

1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

San Onofre Unit 1 (SONGS 1) commercially generated power from January 1, 1968 until November 30, 1992. SONGS 1 was permanently defueled on March 6, 1993 and was maintained in SAFSTOR until June 1999, when the Decommissioning program was initiated.

This Defueled Safety Analysis Report (DSAR) was prepared in response to the requirements of 10 CFR 50.71(e)(4):

"For nuclear power reactor facilities that have submitted the certifications required by 50.82(a)(1), subsequent revisions must be filed every 24 months."

The NRC provided guidance in Regulatory Guide 1.184, Decommissioning of Nuclear Power Reactors, for updating the Final Safety Analysis Report (FSAR) of a permanently shutdown facility. Section 8.2, "Maintenance of the Final Safety Analysis Report", identifies those sections which should continue to be updated periodically. Those sections were used in the preparation of the DSAR. The information provided in the specific sections of the DSAR was taken from various design and Licensing basis documents including the Unit 1 UFSAR, Unit 1 UFHA, Post Shutdown Decommissioning Activities Report (PSDAR), and the Permanently Defueled Technical Specifications (PDTs).

The SONGS 1 DSAR provides an updated Licensing Basis for the defueled condition and for Decommissioning activities.

1.1.1 ORGANIZATION OF THE DEFUELED SAFETY ANALYSIS REPORT

The SONGS 1 DSAR is organized into the following main sections:

- INTRODUCTION
- SITE CHARACTERISTICS
- FACILITY DESCRIPTION
 - Facility Description
 - Fuel Storage Facility
 - Sphere
 - Reactor Auxiliary Building
 - Intake Structure
 - Turbine Building
 - Electrical System
 - Monitoring and Communications
 - Fire Protection
- LICENSEE ORGANIZATION AND CONDUCT OF OPERATIONS
- RADIOACTIVE WASTE MANAGEMENT
- RADIATION PROTECTION
- ACCIDENT ANALYSIS

1.1.2 BACKGROUND

SONGS 1 is currently defueled with the spent fuel transferred to the Independent Spent Fuel Storage Installation (ISFSI). The Decommissioning Project is proceeding to dismantle and decontaminate the plant to levels that will permit release for unrestricted use.

The SONGS 1 UFSAR was prepared for the operating plant license and written to comply with the applicable regulatory requirements. The UFSAR was organized around the performance of the fuel, the reactor, the reactor coolant system, and the associated support and safety systems.

The DSAR, which replaces the UFSAR, was created to describe the plant and to present its licensing basis during the decommissioning process. Many of the topics and analysis discussed in the UFSAR, particularly those concerned with the adequacy for power operation, do not apply to decommissioning. The process of eliminating inapplicable information began with the original DSAR and has been carried forth by the subsequent revisions. The information that remains is focused on providing an initial condition for the 50.59 evaluations of dismantlement and demolition activities.

1.1.3 ADMINISTRATIVE SECTIONS

The administrative sections: Licensee Organization, Conduct of Operations, Radiation Protection, and Radioactive Waste Management, are similar to those sections in the UFSAR, updated for Decommissioning.

1.2 SITE DESCRIPTION

San Onofre Nuclear Generating Station, Unit 1 (SONGS 1) is part of a three unit station located on the coast of Southern California, in San Diego County. The site is located entirely within the Camp Pendleton Marine Corps Base under an easement granted by the United States Government. Unit 1 is northwest of, and adjacent to, Units 2 and 3. Figure 1-1 shows the general location of the station.

SONGS 1 is jointly owned by Southern California Edison Company (SCE) and San Diego Gas and Electric Company (SDG&E). SCE is the primary owner and operator of the station. The use of the property on which the three SONGS units are built was granted to SCE and SDG&E until May 12, 2024. Unit 1 went critical on June 14, 1967 and entered commercial operation on January 1, 1968. As a result of an agreement with the California Public Utilities Commission (CPUC), operation of SONGS 1 was permanently discontinued on November 30, 1992, at the end of Fuel Cycle No. 11. The reactor was defueled and maintained in SAFSTOR until June 1999. All spent fuel was transferred from the Unit 1 spent fuel pool to the ISFSI as of August 31, 2004. SONGS 1 is currently being dismantled and demolished in accordance with Decommissioning Program requirements.

