



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

July 15, 2019

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

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INSPECTION
REPORT 05000361/2019-003 AND 05000362/2019-003

Dear Mr. Bauder:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on June 3-6, 2019, at the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. The NRC inspectors discussed the results of this inspection with you and members of your staff during a final exit meeting conducted on June 6, 2019. The inspection results are documented in the enclosure to this letter.

This inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm compliance with the Commission's rules and regulations, and with the conditions of your licenses. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, performance of independent radiation measurements, and interviews with personnel. Specifically, the inspectors reviewed decommissioning planning activities for SONGS Units 2 and 3, controls for spent fuel safety, and implementation of your safety review and design change program. Within the scope of the inspection, no violations were identified and a response to this letter is not required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, Enclosure 1, and your response if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC's Website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Enclosure 2 transmitted herewith contains SUNSI. When separated from Enclosure 2, this transmittal document and Enclosure 1 are decontrolled.

D. Bauder

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However, Enclosure 2 of the inspection report contains Security-Related Information, so the enclosure will not be made publically available in accordance with 10 CFR 2.390(d)(1). If you choose to provide a response that contains Security-Related Information, please mark your entire response “Security-Related Information – Withhold from Public Disclosure under 10 CFR 2.390” in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). The NRC is waiving the affidavit requirements for your response in accordance with 10 CFR 2.390(b)(1)(ii).

If you have any questions regarding this inspection report, please contact Stephanie Anderson at 817-200-1213, or the undersigned at 817-200-1249.

Sincerely,

/RA/

Gregory G. Warnick, Chief
Reactor Inspection Branch
Division of Nuclear Materials Safety

Docket Nos.: 050-00361; 050-00362
License Nos.: NPF-10; NPF-15

Public Enclosure:

1. Inspection Report 050-00361/2019-003;
050-00362/2019-003
w/Attachment: Supplemental Information

Non-Public Enclosure:

1. Inspection Report 050-00361/2019-003;
050-00362/2019-003
w/Attachment: Supplemental Information
2. Material Control and Accounting

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket Nos.: 050-00361; 050-00362
License Nos.: NPF-10; NPF-15
Report Nos.: 05000361/2019-003; 05000362/2019-003
Licensee: Southern California Edison Company
Facility: San Onofre Nuclear Generating Station, Units 2 and 3
Location: 5000 South Pacific Coast Highway, San Clemente, California
Inspection Dates: June 3-6, 2019
Inspectors: Stephanie G. Anderson, Health Physicist
Reactor Inspection Branch
Division of Nuclear Materials Safety

Chris D. Steely, Health Physicist
Reactor Inspection Branch
Division of Nuclear Materials Safety

W. Chris Smith, Health Physicist
Reactor Inspection Branch
Division of Nuclear Materials Safety
Approved By: Gregory G. Warnick, Chief
Reactor Inspector Branch
Division of Nuclear Materials Safety

Enclosure 1

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3
NRC Inspection Report 05000361/2019-003; 05000362/2019-003

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the San Onofre Nuclear Generating Station, Units 2 and 3. In summary, the licensee was conducting these activities in accordance with site procedures, license requirements, and applicable NRC regulations. Within the scope of the inspection, no violations were identified.

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- The licensee continued to conduct decommissioning in accordance with the general guidance provided in the Post-Shutdown Decommissioning Activities Report. The licensee implemented an oversight program to ensure that contractors conducted decommissioning work activities in accordance with procedural requirements as well as licensee expectations. The licensee implemented operational, radiological, and housekeeping programs to ensure safe storage of spent fuel. (Section 1.2)

Spent Fuel Pool Safety at Permanently Shutdown Reactors

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

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

- The inspectors did not identify any regulatory issues associated with the selected samples for the safety reviews, design changes, or modifications, and found that the design change packages were being performed in accordance with the regulatory and procedural requirements. (Section 3.2)

Report Details

Summary of Plant Status

On June 12, 2013, the Southern California Edison Company (SCE), the licensee, formally notified the NRC by letter that it had permanently ceased power operations at the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, effective June 7, 2013. The licensee's letter is available in the Agencywide Documents Access and Management System (ADAMS) under (ADAMS Accession No. ML131640201). By letters dated June 28, 2013 (ADAMS Accession No. ML13183A391), and July 22, 2013 (ADAMS Accession No. ML13204A304), the licensee informed the NRC that the reactor fuel had been permanently removed from SONGS, Units 3 and 2, reactor vessels as of October 5, 2012, and July 18, 2013, respectively.

