



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

August 3, 2016

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: ERRATA TO SAN ONOFRE NUCLEAR GENERATING STATION –  
NRC INSPECTION REPORTS 05000361/2016001; 05000362/2016001; AND  
07200041/2016001

Dear Mr. Palmisano:

The U.S. Nuclear Regulatory Commission (NRC) has identified errors in NRC Inspection Report Nos. 05000361/2016001, 05000362/2016001, and 07200041/2016001 dated May 5, 2016 (ADAMS Accession No. ML16127A580). Specifically, the report incorrectly identifies the license amendment request letter dated August 20, 2015, and the Post-Shutdown Decommissioning Activities Report (PSDAR) dated September 23, 2014, as commitment documents to the NRC. These two documents are not considered regulatory commitments to the NRC.

The license amendment request is approved through issuance of amendments to the San Onofre Nuclear Generating Station (SONGS) operating license. In this case, Amendment No. 233 to Facility Operating License No. NPF-10 and Amendment No. 226 to Facility Operating License No. NPF-15 and the associated Technical Specifications for Units 2 and 3, respectively, were revised in response to the license amendment request letter dated August 20, 2015, and as supplemented by letters dated November 19, 2015, and January 12, 2016 (ADAMS Accession Nos. ML15236A018, ML15327A410, and ML16014A376, respectively).

The revisions to the Technical Specifications are considered regulatory requirements, but not specifically the license amendment request letter itself. The approved Technical Specification changes allowed for the licensee to revise the 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 resulting from the time that has elapsed since the permanent shutdown of the units in 2012. The revisions support design basis changes associated with implementing the “cold and dark” plant status described in the PSDAR.

The PSDAR is required to be submitted to the NRC under 10 CFR 50.82(a)(4) and the licensee is required to keep it updated. Since the PSDAR is not required to be approved by the NRC, then it is not recognized as a regulatory commitment to the NRC. Further, if the licensee decides to change its direction from what is stated in the PSDAR, then the licensee shall notify the NRC in accordance with 10 CFR 50.82(a)(7).

The NRC has reissued the applicable pages of the report to correct this error. Please replace the pages 5, 7, 10, and 20 of the inspection report with the attached corrected pages.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter and its enclosure 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>.

Sincerely,

*/RA/*

Jack E. Whitten, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Docket Nos. 50-361; 50-362; and 72-41  
License Nos. NPF-10; NPF-15

Enclosure:  
Inspection Report 05000361/2016001;  
05000362/2016001; 07200041/2016001  
w/Attachment: Supplemental Information

## 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 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 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.

Current work in progress included construction of "cold and dark" plant status modifications that include a stand-alone electrical ring bus, a new switchgear room, and approximately 70,000 feet of cabling to support electrical power needs during decommissioning. The licensee also continued to construct the SFP islanding equipment in accordance with the PSDAR and the description submitted in its license amendment request letter dated August 20, 2015, (ML15236A018).

The licensee's management, safety review, and other oversight committees are being conducted and maintained in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee is implementing its corrective action program in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP and in accordance with the applicable regulatory requirements and license conditions.

In addition, the licensee's work activities, which included removal of systems from service that were no longer required to maintain the integrity of the reactor coolant pressure boundary, shutdown of the reactor, and maintain the reactor in a shutdown condition, were completed in accordance with the licensee's safety review processes.

During the onsite inspection, the licensee was performing fuel examination activities and preparing for the new ISFSI pad construction. Further, the licensee continued to conduct routine operations, activities associated with dry cask storage operations, maintenance and surveillance activities, and environmental monitoring as required by the regulations and license requirements.

sump drainage, salt water dilution, and building ventilation. Work that has been deferred or downgraded included modification of the health physics/chemistry laboratory and fire suppression system.

The inspectors conducted detailed walk-downs of the work in progress and reviewed the status of the various cold and dark plant modification projects. The inspectors noted that the licensee's contractor was conducting work with an emphasis and keen focus on industrial safety. The licensee continued to implement the activities described in the PSDAR for the cold and dark plant modification strategy.

b. Radiological Surveys of Electrical Switchyard Area

The licensee notified the NRC by letter dated March 3, 2015, (ML15071A018) of the proposed plan for San Diego Gas and Electric to construct a synchronous condenser in the southern portion of the switchyard. To support this effort, the licensee planned to conduct various radiological surveys within the area and to develop a cross-contamination prevention plan for the area. The licensee estimated that approximately 20,000 cubic yards of soil will be excavated and released as part of this construction project. The NRC inspectors reviewed the licensee's plans for radiologically surveying the area.

The licensee's contractor conducted a radiological characterization survey of the switchyard as part of the overall site characterization efforts. The characterization survey included: 1) walk-over gamma radiation scans using ambient gamma-detecting scintillation detectors; 2) static, fixed point measurements for gamma radiation using gamma-detecting scintillation detectors; 3) asphalt sampling; and 4) surface and subsurface soil sampling. These characterization surveys were conducted in September 2014 and March 2015. The radiation survey results indicated that several sediment samples from storm drain gutters contained measurable quantities of licensed material (cesium-137 and/or cobalt-60). All other sample results were indistinguishable from background levels. The results of the survey were documented in a Site Characterization Report dated June 2015.

The licensee has planned a phased approach for the final status survey of the synchronous condenser area. Phases I and II included surface soil, subsurface soil, and borehole sampling. These samples were collected in January 2015. Five composite samples were transferred to the NRC for independent analysis. The results of these samples are provided in NRC Inspection Report No. 050000361/2016008 and 05000362/2015008, dated July 10, 2015, (ML15191A223). The inspector reviewed and confirmed that all sample results for cobalt-60 and cesium-137 were less than the minimum detectable concentration limits for the measuring equipment.

The licensee's contractor subsequently developed a Radiological Characterization Plan, which describes the scanning and soil sampling to be performed at various stages of the soil excavation work. The pre-excavation work included gamma scans and soil sampling consistent with Class 3 surveys, as defined in NUREG-1575, Revision 1, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." These sampling efforts were completed in September 2015.

and operations as appropriate. Each system is designed as Seismic Class III (California building code), Quality III-AQ (augmented quality), and non-safety related. Each system is designated as non-safety related because it does not have to perform a safety-related function. The NRC inspectors conducted a detailed review of SFP island system design, operations, and maintenance to verify compliance with license, PSDAR, and procedure requirements.

The inspectors compared the design of the SFP islands to the description provided in Attachment A of the license amendment request letter dated August 20, 2015, (ML15236A018), as supplemented by letter dated January 12, 2016, (ML16014A376). The inspectors compared system components to the design specifications provided by the vendor. At the time of the inspection, the two systems, one for each unit, had been constructed and were in service. At a future date, each spent fuel island system will be made permanent and the existing systems and equipment removed from operation and eventually retired.

The inspectors reviewed the alarms, controls, and interlocks for the new systems. The licensee had installed alarms, controls, and interlocks in accordance with vendor instructions. At the time of the inspection, the active alarms in the control room consisted of a combination of new SFP island equipment alarms and several alarms connected to permanent plant equipment. As cold and dark plant modifications continue to be implemented, the licensee is expected to remove the permanent plant alarms from service.

The inspectors reviewed the system operating procedure, SO23-3-2.11.2, "Spent Fuel Pool Cooling Island Operation," Revision 5. The operating procedure provided instructions for various modes of operation, including switch-over to the permanent SFP cooling equipment, if needed for operation. The inspectors confirmed that the operating instructions were in agreement with the as-built design of the system, and the operators were conducting operations in agreement with procedure requirements.

At the time of the inspection, the SFP island ion exchange columns were not in service. The licensee had not installed resins in these columns; but instead, planned to use portable cleanup skids if pool water clarity becomes a problem.

In addition, the inspectors reviewed the licensee's planned maintenance activities and confirmed that the licensee had implemented a maintenance program for the various system components. The maintenance instructions included routine verification of the tightness of bolts to maintain seismic qualification of certain spent fuel pool system components, which is included as a description in the license amendment request dated August 20, 2015, (ML15236A018).

The inspectors reviewed the licensee's mitigating strategies for adding water to the SFPs during normal, off-normal, and emergency conditions. The licensee continues to maintain alternate sources of water from various sources, including the existing purification pumps, until the enhanced makeup water system has been placed into service.

decommissioning activities are being implemented in accordance with the requirements of 10 CFR 50.59, 10 CFR 50.71, 10 CFR 72.48, and 10 CFR Part 50, Appendix B. In addition, the inspectors discussed the implementation and effectiveness of the design control and safety review programs with SONGS personnel.

The inspectors also reviewed the organization, composition, and controls implemented for each of the SONGS management and safety review committees to ensure that the licensee was maintaining effective oversight of decommissioning activities. The inspectors also attended several oversight committee meetings and discussed the program with licensee staff.

## 5.2 Observations and Findings

### a. Design Control and Plant Modifications

The SONGS DQAP includes design control provisions to control inputs, processes, outputs, changes, interfaces, records, and organizational interfaces of the licensee's designs. The design control provisions include requirements for verifying the acceptability of design activities and documents, consistent with their effects on safety for structures, systems, and components that have important-to-safety functions. The regulations under 10 CFR 50.59(c)(1) states in part, that a licensee may make changes in the facility as described in the UFSAR, make changes in the procedures as described in the UFSAR, and conduct tests or experiments not described in the UFSAR without obtaining a license amendment pursuant to 10 CFR 50.90 in certain situations.