The station site is located in a sparsely populated area. It is surrounded principally by unused land due to the natural exclusion provided by the Marine Corps reservation. The topography surrounding the site consists of a gently sloping coastal plain, terminated abruptly at the shoreline by high sea cliffs. Excavation of the bluff at the shoreline has provided a foundation for the station of extremely dense sand. From seismic, geologic, and foundation considerations, this formation is adequate to support the structural loads. The site enjoys favorable meteorological conditions, except for relatively few occasions, with daily land and sea breezes. Investigations in meteorology, oceanography, and environmental monitoring have been conducted to verify the environmental characteristics of the site.

1.3 FACILITY DESCRIPTION

Three nuclear generating units and supporting facilities are located on the SONGS site. Figure 2-1 shows the original layout of the SONGS Site Plan. SONGS 1 was comprised of a Westinghouse three-loop, 450 MWe Nuclear Steam Supply System (NSSS) and turbine-generator. All spent fuel has been removed from the reactor and transferred to the ISFSI.

The major structures on the SONGS 1 portion of the site were the: Containment Sphere Turbine Building, Fuel Storage Facility, Reactor Auxiliary Building, and the Intake and Discharge Structure. These structures and their foundations have been removed or abandoned as described in Facility Description sections. The North Industrial Area or Unit 1 Industrial Area is used from time to time for temporary staging of large contaminated equipment from Units 2 and 3 as it is decontaminated or prepared for shipment to an off-site facility for treatment and/or disposal. Examples of the types of equipment that could be temporarily staged in the Unit 1 Industrial Area include the original steam generators and the reactor vessel heads. All these activities are not associated with the Unit 1 Decommissioning. The decommissioned general arrangement is shown on drawing 40028.

1.4 REGULATORY HISTORY & MAJOR PROJECTS

SONGS 1 operation was authorized by a Provisional Operating License issued on March 27, 1967, by the NRC's predecessor, the Atomic Energy Commission (AEC). Initial criticality was achieved on June 14, 1967, and SONGS 1 began commercial operation on January 1, 1968. The Environmental Report and the Final Environmental Statement (FES) were issued in accordance with applicable regulations implementing the requirements of the National Environmental Policy Act of 1969.

On July 28, 1970, following two extensions to the Provisional Operating License, SCE submitted an application to convert the Provisional Operating License to a Full-Term Operating License (FTOL or simply the "Operating License"). In connection with this application, SCE provided, in February, 1986, and August, 1991, updated information relevant to the findings and conclusions contained in the FES. Based on the updated information, the NRC issued an Environmental Assessment in September, 1991, which updated the FES. This was followed by issuance of the Facility Operating License (OL) on September 26, 1991. The license authorized SONGS 1 operation until March 2, 2004, 40 years after the date of issuance of the Construction Permit.

The long delay (from July, 1970, to September, 1991) in issuing the OL was caused by the NRC (and AEC) re-evaluation of the SONGS 1 design in light of industry operating experience and the updated design standards which were established after the plant was constructed. SONGS 1 operated under a Provisional Operating License since March 27, 1967, as authorized by 10 CFR 2.109, until the OL was issued.

SONGS 1 was permanently shut down on November 30, 1992, at the end of Fuel Cycle No. 11. On April 2, 1992, SCE submitted an application to the NRC to modify the OL to an Operating (Possession Only) License (POL). The NRC issued the license amendment on October 23, 1992. The POL became effective on March 9, 1993, after SCE provided certification that operation of the reactor had been permanently terminated and all fuel from the SONGS 1 core was stored in the plant's spent fuel pool.

The SONGS 1 Post-Shutdown Decommissioning Activities Report (PSDAR) outlines the planned Decommissioning process. SCE originally intended to decommission SONGS 1 along with Units 2 and 3, at the end of their licenses (2013). The NRC was subsequently advised in the PSDAR, dated December 15, 1998, that SCE intended to start Decommissioning in June 1999, a significantly earlier date than that indicated previously.

1.5 DECOMMISSIONING STATUS

As described in the Post Shutdown Decommissioning Activities Report, SONGS 1 is undergoing active decommissioning to return the site to a condition suitable for unrestricted use. All systems, structures and components and their foundations have been removed or abandoned as described in Section 3. The remaining decommissioning activity in progress is soil remediation, compaction and grading.

1.6 DSAR BASIS AND DESCRIPTION

The SONGS 1 DSAR provides an updated Licensing Basis for the defueled condition and for Decommissioning activities.

