

NUCLEAR REGULATORY COMMISSION

Docket No. 50-205, 50-361, and 50-362

Southern California Edison

San Onofre Nuclear Generating Station, Unit 1, 2, and 3

**Exemption from a Specific 10 CFR 72.106(b) Independent Spent Fuel Storage Installation
Requirement**

I. Background.

San Onofre Nuclear Generating Station (SONGS), Units 1, 2, and 3, are licensed to Southern California Edison (SCE)¹ under part 50, “Domestic Licensing of Production and Utilization Facilities,” of title 10 of the *Code of Federal Regulations* (10 CFR) (U.S. Nuclear Regulatory Commission (NRC) license nos. DPR-13, NPF-10, and NPF-15, respectively, and docket nos. 50-206, 50-361, and 50-362, respectively). SONGS Units 1, 2, and 3 are decommissioning nuclear power reactor units located 4 miles southeast of San Clemente, California, in San Diego County, California, approximately 62 miles southeast of Los Angeles, and approximately 51 miles northwest of San Diego, on an 84-acre site located entirely within the Camp Pendleton Marine Corps Base.

II. Request/Action.

On December 16, 2021 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. [ML21355A245](#)), SCE submitted a request, as supplemented on February 28, 2022 ([ML22062B028](#)), and September 29, 2022 ([ML22277A016](#)), for an exemption from a requirement of paragraph (b) of Section 72.106, “Controlled area of an

¹ SONGS is jointly owned by SCE (78.21 percent), San Diego Gas & Electric (20 percent), and the city of Riverside (1.79 percent). SCE is authorized to act as agent for the other co-owners and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

[independent spent fuel storage installation] ISFSI or [monitored retrievable storage installation] MRS,” for the SONGS ISFSI. In the request, SCE states that it wishes to establish the ISFSI Controlled Area Boundary (CAB) at or within the site boundary, which coincides with physical boundaries that in some places are less than the 100 meters from the ISFSI required by 10 CFR 72.106(b). Specifically, SCE indicated that the areas that would be less than 100 meters from the ISFSI would be the North Industrial Area seawall to the west of the ISFSI and the Owner Controlled Area fence line to the east of the ISFSI.

SCE is requesting the exemption in response to a lease condition granted by the California State Lands Commission (CSLC) in 2019 in relation to the land upon which the ISFSI is situated. Specifically, Lease Condition 32 states:

At the conclusion of the transfer of the SONGS spent nuclear fuel to the Approved Independent Spent Fuel Storage Installation (Approved ISFSI), the Lessee shall seek approval from the NRC to decrease the size of the Exclusion Area Boundary (EAB) to the minimum required by law. Lessee and Lessor shall jointly consult with the California Coastal Commission (CCC) to ensure that such an approval, if granted, will not interfere with the Lessee’s compliance with the CCC permit conditions.

To meet the lease condition, SCE would pursue the disestablishment of the EAB in accordance with 10 CFR 50.59, “Changes, tests, and experiments,” which allows reactor licensees to make certain changes without prior NRC approval. Since SONGS has permanently ceased reactor operations in Unit 2 and 3, an EAB is no longer required to be maintained. If this change meets the requirements of 10 CFR 50.59, SCE would reflect removal of the EAB in the SONGS final safety analysis report. While compliance with this lease condition only requires an attempt to decrease the size of the EAB, SCE states that an exemption to 10 CFR 72.106(b) to decrease the size of the SONGS ISFSI CAB will also serve the public’s interest related to beach access. However, the public already has full access to the beach area, the bluff overlooking the

ISFSI, and the Pacific Ocean on the seaward side of SONGS. These public thoroughfares are allowed in accordance with 10 CFR 72.106(c). However, SCE has an agreement with Camp Pendleton, the State of California, and local agencies to restrict public access to these areas and thoroughfares during an emergency such as a hostile action, natural disaster, or fire.

If the exemption is approved, SCE would modify their agreements with the Camp Pendleton, State of California, or local agencies to respond and perform duties within the ISFSI CAB under emergency conditions because SCE would no longer control areas beyond their site boundary. However, in any emergency, first responders would likely secure access to the beach area based upon the circumstances, to protect the public in the event of an emergency.

