



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

September 22, 2021

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 05000361/2021-003 AND 05000362/2021-003

Dear Mr. Bauder:

This letter refers to the U.S. Nuclear Regulatory Commission's (NRC's) inspection conducted on August 23-26, 2021, 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 August 26, 2021. 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 license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of site meetings, performance of independent radiation measurements, and interviews with personnel. Specifically, the inspectors reviewed decommissioning planning activities for SONGS Units 2 and 3, effectiveness of all personnel exposure monitoring, and the implementation of the effluent and environmental programs. 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, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's 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.

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

Sincerely,



Signed by Warnick, Gregory
on 09/22/21

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

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

Enclosure:
Inspection Report 05000361/2021-003;
05000362/2021-003

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05000361/2021-003; 05000362/2021-003 - DATED SEPTEMBER 22, 2021

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket Nos. 05000361; 05000362

License Nos. NPF-10; NPF-15

Report Nos. 05000361/2021-003; 05000362/2021-003

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: August 23-26, 2021

Inspectors: Stephanie G. Anderson
Senior Health Physicist
Reactor Inspection Branch
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Senior Health Physicist
Decommissioning, ISFSI and Reactor HP Branch
Division of Radiological Safety and Security

Accompanied By: Binesh K. Tharakan
Technical Assistant
Division of Nuclear Materials Safety

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

Enclosure

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3
NRC Inspection Report 05000361/2021-003; 05000362/2021-003

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

- Decommissioning activities were being conducted in accordance with the general guidance provided in the Post-Shutdown Decommissioning Activities Report. Radiological postings were consistent with regulatory requirements. The inspectors determined that the licensee was adequately controlling decommissioning activities and radiological work areas at the facility. (Section 1.2)

Occupational Radiation Exposure at Permanently Shutdown Reactors

- The licensee adequately implemented its occupational radiation protection program in accordance with procedures and regulatory requirements. (Section 2.2)

Radioactive Waste Treatment, and Effluent and Environmental Monitoring

- The licensee implemented and maintained the effluent monitoring and control systems for calendar year 2020 in accordance with the Offsite Dose Calculation Manual. The licensee's program met the appropriate regulatory requirements set forth in the Offsite Dose Calculation Manual for sample collection methodology and locations, quality control and quality assurance of the program, and comparison of data results to preoperational data results. (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). The current version of the PSDAR is dated May 7, 2020 (ADAMS Accession No. ML20136A339).

The licensee submitted a license amendment request dated December 15, 2016 (ADAMS Accession No. ML16355A015), to revise the Permanently Defueled Emergency Plan into an Independent Spent Fuel Storage Installation (ISFSI) Only Emergency Plan (IOEP), and to revise the emergency action level (EAL) scheme into ISFSI-Only EALs for SONGS, Units 1, 2, and 3 ISFSI. The proposed changes reflect the new status of the facility, as well as the reduced scope of potential radiological accidents, since all of the 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 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 Updated Final Safety Analysis Report.

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 Spent Fuel Pools (SFPs) and its transfer to dry cask storage within an onsite ISFSI. These changes 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 since 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 became effective as of the date the licensee submitted a written notification to the NRC that all spent nuclear fuel assemblies had been transferred out of the SONGS SFPs and placed in storage within the onsite ISFSI. In a letter to the NRC dated August 7, 2020, (ADAMS Accession No. ML20227A044) the licensee has certified that all spent fuel has been removed from the SFPs of Units 2 and 3. Accordingly, SONGS entered their ISFSI-Only Technical Specifications, Emergency Plan (EP), and Security Plan on August 10, 2020.

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) performed the California Environmental Quality Act review, which was 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. On October 17, 2019, the California Coastal Commission approved, with conditions, the Coastal Development Permit to begin decontamination and dismantlement of the above grade structures at SONGS, which authorized active decommissioning activities at the site. Now that all spent fuel has been removed from the SFPs to the ISFSI, SDS has begun active decommissioning of the site. During the inspection week, SDS was actively demolishing the Administrative, Warehouse, and Shop (AWS) building and removing parts of the Unit 2 turbine systems and structures.

