



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

May 23, 2023

EA-23-043

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 050-00361/2023-002, 050-00362/2023-002, AND 072-00041/2023-001

Dear Doug Bauder:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) decommissioning and Independent Spent Fuel Storage Installation (ISFSI) inspection conducted March 20-23, 2023, at the San Onofre Nuclear Generating Station, Units 2, 3 and ISFSI. The NRC inspectors discussed the results of the decommissioning and ISFSI inspection with members of your staff during a debrief meeting conducted on March 23, 2023. A final exit meeting was conducted via Microsoft Teams on April 20, 2023, to inform members of your staff of the final inspection results. The inspection results are documented in the enclosure to this letter.

The NRC inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, 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 examined decommissioning and ISFSI performance and status reviews for SONGS Units 2, 3 and ISFSI, the licensee's corrective action programs, safety reviews, design changes, and modifications program.

Based on the results of these inspections, the inspectors documented two violations of NRC requirements in this report. Both violations were determined to be a Severity Level IV violations of very low safety significance under the NRC's traditional enforcement process.

One violation related to Title 10 of the *Code of Federal Regulations* (CFR) 71.107(a) for the licensee's failure to implement the design control requirements during the welding activities associated with a Greater-Than-Class-C (GTCC) waste canister. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy. The current NRC Enforcement Policy is included on the NRC's Website at

(<https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). This NCV is described in the subject inspection report.

The second violation related to 10 CFR 50.59(d)(1) associated with tornado hazard protection during transportation activities. Because this violation was identified during the discretion period covered by Enforcement Guidance Memorandum (EGM) 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at ISFSIs," and because the licensee was implementing compensatory measures and has taken or plans to take the necessary actions to restore compliance, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued ISFSI handling operations.

You are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. However, if you contest the violations or significance of the NCV or Enforcement Discretion, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to: (1) the Regional Administrator, Region IV, and (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

If you have any questions regarding this inspection report, please contact Troy Johnson at (817) 200-1596, or the undersigned at (817) 200-1249.

Sincerely,



Signed by Warnick, Gregory
on 05/23/23

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

Docket Nos. 050-00361, 050-00362, 072-00041
License Nos. NPF-10; NPF-15

Enclosure:
Inspection Report 050-00361/2023-002; 050-00362/2023-002; 072-00041/2023-001
w/Attachment: Supplemental Inspection Information

Distribution via ListServ

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

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

License Nos. NPF-10; NPF-15

Report Nos. 050-00361/2023-002; 050-00362/2023-002; 072-00041/2023-001

Enterprise Identifier: I-2023-002-0071 and I-2023-001-0098

Licensee: Southern California Edison Company

Facility: San Onofre Nuclear Generating Station, Units 2, 3, and ISFSI

Location: 5000 South Pacific Coast Highway
San Clemente, California

Dates: March 20-23, 2023

Inspectors: M. Troy Johnson, Health Physicist
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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, 3, and ISFSI
NRC Inspection Report 05000361/2023-002; 05000362/2023-002; 072-00041/2023-001

On March 20-23, 2023, the U.S. Nuclear Regulatory Commission (NRC) performed a routine, announced, on-site inspection of the decommissioning and Independent Spent Fuel Storage Installation (ISFSI) activities being conducted at the San Onofre Nuclear Generating Station (SONGS). The licensee and its decommissioning contractor were conducting decommissioning activities in accordance with site procedures, license requirements, and applicable NRC regulations. In the area of ISFSI activities, two violations of very low safety significance were identified for the licensee's failure to perform welding activities in accordance with design requirements and failure to evaluate potential tornado hazards during transportation activities of Greater-Than-Class-C (GTCC) waste canisters. Respectively, one violation was treated as a non-cited violation in accordance with the NRC's Enforcement Policy and the other violation was identified as being covered by the NRC's Enforcement Guidance Memorandum (EGM) 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at ISFSIs," revision 1, dated March 3, 2023.

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

The licensee and its decommissioning contractor were conducting decommissioning activities in accordance with the instructions provided in the Post Shutdown Decommissioning Activities Report (PSDAR) and site procedures. Radiological controls and related postings were being maintained. (Section 1.2)

Problem Identification and Resolution at Permanently Shutdown Reactors

The licensee and its decommissioning contractor were identifying, resolving, and correcting issues, as well as conducting audits and assessments in accordance with their procedures and federal regulations. Additionally, the licensee and its decommissioning contractor had established, implemented, and performed management reviews of the safety conscious work environment. (Section 2.2)

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

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

Operation of an Independent Spent Fuel Storage Installation

The inspectors reviewed the quality assurance audits and surveillances performed by the licensee since the last ISFSI inspection. Issues identified in the quality assurance audits and surveillances were entered into the site's corrective action program for resolution. No findings were identified related to the licensee's ISFSI quality assurance activities. (Section 4.2.a)

Radiation levels around the ISFSI facility were within the expected ranges. The ISFSI facility was maintained in good physical condition. No flammable materials were stored in the ISFSI, all vegetative growth had been controlled, and radiation postings met the Title 10 of the *Code of*

Federal Regulations (10 CFR) Part 20 requirements. At the time of the inspection, there were no observable signs of degradation. (Section 4.2.b)

Environmental data reviewed from the 2021 and 2022 site radiological environmental operating reports determined that radiation levels offsite were nominal and in accordance with the design basis and 10 CFR 72.104. (Section 4.2.c)