Operations at SONGS 1 are controlled under the Permanently Defueled Technical Specifications (PDTs), issued by Amendment No. 155 dated December 28, 1993, and modified by subsequent amendments, and by the SONGS 1 operating procedures. Decommissioning activities, dismantlement, demolition and decontamination, are performed under applicable site-wide programs and SCE design control processes, including processes developed specifically for controlling the removal of abandoned equipment.

The DSAR format was chosen to simplify the preparation of 50.59 evaluations for dismantlement of the facility and the completion of the Decommissioning process. The dismantlement is proceeding by removing systems and components in an order determined by their location rather than by system function and operation. The descriptions of plant equipment and Decommissioning activities are organized by their location within the facility, rather than by system.

Many of the topics and analyses discussed in the UFSAR, particularly those that demonstrate the technical adequacy for power operation, do not apply to Decommissioning. The Facility Description sections have been revised to retain information that might be useful for preparing dismantlement 50.59 evaluations under the 50.59 process, while eliminating obsolete information.

The Facility Description sections contain a description of the major systems and components that are still in service, physical descriptions of major abandoned components, and design evaluations addressing the interactions between the plant components and Decommissioning activities. The descriptions provided for components which no longer are important to safety are intended to aid in understanding the past use of the components and identifying possible safety hazards during dismantlement. Therefore, no additional attention was given to verifying the design information for these components.

1.6.1 DELETED

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1.8 IDENTIFICATION OF AGENTS AND CONTRACTORS

1.8.1 OWNERS OF THE FACILITY AND HOLDERS OF THE OPERATING LICENSE

Sole owners of the facility and holders of the Possession Only License (POL) are:

Southern California Edison Company (SCE), and
San Diego Gas and Electric Company (SDG&E).

1.8.2 PROJECT MANAGER

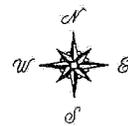
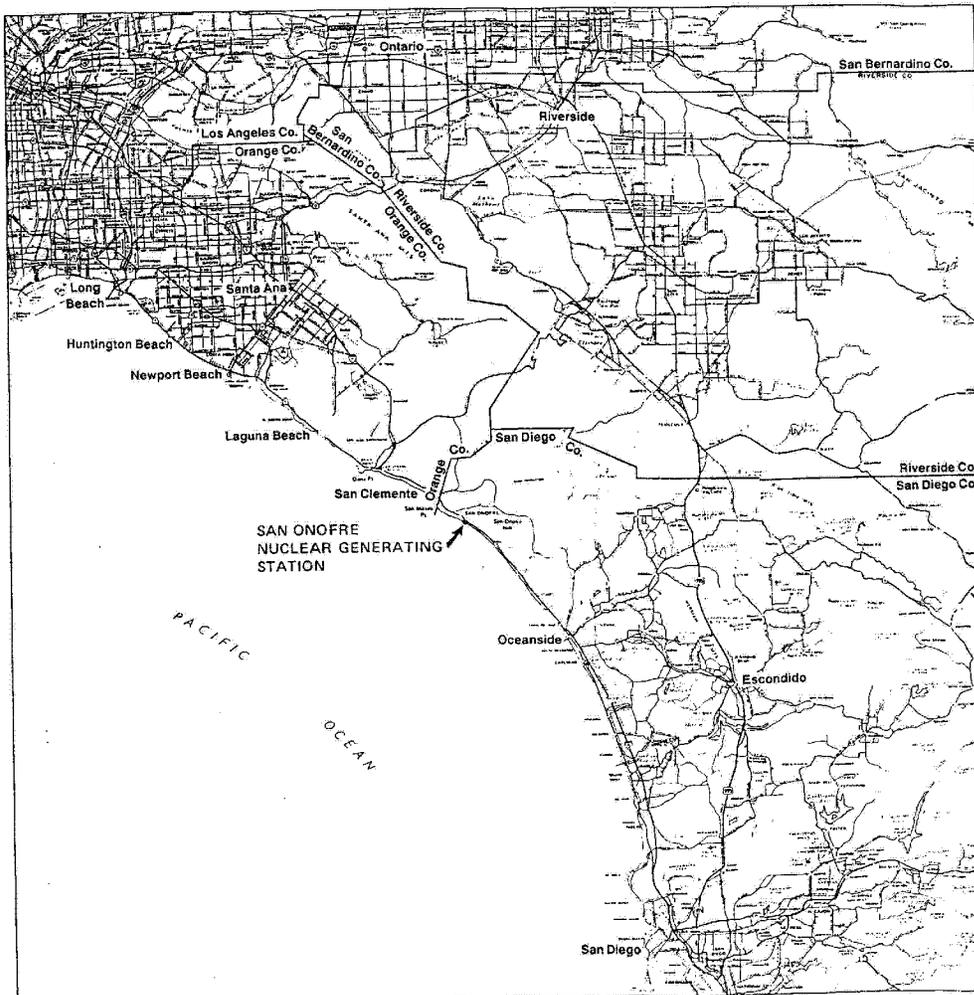
SCE is the manager for the Decommissioning Project and is responsible for the technical adequacy of the design, modification, operation, and demolition activities at Unit 1.