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

1.1 Inspection Scope

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

- Status of decommissioning and verify whether the licensee was conducting decommissioning and maintenance activities in accordance with regulatory and license requirements;
- Licensee awareness of work activities to assess their control and conduct of decommissioning;
- Status of the licensee's decommissioning staffing, personnel qualifications, and training requirements, including that of the contracted workforce, to ensure that

license requirements were met, as applicable to the current decommissioning status;

- Whether the licensee was identifying problems related to decommissioning and maintenance activities at an appropriate threshold and entering them into the corrective action program;
- Performed plant tours to assess field conditions and decommissioning activities; and
- Observed and assessed the status of facility housekeeping.

1.2 Observations and Findings

The PSDAR provides a high-level description of the planned decommissioning activities. At the time of the inspection, the licensee and its decommissioning general contractor were conducting decommissioning activities in accordance with the PSDAR. The inspectors discussed the current schedule with management staff and conducted site tours to observe work in progress. Critical path activities included preparation of the interior and exterior of the containment structures for future decommissioning followed by preparation and implementation of the reactor vessel internals segmentation work.

The inspectors attended meetings that included discussion of decommissioning activities as well as the current plant status for each day. The meetings provided participants with useful information about the daily status of plant activities. The inspectors performed tours of the facilities, command center, and the Unit 2 and Unit 3 containment buildings. Plant staff appeared to be knowledgeable of site conditions and based on observations, the inspectors determined that the licensee was adequately maintaining the material condition of the facilities, as well as the structures, systems, and components that are necessary for safe decommissioning. General observations by the inspectors identified good housekeeping practices, and appropriate radiological postings and labeling. The inspectors did not identify any radiation area that was not posted by the licensee.

The licensee's decommissioning contractor, SDS, is currently preparing the Unit 2 and Unit 3 containment buildings for the reactor vessel internals segmentation project. This includes making modifications inside the containment buildings, including removal of the safety injection tanks, and removal of all interferences to bring the reactor vessel internals segmentation equipment into the containments. The inspectors toured the Unit 2 and Unit 3 containment buildings and evaluated whether site personnel were focusing on safety, adherence to procedures, and radiological precautions as directed by regulatory and procedural requirements.

The inspectors observed the status of work outside of the power block. Various shop and office buildings around the power block have been demolished, were being demolished, or will be demolished in the near future. The AWS building was in the process of being demolished. Parts of the Unit 2 turbine systems and structures were being removed in preparation for the Turbine Building to be demolished in the future. Building rubble was being radiologically surveyed and sorted for unconditional release.

1.3 Conclusion

Decommissioning activities were being conducted in accordance with the general guidance provided in the PSDAR. Radiological postings were consistent with regulatory requirements. The inspectors determined that the licensee was adequately controlling decommissioning activities and radiological work areas at the facility.

2 Occupational Radiation Exposure at Permanently Shutdown Reactors (83750)

2.1 Inspection Scope

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

- Planning and preparation for radiation work were adequate and licensee management supported RP planning;
- Training and qualifications of personnel were adequate for the radiation protection organization;
- Internal dosimetry procedures and processes meet requirements;
- Management and administrative controls of external radiation exposure meet requirements and were designed to maintain exposures "As Low As is Reasonably Achievable" (ALARA);
- Processes or other engineering controls were used to the extent possible to limit concentrations of airborne radioactive materials; and
- Source term has been appropriately characterized and work practices reflect current conditions.

2.2 Observations and Findings

The inspectors reviewed the annual radiation protection program review performed by SDS under "2020 Radiation Protection Program Annual Review," dated March 2021. Overall, SDS concluded the assessment areas were satisfactory. The inspectors determined that the licensee had performed an adequate assessment and identified areas requiring corrections and improvement opportunities that had been entered in the corrective action program.