Since the last NRC ISFSI inspection, the licensee revised the site's two 10 CFR 72.212 reports. The inspectors determined that all changes met NRC requirements specified in 10 CFR 72.48 and 10 CFR 72.212. No issues were identified in the review of the changes associated with the 72.212 reports. (Section 4.2.d)

Selected condition reports were reviewed for the period of August 2020 through February 2023. A wide range of issues were identified and resolved by the licensee. The issues reviewed did not have a significant impact on safety and resolution of those issues were appropriate. No adverse trends were identified during the review. (Section 4.2.e)

The ISFSI-only Emergency Response Plan was being maintained. Drills, exercises, and training were performed in accordance with requirements in the plan. Offsite support agencies were offered an opportunity to participate in the licensee's latest biennial exercise. (Section 4.2.f)

The inspectors reviewed a sample of 10 CFR 50.59 and 10 CFR 72.48 screenings and evaluations that had been performed within the inspection period. A Severity Level IV violation of 10 CFR 50.59(d)(1) was identified, for the licensee's failure to provide a written evaluation which provided the bases that GTCC canisters were adequately protected during short duration transportation operations from potential tornado missiles and wind. Since this violation was identified during the discretion period covered by EGM 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at ISFSIs," revision 1, and because the licensee was implementing compensatory measures as described in the EGM and had taken the necessary actions to restore compliance, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued ISFSI handling operations. (Section 4.2.g)

The inspectors identified a Severity Level IV, non-cited violation of 10 CFR 71.107(a), for the licensee's failure to ensure applicable regulatory requirements and the package design as specified in the license were correctly translated into procedures. As a result, the licensee, initially, failed to weld the GTCC canister in accordance with the design drawings. The inspectors determined the finding was of very low safety significance since the licensee took immediate actions to repair the weld to license requirements and the licensee conducted a detailed engineering evaluation that demonstrated the weld in question met design basis stress limits and strength requirements even if the weld had not been repaired. (Section 4.2.h)

Report Details

Summary of Plant Status

On June 12, 2013, the Southern California Edison (SCE) Company, the licensee, formally notified the U.S. Nuclear Regulatory Commission (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). 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 the Units 3 and 2 reactor vessels as of October 5, 2012, and July 18, 2013, respectively. 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 outlines the planned decommissioning activities. The current version of the PSDAR is dated May 7, 2020 (ML20136A339). 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 Energy Solutions as the decommissioning general contractor. The joint venture between the two companies was called SONGS Decommissioning Solutions (SDS). The SDS organization manages most decommissioning activities as described in the PSDAR.

By letter dated August 7, 2020 (ML20227A044), the licensee certified that all spent fuel was removed from both Units 2 and 3. Accordingly, SONGS entered their Independent Spent Fuel Storage Installation (ISFSI) Only Technical Specifications, Emergency Plan, and Security Plan on August 10, 2020. After removal of all spent fuel from the two units, SDS started decommissioning work within the two containment buildings and spent fuel pool (SFP) rooms.

The SONGS ISFSI consists of two ISFSI designs located adjacent to each other: the Orano Transnuclear (TN) Nutech Horizontal Modular Storage (NUHOMS) system and the Holtec International Storage Module Underground Maximum Capacity (HI-STORM UMAX) system. The TN ISFSI contains a total of 63 advanced horizontal storage modules (AHSMs) on the NUHOMS ISFSI pad. Spent fuel from all three reactors are stored in 50 of the AHSMs, each containing twenty-four fuel assemblies. Greater-Than-Class-C (GTCC) waste from the Unit 1 reactor decommissioning project and two canisters of GTCC waste from the Unit 2 and 3 spent fuel pools were already in storage at the NUHOMS ISFSI. The ten empty AHSMs will be available for storage of additional GTCC waste from decommissioning the Units 2 and 3 reactors.

The HI-STORM UMAX ISFSI portion was designed to hold 75 Holtec multi-purpose canisters (MPCs). The Holtec MPC-37 canister design can hold 37 pressurized water reactor fuel assemblies. The total number of canisters with spent fuel at the UMAX ISFSI is 73. One Cavity Enclosure Container (CEC) will be left empty and one CEC contains a test canister with heating elements that will be used for aging management studies.

During the inspection week, the activities in progress included continued segmentation of the reactor vessel internals inside the two containments and the processing of one GTCC canister inside Unit 3 to support transportation to the ISFSI. The decommissioning contractor was in final preparations to remove two additional GTCC radioactive waste containers from Unit 2 and 3 containment pools, removing mirror insulation from the steam generators, and removing the final fuel rack from the Unit 2 SFP. Demolishing the Unit 3 turbine building continued and further radiological surveys in the Units 2 and 3 intake structures for future release was in progress. Finally, the contractor was conducting initial flowable fill preparations for previously surveyed portions of the intake structure.

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

1.1 Inspection Scope

The objectives of this portion of the inspection were to: (1) evaluate the status of decommissioning and verify whether the licensee was conducting decommissioning and maintenance activities in accordance with regulatory and license requirements; (2) evaluate the licensee awareness of work activities to assess their control and conduct of decommissioning; and (3) evaluate 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.

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 begins with the completion of fuel transfer operations and extends through the end of the decommissioning and decontamination work. At the time of the inspection, the licensee and its decommissioning general contractor SDS, were conducting decommissioning activities in accordance with the general guidance provided in Section II.B.1 of the PSDAR. The inspectors discussed the current schedule with decommissioning management staff, reviewed applicable procedures, validated select training records for the reactor vessel internal segmentation workers, and conducted site tours to observe, in part, work in progress.