Paragraph (b) of 10 CFR 72.106 requires that any individual located on or beyond the nearest boundary of the controlled area may not receive from any design basis accident the more limiting of a total effective dose equivalent of 0.05 Sieverts (Sv) (5 roentgen equivalent man (rem)), or the sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) of 0.5 Sv (50 rem). The lens dose equivalent may not exceed 0.15 Sv (15 rem) and the shallow dose equivalent to skin or any extremity may not exceed 0.5 Sv (50 rem). The minimum distance from the spent fuel, high-level radioactive waste, or reactor-related Greater Than Class C (GTCC) waste handling and storage facilities to the nearest boundary of the controlled area must be at least 100 meters.

Under the provisions of 10 CFR 72.7, "Specific exemptions," the Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of 10 CFR 72.106(b) as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

III. Discussion.

A. The Exemption is Authorized by Law.

The NRC regulations in 10 CFR 72.7 allow the Commission to grant exemptions from the requirements of the regulations in 10 CFR part 72, "Licensing Requirements for the

Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste,” if it determines, among other things that the exemption would be authorized by law. There are no provisions in the Atomic Energy Act of 1954, as amended (or in any other Federal statute) that impose a requirement to maintain the ISFSI controlled area boundary at a specific distance. Therefore, the NRC concludes that there is no statutory prohibition on the issuance of the requested exemption and the NRC is authorized to grant the exemption by law.

B. The Exemption Will Not Endanger Life or Property or the Common Defense and Security.

The regulation at 10 CFR 72.106(b) establishes specific dose constraints for the ISFSI CAB to protect the public, and requires that the CAB be located at a minimum distance of 100 meters. To support its request for an exemption from this minimum distance, SCE provided calculations and direct radiation measurements to demonstrate that the dose limits during normal operations and anticipated occurrences under paragraph (a) of 10 CFR 72.104, “Criteria for radioactive materials in effluents and direct radiation from an ISFSI or MRS,” and during design basis accidents under 10 CFR 72.106(b), are still met at a reduced ISFSI CAB distance.

In order to estimate the radiation dose at the modified SONGS ISFSI CAB, the licensee performed analyses for the SONGS ISFSI to calculate the dose from possible releases at multiple locations along the modified CAB. These shielding analyses included dose contributions from SONGS Units 1, 2, and 3 fuel stored in Transnuclear (TN) 24PT1 and 24PT4 fuel storage canisters in TN Advanced Horizontal Storage Modules (AHSMs), SONGS Units 1, 2, and 3 GTCC waste stored in GTCC waste containers in TN AHSMs, and SONGS Units 2 and 3 fuel stored in Holtec multi-purpose fuel storage canisters inside the vertical ventilated modules (VVMs) of the Holtec UMAX storage system. The licensee also included estimated doses from future canister transfer operations that will occur when canisters are moved from their stored location into certified transportation packages.

The licensee modeled spent fuel in the TN and Holtec storage systems with design basis characteristics for the Westinghouse 14x14 (SONGS Unit 1) and Combustion Engineering 16x16 (SONGS Units 2 and 3) pressurized-water reactor fuel configurations. These design basis characteristics include an initial enrichment of 3.8 percent, burnup of 45 GigaWatt-days per metric ton uranium (GWd/MTU), a cooling time of 10 years for Unit 1 fuel, and a cooling time of 5 years for Units 2 and 3 fuel. The NRC staff finds that these design basis parameters are appropriate for determining doses at the modified SONGS ISFSI CAB. In particular, the cooling times assumed are conservative relative to the actual shut down dates for the three SONGS units (1992 for Unit 1, 2012 for Units 2 and 3), such that the dose at the modified ISFSI CAB is significantly overestimated.

The licensee used the three-dimensional Monte Carlo N-Particle (MCNP) transport code to estimate doses around the SONGS ISFSI due to stored Units 1, 2, and 3 fuel, GTCC, and future canister transfer operations, as discussed in SCE Calculation SO1-207-1-C116, Revision 2, "Modified Control Area Boundary ISFSI Dose Calculation" ([ML22062B039](#)). The dose points considered in the licensee's analysis are shown in Figure 1.2 of SO1-207-1-C116 and are either at or beyond the modified SONGS ISFSI CAB. The dose points of primary interest for this exemption request are dose points 29, 30, 31, and 40, which are all on the seawall closest to the fuel stored in Holtec UMAX storage systems. The closest of these dose points is 38 meters from the nearest UMAX storage system.