The inspectors reviewed staffing levels and On-the-Job training and Task Performance Evaluation for Basic and Advanced Radiation Protection Technician qualifications and discussed with appropriate SDS personnel. The inspectors note that radiation protection technicians are required to complete the advanced radiation protection technician qualification to cover work in areas greater than 1 rem/hr and that there are sufficient radiation protection technicians with this qualification to cover expected jobs.

The inspectors reviewed condition reports associated with radiation protection over the past year and found that the site had adequately identified and resolved deficient items generally with thorough documentation.

The inspectors reviewed the SDS Radiological Work Planning and Controls procedure SDS-RP2-PGM-2000, "Radiological Work Planning and Controls," Revision 10. The procedure adequately provides a method for evaluating planned work to determine appropriate radiation safety controls, work oversight, and radiological risk. The inspectors reviewed several radiation work permits (RWPs), ALARA plans, and work packages, including available paperwork relating to thimble support plate removal and segmentation at Unit 2 and determined the licensee had implemented the procedure as required.

The inspectors toured Unit 2 and 3 containments and assessed area radiological conditions in the facility, including postings and general housekeeping and spot checked several air samplers and radiation protection instrumentation for up to date calibration, source checks, placement, and material condition as applicable. During the tours, the inspectors conducted independent radiological surveys using a Thermo Scientific Radeye G survey meter (Serial No. 13421 with calibration due date of December 22, 2021). The inspectors observed a daily radiation protection morning briefing, a high radiation area briefing, and a morning pre-job brief for workers performing activities in Unit 3 containment. The inspectors observed a calibration of a Ludlum 3 instrument in accordance with procedure SDS-RP4-PCD-1002, "Performance Testing of Common Portable Survey Instruments," Revision 7. The inspectors determined that radiological conditions, radiological briefings, and instrumentation conditions were adequate.

The inspectors reviewed several personnel contamination event records and an internal dose assessment performed using procedure SDS-RP3-PCD-1002, "Internal Dose Assessment," Revision 7. The individual was assigned 7 mrem internal dose. The inspectors reviewed the ALARA plan, RWP, work procedures, observed the process and source check for whole body counting, and interviewed appropriate SDS radiation protection personnel and determined that the site had appropriately performed the internal dose assessment after the individual was found to have low levels of contamination around the face and throat area after performing radioactive waste repackaging. The inspectors noted that the post job review was being written and will be reviewed during a subsequent inspection to determine whether lessons learned were appropriately applied to subsequent work activities.

2.3 Conclusion

The licensee adequately implemented its occupational radiation protection program in accordance with procedures and regulatory requirements.

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

3.1 Inspection Scope

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

- Radioactive waste treatment systems were maintained and operated to keep offsite doses ALARA;
- Licensee effectively controls, monitors, and quantifies releases of radioactive materials in liquid, gaseous, and particulate forms to the environment;
- Radiological environmental monitoring programs were effectively implemented to ensure effluent releases were being adequately performed as required to minimize public dose; and
- Licensee implementation of the voluntary NEI/Industry Ground Water Protection Initiative.

3.2 Observations and Findings

In accordance with Licensee Controlled Specification Section 5.7.1, the licensee submitted the annual radiological environmental and radioactive effluent release reports to the NRC. The 2020 annual radioactive effluent release report was submitted on April 27, 2021 (ADAMS Accession No. ML21127A150). The 2020 annual radiological environmental operating report was submitted on May 11, 2021 (ADAMS Accession No. ML21133A252).

The annual radioactive effluent release report documented the gaseous and liquid effluents for 2020. The inspectors reviewed the annual report and compared the data and information provided against the requirements in the Offsite Dose Calculation Manual (ODCM). The ODCM provided detailed guidance for monitoring and controlling liquid and gaseous effluents, as well as calculating offsite doses. The licensee calculated the quarterly doses at the site boundary in accordance with the ODCM, and the results were well below the regulatory requirements based on liquid and airborne effluent releases and direct radiation measurements.