At the time of the inspection, there were two reactor vessel internals volume reduction stations in service in each of the two units. In Unit 2, the contractor was actively cutting the upper guide structure fuel alignment plate at one station and the core shroud core plate at the other station. In Unit 3, the contractor was cutting the upper guide structure core plate at one station and the core support barrel D-ring at the other station. The inspectors specifically reviewed the approved work packages for reactor vessel internal segmentation, attended a pre-job brief, and interviewed the staff who were conducting the work. The inspectors concluded that the contractors were conducting the work in accordance with approved procedures with a focus on personal safety.

The inspectors toured the Unit 2 and Unit 3 containments and observed general work in progress while evaluating the material condition inside the containment buildings. The work in progress was largely focused on the final preparations involving the GTCC liners in shielded containers and removing items from the containments to be shipped off as radioactive waste. Housekeeping was adequate in both containments, and the

radiological controls were consistent with regulatory requirements in the areas observed by the inspectors.

Section II.B.3 of the PSDAR provides a description of the planned decommissioning and dismantlement activities. Material with contamination below the applicable radiological limits may be released for unrestricted disposition including recycling, while radioactive contaminated material will be packaged and shipped to a low-level waste disposal facility. The Unit 2 turbine building has been essentially demolished and what remains is a pile of fist sized rubble that is being shipped away in rail cars as very low-level radioactive waste. The work in progress during the inspection included continued demolition of the Unit 3 turbine building with significant progress having been made since the previous inspection. The contractor was noted as separating the metal from the concrete debris for recycling and paying specific attention to the application of dust mitigating equipment. The inspectors also noted that the decommissioning work was being conducted with an emphasis on personnel safety.

The inspectors reviewed the Defueled Safety Analysis Report (DSAR) revision 8 updated November 14, 2022, in part, for updates as required by 10 CFR Part 50.71. The portions reviewed by the inspectors were current and in compliance.

The inspectors conducted independent radiological surveys during plant tours using a Radeye G gamma survey meter (serial number 30932, calibrated to cesium-137 with a calibration due date of November 9, 2023). The inspectors validated, in part, that the licensee had properly posted the radiological areas that were toured. No high radiation area was identified that was not already posted and controlled. No radiation areas were identified outside of the radiologically restricted and posted areas.

1.3 Conclusion

The licensee and its decommissioning contractor were conducting decommissioning activities in accordance with the instructions provided in the PSDAR and site procedures. Radiological controls and related postings were being maintained.

2 Problem Identification and Resolution at Permanently Shutdown Reactors (IP 40801)

2.1 Inspection Scope

The objectives of this portion of the inspection were to: (1) evaluate the effectiveness of licensee controls in identifying, resolving, and correcting issues in accordance with the quality assurance (QA) program and 10 CFR 50, Appendix B requirements; (2) determine whether audits and assessments were conducted in accordance with the QA program and regulatory requirements; and (3) confirm that the licensee had established, implemented, and performed management reviews of the safety-conscious work environment.

2.2 Observations and Findings

a. Corrective Action Programs

Corrective action programs are required by 10 CFR Part 50, Appendix B, Criterion VXI and Sections 16 of the licensee's Decommissioning Quality Assurance Program (DQAP), revision 9, and SDS's Quality Assurance Program (QAP), Procedure SDS-QA1-PGM-0001, revision 5. In accordance with the two QA plans, significant conditions adverse to quality shall require a cause determination, corrective actions will be implemented to prevent recurrence, and the conditions and associated corrective actions taken will be documented and reported to appropriate levels of management. In addition, reports of conditions adverse to quality are analyzed to identify negative performance trends.

The inspectors reviewed select portions of licensee's corrective action program in procedure ADM-5, "Corrective Action Program," revision 3. Details of the contractor's program were provided in procedure SDS-RA1-PGM-0002, "Corrective Action Program," revision 7. The inspectors attended both the SCE Corrective Action Program (CAP) plant screening committee meeting and the SDS CAP management review committee. Both meetings were conducted to review problems that had been identified and review root causes and corrective action with a focus on preventing reoccurrence. Additionally, the inspectors interviewed both CAP program managers about program trends, challenges faced, management engagement, and future for improvement and development items or plans. A review of selected paperwork showed, since the last inspection, there have been no apparent cause evaluations, root cause evaluations, or significant conditions adverse to quality.

b. Quality Assurance Audit Programs

Quality assurance audits are required by 10 CFR Part 50, Appendix B, Criterion XVIII. The instructions for the audits were provided in Sections 18 of the licensee's DQAP and the SDS QAP. Details of the programs were provided in the licensee's procedure NOD-2, "Audit and Assessment Program," revision 5, and the contractor's procedure SDS-QA1-PCD-0011, "Audit and Surveillance," revision 8.

The inspectors interviewed the SDS and SCE Quality Assurance managers as well as reviewed select documents that demonstrated compliance with 10 CFR Part 50, Appendix B, Criterion XVIII. Both the licensee and its decommissioning contractor maintained a regularly scheduled audit and surveillance program. In the areas reviewed by the inspectors, the licensee regularly questioned and investigated the findings identified by the contractor. Both programs had established regular third-party audits of their programs.

c. Safety Conscious Work Environment

The NRC's Regulatory Issue Summary 2005-18 provides the guidance for establishing and maintaining a safety-conscious work environment. In support of positive nuclear safety cultures, both the licensee and SDS had an established employee concern program. The licensee's program was described in procedure ADM-2, "Decommissioning Employee Concerns Program," revision 2, and SDS's program was described in procedure SDS-RA1-PGM-0004, "Employee Concerns," revision 2.