The inspectors reviewed the licensee's 10 CFR 50.59 safety evaluation program, as implemented by Procedure SO123-XV-44, "10 CFR 50.59 and 72.48 Program," Revision 17. The inspectors compared this procedure with the NRC-endorsed acceptable method for complying with the provisions of 10 CFR 50.59, which is the Nuclear Energy Institute's NEI 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, dated November 2000. The inspectors reviewed four screenings where licensee personnel had determined that a full 10 CFR 50.59 evaluation was not necessary and determined that the licensee's safety evaluation program procedure and processes were adequate for complying with the provisions of 10 CFR 50.59 and 10 CFR 72.48.

The inspectors reviewed the meeting minutes of the Onsite Review Committee Meeting conducted on March 21, 2016. The inspectors compared the conduct of the meeting with the requirements specified in the SONGS UFSAR, Section 17.2.20.2, and SONGS Procedure SO123-XV-60.1, Revision 16. The inspectors determined that the procedure adequately implemented the description of the organization as provided in Section 17.2.20.2 of the UFSAR. Additionally, the inspectors determined that the committee members were properly trained, the committee was properly staffed to conduct meetings, and the committee members fulfilled the charter of the committee as specified in the procedure. The licensee's 10 CFR 50.59 safety evaluation program provides effective periodic training for personnel preparing, reviewing, and approving the associated safety evaluations. In addition, the licensee's program establishes an adequate process to assess training effectiveness.

The NRC has reissued the applicable pages of the report to correct this error. Please replace the pages 5, 7, 10, and 20 of the inspection report with the attached corrected pages.

In accordance with 10 CFR 2.390, "Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management 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/**

Jack E. Whitten, Chief  
 Fuel Cycle & Decommissioning Branch  
 Division of Nuclear Materials Safety

Docket Nos. 50-361; 50-362; and 72-041  
 License Nos. NPF-10; NPF-15

Enclosure:  
 Inspection Report 05000361/2016001;  
 05000362/2016001; 07200041/2016001  
 w/Attachment: Supplemental Information

Distribution  
 See next page

**ADAMS ACCESSION NUMBER: ML16216A364**

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DATE	07/15/16	08/01/16	07/29/16	07/29/16	08/03/16

**OFFICIAL RECORD COPY**

Letter to Thomas J. Palmisano from Jack E. Whitten dated August 3, 2016

SUBJECT: ERRATA TO SAN ONOFRE NUCLEAR GENERATING STATION –  
NRC INSPECTION REPORTS 05000361/2016001; 05000362/2016001 AND  
07200041/2016001

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

May 5, 2016

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  
REPORTS 05000361/2016001; 05000362/2016001 AND 07200041/2016001**

Dear Mr. Palmisano:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspections conducted on March 7-10, 2016, and March 21-24, 2016, at the San Onofre Nuclear Generating Station, Units 2 and 3, and the Independent Spent Fuel Storage Installation. The NRC inspectors discussed the results of these inspections with you and other members of your staff at the final exit meetings on March 10, 2016, and March 24, 2016. The inspection results are documented in the enclosure to this inspection report.

The NRC 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. Within these areas, the inspections consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. No violations were identified and no response to this letter is required.

The inspection conducted the week of March 7, 2016, reviewed your dry fuel storage operations and compliance with the Transnuclear Certificate of Compliance No. 1029, Amendment 1, Updated Final Safety Analysis Report, Revision 3, and the regulations under Title 10 of the Code of Federal Regulations (10 CFR) Part 20 and Part 72. Within these areas, the inspection included a review of radiation safety, cask thermal monitoring, quality assurance, the corrective action program, the safety evaluation program, and changes made to your ISFSI program since the last routine ISFSI inspection that was conducted by the NRC.

In addition, the inspection conducted the week of March 21, 2016, reviewed the decommissioning activities of Units 2 and 3 involving the transition to "cold and dark" plant status, spent fuel safety, radioactive effluents and environmental monitoring, the quality assurance program and design change process. The decommissioning activities were reviewed for compliance with your Permanent Defueled Technical Specifications, Offsite Dose Calculation Manual, Post-Shutdown Decommissioning Activities Report and the regulations under 10 CFR Part 20 and Part 50.

Enclosure

T. Palmisano

- 2 -

In accordance with 10 CFR 2.390, "Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management 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/*

Jack E. Whitten, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Docket Nos. 50-361; 50-362; and 72-41  
License Nos. NPF-10; NPF-15

Enclosure:  
Inspection Report 05000361/2016001;  
05000362/2016001; 07200041/2016001  
w/Attachment: Supplemental Information

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket Nos. 050-00361; 050-00362; 072-00041

License Nos. NPF-10; NPF-15

Report Nos. 05000361/2016001; 05000362/2016001; 07200041/2016001

Licensee: Southern California Edison Company

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

Location: 5000 South Pacific Coast Highway, San Clemente, California

Dates: March 7 through March 10, 2016  
March 21 through March 24, 2016

Inspectors: Rachel S. Browder, C.H.P., Senior Health Physicist  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Robert J. Evans, Ph.D., C.H.P., Senior Health Physicist  
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Eric Simpson, Health Physicist  
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Marlayna Vaaler, Project Manager  
Reactor Decommissioning Branch  
Division of Decommissioning, Uranium Recovery and Waste Programs  
Office of Nuclear Material Safety and Safeguards

Approved By: Jack E. Whitten, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

## EXECUTIVE SUMMARY

NRC Inspection Reports 05000361/2016001; 05000362/2016001 and 07200041/2016001  
Southern California Edison

These U.S. Nuclear Regulatory Commission (NRC) inspections were routine, announced inspections of decommissioning activities and dry fuel storage operations being conducted at the San Onofre Nuclear Generating Station (SONGS). In summary, the licensee was conducting these activities in accordance with site procedures, license requirements, and applicable NRC regulations.

### Decommissioning Performance

- The licensee continued to implement the cold and dark modifications in accordance with Post-Shutdown Decommissioning Activities Report (PSDAR) requirements. The licensee continues to install the spent fuel pool (SFP) makeup systems, and the licensee continued to implement the mitigation strategies as required by the two licenses. The licensee continued to plan for the construction of the synchronous condenser. The licensee established survey plans and implementing procedures based on NRC-accepted guidance for final status surveys. Finally, the inspectors conducted site tours within the radiologically restricted areas and concluded that the licensee was maintaining the areas in accordance with radiation protection procedures and regulatory requirements. (Section 1.2)

### Spent Fuel Pool Safety

- The licensee was operating and maintaining the SFP island systems in accordance with PSDAR, license commitment, and procedure requirements. The licensee also installed, operated, and maintained the SFP island equipment in accordance with the PSDAR, vendor information, and approved procedures. (Section 2.2)

### Radioactive Waste Treatment, Effluent, and Environmental Monitoring

- The licensee's effluent monitoring and environmental monitoring programs were being conducted in accordance with appropriate regulatory requirements as prescribed by the SONGS Offsite Dose Calculation Manual (ODCM). (Section 3.2)

### Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors

- The licensee is implementing its corrective action program in accordance with appropriate regulatory requirements as prescribed by the SONGS Decommissioning Quality Assurance Program (DQAP.) Based on the sample of documents reviewed and activities observed, the inspectors determined that the licensee is successfully implementing its policies and procedures associated with the corrective action program in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures. (Section 4.2)

- The licensee's auditing and decommissioning safety review programs are being conducted and maintained in accordance with the appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee has established audit, review, and oversight programs to ensure that activities are being conducted in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures. These programs function in a timely, independent, and appropriate manner. (Section 4.2)

#### Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors

- The licensee's safety review processes, procedures, and training programs are being conducted and maintained in accordance with the appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee has established Title 10 of the Code of Federal Regulations (10 CFR) 50.59 and 10 CFR 72.48 programs to ensure that activities are being conducted in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures. Decommissioning activities are being implemented in accordance with the requirements of 10 CFR 50.59, 10 CFR 50.71, 10 CFR 72.48, and 10 CFR Part 50, Appendix B. (Section 5.2)
- The licensee's management, safety review, and other oversight committees are being conducted and maintained in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee has established additional oversight and controls for contractor programs to ensure that activities are being conducted in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures. (Section 5.2)

#### Operation of an Independent Spent Fuel Storage Installation

- The inspectors observed that the licensee had met the licensing requirements for the documents and activities reviewed associated with the dry cask storage activities at SONGS. (Section 6.2)

#### Review of 10 CFR 72.212(b) Evaluations

- The licensee was maintaining the 10 CFR 72.212 Evaluation Report current as required. Two changes to the 10 CFR 72.212 report had been made since the last NRC Independent Spent Fuel Storage Installation (ISFSI) inspection in 2014. (Section 7.2)

#### Review of 10 CFR 72.48 Evaluations

- All required screens and safety evaluations had been performed in accordance with procedures and 10 CFR 72.48 requirements. All of the 10 CFR 72.48 screens that were reviewed were determined to have been adequately evaluated by the licensee. (Section 8.2)

### Follow-up of Events

- Licensee Event Report 05000361/2015-002-00, "Spent Fuel Pool Temperature Drifted Below Updated Final Safety Analysis Report Value" was reviewed and closed. (Section 9.1)

## 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.

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Current work in progress included construction of "cold and dark" plant status modifications that include a stand-alone electrical ring bus, a new switchgear room, and approximately 70,000 feet of cabling to support electrical power needs during decommissioning. The licensee also continued to construct the SFP islanding equipment in accordance with the PSDAR and with the commitments made in its license amendment request dated August 20, 2015, (ML15236A018).

