



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

November 29, 2023

Frederic Bailly
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 050-00361/2023-006 AND 050-00362/2023-006**

Dear Frederic Bailly:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on November 13-16, 2023, at the San Onofre Nuclear Generating Station, Units 2 and 3. The inspectors discussed the results of the inspection with you and members of your staff during the exit meeting on November 16, 2023. 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, observation of activities, independent measurement of radiation levels, and interviews with personnel. Specifically, the inspectors reviewed your implementation of decommissioning activities, occupational radiation protection, solid radioactive waste management, and transportation of radioactive materials. Within the scope of the inspection, no violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's 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 Dr. Robert Evans at 817-200-1234 or the undersigned at 817-200-1249.

Sincerely,



Signed by Warnick, Gregory
on 11/29/23

Gregory G. Warnick, Chief
Decommissioning, ISFSI, and Operating
Reactor Branch
Division of Radiological Safety and Security

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

Enclosure:
Inspection Report 050-00361/2023-006; 050-00362/2023-006
w/Attachment: Supplemental Inspection Information

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☒ SUNSI Review By: RJE	ADAMS: ☒ Yes ☐ No	☐ Sensitive ☒ Non-Sensitive	☐ Non-Publicly Available ☒ Publicly Available	Keyword NRC-002
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**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket Nos.	050-00361; 050-00362
License Nos.	NPF-10; NPF-15
Report Nos.	050-00361/2023-006; 050-00362/2023-006
Licensee:	Southern California Edison Company
Facility:	San Onofre Nuclear Generating Station, Units 2 and 3
Location:	5000 South Pacific Coast Highway San Clemente, California
Dates:	November 13-16, 2023
Inspectors:	Robert J. Evans, PE, CHP, PhD, Senior Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security Christian R. Dennes, Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security
Approved By:	Gregory G. Warnick, Chief Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security
Attachment:	Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3
NRC Inspection Report 05000361/2023-006; 05000362/2023-006

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

Decommissioning Performance and Status Review

- The licensee and its decommissioning contractor were conducting decommissioning in accordance with the instructions provided in site procedures and commitments provided in the Post-Shutdown Decommissioning Activities Report. (Section 1.2)

Occupational Radiation Exposure

- The licensee and its decommissioning contractor continued to effectively implement its occupational radiation exposure program. The inspectors reviewed the respiratory protection program and the powered air-purifying respirator life cycle and determine that the licensee adequately followed its procedures and regulations. The licensee continued to effectively implement its As Low As Is Reasonably Achievable program in accordance with procedures and regulatory requirements. Finally, the licensee continued to adequately implement its problem identification and resolution program according to site procedures. (Section 2.2)

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee and its decommissioning contractor conducted waste management and shipping activities in accordance with procedural instructions, Post-Shutdown Decommissioning Activities Report commitments, and regulatory requirements. (Section 3.2)

Report Details

Summary of Plant Status

On June 12, 2013, the Southern California Edison Company, the licensee, formally notified the NRC that it had permanently ceased power operations at San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, effective June 7, 2013 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML131640201). The NRC subsequently 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.

As required by Title 10 the *Code of Federal Regulations* (10 CFR) 50.82(a)(4), the licensee submitted its Post Shutdown Decommissioning Activities Report (PSDAR) to the NRC on September 23, 2014 (ML14269A033). The PSDAR outlined the licensee's planned decommissioning activities. The current version of the PSDAR is dated May 7, 2020 (ML20136A339). As discussed in the PSDAR, the licensee chose to implement the decommissioning alternative DECON. DECON is the removal or decontamination of equipment, structures, or portions of the facility and site that contain radioactive contaminants to levels that permit termination of the license.

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

During the inspection week, decommissioning activities in progress included continued segmentation of the reactor vessel internals. This work was nearly complete. The next major activity planned was the segmentation of the Unit 3 reactor vessel. Other work in progress included: (1) removing the reactor coolant pump motors from the two containments; (2) removing restraints and interferences for future removal of large components from the two containments; (3) cutting the steam generators; (4) removing the insulation from inside the two containments for disposal; and (5) preparing the pressurizers for removal. Other activities in progress included removal of trash and debris from the containments for disposal, removal of hot spots from the two spent fuel pools, and decontamination and radiological survey of embedded drains.