The inspectors conducted separate interviews of the Employee Concern Program (ECP) managers for both the licensee and the decommissioning contractor. Both ECP managers indicated they were engaged with the work force with regular as well as meaningful interaction with management. Additionally, the inspectors had discussions with random employees to further assess the culture and environment.

No findings of significance were noted.

2.3 Conclusion

The licensee and its decommissioning general contractor had established and implemented comprehensive corrective action programs to identify, resolve, and prevent conditions adverse to quality. The licensee and its contractor implemented QA audit programs in accordance with regulatory and procedural requirements. The licensee and its contractor established and implemented employee concerns programs in accordance with site procedures.

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

3.1 Inspection Scope

The objective for this portion of the inspection was to verify the licensee's safety review process was implemented in accordance with the requirements of 10 CFR 50.59, "Changes, tests, and experiments."

3.2 Observations and Findings

The inspectors reviewed select 10 CFR 50.59 applicability determinations and screens, performed by SDS and SCE in support of changes (modifications) to the facility. The inspectors evaluated, in part, whether any facility design changes, tests, experiments or modifications were being effectively conducted, managed, and controlled. The inspectors also verified, in part, that no decommissioning activities involved any changes to technical specifications or the PSDAR. As part of this evaluation the inspectors also investigated if the licensee was implementing an effective training program for any personnel involved in 10 CFR 50.59 screening and evaluations. Specifically, the inspectors reviewed seven select documents including applicability determinations, screens, and evaluations. The documents were found to be effectively written and were screened or evaluated appropriately.

The inspectors reviewed SCE procedure ENG-3, "10 CFR 50.59, 72.48, and 50.82 Program," revision 1 and SDS procedure SDS-RA1-PGM-002, "10 CFR 50.59 and 72.48 Program," revision 3. The inspectors determined both SCE and SDS procedures used guidance from NEI 96-07, "Guidelines for 10 CFR 50.59 Implementation," revision 1, to perform reviews on systems, structures, and components to determine whether any changes, tests, or experiments may be performed without obtaining prior NRC approval. 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 procedures and regulatory

requirements and provided adequate explanation as to why an evaluation was not necessary.

3.3 Conclusion

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

4 Operation of an Independent Spent Fuel Storage Installation (IP 60855)

4.1 Inspection Scope

The inspectors performed a review of the licensee's ISFSI and GTCC waste activities to verify, in part, compliance with requirements of the Certificate of Compliance (CoC) 71-9302, "NUHOMS – MP197HB Transportation Package," revision 11, and associated Transportation Package Safety Analysis Report (TPSAR), revision 21, CoC 72-1029, "TN Advanced NUHOMS Storage System," amendment 4, Final Safety Analysis Report (FSAR), revision 11, and CoC 72-1040, "Holtec HI-STORM UMAX Storage System," amendment 2, UMAX FSAR revision 4, and Flood Wind FSAR revision 5. The inspectors reviewed selected procedures, corrective action reports, and records to verify ISFSI and GTCC waste operations were compliant with each Certificate's technical specifications, requirements in the TPSAR/FSARs, and NRC regulations.

4.2 Observations and Findings

a. Quality Assurance Surveillances and Audits

Since the last ISFSI inspection, the San Onofre QAP issued three 2021 audit reports and one 2022 audit report that related to ISFSI activities. Inspectors also reviewed a sample of surveillances performed by the licensee from August 2020 through February 2023. The licensee's audit and surveillance program encompassed many topical areas and provided in-depth reviews of the licensee's ISFSI programs, operations, training, and record keeping. The audits covered ISFSI documentation and activities related to ISFSI technical specifications, FSAR requirements, implementation of ISFSI programs, training and qualifications, design control, emergency preparedness, and other ISFSI-related areas.

All identified findings or enhancements were placed into the licensee's CAP as Action Requests (ARs). Each AR required a formal response from the impacted program department. The inspectors reviewed the problem statements for each AR that resulted from the four ISFSI audits and sampled surveillances. The ARs were evaluated to ensure that the problems being identified were properly categorized based on their safety significance and were properly resolved by the licensee. The inspectors determined that the corrective actions identified or taken for the issues were appropriate for the significance of the problems being identified. The inspectors did not identify any concerns related to the findings of the site's quality assurance auditing and surveillance program. The audits and surveillances performed met the requirements of 10 CFR Part 72, Subpart G, and the licensee's quality assurance program requirements.

b. Radiological Conditions and Tour of the ISFSI

A tour of the ISFSI was performed during the inspection. A recent radiological survey of the ISFSI was provided to the inspectors prior to arrival at the facility. Licensee ISFSI engineers accompanied the inspectors during the facility tour. During the tour, the inspectors determined that the concrete Advanced Horizontal Storage Modules (AHSMs), AHSM lids, and Underground Maximum Capacity (UMAX) system components were in good physical condition. No flammable or combustible materials were observed anywhere inside or near the ISFSI and all vegetative growth within the ISFSI fence had been controlled by the licensee. Radiation levels surveyed by the inspectors near the edges of the ISFSI remained at background levels. Areas within the ISFSI pad that required postings were properly posted in accordance with 10 CFR Part 20 requirements.

Areas external to the ISFSI pad were also inspected. The site's transfer casks were either stored properly or in use for GTCC operations. Other components used to support cask GTCC transfer operations were verified to be stored properly as well. The equipment was observed to be in good physical condition with no significant observable degradation.

c. Radiological Environmental Monitoring Reports

The ISFSI Annual Radiological Environmental Monitoring Reports were reviewed for 2021 and 2022. The site's environmental monitoring program measured the direct radiation impacts of plant operations at 15 thermoluminescence dosimetry (TLD) monitoring stations which surrounded the ISFSI. Three locations were near the ISFSI's Horizontal Storage Modules (HSMs) and were located along the Security Area Fence. Five locations were near the HSMs or UMAX ISFSI but were within the site's owner-controlled area. Four were along the boundary of the site's owner-controlled area between the side and the ocean. Additionally, the licensee had three control locations which monitored background levels.