The licensee's management, safety review, and other oversight committees are being conducted and maintained in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee is implementing its corrective action program in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP and in accordance with the applicable regulatory requirements and license conditions.

In addition, the licensee's work activities, which included removal of systems from service that were no longer required to maintain the integrity of the reactor coolant pressure boundary, shutdown of the reactor, and maintain the reactor in a shutdown condition, were completed in accordance with the licensee's safety review processes.

During the onsite inspection, the licensee was performing fuel examination activities and preparing for the new ISFSI pad construction. Further, the licensee continued to conduct routine operations, activities associated with dry cask storage operations, maintenance and surveillance activities, and environmental monitoring as required by the regulations and license requirements.

## 1. Decommissioning Performance (71801)

### 1.1 Inspection Scope

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

### 1.2 Observations and Findings

#### a. Review of Cold and Dark Plant Modifications

The PSDAR, Section II, provides an overview of the planned decommissioning activities. These activities include site modifications as necessary to support future decommissioning and decontamination efforts. One such modification mentioned in Section II.A of the PSDAR is the planning, design, and implementation of “cold and dark.” The licensee plans to have all cold and dark plant modifications in place by mid-2016. The inspectors reviewed the status of the licensee’s efforts in implementing the cold and dark plant modifications.

As of March 2016, the priority work included final 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 ring bus work included installation of electrical cables, panels, raceways, and cabinets. The 12-kilovolt line at the time of the inspection had been installed and temporarily energized. The licensee plans to connect two backup diesel generators (500-kilowatt and 1500-kilowatt) to the ring bus. These two diesel generators will provide power to critical cold and dark equipment and electrical panels during loss of power events. In addition, the licensee’s contractor was wiring the electrical panels in the 37-foot elevation of the radwaste building. The electrical panels will convert the 12-kilovolt incoming power to 480/120-volt power for distribution into the plant. The new electrical distribution system is identified by orange-colored cabling that easily stands apart from the permanent plant electrical distribution systems, which will be decommissioned.

In addition to the electrical distribution work, the licensee was installing an enhanced SFP makeup system for each unit. The systems are classified as augmented quality and seismic Category I. The purpose of the SFP makeup system is to protect spent fuel cladding by maintaining water level in the spent fuel pool. The system will provide demineralized makeup water from the existing primary makeup storage tank to the respective SFP. The planned work consisted of reusing two existing plant pumps, installing a new high-capacity makeup pump, and installing the associated piping, valves, and instrumentation. At the time of the inspection, the licensee continued to keep the permanent plant makeup equipment in service until the new system had been constructed and tested. The licensee had developed, but had not issued, operating procedures for the new equipment.

Other cold and dark plant modification work in progress included the installation or modification of the command center, security power, telecommunications, fire detection,



sump drainage, salt water dilution, and building ventilation. Work that has been deferred or downgraded included modification of the health physics/chemistry laboratory and fire suppression system.

The inspectors conducted detailed walk-downs of the work in progress and reviewed the status of the various cold and dark plant modification projects. The inspectors noted that the licensee's contractor was conducting work with an emphasis and keen focus on industrial safety. The licensee continued to implement the commitments provided in the PSDAR for the cold and dark plant modification strategy.

b. Radiological Surveys of Electrical Switchyard Area

The licensee notified the NRC by letter dated March 3, 2015, (ML15071A018) of the proposed plan for San Diego Gas and Electric to construct a synchronous condenser in the southern portion of the switchyard. To support this effort, the licensee planned to conduct various radiological surveys within the area and to develop a cross-contamination prevention plan for the area. The licensee estimated that approximately 20,000 cubic yards of soil will be excavated and released as part of this construction project. The NRC inspectors reviewed the licensee's plans for radiologically surveying the area.

The licensee's contractor conducted a radiological characterization survey of the switchyard as part of the overall site characterization efforts. The characterization survey included: 1) walk-over gamma radiation scans using ambient gamma-detecting scintillation detectors; 2) static, fixed point measurements for gamma radiation using gamma-detecting scintillation detectors; 3) asphalt sampling; and 4) surface and subsurface soil sampling. These characterization surveys were conducted in September 2014 and March 2015. The radiation survey results indicated that several sediment samples from storm drain gutters contained measurable quantities of licensed material (cesium-137 and/or cobalt-60). All other sample results were indistinguishable from background levels. The results of the survey were documented in a Site Characterization Report dated June 2015.

The licensee has planned a phased approach for the final status survey of the synchronous condenser area. Phases I and II included surface soil, subsurface soil, and borehole sampling. These samples were collected in January 2015. Five composite samples were transferred to the NRC for independent analysis. The results of these samples are provided in NRC Inspection Report No. 050000361/2016008 and 05000362/2015008, dated July 10, 2015, (ML15191A223). The inspector reviewed and confirmed that all sample results for cobalt-60 and cesium-137 were less than the minimum detectable concentration limits for the measuring equipment.

The licensee's contractor subsequently developed a Radiological Characterization Plan, which describes the scanning and soil sampling to be performed at various stages of the soil excavation work. The pre-excavation work included gamma scans and soil sampling consistent with Class 3 surveys, as defined in NUREG-1575, Revision 1, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." These sampling efforts were completed in September 2015.

The Radiological Characterization Plan also provides instructions for sampling during excavation and after completion of excavation. During excavation, the sampling will consist primarily of composite soil sampling, to ensure that the excavated soil does not contain licensed material in quantities distinguishable from background levels. Backfill, if used, will also be composite sampled to ensure that it does not contain radioactive material. Finally, the final grade for the synchronous condenser will be gamma scanned using gamma-detecting scintillation detectors and soil sampled for use as final status survey data. The licensee stated that after the area has been released for construction of the synchronous condenser they plan to implement a cross-contamination prevention plan in order to control the area

The licensee currently plans to free-release some or all of the excavated soil. The soil will be released in accordance with the licensee's approved material release work plan provided in Radiation Protection Procedure SO123-VII-20.9.3, Revision 12, "Surveys for Release of Liquids, Sludges, Slurries, and Sands." The acceptance criteria for release will be no detectable activity. The inspectors noted that none of the soil samples collected in the vicinity of the proposed synchronous condenser contained any detectable quantities of licensed radiological material, indicating that the soil could be unconditionally released from the switchyard.

The licensee committed in Section II of the PSDAR to conduct final site surveys in accordance with the MARSSIM guidance in NUREG-1575. Based on the licensee's characterization survey that was performed, as well as its proposed survey plan and procedures for the synchronous condenser work, the inspectors concluded that the licensee has developed and implemented a radiological survey program for the synchronous condenser activity using the guidance provided in MARSSIM.

c. Radiological Response Plan for ISFSI Pad Excavation

The licensee plans to construct a new ISFSI pad in the North Industrial Area (NIA). This area includes the footprint of the former SONGS Unit 1 plant that was decommissioned in 1999-2009. The ISFSI pad construction work will require excavation of soil up to 12 feet below the ground surface. Since the soil may contain low levels of radioactivity remaining from Unit 1 decommissioning, the licensee plans to conduct soil sampling and gamma radiation scans as part of the excavation process.

The licensee developed procedures to implement radiological controls in the event any radioactivity is encountered during the soil excavation work. The procedures provide instructions for worker protection under four scenarios: 1) no licensed material identified; 2) radioactive material identified by soil sampling but not gamma scans; 3) radioactive material identified by both soil sampling and gamma scans; and 4) hydrogen-3 (tritium) is identified in groundwater, if shallow groundwater is encountered during excavation work. The licensee plans to reuse the soil, if the soil contains less than 10-percent of the proposed, derived concentration guideline levels; otherwise, the licensee will most likely dispose of the soil. The NRC has not approved a derived concentration guideline level for this site; thus, any application of a derived concentration guideline level will be conducted at risk by the licensee.

The licensee developed basic radiological controls, including training of workers, surveys of the work area, and posting of the work area, which are independent of the various worker protection controls developed for each scenario. The licensee also plans to conduct limited air particulate sampling during excavation activities. Air particulate sampling may include lapel or portable area air samplers. The inspectors determined that the licensee's proposed controls are commensurate with the potential radiological conditions in the area and addresses the potential risks for each scenario that may be encountered.

d. Site Tours

During site tours within the radiologically restricted areas, the inspectors conducted independent gamma radiation measurements using a Ludlum Model 2401-EC2 survey meter (NRC No. 35484G, calibration due date of March 13, 2016.) The inspectors also observed the status of boundaries, postings, and labeling to ensure compliance with regulatory and procedural requirements. The inspectors' survey measurements were comparable to the survey results as presented on area maps created by the licensee's health physics staff. In the areas toured, the licensee implemented radiation protection controls, including postings and labeling, that were in compliance with regulatory and procedure requirements.

1.3 Conclusion

The licensee continued to implement the cold and dark plant modifications in accordance with PSDAR requirements. The licensee continued to install the SFP makeup systems and implement the mitigation strategies as required by the two licenses. The licensee continued to plan for the construction of the synchronous condenser. The licensee established survey plans and implementing procedures based on NRC-accepted guidance for final status surveys. Finally, the inspectors conducted site tours within the radiologically restricted areas and concluded that the licensee was maintaining the areas in accordance with radiation protection procedures and regulatory requirements.

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

2.1 Inspection Scope

The inspectors conducted a review of the Units 2 and 3 SFP island equipment to ensure that the licensee had constructed and implemented the systems in accordance with license, technical specifications, and procedural requirements.