The licensee assumed occupancy factors that estimate the amount of time a member of the public may be present in modeled dose locations. The occupancy factors assumed by the licensee for this analysis are summarized in Table 2.2.1 of SO1-207-1-C116 and are based on Enclosure 1 to the SCE letter dated September 29, 2022, "Occupancy Factors at San Onofre Owner Controlled Area Boundaries." This document states that areas near the facility to the north, east, and south of the facility are inhospitable, and unlikely to be accessed by any member of the public for any significant amount of time. The beach area to the west of the

facility is unlikely to be accessed by any member of the public for any significant amount of time due to the terrain and vegetation, and the licensee assumes a member of the public may be present there for 300 hours out of a year.

The licensee also notes that due to beach erosion and the placement of additional riprap to protect the facility seawall, this area is likely less attractive to members of the public than more accessible beaches nearby, meaning that the estimate of 300 hours of yearly occupancy is likely conservative. The NRC staff finds that the assumed occupancy factors are acceptable for the calculation of modified SONGS ISFSI CAB dose during normal operations and anticipated occurrences, since most locations around the modified ISFSI CAB are unlikely to be occupied for a significant amount of time and the applicant has recent direct radiation measurements demonstrating that actual radiation doses at the modified ISFSI CAB under normal operations and anticipated occurrences are less than the 10 CFR 72.104(a) limits for full year occupancy.

The licensee's results for the modified ISFSI CAB annual doses are summarized in Table 3.6.1 of SO1-207-1-C116. The results include dose contributions from stored fuel in both the TN AHSMs and Holtec VVMs, GTCC waste stored in TN AHSMs, and from canister transfer operations for up to 20 transfers per year. The maximum estimated annual dose from these dose contributions at the nearest point on the modified SONGS ISFSI CAB is 22.63 millirem (mrem) (0.2263 millisievert (mSv)) per year. This is less than the 10 CFR 72.104(a) whole body radiation limit of 25 mrem (0.25 mSv) per year.

The licensee also provided recent Annual Radiological Effluent Release Report results from 2020, which included fixed thermo-luminescent dosimeter (TLD) measurements of dose at the limiting location along the proposed modified SONGS ISFSI CAB. The TLD measured doses include contributions from the majority of fuel currently stored, as well as multiple canister transfer operations that occurred in 2020 to move fuel canisters into stored locations. The TLD doses reported by the licensee correspond to a full occupancy (8,760 hours per year) dose of

17.52 mrem (0.1752 mSv), which is less than the 10 CFR 72.104(a) whole body radiation limit of 25 mrem (0.25 mSv) per year. These measured results demonstrate that the licensee's calculations significantly overestimate the modified SONGS ISFSI CAB dose, due to the many conservatisms incorporated into the analysis.

The NRC staff performed independent confirmatory analyses of the modified SONGS ISFSI CAB dose under normal operations and anticipated occurrences. The staff modeled the fuel and GTCC waste using assumptions similar to the licensee's, in terms of initial fuel enrichment, fuel burnup, cooling time, and storage system arrangement. The NRC staff performed confirmatory calculations using the MAVRIC/Monaco sequence of the SCALE 6.2.4 code system. The staff's results are within the calculation uncertainty of the licensee's results, confirming that the licensee's radiation shielding model is appropriate, and that the facility will continue to meet the dose limits for normal operations and anticipated occurrences established under 10 CFR 72.104(a) with a modified ISFSI CAB.

The licensee also evaluated the facility with the modified ISFSI CAB under design basis accidents to ensure that the facility continues to meet the dose limits of 10 CFR 72.106(b). There are no design basis accidents that significantly affect the shielding capabilities of the TN AHSMs or Holtec VVMs or result in a canister release of radioactive material. However, the licensee determined that a loss of water jacket for the Holtec HI-TRAC VW transfer cask could have dose consequences at the modified ISFSI CAB. The licensee provided an analysis of dose versus distance from a loaded HI-TRAC VW transfer cask with the outer water jacket removed. The details of this analysis are contained in Holtec Calculation HI-2210810, "SONGS HI-TRAC VW Accident Conditions Dose versus Distance." The licensee assumed an accident duration of 30 days, with full time occupancy at the nearest dose location on the modified ISFSI CAB, 38 meters from the transfer cask. The resulting accident dose is 3.87 rem (38.7 mSv), which is less than the 10 CFR 72.106(b) design basis accident dose limit of 5.0 rem (50 mSv).

