

June 22, 2020

10 CFR 50.71(e)

ATTN: Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Subject: **Docket No. 50-206**  
**Defueled Safety Analysis Report**  
**San Onofre Nuclear Generating Station Unit 1**

Reference: Letter from A. Bates (SCE) to U. S. Nuclear Regulatory  
Commission (Document Control Desk) dated June 21, 2018  
Subject: Docket No. 50-206, Defueled Safety Analysis Report,  
San Onofre Nuclear Generating Station, Unit 1

In accordance with the requirements of 10 CFR 50.71(e), Southern California Edison (SCE) hereby submits the amended Defueled Safety Analysis Report (DSAR) for San Onofre Nuclear Generating Station (SONGS) Unit 1.

Attachment 1 contains a summary of the June 2020 changes to the SONGS Unit 1 DSAR. Attachment 2 provides the revised SONGS Unit 1 DSAR. In accordance with 10 CFR 50.71(e)(4), SCE is submitting this notification within 24 months of the previous DSAR submittal referenced above. Changes to the SONGS Unit 1 DSAR are indicated by revision bars.

There are no commitments in this letter or the attachments.

If you have any questions, please contact Mr. Al Bates at (949) 368-6945.

NMSS 01  
NMSS

As Chief Nuclear Officer, San Onofre Nuclear Generating Station, I certify that the information in this submittal accurately presents changes made since the previous submittal necessary to reflect information and analyses submitted to the NRC or prepared in accordance with NRC requirements.

Executed on 6/22/2020

Sincerely,

A handwritten signature in black ink, appearing to be the initials 'ML' followed by a horizontal line.

cc: S. Morris, Regional Administrator, NRC Region IV  
A. Snyder, NRC Project Manager, SONGS Unit 1

Attachments: Attachment 1 – Summary of Changes to SONGS Unit 1 Defueled Safety Analysis Report (DSAR)  
Attachment 2 – San Onofre Nuclear Generating Station Unit 1 DSAR, Amended June 2020

## ATTACHMENT 1

### Summary of Changes to the SONGS Unit 1 Defueled Safety Analysis Report

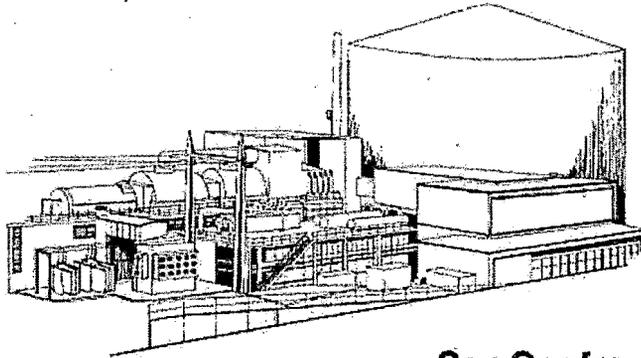
1. Sections 1.1, 1.1.1, 1.1.2, 1.3, 1.5, 3.1.1, 3.1.4, 3.3.2, 5.1, and 5.2.1
  - A. Unit 1 Reactor Pressure Vessel (RPV) has been moved from its current storage location in the NIA, and has been shipped to an off-site disposal facility. Therefore, reference to the storage location of the Unit 1 RPV is removed from the Unit 1 DSAR.
  - B. The SONGS ISFSI has completed the expansion project to accept SONGS Units 2 & 3 spent fuel. The verbiage was changed to indicate completion of the project and also to update Section 1.1.1 to delete referenced SSCs that are no longer described within the main sections denoted.
2. Section 3.1
  - A. The current Facility Description for the Unit 1 DSAR is updated to reflect that there are no longer any 10 CFR 50 structures, systems or components (SSCs) that are safety related or required to be operational. This update included changes to the description of quality class, seismic classification, and quality assurance program requirements.

**ATTACHMENT 2**

**San Onofre Nuclear Generating Station Unit 1**

**Defueled Safety Analysis Report (DSAR)**

**Amended June 2020**



**San Onofre  
Nuclear Generating Station  
Unit 1**



# Defueled Safety Analysis Report

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1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

The San Onofre Nuclear Generating Station (SONGS) was licensed for three units:

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 the Decommissioning Program was initiated in June, 1999.

San Onofre Unit 2 (SONGS 2) last operated on January 9, 2012, and San Onofre Unit 3 (SONGS 3) last operated on January 31, 2012. The permanent shutdown of SONGS Units 2 and 3 was announced in June of 2013. Currently these two units are undergoing decommissioning as described in the Units 2 and 3 Post-Shutdown Decommissioning Activities Report (PSDAR), dated September 23, 2014 (refer to dockets 50-361 and 50-362).

The SONGS 1 Defueled Safety Analysis Report (DSAR) updates the Current Licensing Basis (CLB) for the existing site configuration and is a reference available for reviewing decommissioning actions and plans affecting the SONGS 1 area of the site. The SONGS 1 DSAR is updated every 24 months as required by 10 CFR 50.71(e)(4) under "Maintenance of Records, Making of Reports," as referenced to 10 CFR 50.82(a)(1) under "Termination of License."

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 Updated Fire Hazard Analysis (UFHA), Unit 1 PSDAR, and the Unit 1 Permanently Defueled Technical Specifications (PDTS).

Current Plant Status:

- All of the above ground structures associated with the SONGS 1 operating plant have been demolished and removed.
- SONGS 1 spent fuel assemblies previously stored under water in the Spent Fuel Pools (SFP) have been transferred to dry cask storage in the Independent Spent Fuel Storage Installation (ISFSI) located on the site of the former Unit 1 operating plant.
- The ISFSI has been expanded to store the remaining spent fuel from SONGS Units 2 & 3.

### 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
- LICENSEE ORGANIZATION AND CONDUCT OF OPERATIONS
- RADIOACTIVE WASTE MANAGEMENT
- RADIATION PROTECTION
- ACCIDENT ANALYSIS

### 1.1.2 BACKGROUND

The area formerly occupied by the SONGS Unit 1 operating plant has been designated as the North Industrial Area (NIA). The NIA contains the ISFSI which has been expanded to store additional spent fuel assemblies from Units 2 and 3. Demolition of the above ground structures and decommissioning within the NIA was completed in 2008. In addition to the ISFSI, the NIA contains site utilities (electrical power distribution panel and water), a water storage tank (MT-351), and portable fire pump (MP-1065).

The SONGS 1 Updated Final Safety Analysis Report (UFSAR) was prepared for the operating plant license and was written to comply with the regulatory requirements applicable at that time. 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 maintain the licensing basis current with the decommissioning status. Many of the topics and analyses 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 provides the basis for the 50.59 evaluation process during future dismantlement and demolition activities within the Unit 1 NIA.

## 1.2 SITE DESCRIPTION

San Onofre Nuclear Generating Station, Unit 1 (SONGS 1) is part of a three unit facility 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 facility. 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 SONGS 1 remained in SAFSTOR until decommissioning was started in June of 1999. Spent fuel assemblies previously stored in the Unit 1 spent fuel pool were transferred to the ISFSI as of August 31, 2004, and the remaining Unit 1 spent fuel assemblies stored in the Units 2 and 3 spent fuel pools were transferred to the ISFSI as of June 28, 2005. During the period from 1972 to 1980, 270 SONGS 1 spent fuel assemblies were transported to the GE – Hitachi facility in Morris, Illinois. The SONGS 1 operating plant has been dismantled and demolished in accordance with the Decommissioning Program requirements.

The station site is located in a sparsely populated area. It is surrounded principally by unused land and 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 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.

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 Section 3. The North Industrial Area of Unit 1 may be used for the temporary staging of large equipment from Units 2 and 3 as it is decontaminated or prepared for shipment to an off-site facility for treatment and/or disposal. The decommissioned general arrangement is shown on drawing 40028.

#### 1.4 REGULATORY HISTORY AND 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.

As a result of an agreement with the California Public Utilities Commission (CPUC), 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), dated September 11, 1998, outlined the plan to place SONGS 1 in SAFSTOR. SCE originally intended to decommission SONGS 1 along with Units 2 and 3, after the operating licenses for Units 2 and 3 had expired in 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 previously indicated.

#### 1.5 DECOMMISSIONING STATUS

As described in the PSDAR, SONGS 1 is undergoing decommissioning to return the site to a condition suitable for general use. All systems, structures and components and their foundations have been removed or abandoned as described in Section 3. Soil remediation, compaction, and grading of the NIA site has been completed and the ISFSI has been expanded.

1.6 DSAR BASIS AND DESCRIPTION

The SONGS 1 DSAR provides an updated Licensing Basis for the remaining decommissioning activities.

The SONGS 1 facility is administered under the Permanently Defueled Technical Specifications (PDTs), issued by Amendment No. 155 dated December 28, 1993, and modified by subsequent amendments. The SONGS Operations Division currently has the responsibility for oversight of the North Industrial Area and components previously associated with SONGS Unit 1. The remaining decommissioning activities, such as conducting radiological surveys, are performed under applicable site-wide programs.

The DSAR format was chosen to simplify the preparation of 50.59 reviews and evaluations for dismantlement of the facility and the completion of the decommissioning process. The dismantlement of SONGS 1 proceeded by removing systems and components in an order determined by their location rather than by system function and operation. Therefore, the descriptions of plant equipment and decommissioning activities in the DSAR were organized by their location within the facility, rather than by system.

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

With all of the SONGS 1 above ground structures and components having been removed, many of the detailed Facility Description sections have been deleted. The initial DSAR Facility Description sections contained a description of the major systems and components that were in service for SAFSTOR, 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 were no longer important to safety were intended to aid in understanding the past use of the components and for identifying possible safety hazards during dismantlement. Historical facility descriptions may be obtained from previous revisions of the SONGS 1 DSAR and UFSAR.