2.2 Observations and Findings

A description of planned decommissioning activities is provided in Section II of the PSDAR. To support these decommissioning efforts, the licensee committed to design and install SFP islands for each of the two units. These systems are necessary to support spent fuel storage until the fuel has been transferred to the onsite ISFSI. In the PSDAR, the licensee also committed to perform equipment maintenance, inspection,

and operations as appropriate. Each system is designed as Seismic Class III (California building code), Quality III-AQ (augmented quality), and non-safety related. Each system is designated as non-safety related because it does not have to perform a safety-related function. The NRC inspectors conducted a detailed review of SFP island system design, operations, and maintenance to verify compliance with license, PSDAR, and procedure requirements.

The inspectors compared the design of the SFP islands to the commitments made in the licensee's system description provided in Attachment A to its letter dated August 20, 2015, (ML15236A018), as revised by letter dated January 12, 2016, (ML16014A376). The inspectors compared system components to the design specifications provided by the vendor. At the time of the inspection, the two systems, one for each unit, had been constructed and were in service. At a future date, each spent fuel island system will be made permanent and the existing systems and equipment removed from operation and eventually retired.

The inspectors reviewed the alarms, controls, and interlocks for the new systems. The licensee had installed alarms, controls, and interlocks in accordance with vendor instructions. At the time of the inspection, the active alarms in the control room consisted of a combination of new SFP island equipment alarms and several alarms connected to permanent plant equipment. As cold and dark plant modifications continue to be implemented, the licensee is expected to remove the permanent plant alarms from service.

The inspectors reviewed the system operating procedure, SO23-3-2.11.2, "Spent Fuel Pool Cooling Island Operation," Revision 5. The operating procedure provided instructions for various modes of operation, including switch-over to the permanent SFP cooling equipment, if needed for operation. The inspectors confirmed that the operating instructions were in agreement with the as-built design of the system, and the operators were conducting operations in agreement with procedure requirements.

At the time of the inspection, the SFP island ion exchange columns were not in service. The licensee had not installed resins in these columns; but instead, planned to use portable cleanup skids if pool water clarity becomes a problem.

In addition, the inspectors reviewed the licensee's planned maintenance activities and confirmed that the licensee had implemented a maintenance program for the various system components. The maintenance instructions included routine reviews of the seismic restraints, a commitment that was made in the licensee's August 20, 2015, (ML15236A018) letter to the NRC.

The inspectors reviewed the licensee's mitigating strategies for adding water to the SFPs during normal, off-normal, and emergency conditions. The licensee continues to maintain alternate sources of water from various sources, including the existing purification pumps, until the enhanced makeup water system has been placed into service.

### 2.3 Conclusion

The licensee was operating and maintaining the SFP island systems in accordance with PSDAR, license commitment, and procedure requirements. The licensee also installed, operated, and maintained the SFP island equipment in accordance with the PSDAR, vendor information, and approved procedures.

## 3. **Radioactive Waste Treatment, Effluent, and Environmental Monitoring (84750)**

### 3.1 Inspection Scope

The inspectors reviewed the licensee's radioactive effluent and environmental monitoring programs to verify that the programs are implemented consistent with the licensee's technical specifications and ODCM requirements. In addition, the inspectors verified that the radiological environmental monitoring program monitored non-effluent exposure pathways, and validated that doses to members of the public are within the dose limits provided in 10 CFR Part 20; 10 CFR Part 50, Appendix I; and 40 CFR Part 190, as applicable.

### 3.2 Observations and Findings

Technical Specifications, Section 5.5.2, for the two licenses require the licensee to establish, implement, and maintain the ODCM. The ODCM provides detailed guidance for conducting the SONGS Radiological Environmental Monitoring Program (REMP) and the methodology and parameters used in the calculation of offsite doses resulting from gaseous and liquid effluents. The ODCM also provides the gaseous and liquid monitoring alarms and trip set points for the respective monitors. The NRC regulations specific for monitoring, control, treatment, and reporting of radioactive effluents released from the site apply regardless of the operating status of a nuclear power plant; thus, they continue to apply in decommissioning status. The inspectors performed tours of the facility, specifically focusing on the radioactive effluent systems, including the NIA, which is the footprint for Unit 1; turbine plant sumps; Unit 2 outfall; containment monitors; plant vent stack monitors; and the chemistry laboratories. The inspectors reviewed operations logs from August 1, 2015, through March 3, 2016, regarding the effluent monitors.

#### a. ODCM Changes

On July 17, 2015, the NRC approved the Permanent Defueled Technical Specifications, which removed a number of systems from the technical specifications, including:

- Reactor Coolant System
- Emergency Core Cooling System
- Containment Systems
- Certain Plant Systems
- Refueling Operations
- Gas Storage Tanks
- Explosive Gas Monitoring Instrumentation

Based on the NRC's approved changes to the Permanent Defueled Technical Specifications, the licensee subsequently retired these plant systems from service using guidance provided in procedure SO123-XXIV-10.1, "Engineering Design Control Process – NECPs." Two of the plant systems, the gaseous radwaste system and coolant radwaste system, required 10 CFR 50.59 evaluations be completed by engineering to permanently retire the systems. The licensee performed 12 Effluent Program/ODCM Change screenings, in which the licensee determined that 6 of the screenings required an evaluation.

Permanent Defueled Technical Specification 5.5.2.1.1 allows the licensee to make changes to its ODCM, provided there is sufficient information to support the change together with the appropriate analyses or evaluations to justify the change, and the levels of radioactive effluent control as required by the NRC regulations are not adversely impacted, and the change has been reviewed by the licensee and found acceptable. After performing the appropriate screenings and evaluations, the licensee made changes to its ODCM program that included: 1) removing equipment, monitors, and devices from the program; 2) changing sample collection points; and 3) relocating a garden. These changes were performed in order to accurately reflect the current conditions at the site for monitoring, analysis, and reporting of radioactive effluents released from the site.

The licensee processed the Effluent Program/ODCM Changes under its nuclear notification (NN) system and assigned each one a respective tracking number. The inspectors reviewed the 12 screenings and 6 evaluations. In particular, the following is a list to highlight some of the changes that were performed, and which have been updated to the ODCM, Volume 9, dated November 9, 2015.

- **Evaluation NN: 203063159-002**, Removal South Yard Facility Decontamination Area Exhaust Gaseous Particulate and Iodine Sampler
- **Evaluation NN: 203063159-005**, Removal of the Steam Generator Blowdown System Liquid Radiation Monitors 2(3)RE6753 and 2(3)RE6759
- **Evaluation NN: 203063159-010**, Removal of the Unit 2 and 3 Containment Purge System Gaseous Radiation Monitors 2(3)RE7828
- **Screening NN: 203063159-084**, Site Boundary Sample Garden Relocation
- **Screening NN: 203063159-012**, Fuel Handling Building tritium sample location change
- **Screening NN: 203063159-008**, Removal of Pressurized Ion Chambers (PICs) from the ODCM

The licensee documented the screenings sufficiently and the inspectors did not identify any changes that were incorrectly screened or required further evaluation. For the evaluations that were performed regarding the permanently retired equipment, monitors,

and devices, the licensee provided historical effluent release data from the respective release points, as applicable, to justify there was no impact to the monitoring, control, treatment, and reporting of radioactive effluents released from the site. Since the equipment was drained and retired from service, there are no ODCM sampling and analysis requirements. The licensee stated that operations staff hung clearances on the respective plant equipment to ensure the inputs are isolated. The inspectors reviewed the data and concluded that the licensee provided adequate analyses and justifications to support the Effluent Program/ODCM Change evaluations that were approved.

b. Liquid Effluents

Based on the number of plant systems that have been drained and permanently retired from service, and since the licensee has shipped all resins offsite, the licensee does not process any radioactive liquid wastes. The liquid wastes that remain onsite and any liquids captured through the miscellaneous liquid waste system are stored in tanks at the facility. The tanks include the liquid radwaste primary and secondary tanks, the chemical wastes tanks, miscellaneous waste tanks, and the condensate monitor tanks. Operations tracks the amount of liquids being held in the tanks. The tanks provide plenty of volume for the licensee to store liquid wastes, especially since there is no significant generation of additional liquid wastes. The licensee plans to store its liquid wastes until the decommissioning general contract is awarded and stated that the contractor is expected to develop its plan to process the liquid wastes.

The only continuous release points for Units 2 and 3 liquid effluents are through the two turbine plant sumps, which are then routed to the Unit 2 outfall. These sumps collect all normal equipment and floor drainage from the turbine plant area. The east sump also collects drainage from the auxiliary building sump. Any rain water that accumulates in the full flow condensate polisher demineralizer or blowdown processing system is routed to the Unit 2 turbine plant sumps. The licensee no longer utilizes the Unit 3 outfall. The isolation valves to the Unit 3 outfall are locked in the closed position and removed from service. The licensee stated it was installing four new salt water dilution pumps at the Unit 2 outfall, and installing new piping between Unit 3 and Unit 2 outfall. The new dilution pumps will be used by the decommissioning general contractor to process liquid wastes, which are currently stored in the tanks onsite.

Rainfall runoff generally collects in the NIA yard. The NIA yard drain sump is credited as a liquid radioactive effluent release point and equipped with a continuous radiation monitor (2/3-2101). The licensee performs a weekly sample of the NIA yard sump if the pump is running or collects a composite as necessary. The NIA yard sump is a continuous release pathway to the Unit 2 outfall.