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

1.1 Inspection Scope

To evaluate the status of decommissioning and to verify whether the licensee was conducting decommissioning and maintenance activities in accordance with license and regulatory requirements.

1.2 Observations and Findings

Section II.A of the PSDAR provides a description of the decommissioning periods. The site is currently in Period 4. Period 4 started with the completion of fuel transfer operations in August 2020 and extends through the completion of the decommissioning

and decontamination work. At the time of the inspection, the licensee, and its decommissioning general contractor SDS, were conducting major decommissioning activities in accordance with the general guidance provided in Section II.B.1 of the PSDAR. The inspectors discussed the current decommissioning schedule with management staff and conducted site tours to observe work in progress.

The decommissioning contractor was actively segmenting the reactor vessel internals in both containments. The vessel internals were being segmented, in part, to separate the different classes of wastes for disposal. In Unit 2, the contractor was actively cutting the beam flanges on the lower support assembly. In Unit 3, the contractor was cutting the F-ring of the lower support assembly. The reactor vessel internal segmentation work was scheduled to be completed by early 2024 in both units.

Other work in progress during the inspection included cleanup of the two reactor cavities. This work was being conducted, in part, to support future draining of the cavities. The reactor vessel segmentation work was scheduled to begin after removal of the reactor vessel internals. During the inspection, the inspectors observed the mock-up that was used to train workers for future cutting of the reactor vessel walls. The contractor plans to start the reactor vessel segmentation work in Unit 3 in January 2024.

The inspectors toured the Unit 2 and Unit 3 containments and observed general work in progress. The contractor had removed and shipped five of eight reactor coolant pump motors for offsite disposal at the time of this inspection. Other activities in progress included removal of potentially radioactive insulation, cutting of steam generator shells, and cutting of interferences for future removal of large components. The inspectors observed the loading and movement of containerized wastes from both containments for disposal. The movement activities were closely monitored by the contractor's health physics staff. Housekeeping was adequate in both containments, and radiological controls were consistent with regulatory requirements.

Outside of the two containments, decommissioning work in progress included cleaning and surveying of embedded drain line piping. In addition, the contractor planned to reroute the liquid radioactive waste discharge line to support future decommissioning work. The contractor continued with construction of the material handling facility, a structure that will be used to provide a controlled environment for future loading of loose radioactive wastes into shipping containers. The inspectors noted that the decommissioning work was being conducted with an emphasis on personnel safety.

The inspectors discussed with licensee and contractor representatives about their plans for final status and unconditional release surveys of various buildings and areas. The contractor was actively cleaning, radiologically surveying, and plugging drain lines in the radwaste, fuel handling, penetration, equipment, and control buildings. The contractor also plans to conduct unconditional release surveys of portions of the control buildings for eventual release of the building rubble for recycling. Further, the contractor plans to conduct final status surveys of two utility tunnels and the former multipurpose handling building foundation area.

The inspectors reviewed the status of recently identified problems in the decommissioning program area. The licensee and its contractor identified in September 2023 that the lower reactor vessel internals were misclassified for disposal. The lower areas were expected to consist primarily of Class A wastes, but the licensee and its

contractor discovered that the areas contained some Class B/C and greater-than-class-C wastes. This resulted in additional planning, cutting, packaging, and scheduling time to complete the work. The licensee elected to conduct an independent apparent cause evaluation of the identified problem. At the time of this inspection, the evaluation was in progress.

The inspectors conducted independent radiological assessments during site tours using a hand-held survey meter, a Radeye G gamma survey meter (serial number 13427, calibration due date 3/31/24). The inspectors confirmed that posted signs and survey results were consistent with regulatory requirements.

1.3 Conclusion

The licensee and its decommissioning contractor were conducting decommissioning in accordance with the instructions provided in site procedures and commitments provided in the PSDAR.

2 Occupational Radiation Exposure at Permanently Shutdown Reactors (Inspection Procedure 83750)

2.1 Inspection Scope

To ensure adequate protection of worker health and safety from exposure to radiation or radioactive material. To evaluate whether the licensee adequately identifies problems and implements appropriate and timely corrective actions related to occupational radiation safety.

2.2 Observations and Findings

The PSDAR, Section II.B.1 states that appropriate radiation protection and contamination control measures will be employed. Further, Section IV.E states that the licensee will continue to comply with the NRC dose limits specified in 10 CFR Part 20 and conduct activities in accordance with the principles of As Low As Is Reasonably Achievable (ALARA).