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- 1.6.2 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

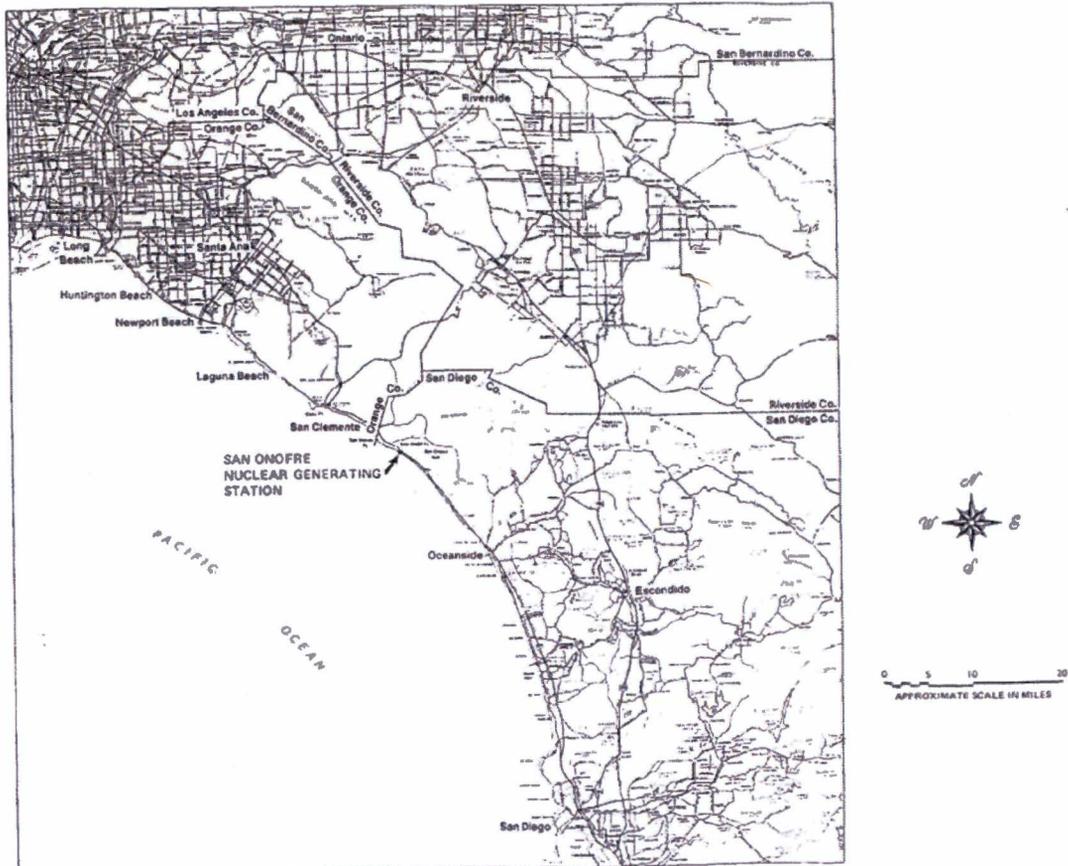
1.9 REFERENCES

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)

## San Onofre Unit 1 DSAR

### INTRODUCTION

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



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

# SONGS Unit 1 DSAR

Figure 1-2

North Industrial Area  
General Arrangement

See Drawing 40028

## 2.0 SITE CHARACTERISTICS

This section describes the San Onofre site, and the location of the SONGS 1 facility. Descriptions are provided of the site characteristics, geography and demographics, the exclusion area, low population zone, and development of the atmospheric dispersion factors.

Hydrological, meteorological and some population data have been moved to Appendix A, Historical Information. This information and its impact to the facility design is not expected to change during Decommissioning (through license termination).

Changes to the Site Characteristics section are no longer required.

### 2.1 GEOGRAPHY AND DEMOGRAPHY

#### 2.1.1 SITE LOCATION AND DESCRIPTION

##### 2.1.1.1 Specification of Location

The SONGS site is located on the coast of Southern California in San Diego County, approximately 62 miles southeast of Los Angeles and 51 miles northwest of San Diego. The site is located entirely within the boundaries of the United States Marine Corps Base, Camp Pendleton, California, near the northeast end of its 18-mile shoreline.

The coordinates for SONGS 1 are latitude 33°22'10" N and longitude 117°33'30"W.

##### 2.1.1.2 Site Area Map

The plant property line, which is also the site boundary, and the location of the original major structures of the facilities, is delineated in Figure 2-1. The site, comprising 83.63 acres, is about 4500 feet long and 800 feet wide. The SONGS 1 power block was located northwest of Units 2 and 3, occupies 11.7 acres. The SONGS 2 and 3 power block occupies 19.5 acres. A spur of the Burlington Northern and Santa Fe Railway line extends into the site area.

The SONGS site exclusion area is a common area for SONGS 1, 2, and 3 and is roughly formed by two semicircles with radii of 1967.5 feet each, centered on the SONGS 2 containment and a point 134 feet southwest of the SONGS 3 containment. The minimum exclusion area distance for SONGS 1 is 996 feet (282 meters) measured from the center of Unit 1 containment northwestward to the nearest point on the exclusion area boundary. The exclusion area boundary is delineated in Figure 2-2. At the northwest and southeast site boundaries, the exclusion area is tangential to, but does not exceed, the site boundary. There are no industrial, commercial, institutional, or residential structures within the exclusion area boundary.

The Pacific Ocean is located immediately west of the site and traverses the seaward side of the exclusion area. The San Onofre State Beach includes sections of the coast on both sides of the site. Access to open beach areas up and down the coast from the exclusion area is provided by a walkway (the beach passageway) adjacent to the SONGS 1, 2, and 3 seawall. The passageway extends the 2200-foot length of the seawall and is bounded on the seaward side by a concrete wall extending approximately three (3) feet above the passageway surface.

A typical cross-section through the beach passageway is shown in Figure 2-3. The passageway is 15 feet in total width with a hard surface which can accommodate pedestrian traffic only. Two removable vehicle barriers are installed along the beach passageway (one at the northwest corner of Unit 2 boundary and another at the southwest corner of Unit 3 boundary) as part of SONGS security enhancements following NRC's order issued on April 29, 2003 to upgrade the plant's security. A 3-foot wide, 20-foot long removable pedestrian bridge is also installed along the passageway at the intake structure area of Units 2 and 3 to permit pedestrian access when the saltwater cooling system of Units 2 and 3 is discharging to the beach, during which the passageway will be flooded. The seaward side of the walkway is formed by a concrete retaining wall which is protected by riprap in the event of infrequent beach erosion caused by wave action.

Old Highway 101 is immediately adjacent to the east boundary line of the site. The highway is currently being used for access the south end of the State Beach. The Burlington Northern and Santa Fe Railway right of way is east of Highway 101. Interstate Highway 5 is adjacent to the railroad right of way.

#### 2.1.1.3 Boundaries for Establishing Effluent Release Limits

The site-restricted area defined for the purpose of establishing effluent release limits coincides with the exclusion area boundary as shown in Figure 2-2. The procedures for control of individual access and a description of the boundary are presented in Section 2.1.2. The Offsite Dose Calculation Manual (SO123-ODCM) describes the administrative controls and calculation methodology applied to maintain effluent releases within regulatory limits.

### 2.1.2 EXCLUSION AREA AUTHORITY AND CONTROL

#### 2.1.2.1 Authority

The applicant's authority to control all activities within the exclusion area was acquired by grant of easement from the United States of America made by the Secretary of the Navy pursuant to the authority of Public Law 88-82. This easement is recorded in the official records of the Recorder of San Diego County, California, on page 85887, Series 5, Book 1964. In order to remove any ambiguities contained in the original grant of easement with respect to the applicant's authority to control activities in the exclusion area, an amendment to the grant of easement was executed on September 18, 1975, and is reproduced below, in part:

"In order to protect the public health and safety, and in accordance with the rules, regulations and requirements of the United States Nuclear Regulatory Commission, successor to the United States Atomic Energy Commission, applicable to the Nuclear Station, the Grantees may determine all activities including exclusion or removal of personnel and property from such exclusion area as is established from time to time by or with the approval of the United States Nuclear Regulatory Commission and is located within the lands described in Exhibit B. Subject to the foregoing, such exclusion area may be used by the Government, its successor or assigns, for military operations (provided same do not endanger operation of the Nuclear Station), agricultural, recreational and such other uses as may be compatible with operation of the Nuclear Station, provided that any and all uses of the exclusion area shall be in accordance with and subject to the rules, regulations and requirements of the United States Nuclear Regulatory Commission applicable to the Nuclear Station, and further provided that no significant hazards to the public health and safety shall result from any such uses."

This amendment to the grant of easement expires on May 12, 2024.

All mineral rights in the land portion of the exclusion area are held by the United States Government.

The Pacific Ocean, Interstate Highway 5 (San Diego Freeway), old U.S. Highway 101, the Burlington Northern and Santa Fe Railway right-of-way, and the beach passageway constitute traverses of the site exclusion area as allowed by 10 CFR 100.3(a).

2.1.2.2 Control of Activities Unrelated to Plant Operation

Recreational activities, such as sunbathing or picnicking, are not permitted within the landward portion of the exclusion area (the area landward of the contour of mean high tide). The seaward portion of the exclusion area (the area seaward of the contour of mean high tide) may be occupied by small numbers of people for passageway transit between the public beach areas upcoast and downcoast from the plant. Additional small numbers of people may be anticipated to occasionally be in the water.

Transient access to an approximately 5-acre area at the southwest corner of the site for the purposes of viewing the scenic bluffs and barrancas is on an unimproved path.

Physical features and administrative controls, limit activities in the landward portion of the exclusion area. These features and controls minimize use of the seaward portion, limiting it to predominately passageway use.

The following enforcement measures ensure that use of the beach exclusion area, not related to operation of the facility, is minimized:

- A. Beach areas within the exclusion area are subject to periodic surveillance by direct means.
- B. If use of beach areas within the exclusion area is observed to be other than for transient use, an announcement may be made over the public address system, or other means, to request the movement of persons out of the exclusion area.
- C. Should actions described above prove to be unsuccessful, plant security personnel may request the assistance of the California State Park Rangers or Camp Pendleton Military Police.

2.1.2.3 Arrangements for Traffic Control

The environs of the Site are the Pacific Ocean and the beach passageway on the west, the San Diego Freeway (Interstate 5), old U.S. Highway 101, and the Burlington Northern and Santa Fe railroad on the southeast and north.