The licensee updated its administrative factors for ODCM liquid set-point values on December 10, 2015. The data is used in the dose projection calculation for liquid effluents and reflects the predominant methods of liquid effluent pathways. The administrative factors are 0.35 for the NIA yard, 0.40 for radwaste discharge, and 0.10 for each Unit 2 and Unit 3 turbine plant sumps. There are no other discharge pathways available. At the time of the inspection, the licensee was using salt water cooling pumps to support SFP cooling system operations. The salt water cooling pumps do not

produce enough dilution flow and the licensee indicated that they would not perform any liquid releases using the salt water cooling pumps.

c. Gaseous Effluents

During the inspection, the licensee informed the inspectors that the primary gaseous effluent pathway is through the plant vent stack. Another gaseous release point at the site is the South Yard Facility work area exhaust. Based on Effluent Program/ODCM Change evaluation NN 203063159-010, noted above, the Units 2 and 3 containment purge system gaseous radiation monitors 2(3)RE7828 and associated equipment were removed from the ODCM. The Units 2 and 3 main purge isolation valves are failed closed and de-energized. The licensee stated that since permanent shutdown of both units, the radioactive release permits for airborne contamination in the Units 2 and 3 containments have identified tritium, with the exception that Unit 3 did not have any purges in 2014. Noble gases have not been detected in any containment purge samples since shutdown, and particulates were detected in only one sample for Unit 2 in 2013. The particulates were cobalt-60 and manganese-54 at very low levels of maximum permissible concentration of  $< 1E-10$  microcuries/cubic-centimeter. The licensee's evaluation documented that if a containment purge is needed, then operations can realign the unit's plant vent stack to the containment purge stack and plant vent stack monitors 2(3)RE7865 would be used to monitor the release.

The licensee updated its administrative factors for ODCM gaseous set point values on December 22, 2015. The data is used in the dose projection calculation for gaseous effluents and reflects the predominant methods of gaseous effluent pathways. The administrative factors are 0.38 for plant vent stack monitors 2/3RT-7808 and 2RT-7865. When monitor 2RT-7865 is aligned to containment, the administrative factor is typically 0.19.

d. ODCM Program

Section 5.3.1 of the ODCM specifies that analyses shall be performed on radioactive materials supplied as part of an Interlaboratory Comparison Program that complies with Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs." The licensee used GEL Laboratories as the contracted vendor to perform environmental analysis and used Environmental Dosimeter Company as the contracted vendor to process and analyze the REMP thermoluminescent dosimeters (TLDs). The inspectors reviewed the vendor's quality assurance audits and the nuclear oversight vendor audits. Following are the specific reports reviewed:

- Environmental Dosimeter Company, Annual Quality Assurance Status Report, January – December 2015
- GEL Laboratories LLC, 2015 Annual Quality Assurance Report for the Radiological Environmental Monitoring Program (REMP)
- FPL/NextEra Energy Nuclear Oversight Vendor Audit Report SBK 14-10 of Environmental Dosimetry Company/Stanford Dosimetry LLC



The audits appeared to be thorough and only identified a few minor findings, which would not have affected any of the analyses submitted to the licensee for its ODCM program.

The licensee self-initiated a notification (NN 203261419) to assess its environmental dosimetry program against ANSI N13.37, "Environmental Dosimetry – Criteria for System Design and Implementation." The licensee subsequently contracted the dosimetry vendor to assess the program as compared to the new American National Standards Institute (ANSI) standard. The licensee received the vendor's assessment dated December 3, 2015. The licensee is currently evaluating the recommendations, which include items such as reporting results in millirem instead of milliRoentgen, and the method used for subtracting background results from environmental dosimeters.

The inspectors observed a chemistry technician perform sample collection in the Units 2 and 3 SFPs on March 23, 2016, using the dip method. The chemistry supervisor indicated that the monthly sample for each unit is collected using the new SFP island sink; however, the weekly samples are more easily collected by the dip method. The inspectors observed good radiation protection (RP) coordination and coverage by the RP staff, good radiological protection techniques by the chemistry technician, as well as the necessary foreign material exclusion controls, such as using hard hat chin straps while obtaining the sample from the SFPs.

e. Groundwater Monitoring

The licensee established 15 groundwater monitoring wells between 2009 and 2012 in the NIA yard, to sample and monitor groundwater. The wells were established following the guidelines of the Nuclear Energy Institute NEI 07-07, "Groundwater Protection Initiative." The licensee's procedure SO123-IX-1.4.1, "Groundwater Monitoring," Revision 9, provides the guidance for sampling. The analyses are performed by the licensee's contracted environmental analysis laboratory that processes the samples under the ODCM. The licensee performed quarterly sampling and the results are documented in the SONGS Annual Radioactive Effluent Release Report. The results are reviewed by the Groundwater Protection Initiative (GPI) Steering Committee, in accordance with SO123-GPI-1, "Ground Water Protection Initiative."

The inspectors reviewed the last quarterly meeting of the GPI, which occurred on December 10, 2014. The meeting minutes reflect that the committee reviewed historical trends of tritium and requested that a plan be developed to terminate the groundwater protection initiative. As part of the groundwater protection initiative, the licensee has been extracting groundwater from beneath the site to hydraulically contain any radioactive fluid plume and to direct the potentially contaminated water to a monitored release point.

The extraction pumps were turned off on April 28, 2015. The licensee performed monthly sampling of seven wells between May 2015 and August 2015. The licensee staff concluded that the temporary suspension of the continuous extraction of groundwater in the NIA had no effect on the groundwater tritium levels of. The tritium levels remained consistent with the results before suspension of the extraction wells.

In addition, the results did not exceed the REMP lower limit of detection of 2000 picoCuries/liter as defined in the ODCM for drinking water. The licensee also recommended that consideration should be given to placing some additional wells in the NIA to monitor for any possible migration of tritium created by the ISFSI pad expansion. The licensee indicated that the results and conclusions will be presented to the GPI Steering Committee for review and final decision. The licensee also explained that since the voluntary groundwater initiative was being reduced and transitioned to a monitoring program, the steering committee's quarterly responsibilities will also be reduced or dissolved.

### 3.3 Conclusion

The licensee's effluent monitoring and environmental monitoring programs were being conducted in accordance with appropriate regulatory requirements as prescribed by the SONGS ODCM.

## 4. **Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors (40801)**

### 4.1 Inspection Scope

The inspectors reviewed the licensee's policies and implementing procedures that govern the corrective action program to verify compliance with the applicable regulatory requirements and decommissioning documents. Specifically, the inspectors reviewed a sample of nuclear notifications (NNs) and verified that the NNs' disposition and control provide adequate documentation and description of conditions adverse to quality, as well as specifying the cause of these conditions and the corrective actions taken to prevent recurrence.

The inspectors also verified that contractor personnel must submit non-conformance reports and proposed corrective actions for licensee review, and that the licensee adequately assessed deficiencies identified or reported by its contractors and entered them into the corrective action program for tracking. The inspectors also discussed the corrective action program with licensee management and technical staff.

In addition, the inspectors reviewed the SONGS policies and implementing procedures that govern the implementation of the internal auditing and decommissioning safety review programs to verify compliance with the requirements in the DQAP and technical specifications, and to ensure that significant decommissioning activities are independently and effectively reviewed.

The inspectors evaluated the effectiveness of licensee controls in identifying, resolving, and preventing issues that degrade safety or the quality of decommissioning. These controls include self-assessment, auditing, corrective actions, and root and apparent cause evaluations. The inspectors reviewed a sample of audit reports and self-assessments to evaluate compliance with the licensee's program and technical requirements. In addition, the inspectors reviewed the disposition of corrective actions to resolve deficiencies identified by audit findings for adequacy and timeliness.

Furthermore, the inspectors discussed the implementation and effectiveness of the audit and safety review programs with SONGS personnel.

#### 4.2 Observations and Findings

##### a. Corrective Action Program

The SONGS DQAP establishes the necessary measures to control items, including services, that do not conform to specified requirements to prevent inadvertent installation or use, as well as to promptly identify, control, document, classify, and correct conditions adverse to quality. Non-conformances are evaluated for their impact on the operability of important-to-safety structures, systems, and components to ensure that the final condition does not adversely affect safety, operation, or maintenance of the item or service. The DQAP requires personnel to identify known conditions adverse to quality to determine what corrective actions are appropriate. Reports of conditions adverse to quality are analyzed to identify trends. The results of evaluations of conditions adverse to quality are analyzed, documented, and reported in accordance with applicable procedures. Significant conditions adverse to quality are documented and reported to responsible management.

The licensee's corrective action program is contained in procedure SO123-XV-50, "Corrective Action Program," Revision 34, which establishes provisions that ensure the NNs produced as a result of the program provide: 1) adequate documentation and description of significant conditions adverse to quality; 2) an appropriate analysis of the cause of these conditions and the corrective actions taken to prevent recurrence; 3) direction for review and approval by the responsible authority; 4) a description of the current status of the corrective actions; and 5) the follow-up actions taken to verify timely and effective implementation of the corrective actions. In addition, the procedure identifies that the timeliness of corrective actions should be commensurate with the safety significance of the item, and that the extent of corrective actions should be determined as appropriate for the circumstances.

At SONGS, each NN receives a review during one or more of the management and safety review committee meetings described in Section 5.2.b, which consist of quality assurance, health physics, engineering, contractor, and inspection personnel, as appropriate, evaluating and dispositioning the NNs in accordance with the SONGS process and documenting the bases for these decisions, as needed. For all NNs, the management and safety review committees assign appropriate personnel to evaluate and disposition the NN and provide adequate documentation of these evaluations. The inspectors attended both, a Management Review Committee (MRC) and a Vendor Oversight Review Committee (VORC) meeting to verify implementation of the SONGS corrective action program. It was noted that contractor representatives readily participated in both meetings. In addition, the licensee's attendees were prepared and knowledgeable of the corrective actions being reviewed.