The ISFSI 100-meter security boundary fence locations are the ones used to demonstrate compliance with the 10 CFR 72.104 requirements for radiation dose. For the 2-year period reviewed by the inspectors, the dose measurements at TLD locations along the 100-meter security boundary fence were equivalent to background levels. The dose results demonstrated the maximum dose to an individual of the public was well below the 10 CFR 72.104(a)(2) requirement of less than 25 mrem per year. No findings of significance were identified related to the radiological review.

d. 10 CFR 72.212 Report

The changes to each of the licensee's 10 CFR 72.212 reports (TN system and Holtec system), since the last ISFSI inspection, were reviewed, in part, to verify continued compliance with NRC regulations, 10 CF 72.48 and 10 CFR 72.212. The licensee had made several changes to each of the 10 CFR 72.212 reports. The current version of the TN NUHOMS Storage System 10 CFR 72.212 report was revision 11 and the current Holtec UMAX Storage System 10 CFR 72.212 report was revision 2.

The changes for the TN 72.212 report included modifying the controlled area boundary, adopting the CoC 72-1029 amendment 4, changes related to GTCC waste processing, adoption of the renewed CoC 72-1029, and changes of the AHSMS to accept GTCC

canisters at the ISFSI pad. The Holtec UMAX 72.212 report changes included modification of the controlled area boundary, operational changes to allow for inspections of the canisters, and updates to evaluations related to site-specific hazards. The inspectors determined that all changes reviewed by the inspectors met NRC requirements specified in 10 CFR 72.48 and 10 CFR 72.212.

e. Corrective Action Program

The inspectors performed a review of the licensee CAP associated with ISFSI operations. A list of ISFSI-related ARs issued since the last routine NRC inspection in August 2020 was provided by the licensee during the current inspection. Select ARs were identified by the inspectors for further review.

The conditions discussed in the ARs reviewed by the inspectors covered a broad range of paperwork and maintenance issues that were identified during routine ISFSI storage operations. Based on the types of problems identified, the licensee continued to demonstrate a reasonably low threshold for placing ISFSI and maintenance issues into the CAP. The actions taken to resolve the issues were appropriate. No significant safety concerns or adverse trends were identified during the triannual review of the CAP.

f. Emergency Planning

The current licensee's ISFSI-only Emergency Plan IOEP-1, "ISFSI only Emergency Plan," revision 2, required emergency drills/exercises were listed in Section 14.0 of the plan. Required annual drills included radiological/health physics drills, medical drills, and fire drills. Biennial exercises were larger drills that tested the adequacy of the implementing procedures, emergency equipment, and communications networks and ensured the emergency response personnel were familiar with their duties. Offsite response organizations were invited to participate in the biennial exercises. The licensee had successfully conducted the required exercises and drills since the last ISFSI inspection. A sample of drill packages and the most recent biennial exercise were selected for review. The inspectors determined that the selected drills and exercises met the objectives of the Emergency Response Plan. No concerns were identified with the licensee's implementation of their Emergency Response Plan.

g. 10 CFR 72.48 and 10 CFR 50.59 Safety Evaluations and Screens

The licensee's 10 CFR 72.48 and 10 CFR 50.59 screenings and evaluations performed since the NRC's last ISFSI inspection were reviewed to determine compliance with regulatory requirements.

The licensee had performed many changes to support the ISFSI operations at SONGS. These changes ranged from GTCC waste operational changes, including new GTCC waste canisters, construction changes at the TN ISFSI, and changes in programs such as training, procedures, processing operations, and aging management activities.

The licensee had performed evaluation "10 CFR 50.59 #1220-81519-2," dated March 2, 2022, with the underlying purpose to evaluate the GTCC operations being performed under the Part 50 license. The review included calculations to ensure that there was reasonable assurance that adequate protective measures can and will be taken in the event of any possible radiological emergency. The calculations reviewed all GTCC

processing operations to ensure any postulated accident with radiological consequence would not exceed the limits of the Environmental Protection Agency Protective Action Guides at the exclusion area boundary nor exceed radiological hazard requirements under NRC regulations 10 CFR 50.67, 10 CFR 100, and 10 CFR 72.106 and therefore would not require a change to the approved licensing basis.

Evaluation 10 CFR 50.59 #1220-81519-2 stated:

The OS197 transfer cask provides radiological shielding and physical protection from potential hazards for the GTCC canister during closure operations and transfer from the reactor cavity to the AHSM, consistent with its original design as a transfer cask for spent fuel as described in the CoC 72-1029 FSAR and licensed under CoC 72-1004..... All dose consequence is well below the criteria of 10 CFR 50.67 and 10 CFR 100 exposure guidelines and in compliance with 10 CFR 72.106 limit of 5 rem for direct radiation.

Upon issuance of NRC Enforcement Guidance Memorandum (EGM) 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at ISFSIs," revision 1, dated March 3, 2023 (ML22087A496), the licensee performed an assessment of all outdoor GTCC waste transfer activities to determine if all operational activities were explicitly analyzed for tornado hazards in the TN system's FSAR. The licensee identified some short-term transportation operations that were not analyzed for physical protection from potential tornado-generated missiles and winds. These short-term duration transportation operations when tornado-generated missiles and winds were not analyzed included (1) an open AHSM interior, when the door is removed to allow insertion of a canister, (2) the short time the OS197 transfer cask lid was removed to facilitate inserting the GTCC canister into the AHSM, and (3) the short time to place the AHSM door on the AHSM after the insertion of the canister was completed.