1.8.3 DELETED

1.9 REFERENCES

1. Letter, J. O. Bradfute, U. S. Nuclear Regulatory Commission, to H. B. Ray, SCE, "Issuance of Amendment for the San Onofre Nuclear Generating Station, Unit No. 1 (TAC NO. M83123)," dated October 23, 1992
2. Letter, H. B. Ray, SCE, to Document Control Desk, U.S. Nuclear Regulatory Commission, "Amendment Application No. 211, Permanently Defueled Technical Specifications, San Onofre Nuclear Generating Station, SONGS 1," dated May 12, 1993

3. Letter, H. B. Ray, SCE, to Document Control Desk, U.S. Nuclear Regulatory Commission, "Amendment Application No. 203, San Onofre Nuclear Generating Station, SONGS 1," dated April 2, 1992
4. Letter, R. M. Rosenblum, SCE, to Document Control Desk, U.S. Nuclear Regulatory Commission, "Operation and Surveillance Requirements for Permanently Defueled Condition for San Onofre Nuclear Generating Station, SONGS 1," dated September 21, 1992
5. Letter, W. C. Marsh, SCE, to Document Control Desk, U.S. Nuclear Regulatory Commission, "Implementation Schedule for Operation and Surveillance Requirements for the Permanently Defueled Condition, San Onofre Nuclear Generating Station, SONGS 1," dated March 3, 1993
6. Letter, W. C. Marsh, SCE, to Document Control Desk, U.S. Nuclear Regulatory Commission, "Preliminary Decommissioning Plan, San Onofre Nuclear Generating Station, SONGS 1," dated December 1, 1992
7. Letter, Michael K. Webb (NRC), to Harold B. Ray (SCE), "Issuance of Amendment No. 155 to Facility Operating License No. DPR-13, San Onofre Nuclear Generating Station Unit, No. 1, Permanently Defueled Technical Specifications (TAC No. M86377)," December 28, 1993
8. Physical Security Plan, San Onofre Nuclear Generating Station Units 1, 2, and 3, Southern California Edison (Safeguards Information Withheld from Public Disclosure in Accordance with 10CFR73.21)
9. Post Shutdown Decommissioning Activities Report (PSDAR) for SONGS 1, December 15, 1998
10. "San Onofre Generating Station Unit 1, Updated Final Safety and Analysis Report," Docket 50-206
11. Regulatory Guide 1.184, Decommissioning of Nuclear Power Reactors, dated June 1997
12. Letter, Drew Holland (U.S. Nuclear Regulatory Commission) to H. B. Ray (SCE), "Spent Fuel Pool Plant Conditions During Decommissioning, San Onofre Nuclear Generating Station, SONGS 1, (TAC No. MB0405, Amendment Application No. 217)," dated October 30, 2001 (NRC Amendment No. 160)
13. "Permanently Defueled Technical Specifications," Amendment No. 155 to License No. DPR-13, Issued December 28, 1993
14. "Permanently Defueled Technical Specifications," Amendment No. 163 to License No. DPR-13, Issued September 22, 2004



0 5 10 20
 APPROXIMATE SCALE IN MILES

<p>SAN ONOFRE NUCLEAR GENERATING STATION Unit 1 Defueled Safety Analysis Report</p>
<p>General Site Area</p>
<p>Figure 1-1</p>

SONGS Unit 1 DSAR

Figure 1-2

North Industrial Area General Arrangement

See Drawing 40028