During the VORC, reported issues were dispositioned into the SONGS corrective action program for any action determined to be a Level 1 (significant condition adverse to quality) or Level 2 (condition adverse to quality) significance. For issues identified as

Levels 3-5 significance, the committee determined whether the issue would be processed through the licensee's corrective action program, or would be processed through the associated contractor's corrective action program. Regardless, the issues were tracked in the SONGS corrective action program and, once completed, the issue was closed in both programs.

The inspectors observed that the licensee's oversight of the contractors' corrective action programs involved close monitoring, review, and evaluation of each program using a combination of individual communications, use of the applicable oversight committees, as well as by the ongoing involvement of the corrective action program manager. Starting with the implementation of the VORC, the licensee is expected to continue to identify opportunities for improvement in the oversight of contractor programs. These efforts can be utilized in the future when overseeing the decommissioning general contractor.

Finally, the inspectors conducted numerous discussions with SONGS personnel, including design engineers, quality assurance personnel, and audit representatives, to verify that all licensee personnel are aware of the corrective action process, recognize when and how to enter into the process, and understand the types of disposition that can result from a NN. The inspectors concluded that all of the licensee personnel interviewed had adequate knowledge of the SONGS corrective action program.

b. Audits and Self-Assessments

The SONGS DQAP establishes the necessary measures to implement audits to verify that activities covered by the DQAP are performed in conformance with documented requirements. The audit program is reviewed for effectiveness as part of the overall audit process. The SONGS DQAP provides for the conduct of periodic internal and external audits. Internal audits are conducted to determine that the program and procedures being audited comply with the DQAP. Internal audits are performed with a frequency commensurate with safety significance and in such a manner as to ensure that an audit of all applicable quality assurance program elements is completed for each functional area within a period of 2 years.

External audits determine the adequacy of a supplier's or contractor's quality assurance program. The licensee ensures that audits are documented and audit results are reviewed. The licensee also ensures that it responds to all audit findings and initiates appropriate corrective actions. In addition, where corrective actions are indicated, the licensee documents follow-up of applicable areas through inspections, review, re-audits, or other appropriate means to verify implementation of assigned corrective actions.

The inspectors reviewed a sample of internal audits to evaluate the implementation of the SONGS audit program and verified that the licensee had prepared and approved plans that identify the audit scope, focus, and applicable criteria before the initiation of the audit activity. The inspectors confirmed that the audit reports contained a review of the relevant decommissioning activities and associated documentation. Specifically, the audit forms were used to verify multiple areas including the environmental program, procedures, emergency response, external dosimetry, nuclear materials accountability program, and

air sampling for occupational workers. For audits that resulted in findings the inspectors verified that the licensee had established a plan for corrective action, that the MRC had reviewed and approved the corrective action, and then verified its satisfactory completion and proper documentation.

The inspectors verified that the SONGS DQAP and associated procedures provide guidance for the indoctrination and training of auditors and lead auditors. These documents prescribe the minimum experience and training requirements for auditors and lead auditors and provide that they be certified based on education, experience, training, examination, audit participation, and communication skills. Each auditor is trained to the applicable quality assurance procedures, as well as other applicable nuclear related codes, standards, regulations, and regulatory guides.

The inspectors reviewed a sample of the training and qualification records of the SONGS auditors and lead auditors and confirmed that auditing personnel had completed all required training and maintained qualification and certification in accordance with the licensee's policies and procedures. The inspectors also verified that audit teams selected by the licensee were sufficiently qualified to evaluate areas within the scope of the audit and that members of the MRC and Nuclear Oversight Board had the necessary knowledge and experience in areas important to decommissioning.

#### 4.3 Conclusions

The licensee is implementing its corrective action program in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP. Based on the sample of documents reviewed and activities observed, the inspectors determined that the licensee is successfully implementing its policies and procedures associated with the corrective action program in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures.

The licensee's auditing and decommissioning safety review programs are being conducted and maintained in accordance with the appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee has established audit, review, and oversight programs to ensure that activities are being conducted in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures. These programs function in a timely, independent, and appropriate manner.

### **5. Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (37801)**

#### 5.1 Inspection Scope

The inspectors reviewed the licensee's safety review processes, procedures, and training to verify that the safety review program is effective at contributing to the protection of public health and safety and the environment. Additionally, the inspectors reviewed selected design changes and facility modifications to determine if changes, tests, experiments, and modifications are effectively conducted, managed, and controlled during plant decommissioning. This inspection verified that major and minor

decommissioning activities are being implemented in accordance with the requirements of 10 CFR 50.59, 10 CFR 50.71, 10 CFR 72.48, and 10 CFR Part 50, Appendix B. In addition, the inspectors discussed the implementation and effectiveness of the design control and safety review programs with SONGS personnel.

The inspectors also reviewed the organization, composition, and controls implemented for each of the SONGS management and safety review committees to ensure that the licensee was maintaining effective oversight of decommissioning activities. The inspectors also attended several oversight committee meetings and discussed the program with licensee staff.

## 5.2 Observations and Findings

### a. Design Control and Plant Modifications

The SONGS DQAP includes design control provisions to control inputs, processes, outputs, changes, interfaces, records, and organizational interfaces of the licensee's designs. The design control provisions include requirements for verifying the acceptability of design activities and documents, consistent with their effects on safety for structures, systems, and components that have important-to-safety functions. The regulations under 10 CFR 50.59(c)(1) states in part, that a licensee may make changes in the facility as described in the UFSAR, make changes in the procedures as described in the UFSAR, and conduct tests or experiments not described in the UFSAR without obtaining a license amendment pursuant to 10 CFR 50.90 in certain situations.

The inspectors reviewed the licensee's 10 CFR 50.59 safety evaluation program, as implemented by Procedure SO123-XV-44, "10 CFR 50.59 and 72.48 Program," Revision 17. The inspectors compared this procedure with the NRC-endorsed acceptable method for complying with the provisions of 10 CFR 50.59, which is the Nuclear Energy Institute's NEI 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, dated November 2000. The inspectors reviewed four screenings where licensee personnel had determined that a full 10 CFR 50.59 evaluation was not necessary and determined that the licensee's safety evaluation program procedure and processes were adequate for complying with the provisions of 10 CFR 50.59 and 10 CFR 72.48.

The inspectors reviewed the meeting minutes of the Onsite Review Committee Meeting conducted on March 21, 2016. The inspectors compared the conduct of the meeting with the requirements specified in the SONGS UFSAR, Section 17.2.20.2, and SONGS Procedure SO123-XV-60.1, Revision 16. The inspectors determined that the procedure was adequate to implement the licensee's commitments provided in Section 17.2.20.2 of the UFSAR. Additionally, the inspectors determined that the committee members were properly trained, the committee was properly staffed to conduct meetings, and the committee members fulfilled the charter of the committee as specified in the procedure. The licensee's 10 CFR 50.59 safety evaluation program provides effective periodic training for personnel preparing, reviewing, and approving the associated safety evaluations. In addition, the licensee's program establishes an adequate process to assess training effectiveness.

The inspectors reviewed procedure SO123-XXIV-10.1, "Engineering Design Control Process – NECPs," Revision 34, which controls and provides implementation for design changes, tests, experiments, and modifications. The inspectors determined that the procedure provided adequate instructions to assure proper implementation, review, and approval of design changes. The inspectors also verified that when issues were identified during this process the licensee appropriately documented the issue(s) in the SONGS corrective action program.

In addition, the inspectors reviewed 13 modification packages that had been installed in the plant since last NRC inspection activity in August 2015. The inspectors performed an in-depth review of 3 evaluations performed pursuant to 10 CFR 50.59, and verified that the evaluations were adequate and prior NRC approval was obtained as appropriate. Following are the design change packages that were reviewed:

- NECP 801096772, "U2 and U3 SFP Level Using Pressure Indication," Revision 1
- NECP 801262260, "Transfer Power from Load-center Breaker 3B0711 to Breaker 2B0711 for Transfer of MCC 3BK," Revision 0
- NECP 801314776, "Transfer Load from MCC 2BF to MCC 2BW," Revision 0

The inspectors reviewed the licensee's work activities in Units 2 and 3, which included removal of systems from service that were no longer required to maintain the integrity of the reactor coolant pressure boundary, shutdown the reactor, and maintain the reactor in a shutdown condition. The inspectors confirmed that these activities were completed in accordance with the licensee's safety review processes, even when implemented by contractor personnel.

b. Management and Safety Review Committees

The overall organizational structure at SONGS is described in the UFSAR, as well as in Appendix A of the DQAP. The inspectors verified that the licensee maintains an overall organizational structure that reflects the decommissioning organization described in these licensing documents. In addition, the licensee continues to manage and implement several oversight and review committees that establish and maintain effective oversight of decommissioning activities

The licensee is transitioning towards an organizational structure that allows a contracted workforce to perform the majority of the decommissioning work activities with appropriate licensee oversight. For some of the contractor organizations currently onsite, the contractor maintains an independent training program, radiological coverage and monitoring procedures, corrective action program, event response procedure, and/or quality assurance program. In all of these cases the licensee has reviewed and approved these contractor programs to ensure there is adequate interface with the licensee's program(s) to ensure continued compliance with regulatory requirements and license conditions.