Prior to performing the first GTCC transfer operations from the Unit 2 or Unit 3 containment buildings, the licensee followed the guidance actions as described in the EGM. The issue was entered into the CAP (AR 0422-39288) and the licensee established additional measures to mitigate tornado hazards, through procedures, during periods of GTCC handling operations. These actions included, restricting outdoor dry transfer activities during periods of adverse weather, establishing meteorological criteria, designating staff to monitor weather during GTCC handling operations, describing actions to take in the event of severe weather necessary to place the GTCC canister in an analyzed condition, minimizing the duration of ISFSI handling operations during which GTCC important to safety structures, systems, and components (SSCs) are in an unanalyzed condition, documentation that required weather checks are complete prior to the start of GTCC handling operations, and documenting in the CAP that the CoC holder either request an amendment within six months of the date of the EGM or implement physical design modifications and/or perform evaluations that demonstrate important to safety SSCs are designed to withstand the effects of natural phenomena, including tornadoes and tornado-generated missiles prior to the expiration date of the EGM (April 15, 2024).

10 CFR 50.59(d)(1) states: The licensee shall maintain records of changes in the facility pursuant to 50.59(c). These records must include a written evaluation which provide the bases for the determination that the change does not require a license amendment pursuant to 50.59(c)(2).

Contrary to the above, on March 2, 2022, the licensee failed to perform an adequate 50.59 written evaluation which provided the bases for the determination that the change did not require a license amendment pursuant to 50.59(c)(2). Specifically, the licensee failed to provide a written evaluation which provided the bases for the determination that the unanalyzed short-term duration transportation operations (discussed above) were either protected from potential tornado-generated missiles/winds or the potential postulated tornado accident results would have met the dose consequence requirements specified in 10 CFR 50.67, 10 CFR 100, and 10 CFR 72.106, and did not require a license amendment pursuant to 50.59(c)(2).

This violation was dispositioned in accordance with the traditional enforcement process using Section 2.3 of the NRC's Enforcement Policy. This issue was determined by inspectors to be of more than minor safety significance, since if left uncorrected, the deficiency could lead to a more significant safety concern. Consistent with the guidance in Section 1.2.6.D of the NRC Enforcement Manual, if a violation does not fit an example in the Enforcement Policy Violation Examples, it should be assigned a severity level: (1) commensurate with its safety significance; and (2) informed by similar violations addressed in the Violation Examples. The violation was evaluated to be similar to a Severity Level IV violation in Enforcement Policy Section 6.1.d.2.

The NRC is exercising enforcement discretion for this violation in accordance with Section 3.0 of the Enforcement Policy. In general, the NRC has extensive history analyzing severe weather events including tornado hazard scenarios using probabilistic methods (or risk assessments) in licensing on a case-by-case basis to assess specific plant features to prevent a release of radioactivity exceeding regulatory limits. For ISFSIs, such methods can be employed, supported by analysis, to demonstrate that tornado hazards will not impair the capability of SSCs important to safety to perform their intended design functions.

The Office of Nuclear Reactor Regulation (NRR) completed a generic risk analysis of potential tornado missile protection non-compliances to examine the risk significance of tornado hazard scenarios (ML14114A556). In this case, the generic bounding risk analysis performed by NRR concluded that a tornado missile scenario is of low-risk significance at power reactor sites, due in part to the low probability of wind speeds exceeding 75 miles per hour (less than 4×10^{-4} per year). This generic analysis did not specifically address ISFSI handling operations but there are several key insights in the analysis that may apply to a risk assessment for this issue. Specifically, rather than evaluate site-specific configurations, the NRR generic analysis used bounding assumptions regarding tornado and high winds initiating event frequencies (IEFs) coupled with bounding assumptions for missile strike area to develop conservative estimates of core-damage frequency. This generic analysis assumes that plants are in a condition vulnerable to a tornado for a full reactor-year worth of exposure time.

For ISFSI/GTCC handling operations, the vulnerable configuration would be typically limited to a few weeks of exposure time per year which would result in additional conservatism to the results documented in the NRR generic analysis. Furthermore, ISFSI handling operations that may lead to loss of confinement of radioactive material due to a missile strike or high winds should be bounded by the assumptions regarding tornado and high winds IEFs. Appropriate administrative controls including compensatory measures would provide defense-in-depth and further reduce the

likelihood of occurrence and mitigate loss of confinement events. This defense-in-depth approach should include provisions to (1) preclude ISFSI handling operations during periods of adverse weather or when adverse weather is predicted, and (2) provide compensatory measures to place important to safety SSCs in an analyzed condition or provide physical protection as necessary to maintain confinement of radioactive material during ISFSI handling operations.

In summary, the combination of the low probability of tornado events in conjunction with formally documented administrative controls that (1) restrict initiation of ISFSI/GTCC handling operations during projected periods of adverse weather and (2) cease ISFSI/GTCC handling operations and place important to safety SSCs in a protected configuration or analyzed condition at the outset of adverse weather conditions, form the basis for the exercise of enforcement discretion for ISFSI/GTCC handling operations. As a further condition of this enforcement discretion, licensees will conduct a site-specific assessment to determine the appropriate corrective actions to ensure that important to safety SSCs will not be adversely impacted by tornado hazards. As such, the exercise of enforcement discretion limited to the conditions of this EGM will not impose significant additional risk to public health and safety.