In the event of an emergency, all traffic within the roadways and waterways is subject to control by agencies of state and local governments. Surveillance measures discussed in paragraph 2.1.2.2 will control the use of the beach passageway.

As documented in the SONGS Permanently Defueled Emergency Plan (PDEP), it is no longer possible for the radiological consequences of design basis accidents or other credible events at SONGS to exceed or approach the limits of the EPA Protective Action Guide beyond the site boundary or require offsite protective actions. Offsite agencies maintain the ability, under their emergency management plans, to implement offsite protective measures, if needed, in the unlikely event of a release due to a beyond design-basis event.

2.1.2.4 Abandonment or Relocation of Roads

There are no public roads that were subject to abandonment or relocation as a result of construction of SONGS 1, 2, and 3.

2.1.3 LOW POPULATION ZONE

The Low Population Zone (LPZ) was the area contained within 1.95 miles of the plant site. This distance was established to ensure that the guidelines of 10 CFR 100 were met with respect to the LPZ and the population center. As documented in the SONGS PDEP, with SONGS Unit 2 and 3 defueled, there are no longer any credible events for SONGS which would require an LPZ. The historical LPZ is shown in Figure 2-4 along with transportation routes that may be used by Marine Corps personnel for evacuation purposes.

Population estimates are included in Appendix A, Historical Information.

2.1.4 REFERENCES

1. Southern California Edison Company, "San Onofre Generating Station (SONGS) Permanently Defueled Emergency Plan," Revision 1, Docket 50-361
2. Southern California Edison Company, Emergency Plan for San Onofre Nuclear Generation Station Units 1, 2, and 3
3. "San Onofre Generating Station Unit 1, Updated Final Safety and Analysis Report," Docket 50-206

## 2.2 HYDROLOGY AND METEOROLOGY

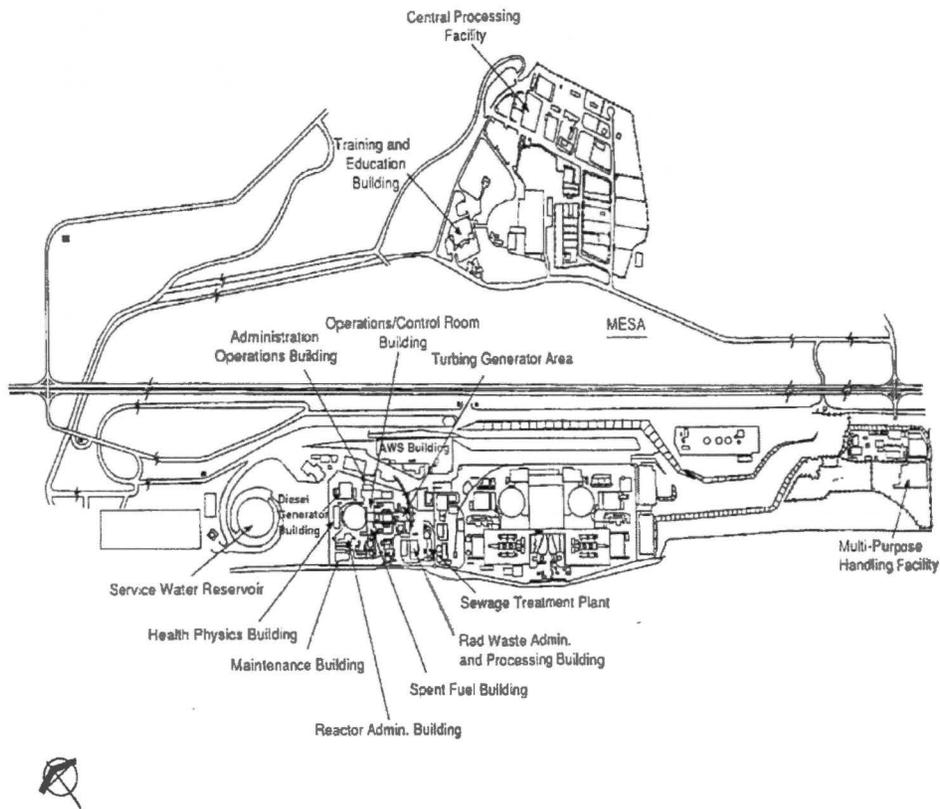
With the removal of the SONGS Unit 1 above ground structures, the details of the hydrology and atmospheric diffusion estimates are considered of historical interest and have been deleted from the DSAR. The hydrological and meteorological data and information developed and verified for the SONGS site are included in Appendix A, Historical Information. A general review has determined that this information, its basis, and its impact to the facility design will not change during Decommissioning (through license termination).

## 2.3 DELETED

TABLE 2-1

## 2.4 BIBLIOGRAPHY

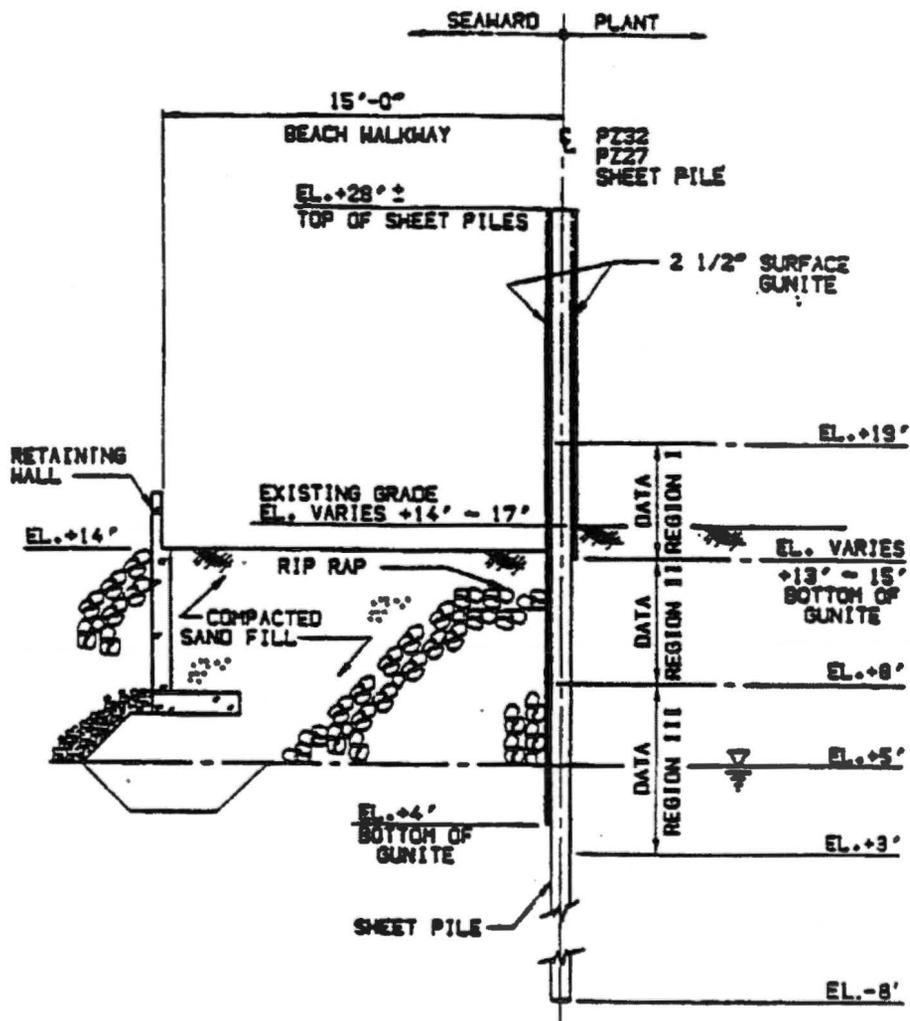
1. Updated Final Safety Analysis Report, San Onofre Nuclear Generating Station, Unit 2 & 3, Southern California Edison Company, Dockets 50-361, 50-362.
2. U.S. Nuclear Regulatory Commission: Safety Evaluation Supporting Amendment No. 25 to Preliminary/Operating License No. DPR-13, Final Evaluation of Atmospheric Transport and Diffusion Characteristics for Accident Analysis - San Onofre (SEP Topic II-2.C), November 18, 1981.
3. J.I.P. Jones and F. Pasquill, "An Experimental System for Directly Recording Statistics of the Intensity of Atmospheric Turbulence," Quarterly Journal Royal Meteorology Society, 85, 365, pp. 225-236, (1959).
4. M. Septoff, A. E. Mitchell, and L. H. Teuscher, Final Report of the Onshore Tracer Tests Conducted December 1976 Through March 1977 at the San Onofre Nuclear Generating Station. NUS-1927, NUS Corporation, Rockville, Maryland, (1977).



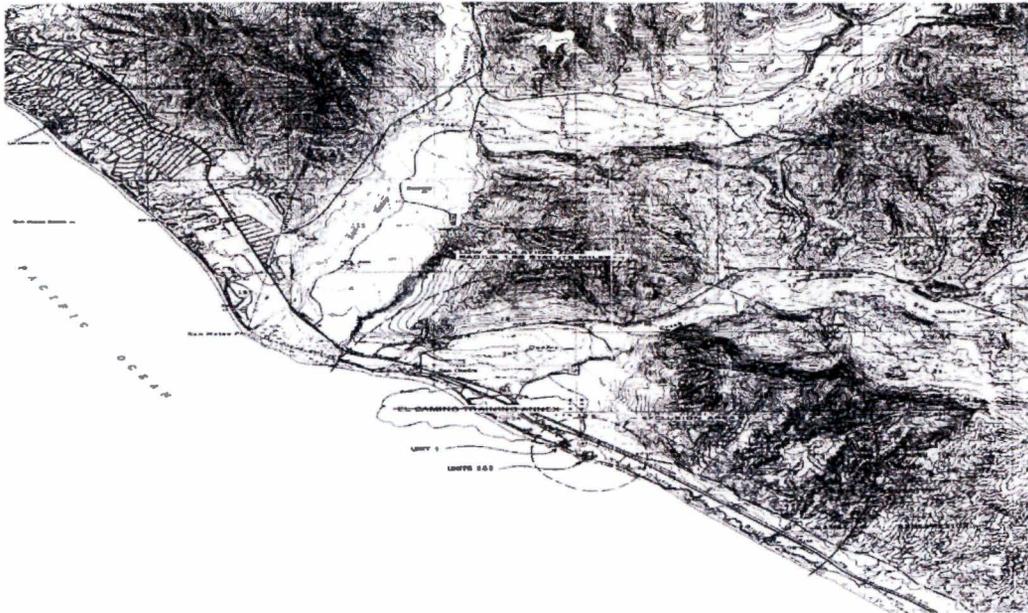
NOTE: The Site Plan for the operating plant is shown for reference and does not include changes made for Decommissioning.