Upon docketing of these certifications, and pursuant to Title 10 of the *Code of Federal Regulations* (CFR) 50.82(a)(2), the SONGS, Units 2 and 3, facility operating licenses no longer authorized operation of the reactors or emplacement or retention of fuel into the reactor vessels. In response to the licensee's amendment request, the NRC issued the permanently defueled technical specifications on July 17, 2015 (ADAMS Accession No. ML15139A390), along with revised facility operating licenses to reflect the permanent cessation of operations at SONGS, Units 2 and 3.

The licensee submitted its Post-Shutdown Decommissioning Activities Report (PSDAR) on September 23, 2014 (ADAMS Accession No. ML14269A033), which is required to be submitted within 2 years following permanent cessation of operations under 10 CFR 50.82(a)(4). The PSDAR outlines the decommissioning activities for SONGS, Units 2 and 3. By letter dated August 20, 2015 (ADAMS Accession No. ML15204A383), the NRC informed the licensee that the PSDAR contained the information required by 10 CFR 50.82(a)(4)(i). In the current plant configuration, the number of operable systems and credible accidents/transients is significantly less than for a plant authorized to operate the reactor or emplace or retain fuel in the reactor vessel.

On March 11, 2016, the NRC issued two revised facility operating licenses for SONGS, Units 2 and 3 (ADAMS Accession No. ML16055A522), in response to the licensee's amendment request dated August 20, 2015 (ADAMS Accession No. ML15236A018). The license amendment allowed the licensee to revise its Updated Final Safety Analysis Report (UFSAR) to reflect the significant reduction of decay heat loads in the SONGS, Units 2 and 3, spent fuel pools (SFPs) resulting from the elapsed time since the two units were shut down in January 2012. The licensee shut down Unit 2 for a scheduled refueling outage but never restarted the unit, and the licensee shut down Unit 3 the same month in response to a steam generator tube leak. The revisions support design basis changes made by the licensee associated with the implementation of "cold and dark" plant status as described in the PSDAR.

The NRC approved exemptions from certain emergency planning requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR Part 50, Appendix E, Section IV, which became effective on June 5, 2015 (ADAMS Accession Nos. ML15105A349 and ML15126A461). These license amendments revised the SONGS emergency action level (EAL) scheme and emergency plan, respectively, to reflect the low likelihood of any credible accident at the plant in its permanently shut down and defueled condition that could result in radiological releases requiring offsite protective measures. The changes to the license were to provide conformance with the related exemptions granted to the licensee by NRC letter dated June 4, 2015 (ADAMS

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Accession No. ML15082A204). The changes were reviewed, and appropriate conforming changes were properly addressed in the applicable revision and sections of the SONGS UFSAR.

The licensee submitted a license amendment request dated December 15, 2016 (ADAMS Accession No. ML16355A015), to revise the Permanently Defueled Emergency Plan (PDEP) into an Independent Spent Fuel Storage Installation (ISFSI)-Only Emergency Plan (IOEP), and to revise the EAL scheme into ISFSI-only EALs for SONGS, Units 1, 2, and 3 ISFSI. The proposed changes would reflect the new status of the facility, as well as the reduced scope of potential radiological accidents, once all spent fuel has been moved to dry cask storage within the onsite ISFSI.

The NRC issued amendments to the SONGS operating licenses to allow transition to an IOEP and EAL scheme on November 30, 2017 (ADAMS Accession No. ML17310B482). The NRC inspectors determined that the SONGS IOEP and associated changes would provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the SONGS facility. The changes were reviewed, and appropriate conforming changes were properly addressed in the applicable revision and sections of the SONGS UFSAR.

License Amendment 169 (Unit 1), 237 (Unit 2), and 230 (Unit 3) were submitted on December 15, 2016, (ADAMS Accession No. ML16355A014) and approved by the NRC by letter dated January 9, 2018 (ADAMS Accession No. ML17345A657). These license amendments changed the operating licenses and technical specifications to reflect the removal of all spent nuclear fuel from the SONGS, Units 2 and 3, SFPs and its transfer to dry cask storage within an onsite ISFSI. These changes will more fully reflect the permanently shutdown status of the decommissioning facility, as well as the reduced scope of structures, systems, and components necessary to ensure plant safety once all spent fuel has been moved to the SONGS ISFSI.