Since this violation was identified during the discretion period covered by EGM 22-001, revision 1, and because the licensee was implementing compensatory measures and has taken the necessary actions to restore compliance, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued ISFSI handling operations (EDG EA 23-054, Tornado Hazards Protection at ISFSIs (EGM 22-001)).

The inspectors reviewed the licensee's 10 CFR 72.48 screenings and evaluations for those changes made within the ISFSI program. All screenings and evaluations were determined to be adequately performed.

h. GTCC Processing

The inspectors evaluated the licensee's NUHOMS GTCC cask loading operations from March 20 – 23, 2023. Specifically, the inspectors observed the following activities regarding GTCC canister 1 of 10 from Units 2 and 3 containment structures:

- Canister welding
- Canister non-destructive exams (NDE)
- Canister bulk dewatering
- Canister drying
- Transfer cask radiation surveys

During observation of the above activities inspectors identified a Severity Level IV, non-cited violation of 10 CFR 71.107(a), for the licensee's failure to ensure applicable regulatory requirements and the package design as specified in the license were correctly translated into procedures.

On March 21, 2023, the inspectors were observing SONGS's loading and processing operations associated with the GTCC waste from the Unit 3 containment building. During the GTCC canister's dewatering activities, inspectors conducted visual inspections of the

shell to inner top cover plate weld and identified an area that appeared to be less than flush. Inspectors reviewed procedure SPM 09.12, "RWC-WA Closure Procedure," revision 3, and identified step 5.6 directed personnel to ensure that this weld was "flush or near flush" to meet the required minimum effective throat depth. The inspectors noted, the procedural step had no quantitative or qualitative value associated with the term "near flush" except in the definition given in step 2.4 describing the weld as even or just slightly below the surface of the adjacent base metal. Inspectors referenced CoC 71-9302, "NUHOMS – MP197HB Transportation Package," revision 11, "NUHOMS - MP197 TPSAR," revision 21, section A.1.4.10.11, drawing number RWC-WA-71-1001, "RWC-WA Main Assembly," revision 0, to obtain information regarding the weld in question. The required size for the shell to inner top cover plate groove weld was noted in the drawing as 0.250" and note # 4 of the same drawing stated all weld sizes are minimum. Both the shell and inner top cover plate are Important to Safety (ITS) Category B components, making the corresponding weld, ITS, as well.

Upon reviewing the procedure, the weld was initialed completed on step 5.6 of the procedure and NDE examination was conducted with no discrepancies noted. Inspectors brought these concerns to the attention of the licensee. After reviewing the specific geometry of the weld preparation area, the licensee performed depth measurements of the weld in question. The licensee's depth measurements identified a nonconforming sub-flush area of 0.012" below the required 0.250" throat depth requirement for a length of 0.750".

10 CFR 71.107(a) "Package Design Control," states, in part, the licensee shall establish measures to ensure the applicable regulatory requirements and the package design, as specified in the licensee or CoC, are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, on March 21, 2023, the licensee failed to establish measures to ensure the applicable regulatory requirements and the package design, as specified in the licensee or CoC were correctly translated into procedures. Specifically, the licensee failed to ensure procedure steps for the shell to inner top cover plate weld met the 0.250" minimum throat depth as specified in the TPSAR drawing.

Even though these welding activities were being performed by TN Services, the licensee is directly responsible for these activities under 10 CFR 71.115 to ensure services met procurement documents.

The licensee's failure to ensure applicable regulatory requirements and the design basis were correctly translated into procedures, as required by 10 CFR 71.107(a), was determined to be a Severity Level IV violation of NRC requirements. The inspectors determined the finding was of very low safety significance since the licensee took immediate actions to repair the sub-flush area prior to continuing the GTCC canister processing operations. The licensee performed engineering evaluation SO23-207-50-C0154, "SONGS RWC-WA Shell Evaluation for Non-Conforming ITCP Weld," revision 1, to demonstrate the structural adequacy of weld, assuming the weld was left uncorrected or not repaired. The evaluation reduced the weld to 0.238" in depth all the way around the canister, instead of just a small $\frac{3}{4}$ " area noted by the inspectors. The evaluation concluded that the smaller weld for the entire circumference would still have contained sufficient weld depth and strength to meet all design basis stress requirements and limits.

Even though the licensee's evaluation demonstrated the non-conformant condition would meet all design basis limits, when un-repaired, the issue was still determined to be of more than minor significance, since this issue would have affected the NRC's regulatory process and had this weld issue not been repaired to meet the original TPSAR drawing, the licensee would have been required to submit that evaluation to the NRC for review under a Part 71 license amendment or an exemption request.

This violation was dispositioned per the traditional enforcement process using Section 2.3 of the NRC's Enforcement Policy. Consistent with guidance in the NRC Enforcement Manual, Part 1, Section 1.2.6.D, if a violation does not fit an example in the Enforcement Policy violation examples, it should be assigned a severity level: (1) commensurate with its safety significance; and (2) informed by similar violation addressed in the violation examples. The violation was evaluated as Severity Level IV because it is similar to Enforcement Policy Section 6.5.d.2 and NRC Inspection Manual Chapter 0617, Vendor and Quality Assurance Implementation Inspection Reports, Appendix E.8.2(a).