<b>SAN ONOFRE NUCLEAR GENERATING STATION</b> Unit 1 Defueled Safety Analysis Report Site Plan (Operating Plant) <b>Figure 2-1</b>
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SAN ONOFRE NUCLEAR GENERATING STATION Unit 1 Defueled Safety Analysis Report
Beach Passageway and Seawall Section
Figure 2-3



<b>SAN ONOFRE NUCLEAR GENERATING STATION</b> Unit 1 Defueled Safety Analysis Report
Low Population Zone
<b>Figure 2-4</b>

### 3.0 FACILITY DESCRIPTION

#### 3.1 FACILITY DESCRIPTION

##### 3.1.1 INTRODUCTION

The above ground structures of the SONGS 1 facility have been removed, and the spent fuel is stored within the ISFSI located on the SONGS 1 site. The SONGS 1 site, currently renamed the North Industrial Area (NIA), includes the expanded ISFSI to accept additional Units 2 and 3 spent fuel assemblies. Open areas of the NIA site are available for equipment staging and as a work area supporting site decommissioning. The remaining decommissioning activities, such as conducting radiological surveys, are performed under applicable site-wide programs.

In the Facility Description section, the term "Unit 1 Facility" refers to the systems, structures, and components associated with the former operating plant. Descriptions referring to the ISFSI are included for clarity, as the ISFSI is located within the NIA and contains the Unit 1 spent fuel and Greater than Class C (GTCC) high level waste. The ISFSI facility was licensed under 10 CFR 72, consequently, specific details are not described in the SONGS 1 DSAR for the 10 CFR 50 operating plant. Refer to docket 72-41 for additional details of the ISFSI.

The NIA yard sump collects groundwater runoff, tritium dewatering outflows, and the overflow from the site sewage treatment plant located in the NIA. The NIA yard sump, consisting of two pumps (P1056, P1060) and a radiation effluent monitor (2/3RT2101), is associated with Units 2/3 components as it directs effluents to the Unit 2 outfall. Additional details are available in the Units 2/3 UFSAR Section 11.5.2.1.4.14 "North Industrial Area Yard Sump Monitor 2/3RT2101," (Docket 50-361).

The Facility Description sections summarize the former operating plant structures and locations for guiding and planning future decommissioning activities. The Facility Description section consists of five sections dedicated to specific buildings and three sections for plant-wide topics: Electrical Systems, Monitoring and Communications, and Fire Protection.

Decontamination and Dismantlement of the SONGS Unit 1 site is not complete. Final restoration of the site will be addressed after all spent fuel has been removed from the site. The remaining SSCs are shown on drawings U1-C-209 and U1-C-0014.

The Unit 1 NIA continues to transform as the ISFSI is expanded. The utilities within in the NIA are under the control of the Operations Division, the construction activities are directed by the Decommissioning Project Division, and the environmental and radiological monitoring requirements are under the oversight of the Radiation Protection, Chemistry, and Environmental Division. These divisions are responsible for maintaining the configuration and status of the NIA.

### 3.1.2 OPERATING STATUS

The Operations Division is responsible for maintaining the Unit 1, Units 2 and 3 facilities, and manages the fire brigade. The Decommissioning P&IDs, which are distinguished from the original P&IDs by a "DE" suffix, depict the current configuration of the North Industrial Area. The Decommissioning P&IDs are updated as required in accordance with site programs and procedures. There are no longer any structures, systems and components that are Required to be Operational (RO).

### 3.1.3 RADIOLOGICAL STATUS

The Radiation Protection, Chemistry, and Environmental Division incorporated the formerly separate Health Physics (HP) Division, and monitors and controls the radiological status of the Unit 1 NIA and decommissioning activities. The NIA no longer contains a restricted access Radiological Control Area (RCA) and is open to the site for general use.

### 3.1.4 EQUIPMENT REMOVAL STATUS

All systems, structures and components and their foundations have been removed or abandoned as described in sections 3.2 through 3.9. Soil remediation, compaction, and grading have been completed to support the NIA for general use and the expanded ISFSI.

### 3.1.5 PLANT CONFIGURATION AT THE START OF DECOMMISSIONING

The physical layout of Unit 1 that existed prior to any dismantlement is shown in the following general arrangement drawings:

<u>Drawing</u>	<u>Title</u>
568700	General Arrangement - Plan of Elevation 35 ft - 6 in.
568701	General Arrangement - Plan of Elevation 14 ft - 0 in.
568702	General Arrangement Sections - Sheet 1.
568703	General Arrangement - Reactor Auxiliary Building and Intake Structure.
568704	General Arrangement Sections - Sheet 2.

All of these historical drawings are listed for information reference only to aid in understanding the plant configuration prior to decommissioning and are available at the site.

### 3.1.6 QUALITY CLASSIFICATION OF STRUCTURES, SYSTEMS AND COMPONENTS

#### 3.1.6.1 Quality Class Basis

The Structures, Systems and Components (SSC) in the SONGS 1 operating plant required for accident mitigation and safety, had a Quality Classification (QC) designation of Safety Related (SR), based on 10 CFR 100 "Reactor Site Criteria." Other SSCs were assigned lesser quality classifications depending on their relative importance to the safety of the reactor. These included Non Safety Related--Fire Protection (NSRFP), Non Safety Related-Anticipated Transients Without Scram (NSR-ATWS), and Non Safety Related (NSR).

After SONGS 1 was defueled, the quality classifications were changed to designate SSCs needed to protect the spent fuel as Required to be Operational (RO), based on 10 CFR 20 "Standards for Protection Against Radiation." Quality classifications for the RO structures, systems and components were assigned consistent with their relative importance to safety of the spent fuel. These include SR, NSRFP, and a new classification of Non Safety Related-Augmented Quality (NSRAQ).

SSCs which are not important to protect the health and safety of the public are designated as Not Required to be Operational (NRO). NRO SSCs are exempt from Quality Assurance program requirements. All NRO SSCs have been assigned a quality classification of Non Safety Related (NSR).

Accidents affecting the spent fuel are no longer possible with the fuel assemblies removed and transferred to the ISFSI. Therefore, there are no longer any SSCs in SONGS 1 that meet the definition of SR or RO. All remaining SSCs that are included in the 10 CFR 50 license for SONGS 1 are NSR and NRO and are exempt from Quality Assurance Program requirements.

ISFSI components associated with the Unit 1 spent fuel assemblies and fuel transfer are classified in accordance with 10 CFR 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste and Reactor-Related Greater than Class C Waste," and are not considered part of the 10 CFR 50 license.

### 3.1.7 SEISMIC CLASSIFICATION OF SSC

The seismic design of SONGS 1 was originally intended to ensure the most adverse conditions of stress and deflection resulting from the combined influence of normal and earthquake loads would not impair safe operation or orderly shutdown of the plant. The following seismic categories are applicable to 10 CFR 50 SSCs:

- Category A: SSCs that are important to the nuclear safety of the plant;
- Category B: SSCs that are important to the continuity of power generation or whose contained activity is such that release would not constitute a hazard;
- Category C: All remaining SSCs not required for safety and not directly associated with power generation.

Regulatory Guide 1.29 is only applicable to 10 CFR 50 SSCs. All remaining 10 CFR 50 SSCs in SONGS 1 are Seismic Category C.

### 3.1.8 QUALITY ASSURANCE CLASSIFICATION PROGRAM

The requirements of the quality assurance program apply to the design, fabrication, construction, modification, testing, operation, and maintenance of structures, systems, and components (SSC) that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public as given in 10 CFR 50, Appendix B.

For decommissioning the designations RO and NRO are used to determine Quality Assurance program applicability. SSC are classified using both the RO (or NRO) designations and the quality class, as SR/RO, NSRFP/RO, NSRAQ/RO, or NSR/NRO. Normal plant quality assurance documentation is maintained for SSC designated as RO. All remaining 10 CFR 50 SSCs are NSR/NRO and are exempt from the Quality Assurance Program.

#### 3.1.8.1 Q-List

All remaining 10 CFR 50 SSC in SONGS 1 are NSR/NRO and are exempt from Quality Assurance Program requirements. The Q-List (SCE Document Number M-37560), which is maintained as a controlled document under the SCE Quality Assurance Program describes that all remaining 10 CFR 50 SSCs are NSR/NRO and Seismic Category C. A detailed list of each 10 CFR 50 SSCs is no longer provided.

#### 3.1.8.2 Quality Groups

Components containing water, steam, or radioactive material are assigned a Quality Group (A, B, C or D) in accordance with NRC Regulatory Guide 1.26, Rev. 2. These quality groups are part of a Quality Assurance program dedicated to assuring:

- 1) the integrity of the reactor coolant pressure boundary,
- 2) the capability to shut down the reactor and maintain it in a safe shutdown condition,  
or
- 3) the capability to prevent or mitigate the consequences of accidents which could cause undue risk to the health and safety of the public.

The current Q-list no longer includes the R.G. 1.26 Quality Group classification for each component since the above no longer applies to any 10 CFR 50 SSCs. The Quality Group definitions below are provided for historical reference:

##### Quality Group A

Group A quality standards are given in 10 CFR 50.55a and are applied to the design, fabrication, erection, and testing of reactor coolant pressure boundary components.

##### Quality Group B

Group B quality standards are given in Regulatory Guide 1.26 and are applied to the water-and-steam-containing components identified in regulatory position C.1 of Regulatory Guide 1.26.