The changes also made conforming revisions to the SONGS, Unit 1, technical specifications and combined them with the SONGS, Units 2 and 3, technical specifications. This license amendment will become effective as of the date the licensee submits a written notification to the NRC that all spent nuclear fuel assemblies have been transferred out of the SONGS SFPs and placed in storage within the onsite ISFSI. In addition, the changes were reviewed, and appropriate conforming changes were properly addressed in the applicable revision and section(s) of the SONGS UFSAR.

On December 20, 2016, the licensee announced the selection of AECOM and EnergySolutions as the decommissioning general contractor for SONGS. The joint venture between the two companies is called SONGS Decommissioning Solutions (SDS). The SDS organization manages the decommissioning activities as the decommissioning general contractor, which is described in the licensee's PSDAR.

The California Environmental Quality Act is the state equivalent of the federal National Environmental Policy Act. For SONGS, the California State Lands Commission (CSLC) will perform the California Environmental Quality Act review, which is triggered by the need to establish the final disposition for the offshore conduits that are under a CSLC lease. On February 11, 2019, the Final Environmental Impact Report was released by the CSLC. The CSLC held a public meeting on March 21, 2019, to consider the Final Environmental Impact Report and a lease application to decommission the offshore infrastructure associated with SONGS, Units 2 and 3. SONGS is currently waiting on the approval from the California Coastal

Commission of the Coastal Development Permit to begin active decommissioning of SONGS, Units 2 and 3.

After the August 3, 2018, canister misalignment incident at SONGS ISFSI, the licensee committed on August 7, 2018, to an NRC review prior to resuming operations of spent fuel loading operations at SONGS. At the time of this inspection, there were no spent fuel transfer operations in progress. The SDS organization had initiated planning for the site's decommissioning activities, which are scheduled to commence once the spent fuel has been moved to the ISFSI and the licensee has received the required permit from the CSLC.

1 Decommissioning Performance and Status Review at Permanently Shutdown Reactors (71801)

1.1 Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, performed radiological surveys, and conducted site tours to assess the licensee's performance in the following areas:

- Status of ongoing decommissioning activities and planning for future activities;
- Operability and functionality of systems necessary for safe decommissioning such as radioactive effluent monitoring, SFP level and temperature control, and radiation protection monitors and alarms;
- Status of field conditions and decommissioning activities; and
- Status of facility housekeeping.

1.2 Observations and Findings

The licensee submitted its PSDAR on September 23, 2014, as required under 10 CFR 50.82(a)(4). The PSDAR provides the general dates for each decommissioning phase implementation period and associated activities for that period. The licensee stated that the implementation of the activities described under each period may overlap and not necessarily be implemented consecutively. The majority of activities described under Period 1, "Transition to Decommissioning," and Period 2, "Decommissioning Planning and Site Modifications," have been implemented, as described in previous inspection reports. The licensee, under its decommissioning general contractor, SDS, was planning and scheduling hazard mitigation activities in preparation for decommissioning, as described under Period 3, "Decommissioning Preparations and Reactor Internal Segmentation."

SDS was continuing to work on the Authorized Limited SAFSTOR Hazard Mitigating Activities related activities. The inspectors interviewed SDS responsible personnel regarding the progress of the hazard mitigation activities and determined that the planned activities were developed in accordance with procedures and regulatory requirements. In addition, the planned activities did not constitute activities approved outside of the PSDAR. The inspectors attended meetings that included discussion of decommissioning activities. The meetings provided participants with useful information about the daily status of plant activities. The inspectors also discussed with SCE and

SDS senior management the schedule for the upcoming decommissioning activities at the site. SDS has a detailed plan pending the approval of the coastal development permit, to begin active decommissioning at the site.

The inspectors performed tours of the facilities, including the Unit 2 and Unit 3 spent fuel handling building, command center, south yard, location of the 1500 kilowatt diesel generator, and general areas along the west and east roads. The control room staffing met or exceeded technical specifications requirements during the inspection period. The operators were knowledgeable of plant conditions, including the status of the SFPs. The operators continuously monitored critical plant parameters including the SFP water levels. Procedures were available in the control room for use by the operators. Based on observations, the inspectors determined that the licensee was adequately maintaining the material condition of the facilities, as well as the systems, structures, and components that supported spent fuel safety.