Based on the results of the licensee's modified SONGS ISFSI CAB dose analysis, and the NRC staff's confirmatory analysis, the staff finds that the doses at the modified ISFSI CAB are below the limits specified during normal operations and anticipated occurrences in 10 CFR 72.104(a), as well as the limits specified during design basis accident conditions in 10 CFR 72.106(b). The evaluation includes appropriate dose analyses for the configurations of SONGS ISFSI features that exist during the different stages of storage operations, including the impacts of normal, off normal, and accident conditions. The NRC staff reached this finding on the basis of a review that considered the regulation itself, appropriate regulatory guides, applicable codes and standards, accepted engineering practices, the statements and representations in the licensee's amendment request and supporting calculations, and the staff's confirmatory analyses.

The NRC staff has determined that the thermal, structural, criticality, retrievability, and radiation protection requirements of 10 CFR Part 72 and the offsite dose limits of 10 CFR Part 20, "Standards for Protection Against Radiation," will be maintained. There are no changes proposed in the licensee's exemption request that affect the thermal, structural, criticality, or retrievability functions of the SONGS ISFSI. Due to the potential for the modified ISFSI CAB to affect radiation protection outside of the CAB, the licensee provided an analysis to demonstrate that the dose limits during normal operations and anticipated occurrences under 10 CFR 72.104(a), as well as during postulated design basis accidents under 10 CFR 72.106(b), will not be exceeded. The NRC staff reviewed the licensee's dose analysis and finds that the licensee has shown with reasonable assurance that these regulatory dose limits will not be exceeded for the modified SONGS ISFSI CAB.

Further, the modified SONGS ISFSI CAB does not have any effect on the measures for physical protection at the site, or otherwise require changes to the approved physical security

plan. The licensee will continue to maintain its security program in accordance with the security plan, NRC regulations, and applicable security orders.

Accordingly, the NRC staff finds the risk to the public from operation of the SONGS ISFSI with the proposed modified CAB boundaries continues to ensure that public health and safety are not reduced under normal operations, anticipated occurrences, and accident conditions (transfer cask water jacket failure). The same level of safety and security will be maintained for the ISFSI CAB modification proposed by the licensee. Therefore, for these reasons the NRC staff concludes that the exemption presents no undue risk to public health and safety and will not endanger life or property or the common defense and security.

C. The Exemption is Otherwise in the Interest of the Public

SCE is requesting this exemption in response to a condition of a lease that was granted by the CSLC² with the aim of furthering the public interest related to coastal access, including access to the beach and to the walkway that runs alongside the seawall on the seaward side of the SONGS site boundary.

While compliance with the lease condition only requires an attempt to decrease the size of the EAB, the licensee believes that also shrinking the ISFSI CAB to or within the SONGS site boundary will similarly serve the public's interest related to beach access that underlies the lease condition. The proposed SONGS ISFSI CAB would allow the licensee to relinquish all explicit control of areas beyond the site boundary during both normal operations and post-accident conditions. The proposed exemption would also bring the part of the ISFSI CAB that now extends past the beach front into or within the SONGS site boundary, which would allow the licensee to modify an associated land agreement with Camp Pendleton because the licensee will no longer have control of areas beyond the site boundary.

² California State Lands Commission Lease No. PRC 6785.1 "SONGS Unit 2 and 3 Offshore Properties," Condition 32.

The licensee in its application commits to continue to monitor onsite conditions at the SONGS ISFSI and will maintain procedural requirements to inform Camp Pendleton and other agencies of any emergency declaration so that they may take appropriate action in accordance with their all-hazards emergency plans. Upon NRC approval of this exemption request, the licensee will establish the SONGS ISFSI CAB at or within the site boundary in order to take advantage of physical barriers and associated access controls. Access is currently allowed to the public on the beach walkway and seaward of the walkway, which are the areas that would no longer be within the SONGS ISFSI CAB as a result of this proposed exemption.