### Quality Group C

Group C quality standards are given in Regulatory Guide 1.26 and are applied to the water-, steam-, and radioactive-waste-containing components identified in regulatory position C.2 of Regulatory Guide 1.26.

### Quality Group D

Group D quality standards are given in Regulatory Guide 1.26 and are applied to water and steam-containing components not part of the reactor coolant pressure boundary nor included in Groups B and C but that are part of systems or portions of systems that contain or may contain radioactive material.

## 3.1.9 DESIGN CRITERIA FOR EVALUATIONS AND MODIFICATIONS OF EXISTING SSC

SONGS 1 was designed and constructed before the General Design Criteria (GDC) current criteria were established for the analysis, design, and construction of nuclear power plants. The NRC's Systematic Evaluation Program (SEP) compared the existing configurations of the SONGS 1 structures, systems, and components with criteria that had evolved since the original design was developed.

### 3.1.9.1 Design Codes and Standards

The original design codes and standards used to construct the operating plant are of historical interest and are presented in Reference 1. Limitations and exceptions to these codes and standards are identified in work package design criteria. Work performed on RO components is within the requirements of the Quality Assurance Program. Work on 10 CFR 50 SSCs in SONGS 1 is performed in accordance with sound engineering practice and may use commercial standards and materials.

### 3.1.9.2 Electrical Engineering Design Criteria

During Decommissioning, electrical work is generally performed under commercial grade standards.

### 3.1.9.3 Design Controls and Work Process

The engineering design process and work activities at SONGS 1 are controlled under site-wide administrative controls. Design activities are planned, performed and documented in accordance with written procedures and instructions to assure control through all phases of design development, review and approval. Determination of 10 CFR 50 Appendix B requirements for design activities at SONGS 1 is currently based on the guidance of the Decommissioning Quality Assurance Program (DQAP) and is implemented through controlled engineering procedures (SONGS Procedures Section XXIV).

The requirements of 10 CFR 50.59 are implemented in accordance with the recommendations and guidelines contained in NEI 96-07, Revision 1, "Guidelines for 10 CFR 50.59 Implementation." A screening process is used to determine when a specific evaluation is required. Evaluations are performed by personnel with pertinent technical expertise in the DSAR and Technical Specifications. The 50.59 process applied to SONGS 1 has been augmented to include a determination that proposed work is within the limits of 50.82(a)(6).

3.1.9.4 Deleted

3.1.10 REFERENCES

1. "San Onofre Generating Station Unit 1, Updated Final Safety Analysis Report," Docket 50-206

3.2 FUEL STORAGE FACILITY

3.2.1 INTRODUCTION

The Fuel Storage Building was an independent and separate Seismic Category A structure which housed the spent fuel pool, an underwater cask transfer area, an underwater fuel transfer area, a cask decontamination area, a storage room, and an abandoned 480V switchgear room. The Fuel Storage Building was located southwest of the containment sphere.

3.2.2 FUEL STORAGE FACILITY STATUS

All structures, systems and components associated with the Fuel Storage Facility have been removed or demolished. Spent fuel assemblies in the Unit 1 spent fuel pool, as well as Unit 1 spent fuel assemblies in the Unit 2 and Unit 3 spent fuel pools, were loaded into a specially designed cask and transferred to the Independent Spent Fuel Storage Installation (ISFSI). Segmented Greater than Class C (GTCC) waste from the reactor vessel internals was placed in GTCC waste container, and was similarly transferred to the ISFSI.

3.2.3 PLANNED DECOMMISSIONING ACTIVITIES

The Fuel Storage Facility has been demolished.

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### 3.2.7 REFERENCES

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## 3.3 SPHERE AND ENCLOSURE BUILDING

### 3.3.1 INTRODUCTION

A spherical steel containment enclosed the reactor and its related equipment. The 140-foot diameter sphere was one-inch thick and extended 40 feet below grade. The sphere was continuously supported by a concrete cradle between the steel sheet and the undisturbed soil. A concrete foundation provided support and shielding for equipment inside the sphere. The concrete Sphere Enclosure Building surrounded the steel containment sphere. The building had three-foot thick cylindrical walls and a conical roof. It was designed to reduce the offsite dose during a design basis accident.

### 3.3.2 SPHERE AND ENCLOSURE BUILDING STATUS

All structures, systems and components internal to the Containment Sphere have been completely removed. The reactor vessel internal (RVI) components were cut up. Highly activated pieces that were Greater than Class C (GTCC) waste were segmented, placed in a GTCC waste container and transferred to the Independent Spent Fuel Storage Installation (ISFSI). The remaining pieces were returned to the reactor vessel and stabilized by grouting. The reactor vessel was packaged for shipment and sent off-site to a disposal facility.

FACILITY DESCRIPTION

The Sphere Enclosure Building and foundation have been completely demolished. The steel sphere has been removed. The lower portion of the concrete cradle foundation located below grade still remains. The bowl was filled with Elastozell and one foot of concrete up to elevation 8 ½ feet.

3.3.3 PLANNED DECOMMISSIONING ACTIVITIES

The Sphere and Enclosure Building has been demolished.

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- 3.3.3.2 Deleted
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3.3.4 DESIGN EVALUATION

- 3.3.4.1 Deleted
- 3.3.4.2 Deleted
- 3.3.4.3 Deleted
- 3.3.4.4 Deleted
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3.3.5 BUILDING DESCRIPTIONS

- 3.3.5.1 Deleted
- 3.3.5.1.1 Deleted
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- 3.3.6 Deleted
- 3.3.6.1 Deleted
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- 3.3.6.4 Deleted
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- 3.3.6.5 Deleted

## 3.3.7 REFERENCES

1. "Permanently Defueled Technical Specifications," Amendment No. 155 to License No. DPR-13, Issued December 28, 1993
2. "Permanently Defueled Technical Specifications," Amendment No. 163 to License No. DPR-13, Issued September 22, 2004

Table 3.3-1  
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3.4 REACTOR AUXILIARY BUILDING

## 3.4.1 INTRODUCTION

The Reactor Auxiliary Building contained the liquid and gaseous radwaste processing equipment and associated holdup tanks. A pipe tunnel connected the Reactor Auxiliary Building to the sphere piping penetration room (dog house). The Reactor Auxiliary building was a single story, partially embedded, reinforced concrete structure rising to about 6 feet above ground level. The northeast corner included a second story that was constructed of masonry walls, conventionally reinforced concrete walls and slabs, and structural steel floor framing.

The overall dimensions of the Reactor Auxiliary Building were approximately 134 feet by 60 feet. The northeast corner, which comprised an additional story, was approximately 32 feet by 41 feet.

The Reactor Auxiliary Building foundation was a reinforced mat, 2 feet 4 inches thick, 134 feet 4 inches long and 60 feet 2 inches wide, bearing directly on the San Mateo formation. The lowest elevation of the basemat was at (-) 4 feet 4 inches.

The area surrounding the Reactor Auxiliary Building was known as the "backyard." The backyard area included equipment which supported the reactor primary systems. The area was paved and fenced forming the controlled boundary of the former Radiological Control Area (RCA). The backyard provided access to the PASS lab, high rad storage vault, pipe tunnel, sphere penetration room, cryogenic building, ventilation building, and ion exchanger vault shield plugs. The Unit 1 RCA has been cleared for general use and no longer exists.

## 3.4.2 REACTOR AUXILIARY BUILDING PLANT STATUS

All structures, systems and components associated with the Reactor Auxiliary Building have been completely removed.

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## 3.4.3 PLANNED DECOMMISSIONING ACTIVITIES

The Reactor Auxiliary Building has been demolished.

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### 3.5 INTAKE STRUCTURE

#### 3.5.1 INTRODUCTION

The Pacific Ocean provided cooling water for SONGS 1 cooling systems and dilution water for liquid releases. Water was drawn from an offshore intake structure which rests on a foundation located 33 feet beneath the ocean bottom and rises vertically to a point about 10 feet above the ocean floor. The inside horizontal dimensions of the offshore intake structure are 16 by 21 feet. Two 12-foot inside diameter reinforced concrete pipes, extending about 3,200 feet and 2600 feet into the ocean, provided for the intake and discharge of seawater. These pipes are buried beneath the ocean bottom, with a minimum of 4 feet of sand cover over the top and 4 feet of rock cover surrounding the intake structure.

The intake pipe conveyed water to and from a concrete intake structure located on-shore. The intake structure was a Seismic Category A buried reinforced concrete structure that housed: (1) the components of the circulating water system, (2) the salt water cooling pumps which supported the component cooling water system and, (3) the tsunami pit. The intake structure foundation was a reinforced concrete slab, 3 feet 4 inches thick, 136 feet 3-1/2 inches long with a varying width, bearing directly on the San Mateo formation. The intake structure provided the structural transition from the pipes used to collect and discharge seawater for salt water cooling and to the ocean.

The intake tunnel consists of a 14-foot, 2-inch outside diameter intake pipe leading to a 12-foot square box culvert to two pump chambers, with a maximum open cross section of 12 feet high by 23 feet wide. The pump well, where the salt water pumps were installed, had a 23-foot high peripheral retaining wall, and the pump chamber top slab formed the base of the pump well.

The discharge tunnel was 10 feet, 8 inches by 12 feet cross-section and it led to the 14-foot, 2-inch diameter outfall tunnel.

The sea wall is a cantilevered sheetpile wall which runs along the western boundary of the site. It is protected with a 2-1/2 inch gunite coating which extends down to elevation 4 feet on the seaward face and down to 1 foot below finished grade on the landward face. The top and bottom elevations of the wall are 28.0 feet and (-) 8.0 feet respectively. The finished grade adjacent to the wall varies from elevation 14.5 feet to elevation 17.0 feet. The stone revetment on the seaward face extends from approximately elevation 5.0 feet to elevation 13.0 feet and is placed at an approximate 1.5:1 slope. The seawall is laterally supported by San Mateo sand.

The Domestic Water System consists of a header supplied with potable water which provides drinking water and other domestic water system needs. To eliminate any potential for contaminating the domestic water system, backflow preventer are installed upstream of all use points.