The inspectors conducted independent radiological surveys during site tours. The inspectors measured the ambient gamma exposure rates using a Thermo Scientific Radeye G (Serial No. 30728, Calibration Due Date 12/12/19). The inspectors did not identify any radiation area that was not already identified and posted by the licensee. The observed radiological postings were in compliance with regulatory requirements. Radiological boundaries were well defined. Housekeeping was adequate for the work in progress.

1.3 Conclusion

The licensee continued to conduct decommissioning in accordance with the general guidance provided in the PSDAR. The licensee implemented an oversight program to ensure that contractors conducted decommissioning work activities in accordance with procedural requirements as well as licensee expectations. The licensee implemented operational, radiological, and housekeeping programs to ensure safe storage of spent fuel.

2 Spent Fuel Pool Safety at Permanently Shutdown Reactors (60801)

2.1 Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, and conducted site tours to assess the licensee's performance in the following areas:

- Design, operational, and administrative measures are in place to prevent a substantial reduction in SFP coolant inventory under normal and accident conditions;
- SFP instrumentation, alarms, and leakage detection systems are adequate to assure safe wet storage of spent fuel;
- SFP water chemistry and cleanliness control programs maintain water purity standards, limits on radionuclide concentration, and minimum boron concentration in accordance with technical specification requirements;
- Criticality controls are consistent with the applicable nuclear criticality safety analyses;

- Procedures, drawings, and PSDAR descriptions and operations regarding SFP operation and power supplies are adequate; and
- Problem identification issues related to SFP activities are entered into the corrective action program at an appropriate threshold.

2.2 Observations and Findings

The technical specifications specify the limiting conditions of operation (LCO) in the fuel storage pools in order to maintain the fuel in a subcritical condition. The LCOs include Technical Specifications 3.1.1 for the minimum level of 23 feet of water between the top of the fuel bundle and fuel pool surface, and Technical Specifications 3.1.2 for the boron concentration to be maintained greater than or equal to 2,000 parts per million (ppm) in order to preserve the assumptions of the fuel handling accident analysis. The inspectors observed the SFP water level was being maintained approximately 27 feet above of the top of the fuel bundles in both pools, and the boron concentration was maintained at 2658 ppm in Unit 2 and 2650 ppm in Unit 3.

The inspectors reviewed the surveillance history since the last inspection and the surveillances were completed as required and no results were below the technical specifications identified above. In addition, SONGS UFSAR, Section 9.1.2.3, Safety Evaluation required the SFP coolant temperature be maintained between 50° Fahrenheit (°F) and 160°F. The inspectors observed SPF temperatures in Units 2 and 3 as 72°F and 73°F respectively.

The inspectors observed the SFP island equipment in Units 2 and 3, reviewed the corrective actions generated for the SFP systems, and reviewed surveillances. The inspectors discussed with the shift manager the licensee's observations of the equipment and determined that the SFP island cooling and makeup systems were functioning adequately. The inspectors concluded the systems were being properly maintained and within technical specifications. At the time of the inspection, there was no evidence of liner leakage in either the Units 2 or 3 SFPs.

The inspectors observed the radiation monitoring system in the Units 2 and 3 SFP handling building, in addition to the display and alarm capability in the Command Center using the command center data acquisition system.

2.3 Conclusion

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

3 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (37801)

3.1 Inspection Scope

The inspectors reviewed documents and interviewed plant personnel to assess the licensee's performance in the following areas:

- Determination that licensee procedures and processes conform to the regulations and guidance associated with 10 CFR 50.59;
- Implementation of a sampling of design change modifications to verify that procedures and controls were followed;
- Verify that the applicable changes were effectively implemented in the plant and in plant procedures, drawings, and training programs if applicable; and
- Verify that the changes made under 10 CFR 50.59 did not require prior NRC approval.