The inspectors reviewed key elements of the occupational radiation safety program to verify that the elements were being implemented as required by site procedures, PSDAR, and regulatory requirements. Specifically, the inspectors reviewed documents and interviewed site personnel to assess the licensee's and its decommissioning contractor's performance in the following areas: (1) occupational radiation exposure; (2) respiratory protection program and the powered air-purifying respirator (PAPR) life cycle; (3) ALARA program; and (4) the licensee's and contractor's problem identification and resolution program implementation relative to the radiation protection program.

The occupational exposures for 2023 were reviewed to ensure adequate protection of worker health and safety from exposure to radiation. At the time of the inspection, a total of 878 workers were monitored during calendar year 2023. The 10 highest exposed workers received a combined total effective dose equivalent of 11.407 rem and an average dose of 1.141 rem with a regulatory limit of 5 rem. The total exposure of all workers was 75.935 rem, and the average dose of 0.086 rem or 86.0 millirem per person. The inspectors concluded that the licensee and its contractor were effectively

implementing the occupational exposure program and doses were within regulatory limits.

The inspectors conducted a detailed review of the licensee's respiratory protection program. The inspectors reviewed procedure SDS-RP1-PCD-2003, "Respirator Inventory, Control, Issue," revision 9, and procedure SDS-RP1-PCD-2004, "Use and Care of 3M TM Versaflo TM M-400 Series Power Air-Purifying Respirators," revision 2. The procedures followed the guidance provided in American National Standards Institute ANSI Z88.2, "American National Standard for Respiratory Protection," and NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials." The inspectors also conducted a walkdown of the areas where respirators were stored, issued, cleaned, and surveyed prior to reuse. The inspectors concluded that the focused procedure areas and PAPR life cycle were satisfactory. The inspectors verified that the licensee adequately implemented its procedures.

The inspectors reviewed the ALARA program and concluded that the licensee and its contractor effectively implemented the program in accordance with site procedures and regulatory requirements. The inspectors reviewed the licensee's ALARA report from November 2023 and determined that the licensee continued to effectively monitor and control radiation exposures of personnel and were expecting to meet their exposure goal for the remainder of the year. The annual ALARA goal was a total dose of 88,712 millirem for 2023. At the time of the inspection, total doses were 77,048.5 millirem. The remaining total dose for the rest of 2023 appeared to be adequate for the predicted work assignments. In summary, the licensee was adequately implementing its ALARA program in accordance with 10 CFR 20.1101(b), "Radiation Protection Program."

The inspectors reviewed procedure SDS-RP2-PGM-1000, "Station ALARA Committee," revision 7, and the ALARA Committee's third quarterly meeting for 2023 (SDS-RPI-MOM-0041). The inspectors concluded that the licensee was adequately implementing its written ALARA program. The program has defined expectations for jobs/projects with dose estimates and clarified the roles and responsibilities of the ALARA Committee members.

The inspectors reviewed procedure SDS-RP2-PCD-1001, "ALARA Work Plans," revision 7. The inspectors reviewed several current ALARA work plans and determined that the licensee continued to adequately implement ALARA concepts into the work plans. The licensee identified specific radiation protection controls to be implemented for evolutions which pose a greater than normal challenge to routine radiological controls.

Finally, the inspectors reviewed recently issued corrective action reports in this program area. The topics included a 3-meter dose rate from Unit 3 ring basket liner not being documented on a radiation protection survey, and shortage of electronic dosimeters available for access into radiologically controlled areas. Corrective actions were taken for each identified problem, and no significant problems were identified by the licensee and its contractor in this program area since the last inspection. The inspectors determined that the licensee and its contractor were identifying and recording potentially nonconforming conditions adequately and appropriately implementing their corrective actions related to occupational radiation safety.

2.3 Conclusion

The licensee and its decommissioning contractor continued to effectively implement its occupational radiation exposure program. The inspectors reviewed the respiratory protection program and the PAPR life cycle and determine that the licensee adequately followed its procedures and regulations. The licensee continued to effectively implement its ALARA program in accordance with procedures and regulatory requirements. Finally, the licensee continued to adequately implement its problem identification and resolution program according to site procedures.

