inspector determined that the licensee demonstrated an effective maintenance rule program.

c. Masterpact Breakers

A potential issue of failure to reclose a Masterpact breaker was identified by a third party nuclear supplier, AZZ/NLI (Nuclear Logistics, Inc.) under 10 CFR Part 21 dated May 13, 2016, under NRC event number EN 51923. A revision to the Part 21 event report was submitted to the NRC on September 23, 2016, which also included TB-12-007, Technical Bulletin, "Masterpact Breakers Fail to Close," Revision 3. The technical bulletin described that the failure to reclose the breaker may occur when a close signal of >200 milli-seconds (mS) was applied while the breaker was charging the closing springs and/or a breaker trip signal from the shunt trip was received while the close circuit was still energized.

The licensee did not receive its Masterpact breakers from AZZ/NLI and the Masterpact breakers installed were classified as non-safety related and not important-to-safety. The licensee initiated AR 0217-26466-1 to re-evaluate the identified failure scenarios described in Revision 3 of the Technical Bulletin, and whether they were applicable to installed breakers. The NRC inspector verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of functionality of the cold and dark electrical system, where the Masterpact breakers were installed.

4.3 Conclusions

The licensee implemented its maintenance program consistently with procedures and regulatory requirements. Plant systems were maintained in accordance with technical specifications requirements. The licensee appropriately implemented the maintenance rule to ensure compliance with the requirements of 10 CFR 50.65 for structures, systems, and components associated with the storage, control, and maintenance of spent fuel.

**5 Exit Meeting Summary**

On February 2, 2017, the NRC inspector presented the final inspection results to Mr. T. Palmisano, Vice President and Chief Nuclear Officer, and other members of the licensee's staff. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## **SUPPLEMENTAL INSPECTION INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

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S.Vaughan, Project Manager  
M.Reitzler, Maintenance/Work Control  
J.Ramsdell, Maintenance  
M.Bryson, Maintenance Supervisor  
S.Chun, Engineering  
R.Ewing, Engineering Supervisor  
S.Hoque, Chemistry Supervisor  
J.Appel, Regulatory Affairs  
M.Alvarado, Nuclear Oversight

### **INSPECTION PROCEDURES USED**

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors  
IP 60801 Spent Fuel Pool Safety at Permanently Shutdown Reactors  
IP 36801 Organization, Management, and Cost Controls  
IP 62801 Maintenance and Surveillance

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

#### **Opened / Closed**

None

#### **Discussed**

None

### **LIST OF ACRONYMS**

ADAMS Agencywide Documents Access and Management System  
CFR *Code of Federal Regulations*  
mrem millirem  
MREP Maintenance Rule Expert Panel  
NRC Nuclear Regulatory Commission  
PSDAR Post-Shutdown Decommissioning Activities Report  
SONGS San Onofre Nuclear Generating Station  
TS Technical Specifications  
UFSAR Updated Final Safety Analysis Report

Attachment

SAN ONOFRE NUCLEAR GENERATING STATION – NRC INSPECTION REPORTS  
 05000361/2017-001; 05000362/2017-001 - DATED MARCH 2, 2017

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DATE	02/27/17	03/2 /17		

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