The licensee in its application explains that the proposed exemption supports the public interest of increased access to California's natural resources - in this case, the beach, shoreline, and ocean adjacent to the SONGS ISFSI - which was the impetus for CSLC Lease Condition 32. With this approval the licensee can relinquish control of areas that are otherwise subject to control via agreements with various outside entities during off normal and emergency conditions. The licensee states in its application that "these agreements have been interpreted by some as imposing potential constraints on public access to the beach." Furthermore, the licensee states that it has briefed and will continue to brief and consult with the CSLC and CCC regarding the proposed exemption to ensure that its being granted will not interfere with the licensee's compliance with CCC permit conditions.

The NRC staff evaluated the information above and concludes that the exemption is in the interest of the public because it would allow unfettered access to the beachfront during operations at the SONGS ISFSI, to include normal and accident conditions, while still meeting all NRC safety and security regulatory requirements, including the dose limits established in 10 CFR 72.106(b) and 10 CFR 72.104(a).

D. The Environmental Assessment for this Exemption Resulted in a Finding of No Significant Impact

With respect to compliance with section 102(2) of the National Environmental Policy Act, 42 USC 4332(2) (NEPA), the NRC staff performed an Environmental Assessment.

Based on its review of the exemption request, in accordance with the requirements of 10 CFR Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions,” the NRC staff has determined that moving the SONGS ISFSI CAB will not significantly affect the quality of the human environment. Approval of the exemption request would not result in any new construction. The SONGS ISFSI is a passive facility that produces no liquid or gaseous effluents. This exemption will have no effect on the consequences of a hypothetical terrorist attack.

No significant radiological or non-radiological impacts are expected from continued normal operations. Occupational dose estimates associated with the proposed action and continued normal operation and maintenance of the SONGS ISFSI are expected to be at levels that are as low as reasonably achievable (ALARA) and within the limits of 10 CFR 20.1201, “Occupational dose limits for adults.”

Therefore, pursuant to 10 CFR 51.31, “Determinations based on environmental assessment,” the NRC staff has determined that preparation of an environmental impact statement is not required for the proposed action and no further analysis is required under NEPA. Pursuant to 10 CFR 51.32, “Finding of no significant impact,” a Finding of No Significant Impact (FONSI) is appropriate. The Environmental Assessment and FONSI was finalized on December 8, 2022 ([ML22341A195](#)) and published in the *Federal Register* on December 28, 2022 (87 FR 79910).

IV. Conclusions.

Accordingly, the Commission has determined that, pursuant to 10 CFR 72.7, the exemption is authorized by law, will not endanger life or property or the common defense and

security and is otherwise in the public interest. Therefore, effective immediately, the Commission hereby grants SCE an exemption from 10 CFR 72.106(b) to reduce the SONGS ISFSI CAB in areas as identified in its application to less than 100 meters.

Dated this 5th day of January 2023.

For the Nuclear Regulatory Commission.



Signed by Marshall, Jane
on 01/05/23

Jane E. Marshall, Director,
Division of Decommissioning, Uranium Recovery
and Waste Programs,
Office of Nuclear Material Safety
and Safeguards.

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – ISSUANCE OF EXEMPTION FROM THE 100 METER REQUIREMENT IN TITLE 10 OF THE CODE OF FEDERAL REGULATIONS, PARAGRAPH 72.106(B), REGARDING THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION CONTROLLED AREA BOUNDARY (L-2021-LLE-0056)

DATE: January 5, 2023

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Exemption: ML22287A097

ADAMS Accession Package ML22287A34 ML22287A135 (Letter)

*via e-mail

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DATE	01/05/23	01/05/23			

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SAN ONOFRE NUCLEAR GENERATING STATION, ISSUANCE OF EXEMPTION FROM TITLE 10 OF THE CODE OF FEDERAL REGULATIONS PART 72.106(b), INDEPENDENT SPENT FUEL STORAGE INSTALLATION CONTROLLED AREA BOUNDARY (L-2021-LLE-0056) DATE January 5, 2023

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ADAMS Accession No.: ML22287A134; ML22280A097

*** via email**

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