The licensee continues to maintain a MRC, Onsite Review Committee, Nuclear Oversight Board, and has recently implemented a VORC. Licensee Procedures SO123-XV-60.1, "Onsite Review Committee (OSRC)," Revision 16, and SO123-XII-18.17, "Nuclear Oversight Board Functions and Responsibilities," Revision 7, address the responsibilities, composition, qualifications, and functions of these two organizations and establish the appropriate level of independence to be able to make recommendations to licensee management. The MRC and VORC charters contain similar information and all the review committees are used to ensure that both licensee and contractor staff are performing decommissioning activities in accordance with the appropriate regulatory requirements, license conditions, and decommissioning documents.

The inspectors reviewed the meeting minutes of the Onsite Review Committee, conducted on March 21, 2016, attended a VORC meeting on March 23, 2016, and attended a MRC meeting on March 24, 2016. In general, the licensee is appropriately implementing the various oversight committees to ensure that all conditions that could impact the safety or quality of decommissioning activities at SONGS are being addressed in a manner commensurate with their potential impact on the overall project.

Specifically, the inspectors noted that implementation of the VORC has established a robust and thorough means for collecting and evaluating the non-conformances and corrective actions reported by the various contractor personnel onsite at SONGS. Continued use of the VORC will help ensure that the licensee's corrective action program maintains adequate contact with similar contractor programs and that potential issues are addressed by both licensee and contractor personnel as the decommissioning projects continue. Finally, the inspectors reviewed the closure of several corrective actions and other oversight committee items to verify that the licensee appropriately implemented or resolved the recommendations of the safety review committees as required by the applicable decommissioning documents.

### 5.3 Conclusions

The licensee's safety review processes, procedures, and training programs are being conducted and maintained in accordance with the appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee has established 10 CFR 50.59 and CFR 72.48 programs to ensure that activities are being conducted in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures. Decommissioning activities are being implemented in accordance with the requirements of 10 CFR 50.59, 10 CFR 50.71, 10 CFR 72.48, and 10 CFR Part 50, Appendix B.

The licensee's management, safety review, and other oversight committees are being conducted and maintained in accordance with appropriate regulatory requirements as prescribed by the SONGS DQAP. The licensee has established additional oversight and controls for contractor programs to ensure that activities are being conducted in accordance with the applicable regulatory requirements, license conditions, and DQAP procedures.



## **6. Operation of an Independent Spent Fuel Storage Installation (60855)**

### **6.1 Inspection Scope**

A routine inspection was conducted of the SONGS's ISFSI to verify ongoing compliance with the Transnuclear (TN) Certificate of Compliance (CoC) No. 1029, Amendment 1 and its associated Technical Specifications, the TN Standardized Advanced Nuclear Horizontal Modular Storage (NUHOMS®) System's UFSAR, Revision 3 and the regulations in 10 CFR Part 20 and Part 72.

### **6.2 Observations and Findings**

The inspectors performed a paperwork review of documents related to dry fuel storage operations, including licensee performed quality assurance audits and surveillances, ISFSI and fuel building crane related condition reports, cask maintenance records, ISFSI monitoring data and surveillance records, and TN CoC No. 1029 Technical Specification (TS) for temperature and ventilation surveillance records. In addition, the inspectors performed an inspection of the SONGS ISFSI pad to assess its condition and the condition of the spent fuel storage casks, and verified the radiation levels onsite, the inspectors spent a day observing spent fuel assembly sipping operations in the Unit 3 spent fuel building.

Six ISFSI related audit reports were issued since the last ISFSI inspection in January 2014. Those reports covered programs, such as Nuclear Regulatory Affairs, RP, Procurement and Material Control, Security and Safeguards, and Fire Protection. The audits resulted in two minor ISFSI related condition reports that were placed into the licensee's corrective action program for final resolution.

The inspectors reviewed a quality assurance surveillance report which chronicled the SONGS Nuclear Oversight Department's observation of a routine ISFSI maintenance activity: verifying the torque of the door attachment bolts for 10 of the 51 loaded advanced horizontal storage modules (AHSMs). No problems were noted during that evolution. In addition, the inspectors reviewed three vendor quality assurance surveillance reports. One of the reports was a Nuclear Procurement Issues Committee (NUPIC) joint audit of Holtec International, including its facilities located in Marlton, New Jersey; Holtec Manufacturing Division in Turtle Creek, Pennsylvania; Orrvilon facility in Orrville, Ohio; and the Nanotec facility in Lakeland, Florida. This audit did not include any items designed for use in the Holtec International HI-STORM UMAX ISFSI that is planned for construction at SONGS beginning this year.

The second vendor surveillance was a facility assessment report for the Holtec Orrvilon and Holtec Manufacturing Division facilities. The facility assessment report documented a pre-surveillance visit by the licensee to the two Holtec fabrication facilities to determine which steps in the fabrication process would be best to concentrate its inspection efforts during the manufacturing of the 73 multi-purpose canisters (MPCs), Holtec Model MPC-37s, that will be required for the storage of spent fuel in the proposed Holtec HI-STORM UMAX ISFSI at SONGS.

Lastly, the inspectors reviewed a Source Verification Report for SONGS's current ISFSI vendor, TN. The licensee sent an auditor to surveil numerous steps in the fabrication process of six TN DSC-32 Model Dry Shielded Canisters, DSC-32-001 through DSC-32-006. Although purchased by the licensee, the six DSC-32s will never be used at SONGS. The 2,668 spent fuel assemblies remaining in the Units 2 and 3 spent fuel pools will all be stored in the proposed HI-STORM UMAX ISFSI, once it has been constructed and its licensing has been completed. No significant deficiencies were identified in any of the vendor surveillance reports reviewed by the NRC inspectors.

The licensee provided a list of ISFSI and fuel building crane related NNs issued since the last NRC inspection (January 2014) to the inspectors. The inspectors selected 27 for further review. The inspectors determined that the NNs were well documented and properly categorized based on the safety significance of the identified condition. All follow-up corrective actions were appropriately assigned. Based on the types of conditions described in the NNs, the licensee demonstrated a suitably low threshold for placement of issues into its corrective action program. Based on the NNs reviewed, the NRC concluded that the licensee demonstrated good attention to detail in regards to the operation and routine maintenance of its ISFSI program and the fuel building crane. No significant trends or safety concerns were identified during the review of the corrective action program. The licensee identified conditions were processed in accordance with Procedure SO123-XV-50.

The inspectors attended both the managers' daily turnover meeting and the craft technical turnover briefing for the ongoing Unit 3 fuel sipping and inspection operations. The licensee began its fuel sipping operations on December 1, 2015, in the Unit-2 fuel handling building SFP. The Unit 2 fuel sipping operations concluded in February 2016. Fuel sipping in the Unit 3 SFP began on February 23, 2016, and was scheduled to continue until the end of April 2016. Fuel sipping is a method to determine whether a fuel assembly shows evidence of cladding failure through the detection of trapped radioactive fission product gases that are pulled out of the fuel after being subjected to a pressure differential. In addition to the sipping operations, the fuel assemblies were also visually inspected for irregularities, debris, and other damage.

At the time of the NRC visit, fuel assembly sipping and inspection were taking place Monday through Thursday, while Fridays were set aside for visual inspections only. As of March 8, 2016, the fuel assemblies to date had a failure rate of roughly 1 percent. The number of cladding defects identified in the Unit 2 SFP were 10 out of a total of 1,318 fuel assemblies tested.

During the evening of March 7, 2016, the Unit 3 fuel bridge crane experienced operational problems in its ability to traverse the SFP. The licensee described the problem as "crabbing," where the fuel bridge crane did not travel smoothly. As a result, the fuel bridge crane was declared inoperable and all fuel movements were suspended until the fuel bridge crane could be repaired. During the temporary stoppage of SFP operations, an NRC inspector was provided access to the fuel movers and craft technicians performing the fuel sipping operations for questions. There are several

types of fuel sipping operations that can take place at various times during a reactor's operation. The type of sipping being performed at SONGS was Westinghouse Canister Sipping.

In canister sipping, a fuel assembly is placed into a cylindrical vessel at the bottom of the SFP. Spacers are used in the vessel such that the fuel assembly is raised to a standard height inside of the cylinder before it is sealed off. Once sealed, a volume of air is blown into the cylinder to form a space over the fuel assembly. It should be noted that the fuel assembly is always covered with water from the SFP. Next, a vacuum is applied to the air space over the fuel assembly, providing the pressure differential to liberate any trapped fission gases from the fuel through cracks or other fissures. The vacuum is drawn through a sodium iodide scintillation detection crystal, which is where the radioactive gases are detected. The gas is recirculated through the system, which, in theory, allows for improved detection efficiency because any of the gases pulled from the failed fuel will concentrate and not escape the closed loop system. Once a failed fuel element is detected, the system is secured to prevent contamination of the detector. The canister sipping set-up used at SONGS employed dual cylinders and two identical detector systems installed in parallel to improve throughput.

An NRC inspector was invited to enter the fuel building with the fuel sipping technicians who demonstrated their preoperational setup procedure with the specialized fuel sipping equipment and answered multiple questions raised by the inspector. The technicians were eager to provide answers to the wide variety of questions raised by the inspector. These questions specifically were about their unique equipment, differences in fuel sipping technology, and their experiences and expectations while sipping older fuel assemblies.

The fuel bridge crane had been repaired and fuel sipping operations recommenced by March 8, 2016. An NRC inspector observed approximately six fuel assemblies being sipped. None of the ones observed during the sipping process were found to be leakers. However, several instances of foreign materials were found on fuel assemblies by the inspector and were noted. Each fuel assembly inspection was recorded with video cameras and several still photographs of debris on fuel assemblies were taken and cataloged for record keeping purposes.