### 3.5.2 INTAKE STRUCTURE

All structures, systems and components associated with the Intake Structure, including the Circulating Water System and Salt Water System, have been removed from the site. The yard sump and overflow berm have been removed.

Except for the east wall of the intake structure circulation water pit, the entire structure was removed down to elevation 8 foot 6 inches. The east wall of the circulation water pit was removed down to grade which is approximately 13 foot 4 inches. The offshore circulating water conduits were sealed off in the Intake/Discharge Gate Structures by placing stop gates in the gate slots and slurry filling the structure up to 8 foot 6 inches. The remaining portions of the intake structure were filled up to elevation 8 foot 6 inches with 70 pcf minimum Elastizell. The Turbine Plant Cooling Water line was breached between the Concrete Junction Box and Anchor Block 2 and the Discharge Structure Gate structure, filling with slurry. The off-shore intake structure and tunnels were abandoned in place.

The seawall remains as the western security boundary of the North Industrial Area; it has no other design function.

The Domestic Water System remains in service throughout the site, however, it no longer interfaces with any SSC associated with Unit 1.

### 3.5.3 PLANNED DECOMMISSIONING ACTIVITIES

The Intake Structure and all associated equipment has been demolished or abandoned, and decommissioning is complete. On February 24, 2010 the NRC approved Amendment No.165 to the SONGS 1 Facility Operating License No. DPR-13. Under the provisions of 10 CFR 20.1402 "Radiological Criteria for Unrestricted Use," and 10 CFR 83 "Release of part of a Power Reactor Facility or Site for Unrestricted Use," the amendment released for unrestricted use approximately 7.5 acres of ocean bottom leased from the California State Lands Commission containing the abandoned SONGS 1 circulating water system submerged inlet and outlet conduits.

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### 3.5.8 REFERENCES

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### 3.6 TURBINE BUILDING

#### 3.6.1 INTRODUCTION

The Turbine Building consisted of four individual structural systems which surrounded the turbine pedestal. These four structural systems were the turbine building north and south extensions and east and west heater platforms. The Turbine Building area contained the main steam system, the turbine-generator unit, the electrical distribution system, compressed air system, and several other support systems related to power production.

The turbine building north extension was a one-story structural steel frame building with a mezzanine. It had approximate plan dimensions of 40 feet by 50 feet with an 8-1/2 inch thick prestressed concrete slab at elevation 42 feet, 0 inches, and a steel grating platform at elevation 30 feet, 0 inches. The west side of the turbine building north extension was adjacent to the fuel storage building. Doors in the east wall of the fuel storage building provided personnel access to the spent fuel pool area from the turbine building north extension, elevation 42 feet, 0 inches. Expansion joints were provided at the junctures between the turbine building north extension and other buildings, including the fuel storage building.

The turbine building foundation consisted of column spread and combined footings, bearing directly on the San Mateo formation. Footing width varies from 3 feet to 5 feet, while footing thickness varied from 2 feet, 6 inches, to 5 feet. Elevation of top of the footing varied from elevation 6 feet to elevation 17 feet, 7 inches.

#### 3.6.2 TURBINE BUILDING STATUS

The Turbine Pedestal Bottom mat, Anchor Blocks 1 and 2, intake culverts and discharge culverts have been abandoned. The anchor blocks, and the intake and discharge culverts have been filled with a 100 psi minimum slurry. The turbine pedestal foundation floor drains and the reheater pit sump and its drain line were filled with 100 psi slurry.

All other structures, systems and components associated with the Turbine Building have been removed from the site.

#### 3.6.3 PLANNED DECOMMISSIONING ACTIVITIES

The Turbine Building has been demolished.

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### 3.7 ELECTRICAL SYSTEMS

#### 3.7.1 INTRODUCTION

The electric system that served SONGS 1 was electrically independent of SONGS 2 and 3. Electrical isolation of most of the original electrical equipment was accomplished by the Cold and Dark modification. Under Cold and Dark, the station electrical system provided power to the facility from the SDG&E 12 kV system located at the Mesa. Substation "Gary" fed the North Construction load Center B34 and "Fran" fed Switchboard CD-5. Three motor control centers (CD1, CD2, CD3), fed from CD-5 were installed by Cold and Dark. Two 120-208 VAC distribution panels CD1-DP1 and CD3-DP2 were powered from MCC-CD1 and MCC-CD3.

#### 3.7.2 ELECTRICAL SYSTEM STATUS

The electrical system that served SONGS 1 has been dismantled, demolished or abandoned. The SDG&E 12 kV system, 480V system, and the 120 VAC systems have all been removed.

A new electrical distribution system has been installed to support the North Industrial Area. The system consists of 480VAC load center 2/3B57 fed from SDG&E 12kV line "Gary" which provides electrical power for the North Security Processing Facility and North Industrial Area Yard Drain Sump Switchboard 2/3B58. A separate 480V substation is fed from SDG&E 12kV line "Fran." This substation consists of Transformer X69A, Switchboard CD-5A, MCC-CD3A and 120-208VAC Distribution Panel CD3A-DP1. This substation supplies decommissioning loads and power to the Motor Operated gate MOG-1.

### 3.7.3 PLANNED DECOMMISSIONING ACTIVITIES

There are no AC power systems remaining in service for the SONGS 1 power plant. The AC power supply system installed and currently serving the North Industrial Area does not interface with any SSC associated with the Unit 1 facility.

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## 3.8 MONITORING AND COMMUNICATIONS

### 3.8.1 INTRODUCTION

A new Control Room was located in the HP/Operations Building (A52) for SAFSTOR and subsequent decommissioning. Plant conditions were monitored from the Control Room via a personal computer (PC). There were no control functions. Equipment was controlled locally by plant operators or, in a few cases, was automatically controlled.

### 3.8.2 MONITORING AND COMMUNICATIONS STATUS

After all Unit 1 spent fuel was transferred to the ISFSI, the control room was no longer required. Equipment control responsibility for the NIA was taken over by Operations.

### 3.8.3 PLANNED DECOMMISSIONING ACTIVITIES

Decommissioning activities related to plant monitoring and communications have been completed.

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### 3.9 FIRE PROTECTION

#### 3.9.1 INTRODUCTION

The fire protection program protected safety related equipment that was required to be operable for the safe shutdown of the operating plant. The Unit 1 fire protection capability included permanent detection and suppression equipment, mobile fire apparatus, and portable fire extinguishers. Additional fire protection features were in place to satisfy Nuclear Electric Insurance Limited (NEIL) Property and Loss prevention requirements and to provide defense-in-depth fire protection features for the surrounding structures. Administrative measures controlled the transient combustible materials and ignition sources.

#### 3.9.2 FIRE PROTECTION STATUS

All safety related equipment and buildings have been removed. Fire protection features were systematically abandoned and removed as fire hazards were eliminated and buildings were demolished. The fire protection system has been reduced to manual suppression capabilities throughout the Unit 1 North Industrial Area.

Fire protection requirements are established by SO123-FP-1, Fire Protection Program, which covers Units 1, 2 & 3. The reduced fire protection program requirements for the Unit 1 North Industrial Area include control of combustibles, control of ignition sources, and manual suppression capabilities, including firewater supply and fire brigade staffing. The fire protection system includes sprinkler systems in occupied structures, fire extinguishers, hydrants and hose valves. The water supply and pumping equipment are from Unit 2/3.

Additional details of the fire protection system are available in the historical Updated Fire Hazards Analysis (UFHA) Section 6. The fire zones and fire protection features are shown on drawing 83321. This drawing is provided for reference information only.

#### 3.9.3 PLANNED DECOMMISSIONING ACTIVITIES

The modification and/or removal of fire protection features will continue as conditions change during decommissioning. Significant decommissioning activities are reviewed by Fire Protection Engineering staff, who may require temporary or permanent fire protection features be established based on conditions at the time.

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3.9.6.1 Deleted  
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3.9.7 Deleted  
3.9.7.1 Deleted  
3.9.7.2 Deleted  
3.9.7.3 Deleted

3.9.8 REFERENCES

1. Deleted
2. Letter, Huffman (NRC) to Ray (SCE), Subject, "San Onofre Nuclear Generating Station - Unit 1- Issuance of Amendment Upon Transfer of All Spent Fuel Storage From The Spent Fuel Pool Into Dry Cast Storage (TAC No L52616)", dated September 22, 2004. Amendment No. 163 to Facility Operating License No DPR-13 for SONGS Unit 1.
3. Letter, McConnell (NRC) to Ridenoure (SCE), Subject, "San Onofre Nuclear Generating Station, Unit 1, Issuance of Amendment to Release the Off-Shore Portions of the Circulating Water System from the License," dated February 24, 2010. Amendment No. 165 to Facility Operating License No DPR-13 for SONGS Unit 1.

List of Figures Deleted from the SONGS Unit 1 DSAR

- Figure 3.1-1
- Figure 3.1-2
- Figure 3.1-3
- Figure 3.1-4
- Figure 3.1-5
- Figure 3.1-6
- Figure 3.2-1
- Figure 3.2-2
- Figure 3.2-3
- Figure 3.2-4
- Figure 3.2-5
- Figure 3.2-6
- Figure 3.2-7
- Figure 3.2-8
- Figure 3.2-9
- Figure 3.2-10
- Figure 3.2-11
- Figure 3.2-12
- Figure 3.2-13
- Figure 3.2-14
- Figure 3.2-15
- Figure 3.2-16
- Figure 3.2-17
- Figure 3.2-18
- Figure 3.2-19
- Figure 3.2-20
- Figure 3.3-1
- Figure 3.3-2
- Figure 3.3-3
- Figure 3.3-4
- Figure 3.6-1

Unit 1 Fire Area Boundaries and Fire Protection Features

Refer to the (Historical) UFHA Section 6 Docket 50-206

4.0 LICENSEE ORGANIZATION AND CONDUCT OF OPERATIONS

For a description of the Licensee Organization and Conduct of Operations for SONGS Unit 1, see SONGS Units 2&3 UFSAR Chapter 13.