The annual radioactive effluent release report also documented the shipments performed during calendar year 2020. The licensee's decommissioning contractor SDS, made 30 shipments of solid waste to the EnergySolutions disposal site in Clive, Utah. The licensee's decommissioning contractor SDS, maintains a contract with vendor Bear Creek Operations that provides volume reduction services. Six shipments were made from SDS to Bear Creek Operations for volume reduction in calendar year 2020.

The inspectors reviewed the annual radiological environmental operating report for 2020 and concluded that the licensee had collected the required samples of environmental media and measured radiation levels in the environment at the specified locations around the facility and performed the analyses in accordance with the ODCM. The environmental and exposure monitoring data results continued to represent background levels around the facility; and therefore, there was no accumulation of radioactivity in the environment as a result of licensed activities.

The licensee performed the annual land-use census as required by the ODCM, in which the results were documented in the annual radiological environmental operating report. There were no changes necessary in the sampling media or sampling locations in

response to the annual land-use census. In addition, the inspectors reviewed the interlaboratory comparison results and noted the program contained the appropriate radioisotopes for current plant conditions and it was performed as required.

The SDS decommissioning contractor uses a stand-alone liquid radwaste processing (LRWP) skid system to process liquids currently stored onsite and liquids generated during the entire decommissioning activities at the site. The inspectors conducted a walk-down with SDS personnel to observe the liquid pathways at the facility, including the installed LRWP skid system. The inspectors examined the configuration, flow path, and associated procedures for the LRWP skid. In 2020, the LRWP system was modified to improve the efficiency of liquid radwaste releases by adding two larger capacity tanks for batch releases. Each of these tanks are capable of holding 120,000 gallons.

The licensee documented and tracked each deviation from the ODCM as required by Section 5.0 of the ODCM. Deviations from the ODCM were associated with external factors not within the control of the licensee. The licensee stated that the 2020 deviations had no meaningful impact on the radiological environmental monitoring program data and did not compromise the validity of the reported conclusions. The inspectors concluded that the deviations were within the criteria of the ODCM and did not impact the ODCM program.

3.3 Conclusion

The licensee implemented and maintained the effluent monitoring and control systems for calendar year 2020 in accordance with the ODCM. The licensee's program met the appropriate regulatory requirements set forth in the ODCM for sample collection methodology and locations, quality control and quality assurance of the program, and comparison of data results to pre-operational data results.

4 **Exit Meeting Summary**

On August 26, 2021, the NRC inspectors presented the final inspection results to Mr. Doug Bauder, Chief Nuclear Officer and Vice President Decommissioning, 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 all 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 Manager
L. Rafner, SCE, Regulatory Affairs
M. Morgan, SCE, Regulatory Affairs
B. Corbett, SDS, Radiation Protection Manager
S. Enright, SDS, ALARA & Special Projects Manager
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B. Metz, SCE, Manager of Environmental and Decommissioning Oversight
G. Huff, SDS, ODCM Remp Specialist
C. Aung, SDS, Chemistry Manager
N. Hansen, SDS, Remp Specialist

INSPECTION PROCEDURES USED

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83750 Occupational Radiation Exposure at Permanently Shutdown Reactors
IP 84750 Radioactive Waste Treatment, and Effluent and Environmental Monitoring

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
AWS	Administrative, Warehouse, and Shop
CFR	<i>Code of Federal Regulations</i>
CSLC	California State Lands Commission
D&D	Decontamination and Dismantlement
EAL	Emergency Action Level
EP	Emergency Plan
IOEP	ISFSI-Only Emergency Plan
ISFSI	Independent Spent Fuel Storage Installation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PSDAR	Post-Shutdown Decommissioning Activities Report
RWP	Radiation Work Permit
SCE	Southern California Edison Company
SDS	SONGS Decommissioning Solutions
SFP	Spent Fuel Pool
SONGS	San Onofre Nuclear Generating Station
TS	Technical Specification