All of the fuel movements were carefully performed. The fuel bridge crew employed three-way communications between the fuel movers, persons tracking fuel assembly selection, and fuel sipping technicians. The NRC inspector did not identify any safety related issues during the observed operations.

The inspectors verified the radiological conditions of the SONGS ISFSI through a review of TLD direct radiation monitoring data, the most recent radiological survey, and a tour of the ISFSI pad with a radiation survey meter. An inspector was accompanied by an RP Manager and an ISFSI Program Manager during the inspection of the ISFSI pad. The ISFSI pad was securely fenced and locked inside a separate protected area outside of the reactor site's protected area. The ISFSI was clear of any notable vegetative growth and there were not any combustible, flammable, or unexpected items present on the storage pad. The ISFSI pad contained 63 TN AHSMs, 51 of them loaded

and 12 empty. All of the AHSMs were in good physical condition. Measurements were taken in close proximity to the loaded casks by the RP technician with a Bicron MicroRem tissue-equivalent survey meter (S/N C881C, calibration due May 30, 2016) to record gamma dose rates in microrem per hour ( $\mu\text{rem/h}$ ). The highest level observed in a random sampling of AHSMs was 500  $\mu\text{rem/h}$ . The measurements taken by the RP technician confirmed the measurements recorded on the most recent ISFSI site survey. The NRC inspector carried a Ludlum Model 19 sodium-iodide gamma survey meter (NRC #016337, calibration due August 6, 2016) to record gamma exposure rates in microRoentgens per hour ( $\mu\text{R}^1/\text{h}$ ). The inspector recorded radiation levels ranging from 12 – 48  $\mu\text{R/h}$  at the ISFSI fence boundary locations.

The radiological conditions in and around the ISFSI were as expected, given the initial heat loads of the spent fuel, time spent on the pad, and storage configuration of the spent fuel in the SONGS ISFSI. The ISFSI was properly posted as a radioactive materials area. To review the contents of the SONGS ISFSI, see the previous NRC inspection report for this site (ML14045A317).

The direct radiation monitoring TLD data for the ISFSI was reviewed for the current and previous two years. The TLD monitoring results documented a decrease in radiation dose in close proximity to the ISFSI pad as the spent fuel contents continued to cool and decay. No additional spent fuel has been placed into the SONGS ISFSI since 2012.

Annual REMP data documented the dose equivalent to any real individual located beyond the site controlled area was well below the 10 CFR 72.104(a)(2) requirement of less than 25 millirem (mrem) per year. Annual monitoring data near the ISFSI boundary locations show that accessible areas of the ISFSI also fall below the 10 CFR 20.1502(a)(1) dose limit for unmonitored individuals, which is 500 mrem per year. Direct radiation impacts from the SONGS ISFSI met all regulatory requirements.

The NRC inspectors reviewed three randomly selected weeks of TN AHSM temperature surveillance records to ensure that the TN CoC 1029 Technical Specification 5.2.5 requirements were being met for fuel stored on the ISFSI pad. The information provided by the licensee was complete.

### 6.3 Conclusion

The inspectors observed that the licensee had met the licensing requirements for the documents and activities reviewed associated with the dry cask storage activities at SONGS.

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<sup>1</sup> For the purposes of making comparisons between NRC regulations based on dose-equivalent (rem) and measurements made in Roentgens, it may be assumed that one Roentgen equals one rem. (<http://www.nrc.gov/about-nrc/radiation/protects-you/hppos/qa96.html>)

## **7. Review of 10 CFR 72.212(b) Evaluations (60856)**

### **7.1 Inspection Scope**

The 10 CFR 72.212 Evaluation Report was reviewed to verify site characteristics were still bounded by the TN NUHOMS System design basis.

### **7.2 Observations and Findings**

The licensee was operating under Revision 9 of its 10 CFR 72.212 Evaluation Report, the same as during the previous ISFSI inspection. Since the last inspection, however, two 10 CFR 72.48 screens were performed for editorial changes to the 10 CFR 72.212 Evaluation Report. Those changes were documented in the form of the licensee's Engineering Change Notice/Calculation Change Notice (ECN/CCN) process, instead of a report revision.

### **7.3 Conclusions**

The licensee was maintaining the 10 CFR 72.212 Evaluation Report current as required. Two changes to the 10 CFR 72.212 report had been made since the last NRC ISFSI inspection in 2014. No issues were found associated with the ECN/CCN documentation regarding those changes.

## **8. Review of 10 CFR 72.48 Evaluations (60857)**

### **8.1 Inspection Scope**

The licensee's 10 CFR 72.48 screenings and evaluations since the 2014 NRC ISFSI inspection were reviewed to determine compliance with regulatory requirements

### **8.2 Observations and Findings**

The licensee's 10 CFR 72.48 screens and evaluations for changes to the ISFSI program since the last NRC inspection were reviewed to determine compliance with regulatory requirements. Two 10 CFR 72.48 screens and no full 10 CFR 72.48 evaluations had been performed since the last SONGS inspection. The licensee had not performed any 10 CFR 50.59 screens or safety evaluations for the fuel building cask handling crane since the last inspection.

### **8.3 Conclusions**

All required screens and safety evaluations had been performed in accordance with procedures and 10 CFR 72.48 requirements. All of the 10 CFR 72.48 screens that were reviewed were determined to have been adequately evaluated by the licensee.

## 9. Follow Up of Events

### 9.1 (Closed) Licensee Event Report (LER) 05000361/2015-002-00, "Spent Fuel Pool Temperature Drifted Below Updated Final Safety Analysis Report (UFSAR) Value"

#### a. Inspection Scope

On November 19, 2015, the licensee determined that the SONGS Unit 2 SFP temperature had drifted approximately two degrees below the analyzed temperature of 68°F Fahrenheit (°F) on several previous days. Based on a review of operation logs and other available data, the licensee identified 41 days for Unit 2 and 45 days for Unit 3 during which the temperature fell below the analyzed value. The typical drift was up to 2 degrees below 68°F, with the lowest recorded temperature of approximately 61°F one time for Unit 2 and Unit 3.

The licensee evaluated and analyzed a new lower temperature limit for the spent fuel pools using an updated spent fuel criticality calculation that modified the existing input data to be consistent with the current situation for the SFPs at SONGS. The revised calculation established a new lower temperature limit of 50°F. The SONGS UFSAR, Section 9.1.2.3, Safety Evaluation, was updated to document the spent fuel pool temperature range being acceptable from 50°F to 160°F.

The licensee determined that the cause for the low SFP temperatures was the reduced heat load in the facility coupled with low ocean temperatures. Each SFP is cooled by each unit's component cooling water system, which is cooled by the Pacific Ocean. Since there are no longer other plant loads, there is not a significant difference between the SFP temperatures and the ocean temperature, as there was when the facility was operating. Therefore, the SFP temperatures have decreased and are more affected by changes in the ocean temperature.

The licensee has noted and the inspectors confirmed that with the operation of the new independent spent fuel pool cooling system for each unit, the temperature of the SFPs will be able to be held at a constant temperature. In addition, the inspectors verified that the lower analyzed temperature limit of 50°F did not have a safety significant impact on the spent fuel cladding material properties.

#### b. Conclusions

LER 05000361/2015-002-00, "Spent Fuel Pool Temperature Drifted Below Updated Final Safety Analysis Report (UFSAR) Value" is closed with no findings identified.

## 10. Exit Meeting Summary

On March 10, 2016, and March 24, 2016, the NRC inspectors presented the inspection results to SCE management and staff. There was no proprietary information provided to the inspectors.

**SUPPLEMENTAL INSPECTION INFORMATION**

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M.Morgan, Regulatory Affairs  
J.Appel, Regulatory Affairs  
N.Mascolo, Manager, Natural Resources and Public Lands

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

Opened

None

Closed

05000361/2015-002-00	LER	Spent Fuel Pool Temperature Drifted Below Updated Final Safety Analysis Report (UFSAR) Value (Section 9.1)
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Discussed

None

## LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AHSM	advanced horizontal storage module
ANSI	American Nuclear Standards Institute
CCN	Calculation Change Notice
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
DSC	dry shielded canister
DQAP	Decommissioning Quality Assurance Program
ECN	Engineering Change
GPI	groundwater protection initiative
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LER	Licensee Event Report
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575)
MPC	multi-purpose canister
MRC	Management Review Committee
NEI	Nuclear Energy Institute
NIA	north industrial yard
NN	nuclear notification
NUPIC	Nuclear Procurement Issues Committee
ODCM	Offsite Dose Calculation Manual
OSRC	Onsite Review Committee
PSDAR	Post-Shutdown Decommissioning Activities Report
RP	radiation protection
REMP	Radiological Environmental Monitoring Program
S/N	serial number
SFP	spent fuel pool
TLD	thermoluminescent dosimeter
TN	Transnuclear
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VORC	Vendor Oversight Review Committee



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Sincerely,

/RA/

Jack E. Whitten, Chief  
 Fuel Cycle & Decommissioning Branch  
 Division of Nuclear Materials Safety

Docket Nos. 50-361; 50-362; and 72-041  
 License Nos. NPF-10; NPF-15

Enclosure:  
 Inspection Report 05000361/2016001;  
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Letter to Thomas J. Palmisano from Jack Whitten dated May 5, 2016

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INSPECTION  
REPORTS 05000361/2016001; 05000362/2016001 AND 07200041/2016001

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