3.2 Observations and Findings

The inspectors reviewed four 10 CFR 50.59/72.48 applicability determinations and screens, performed by SCE in support of changes (modifications) to the facility. The majority of SCE performed 10 CFR 50.59/72.48 applicability determinations, screens, and evaluations were in support of the SONGS ISFSI. Because the modifications associated with the ISFSI were previously reviewed as part of the NRC's Special Inspection, Inspection Report # 2018-001, related to the Holtec canister unsecured load event, the inspectors focused efforts on the non-ISFSI safety reviews, design changes, and modifications. SCE performed their 10 CFR 50.59/72.48 reviews in accordance with Procedure SO123-XXIV-10.1, "Engineering Design Control Process – NECPs," Revision 42. The following design change packages were reviewed:

- Applicability Determination 0219-30429-4, "UFSAR Section 9A Changes to Reflect Current Operating Practices"
- 72.48 Screen 0219-92285-5 72.48 SO23-3-3-21.2, "Defueled Surveillances, Revision 35"
- 50.59 Screen 1118-30241-6, "Meteorological Tower Differential Temperature Channel Surveillance Clarifications"
- 50.59 Screen 1118-70367-2, "Reclassification of Security Structures, Systems and Components"

SDS performed the 10 CFR 50.59/72.48 reviews in accordance with Procedure SDS-RA1-PGM-002, "10 CFR 50.59 and 72.48 Program," Revision 2. The inspectors reviewed the following SDS 10 CFR 50.59 screens, performed in support of changes (modifications) to the facility:

- 50.59 Screen SDS-50.59-2019-0006, “Saltwater Dilution Pressure vs Flow and PT Alarm Setpoint”
- 50.59 Screen SDS-50.59-2018-0009, “Saltwater Dilution System Setpoint Calculation Change”
- 50.59 Screen SDS-50.59-2018-0005-2, “Units 2 & 3 Containment Ventilation (Partial Turnover)”

The inspectors determined both the SCE and SDS procedures used guidance from NEI 96-07, Utility Services Alliance 10 CFR 50.59 Resource Manual, and 10 CFR 72.48 Resource Manual to perform reviews for either the facility or dry cask storage related systems, structures, or components to determine whether any changes, tests, or experiments may be performed without obtaining prior NRC approval. The inspectors determined that Procedures SO123-XXIV-10.1, “Engineering Design Control Process – NECPs,” Revision 42 and SDS-RA1-PGM-002, “10 CFR 50.59 and 72.48 Program,” Revision 2, were written in accordance with the NRC endorsed NEI 96-07 guidance. The inspectors determined that the procedures provided instructions to assure proper implementation, review, and approval of design changes. The inspectors concluded that SCE and SDS reviewed the proposed activities under the 10 CFR 50.59 screening process in accordance with procedural and regulatory requirements and provided an adequate explanation as to why an evaluation was not necessary.

3.3 Conclusions

The inspectors did not identify any regulatory issues associated with the selected samples for the safety reviews, design changes, or modifications, and found that the design change packages were being performed in accordance with the regulatory and procedural requirements.

4 **Exit Meeting Summary**

On June 6, 2019, the NRC inspectors presented the final inspection results to Doug Bauder, Vice President and Chief Nuclear Officer, and other members of the licensee’s staff. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified with the exception of certain SDS procedures and documents reviewed during the inspection, which were marked as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Bates, SCE, Regulatory Affairs and Oversight Manager
S. Mannon, SDS, Regulatory Affairs
D. Evans, SCE, Regulatory Affairs
R. Granaas, SCE, Senior Nuclear Engineer
R. Chang, SCE, Consulting Nuclear Engineer
T. Dieter, SDS, Executive Sponsor
T. Kaiser, SDS, D&D Project Director
R. Kalman, SDS, Operations Project Director

INSPECTION PROCEDURES USED

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 60801 Spent Fuel Pool Safety at Permanently Shutdown Reactors
IP 37801 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
IP 85103 Material Control and Accounting at Decommissioning Nuclear Power Reactors

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS Agencywide Documents Access and Management System
CFR *Code of Federal Regulations*
CSLC California State Lands Commission
EAL Emergency Action Level
°F Degrees Fahrenheit
IOEP ISFSI Only Emergency Plan
ISFSI Independent Spent Fuel Storage Installation
LCO Limiting Condition of Operation
MC&A Material Control & Accounting
NMMSS Nuclear Materials Management and Safeguards System
NRC Nuclear Regulatory Commission
PDEP Permanently Defueled Emergency Plan
PSDAR Post-Shutdown Decommissioning Activities Report
PPM Parts Per Million
SDS SONGS Decommissioning Solutions

SCE	Southern California Edison Company
SFP	Spent Fuel Pool
SNM	Special Nuclear Material
SONGS	San Onofre Nuclear Generating Station
UFSAR	Updated Final Safety Analysis Report