## 5.0 RADIOACTIVE WASTE MANAGEMENT

### 5.1 CURRENT RADIOLOGICAL STATUS

The Radiation Protection (RP), Chemistry, and Environmental Organization monitors and controls the radiological status of the Unit 1 North Industrial Area (NIA) and decommissioning activities. The RP organization maintains current information on radiation and contamination levels within the Unit 1 NIA.

The SONGS Unit 1 NIA no longer contains an active Radiological Controlled Area (RCA). Radioactive waste handling and packaging activities are not currently being conducted in the NIA. With the completion of the ISFSI expansion, limited areas within the NIA may become available for future use in conjunction with the decommissioning of SONGS Units 2 and 3.

With all of the SONGS Unit 1 operating systems and above ground structures having been demolished and removed, there are no significant sources of radioactive waste or effluents emanating from the site of the former Unit 1 operating plant, nor have any significant emissions been detected from the ISFSI. As reported in the "Annual Effluent Release Report for the Independent Spent Fuel Storage Installation (ISFSI) – 2015," dated February 10, 2016, there were no releases of liquid or gaseous effluents to the environment from the SONGS ISFSI in 2015.

Although radioactive waste is not being processed currently at SONGS Unit 1, the processes described herein are commonly utilized at the SONGS site and may be conducted in the future within the SONGS NIA.

### 5.2 RADIOLOGICAL HISTORY

The radioactive waste management and disposal systems at SONGS 1 were designed to provide controlled handling and release or disposal of liquid, gaseous, and solid wastes generated. Plant personnel and the general public were protected from significant exposure to radiation from wastes.

Any releases of radioactive nuclides in either liquid or gaseous wastes discharged from the plant during decommissioning activities are a very small fraction of the quantity permitted under 10 CFR 20. Additionally, the objective is to meet the numerical guidelines outlined in 10 CFR 50, Appendix I, regarding "as low as is reasonably achievable."

Liquids were collected and processed by filtration prior to discharge to the ocean. The gas treatment systems were no longer required during decommissioning, as there were no significant sources of fission product gases. The radiation monitoring system for airborne discharges at SONGS Unit 1 was removed during demolition. Solid wastes were stored, packaged, and shipped offsite for either (1) direct disposal at licensed burial facilities or (2) volume reduction licensed waste processor(s).

Fuel cladding leakage occurred during several fuel cycles at SONGS 1. Monitoring programs such as primary chemistry, effluent chemistry and health physics detected fission product contamination and characterized the typical constituents of fission products and corrosion products. Activity of these isotopes could be found throughout systems that handled liquids and gases during normal operation.

RADIOACTIVE WASTE MANAGEMENT

The unit had a history of steam generator tube leakage. For this reason, secondary systems were considered suspect and were treated as such under the administrative programs. Similarly, liquid systems interfacing with known contaminated systems through heat exchangers were also considered suspect due to the possibility of tube leakage during operation. All plant sumps and drains were considered suspect, or were known to be contaminated, and were regarded as potentially contaminated.

In 2007, the Nuclear Energy Institute (NEI) established the NEI 07-07 "NEI Groundwater Protection Initiative" standard for monitoring and reporting radioactive isotopes in groundwater. There is no drinking water pathway for groundwater underneath the site, however SONGS implemented the groundwater protection industry standard. Initial ground water sample data indicated the presence of low but detectable levels of tritium in shallow ground water between the former Unit 1 sphere and fuel handling building, extending towards the seawall. The concentrations of tritium were well below all regulatory limits. The groundwater at that location was extracted through a dewatering process and discharged through the monitored Unit 2/3 release point. Groundwater monitoring has continued under the NEI 07-07 initiative.

With the cessation of operation in 1992, and the ensuing period of inactivity, the inventories and normal releases of radioactivity at SONGS 1 were greatly reduced from those which existed shortly after plant shutdown. The potential consequences of an accident or uncontrolled release of radioactive material from the site of the Unit 1 facility resulting from decommissioning, remain well below the regulatory limits applicable to the operating plant. Decommissioning activities are very conservatively bounded by the conditions that existed shortly after the operating plant was shutdown. These bounding values for activities, inventories and releases of radioactive products are included in Section 5.1 of Appendix A, "Historical Information," as a point of reference.

#### 5.2.1 SPENT FUEL POOL

All spent fuel assemblies and hardware have been transferred to the Independent Spent Fuel Storage Facility (ISFSI), and the Unit 1 Spent Fuel Pool has been demolished.

An activation analysis of the reactor vessel and its internals was performed to generate radioactivity levels in these components (Reference 2). The results expressed in units of curies were used to segment the waste into low level radioactive waste shipments for near surface disposal and Greater than Class C (GTCC) waste to be stored in the ISFSI. The total activity calculated for the vessel and non-GTCC internals as of 04/01/2002 was less than 5.0E+04 Curies. The total GTCC activity level calculated was less than 3.5 E+05 as of 04/01/2002. GTCC waste has been transferred to the ISFSI.

#### 5.2.2 DELETED

### 5.2.3 AIRBORNE RELEASES

Any airborne releases are well below the requirements of 10 CFR 20.106(b); 10 CFR 20 Appendix B Table II; and 10 CFR 50 Appendix I, as there is no remaining significant source of fission product gases.

All building structures that previously contained, handled, and or processed radioactive liquids and gases have been demolished. There are no more sources of noble gases or iodine. Local engineering controls are implemented to control the production of particulate airborne material for any potentially contaminated work and are assessed by local air sampling.

### 5.2.4 ESTIMATED DOSES FOR AIRBORNE RELEASES

Experience since plant shutdown has indicated that airborne radioactive releases are only a very small fraction of the allowable limits given in 10 CFR 20 Appendix B Table II.

### 5.2.5 LIQUID RELEASES

All Unit 1 plant liquid discharge systems have been demolished. Any liquid radwaste that would be created through future decommissioning activities is dispositioned per the site procedure SO123-XV-29. Precipitation runoff from the NIA, tritium dewatering outflows, and sewage plant overflows, is collected by the NIA Yard Sump, monitored, and directed to the Unit 2 outfall for release.

### 5.2.6 ESTIMATED DOSES FOR LIQUID RELEASES

The calculated dose or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas, is limited during any calendar quarter to  $\leq 1.5$  mrem to the total body and to  $\leq 5$  mrem to any organ and during any calendar year to  $\leq 3$  mrem to the total body and to  $\leq 10$  mrem to any organ. These dose allowances are in compliance with 10 CFR 50 Appendix I and 10 CFR 20.

### 5.2.7 DELETED

### 5.2.8 REFERENCES

1. San Onofre Nuclear Generating Station Radioactive Annual Effluent Release Report, June 1996.
2. SO1-207-1-M106, San Onofre Nuclear Generating Station Unit 1 Reactor Vessel and Internals Characterization, Report WMG-20004-9088.
3. "Annual Radioactive Effluent Release Report for Independent Spent Fuel Storage Installation – 2015, San Onofre Nuclear Generating Station Units 1, 2 and 3," dated February 10, 2016, Dockets 50-206, 50-362, 72-41.

RADIOACTIVE WASTE MANAGEMENT

5.3 DELETED

5.3.1 (DELETED)

5.3.2 (DELETED)

5.3.3 (DELETED)

5.3.4 DELETED

5.4 DELETED

5.5 SOLID WASTE

The handling of solid radwaste generated during all phases of Decommissioning is described in the following subsections.

The major source of dry active waste was debris generated by building demolition and material removed from the plant as a part of Decommissioning. Controlled dismantlement methods were used to minimize the radioactive waste volume produced and to prevent the spread of contamination.

5.5.1 DESIGN OBJECTIVES

The solid radwaste is packaged and stored until it is shipped offsite for permanent disposal at a licensed burial facility. The solid wastes are generated by dismantling and demolition activities.

The design objectives may be stated as follows:

- (1) To provide a means for collecting and processing the plant's radioactive waste streams in accordance with both regulatory and burial site criteria;
- (2) To maintain any potential radiation exposure to plant personnel and the environment, as a result of the packaging, within the dose limits of 10 CFR 20 and 10 CFR 50; and
- (3) To package the plant's solid radioactive wastes in conformance with the requirements of 10 CFR 61 and 10 CFR 71.

5.5.2 DELETED

5.5.3 SOLID RADWASTE EQUIPMENT AND PROCESSES

5.5.3.1 (Deleted)

5.5.3.2 (Deleted)

RADIOACTIVE WASTE MANAGEMENT

5.5.3.3 Dry Active Waste Collection and Processing

The radioactive trash collected from the plant radioactive work areas may contain compactible dry active waste, noncompactible dry active waste, wet waste, and protective clothing. These items are segregated and collected in their respective receptacles at the exit point of the contaminated work area. The trash is collected from these receptacles and is packaged according to its classification.

The collection containers (plastic bags) of dry active waste are inspected for other classes of waste such as noncompactible waste or "wet trash" before the dry active waste is loaded into a container. Compactible dry active waste is generally packaged and shipped offsite to a vendor who performs volume reduction.

The noncompactible waste is packaged in strong tight containers. After placing the maximum capacity of metallic objects in each box, the voids may be further filled by sifting sand/dirt or rubble into the box. The box is sealed and staged for shipment.

The wet trash is segregated and packaged into appropriate containers using appropriate operating procedures and controls to keep exposure ALARA.

The protective clothing collected from receptacles is packaged and transported offsite to a licensed facility for cleaning. If the protective clothing is determined to be not reusable, it is packaged according to directions for the disposition and burial offsite of compactible dry active waste or wet waste.

5.5.3.4 (DELETED)

5.5.3.5 Solidification Program for Wet Wastes

At present, the solidification of SONGS solid radwaste is not accomplished at the site. To ensure that the packaged waste would meet the burial site and regulatory requirements for packaging and shipping, the qualified service contractors must supply detailed information to SCE about the solidification process, the sampling program, verification for free standing water, and exothermic process considerations. The information is evaluated before the service contract is awarded. After the award of contract, any special procedures required for this operation, such as sampling to ensure solidification and verification of the free standing water, are reviewed and may be accepted or rejected.