The licensee created a Non-Conformance Report (NCR), TN NCR 2023-018, to document this event. The licensee restored compliance by performing a weld repair on the affected area as well as revising the procedure to ensure the minimum throat depth would be met for the remaining canisters to be loaded. Because the licensee placed this issue into their CAP (AR 0323-12883), the safety significance of the issue was very low, and the issue was not repetitive or willful, this Severity Level IV violation was treated as a non-cited violation (NCV), consistent with Section 2.3.2.a of the Enforcement Policy (NCV 0500362/2023-002-01, Failure to have design bases correctly translated into procedures).

4.3 Conclusion

The inspectors reviewed the quality assurance audits and surveillances performed by the licensee since the last ISFSI inspection. Issues identified in the quality assurance audits and surveillances were entered into the CAP for resolution. No findings were identified related to the licensee's ISFSI quality assurance activities.

Radiation levels around the ISFSI facility were within the expected ranges. The ISFSI facility was maintained in good physical condition. No flammable materials were stored in the ISFSI, all vegetative growth had been controlled, and radiation postings met the 10 CFR Part 20 requirements. At the time of the inspection, there were no observable signs of degradation.

Environmental data reviewed from the 2021 and 2022 site radiological environmental operating reports determined that radiation levels offsite were nominal and in accordance with the design basis and 10 CFR 72.104.

Since the last NRC ISFSI inspection, the licensee revised the site's two 10 CFR 72.212 reports. The inspectors determined that all changes met NRC requirements specified in 10 CFR 72.48 and 10 CFR 72.212. No issues were identified in the review of the changes associated with the 72.212 reports.

Selected condition reports were reviewed for the period of August 2020 through February 2023. A wide range of issues were identified and resolved by the licensee. The

issues reviewed did not have a significant impact on safety and resolution of those issues were appropriate. No adverse trends were identified during the review.

The ISFSI-only Emergency Response Plan was being maintained. Drills, exercises, and training were performed in accordance with requirements in the plan. Offsite support agencies were offered an opportunity to participate in the licensee's latest biennial exercise.

The inspectors reviewed a sample of 10 CFR 50.59 and 10 CFR 72.48 screenings and evaluations that had been performed within the inspection period. The inspectors identified a Severity Level IV violation of 10 CFR 50.59(d)(1), for the licensee failure to provide a written evaluation which provided the bases that GTCC canisters were adequately protected during short duration transportation operations from potential tornado-generated missiles and wind. Since this violation was identified during the discretion period covered by EGM 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at ISFSIs," and because the licensee was implementing compensatory measures as described in the EGM and had taken the necessary actions to restore compliance, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued ISFSI handling operations.

The inspectors identified a Severity Level IV, NCV of 10 CFR 71.107(a), for the licensee's failure to ensure applicable regulatory requirements and the package design as specified in the license were correctly translated into procedures. As a result, the licensee failed to initially weld the GTCC canister in accordance with the design drawings. The inspectors determined the finding was of very low safety significance since the licensee took immediate actions to repair the weld to license requirements and the licensee conducted a detailed engineering evaluation that demonstrated the weld in question met design basis stress limits and strength requirements even if the weld had not been repaired.

5 Exit Meeting Summary

On April 20, 2023, the inspectors presented the final inspection results to Mr. Doug Bauder, the 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 except for certain Holtec, TN, and SDS procedures and documents which were marked as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee and Contractor Personnel

A. Bates, SCE, Regulatory Affairs Manager
C. Boschetti, SDS, Quality Manager
J. Carey, SCE, Corrective Action Program Manager
R. Granaas, SCE, Fuels/ISFSI Engineer
H. Joyce, SDS, CAP Manager
R. Kalman, SDS, Executive Sponsor
J. Madigan, SCE, Nuclear Oversight and Safety Culture Manager
S. Mannon, SDS, Regulatory Affairs Manager
M. Morgan, SCE, Licensing Engineer
M. Orewyler, SCE, Senior ISFSI Manager
L. Rafner, SCE, Regulatory Affairs
J. Stephenson, SCE, ISFSI Engineer

INSPECTION PROCEDURES USED

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors

IP 40801 Problem Identification and Resolution at Permanently Shutdown Reactors

IP 37801 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors

IP 60855 Operation of An Independent Spent Fuel Storage Installation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

EA 23-043	EDG	Tornado Hazards Protection at ISFSIs (EGM 22-001)
05000362/2023-002-01	NCV	Failure to have design bases correctly translated into Procedures

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AHSM	Advanced Horizontal Storage Modules
AR	Action Request
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CoC	Certification of Compliance
GTCC	Greater-Than-Class C
DSAR	Defueled Safety Analysis Report
DQAP	Decommissioning Quality Assurance Program
EA	Enforcement Action
ECP	Employee Concern Program
EDG	Enforcement Discretion Guidance
EGM	Enforcement Guidance Memorandum
FSAR	Final Safety Analysis Report
HSM	Horizontal Storage Module
IEF	Initiating Event Frequencies
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
ITS	Important to Safety
mrem	milliRoentgen equivalent man
NCR	Non-Conformance Report
NCV	non-cited Violation
NDE	non-destructive Exams
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NUHOMS	Nutech Horizontal Modular Storage System
PSDAR	Post Shutdown Decommissioning Activities Report
QA	quality assurance
QAP	Quality Assurance Program
SCE	Southern California Edison Company
SDS	SONGS Decommissioning Solutions
SFP	spent fuel pool
SLIV	Severity Level IV
SONGS	San Onofre Nuclear Generating Station
SSC	systems structures & components
TLD	thermoluminescence dosimetry
TN	Transnuclear
TPSAR	Transportation Package Safety Analysis Report
UMAX	Underground Maximum Capacity