3 **Solid Radioactive Waste Management and Transportation of Radioactive Materials (Inspection Procedure 86750)**

3.1 Inspection Scope

To verify the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material.

3.2 Observations and Findings

Section II.B of the PSDAR provides the commitments for decontamination and dismantlement activities and radioactive waste management plans. The authorized options include decontamination in place, decontamination and dismantlement, or dismantlement and disposal of material. Material with contamination below the applicable limits may be released for unrestricted disposition including recycling. Radioactive contaminated or activated material will be characterized, removed, segregated, and shipped for disposal. A waste management plan was developed by the contractor to control each waste stream. Further, Section IV.E of the PSDAR states that the licensee will comply with all applicable NRC and U.S. Department of Transportation regulations and will use approved packaging and shipping containers for the shipping of radiological wastes.

The inspectors reviewed and discussed procedure, SDS-WM1-PGM, "Waste Management Program," revision 18, with contractor staff. The procedure provided instructions for management of the seven different waste streams. The inspectors also reviewed and discussed the methods used by the contractor to load wastes into containers for disposal, as described in procedure SDS-WM1-PCD-0021, "Packaging Solid Radioactive Waste," revision 9. For example, the loading process required that workers be cognizant of weight restrictions and void spaces. During site tours of the two containment buildings, the inspectors noted that containers were being loaded in compliance with the procedural limitations for weight, void spaces, liquid content, and potential for internal movement during shipment. The inspectors also noted that the licensee was staging equipment and wastes in the two containments for future loading and shipment.

The contractor continued to maintain records of the total number of shipments and quantity of material disposed by waste class. At the time of the inspection, the contractor had shipped approximately 600 individual shipments in 2023. The total volume of waste material shipped was approximately 1.22 million cubic feet containing approximately 1,120 curies of radioactivity. The predominant radionuclide in the material was cobalt-60 followed by nickel-63 and iron-55.

The inspectors observed two shipments that included contaminated laundry and a reactor coolant pump motor. The contractor conducted radiological surveys and created shipping papers for the two shipments. The inspectors compared the shipments to the instructions provided in procedure SDS-WM1-PCD-0009, "Operating Procedure for Brokering of Hazardous Materials," revision 9. The contractor also demonstrated how it developed the manifests using industry accepted software. The inspectors concluded that the two shipments were conducted in accordance with procedure requirements.

Finally, the inspectors reviewed recently issued corrective action reports in this program area. The topics included a non-reportable transportation incident, accidental removal of labels, marking missing on a shipment, and software issues. No significant problem was identified by the licensee and its contractor in this program area since the last inspection. The inspectors concluded that the licensee and its contractor were identifying and recording potentially nonconforming conditions.

3.3 Conclusion

The licensee and its contractor conducted waste management and shipping activities in accordance with procedural instructions, PSDAR commitments, and regulatory requirements.

4 **Exit Meeting Summary**

The inspectors presented the final inspection results to the Chief Nuclear Officer/Vice President Decommissioning and other members of the licensee's staff on November 16, 2023. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified except for certain SDS procedures and documents which were marked as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee and Contractor Personnel

F. Bailly, SCE, Chief Nuclear Officer and Vice President Decommissioning
R. Corbett, SDS, Radiation Protection Manager
A. Jahr, SDS, Waste Manager
R. Kalman, SDS, Executive Sponsor
S. Mannon, SDS, Project Director/Regulatory Manager
M. Morgan, SCE, Regulatory Affairs Manager
J. Peattie, SCE, General Manager
L. Rafner, SCE, Regulatory Affairs
V. Bilovsky, SCE, Decommissioning Project Director

INSPECTION PROCEDURES USED

IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83750	Occupational Radiation Exposure at Permanently Shutdown Reactors
IP 86750	Solid Radioactive Waste Management and Transportation of Radioactive Materials

LIST OF ITEMS OPENED, CLOSED, and DISCUSSED

Opened

None

Discussed

None

Closed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Is Reasonably Achievable
CFR	<i>Code of Federal Regulations</i>
NRC	Nuclear Regulatory Commission
PAPR	powered air-purifying respirator
PSDAR	Post Shutdown Decommissioning Activities Report
REMP	Radiological Environmental Monitoring Program
SDS	SONGS Decommissioning Solutions
SONGS	San Onofre Nuclear Generating Station