5.5.3.5.1 (Deleted)

5.5.3.6 (Deleted)

5.5.4 PACKAGING

Before packaging, the solid radioactive waste is evaluated and classified in accordance with the requirements of 10 CFR 61. This classification determines the manner in which the solid radioactive waste is handled, packaged, labeled, and prepared for shipment in order to comply with all applicable regulations.

RADIOACTIVE WASTE MANAGEMENT

Several sizes of containers are used for packaging the radioactive solid waste. The dry active waste may be compressed into 55-gallon drums or, when noncompactible, packaged in strong tight containers of different dimensions. The wet solid waste materials are rendered dry prior to packaging and/or disposal.

The packaging containers conform to the applicable regulatory requirements of 10 CFR and 49 CFR and the criteria specified in the burial site licenses for receiving and burying solid radioactive waste.

#### 5.5.5 DISMANTLEMENT, DECONTAMINATION, AND DISPOSAL

During Decommissioning SCE may decontaminate and dismantle the contaminated structures, systems and components (SSC) by decontamination in place, dismantlement and decontamination, dismantlement and disposal, or a combination of these methods. Buildings will be dismantled and prepared for disposal. Appropriate methods will be selected for particular situations with the objectives of safely and efficiently removing the SSC while reducing contamination levels and worker exposure.

##### 5.5.5.1 Decontamination Methods

Contaminated systems and components are removed and sent to a processing facility or to a LLRW disposal facility. Onsite decontamination is generally limited to activities needed to maintain personnel exposure as low as reasonably achievable (ALARA), to expedite equipment removal, and to minimize the spread of contamination. Decontamination may also be conducted as part of volume reduction or as a step in the process to free release an item.

Fixation or removal of loose surface contamination is accomplished primarily by application of coatings and wiping. Airborne contamination control and waste processing systems are used, as necessary, to control and monitor such contamination if other methods are used, e.g., grit blasting or high pressure water. Openings in components are covered and sealed to minimize the spread of contamination as components are moved to packaging areas.

##### 5.5.5.2 Dismantlement

Controlled dismantlement methods are used to remove SSCs. Two basic types of dismantlement are mechanical and thermal.

Mechanical methods, those which machine the surfaces of the material being cut, typically do not generate significant amounts of contamination. This attribute makes these methods attractive for cutting contaminated piping and components. The outside diameter machining method is best suited for large bore piping. Smaller bore piping and supports can be cut using any of the mechanical methods, e.g., saws, reciprocating saws and hydraulic shears.

Thermal methods melt or vaporize the surfaces of the material being cut. The cutting debris is transported from the cut region with a gas jet or water spray. Although thermal methods are significantly quicker than mechanical methods, they generate airborne contamination. Contamination control and effluent control measures are implemented, as appropriate, to minimize worker exposure and the potential for an unmonitored effluent release. HP&E Position Paper "Airborne Effluent Controls During Decommissioning," dated September 27, 2000, provided additional guidance on effluent control measures to minimize airborne effluents.

RADIOACTIVE WASTE MANAGEMENT

5.5.5.3 Processing Building Debris and Dismantled Equipment

LLRW is processed in accordance with plant procedures and shipped to an offsite processing facility or LLRW disposal facility. No incineration will occur onsite.

Concrete which cannot be decontaminated is packaged and shipped to a LLRW disposal facility. Contaminated structural steel components may be removed to an onsite processing area for decontamination, volume reduction, and packaging for shipment to an appropriate facility.

5.5.5.4 Soil Remediation

Soils and asphalt pavement is surveyed and characterized in accordance with the Site characterization program. As necessary, soil and pavement is removed, processed, and disposed of at a licensed LLRW processing or disposal facility if determined to contain contamination levels above those required for compliance with 10 CFR 20, Subpart E.

5.5.6 STAGING, PROCESSING AND STORAGE FACILITIES

Several areas may be used for the processes of decontamination, segregation, storage and packaging radioactive waste. Section 6.1 describes the South Yard Facility (SYF), and the Units 2&3 Truck Bay. The description of the Multipurpose Handling Facility (MPHF), follows.

The MPHF is an in-process staging area for the accumulation of solid radwaste until it is released for shipment. The MPHF consists of an office building, a staging building, and an equipment pad. The facility is surrounded by a gated chain link fence. The MPHF is located at the southern edge of the SONGS owner-controlled area. The location of the facility with respect to SONGS 1 is presented in Figure 2.1.

The following subsections present a general overview of each area.

5.5.6.1 Office Building and Equipment Pad

The office building houses the office, control room, equipment room, and locker rooms, and also serves as the main personnel access to the MPHF. The equipment pad is on the east side and adjacent to the office building. Located on the equipment pad are the air handling units ductwork and effluent monitoring equipment for the staging building.

5.5.6.2 Truck Bay

The truck bay is 67 feet long and 12 feet wide and is surrounded by the loading dock and walkway areas, which are 4 feet above the floor level of the truck bay. The roll-up door opening is 14 feet high by 11 feet 6 inches wide.

Above the east walkway is a leaded glass view port that allows containers in the sample vault to be inspected. Also located in the truck bay is the sump discharge station, a personnel decontamination shower, and a frisking station. A ladder with a locking hatch cover leads from the walkway to the maintenance area. In the northwest corner of the truck bay is an emergency exit leading directly to the outside ground level.

5.5.6.3 Maintenance Area

The maintenance area is located east of the truck bay and serves as a work area and a shielding labyrinth. Housed there is the pump, the hydrogen purge station, the container decontamination spray system, and the swiper arm. A floor plug covers the sump drain valves and also serves as the sump lid.

Personnel access to the maintenance area is by way of a ladder extending from the truck by a walkway area. Access for containers is through an opening in the labyrinth west wall, 10 feet wide and covered with a sliding safety gate.

5.5.6.4 North Staging Area

The north staging area for the high specific activity containers of solid radwaste consists of the sample vaults, the main vault, and the floor staging area surrounding the vaults. Each sample vault is a separate cubicle with an individual lid. Access for containers is through an opening 11 feet wide in the labyrinth east wall. Personnel access to this area requires installation of a temporary ladder.

5.5.6.5 South Staging Area

In the south staging area, roll-up door 8 feet wide by 11 feet 11 inches high opens into 3200 square feet of floor space designed to accommodate pallets of drums and LSA boxes of dry active waste (low specific activity). An emergency exit is located at the east wall. Outside the roll-up door is an equipment storage room and the forklift charging station. The south staging area is section lined to provide a method of accountability and location for the packaged solid radwaste awaiting shipment.

5.5.7 SHIPMENT

Shipping casks and radwaste packages are used to transport the waste from the site to the burial ground. A contract trucking firm is hired to transport the shipping cask and radwaste packages to the burial site. Shipping casks waiting to be loaded are stored near the MPHf.

Depending on the activity level and waste classification, some of the dry active waste may be transported in a covered van or on a flatbed trailer without requiring placement in a shipping cask.

Intermodal containers and gondolas are used for shipping large components and bulk materials by rail.

5.5.8 DELETED

5.6 DELETED

5.6.1 DELETED

5.6.2 DELETED

5.6.3 DELETED

5.6.4 DELETED

5.6.5 DELETED

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RADIOACTIVE WASTE MANAGEMENT

TABLE 5-1  
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TABLE 5-2  
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TABLE 5-3  
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TABLE 5-4  
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TABLE 5-5  
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6.0 RADIATION PROTECTION

For a description of Radiation Protection for SONGS Unit 1, see SONGS Units 2&3 UFSAR Chapter 12.

7.0 SITE CHARACTERIZATION

SECTION 7 HAS BEEN DELETED IN ITS ENTIRETY

## 8.0 ACCIDENT ANALYSIS

### 8.1 INTRODUCTION

Unit 1 was licensed to operate in consideration of a spectrum of postulated accidents with offsite dose consequences. Decommissioning activities are permitted by this same license and are predicated on the objective of posing no greater risk to the public than that which existed when the reactor was operating. The guidelines selected by Southern California Edison to evaluate risk during Decommissioning are based on the conservative assessment that postulated accidents from Decommissioning activities are moderately frequent events, as described in Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)." The risk associated with an activity is acceptable if the potential accident dose consequences are a small fraction of the values established in 10 CFR Part 100, i.e., less than approximately 2.5 rem (whole body) and 30 rem (thyroid) for two-hour doses at the exclusion area boundary (EAB). (It should be noted that, due to the decay of fission product gases, the possibility of a significant thyroid dose no longer exists.)

All spent fuel assemblies have been removed from the spent fuel pools and transferred to the Independent Spent Fuel Storage Installation (ISFSI). The analysis approved for the operating plant license is considered as bounding for any associated decommissioning activities conducted at the Unit 1 site.

### 8.2 DELETED

#### 8.2.1 DELETED

#### 8.2.2 DELETED

#### 8.2.3 DELETED

#### 8.2.4 DELETED

#### 8.2.5 DELETED

#### 8.2.6 DELETED

### 8.3 LICENSING BASIS ACCIDENTS

#### 8.3.1 REQUIREMENT FOR DECOMMISSIONING

With all of the SONGS 1 operating plant above ground structures having been demolished and removed, and the spent fuel stored contained within the ISFSI, there are no significant design basis accidents remaining to be addressed under the operating plant license. Decommissioning activities conducted within the Unit 1 North Industrial Area are very unlikely to incur any significant dose risk to the public and are well bounded by the analysis accepted for the operating plant.

The moderately frequent event is considered an appropriate and conservative guideline for evaluating Decommissioning accidents because:

1. Decommissioning activities which have the potential to initiate an accident are carefully performed and controlled under existing site procedures and programs.

2. Decommissioning activities are comparable to previously accepted activities which were part of the operating plant licensing basis, e.g., processing radioactively contaminated ion exchange resins, managing the risk of radioactive exposure with an ALARA program.
3. The probabilities for specific accidents are low because the activities are performed infrequently.

### 8.3.2 EVALUATION OF ACCIDENTS DUE TO DECOMMISSIONING ACTIVITIES

Decommissioning activities, including dismantlement, demolition and waste handling, are reviewed to determine if the potential exists for an accident that might result in an unplanned release of radioactive material. Where the possibility of a release does exist, the accident is evaluated to ensure that the estimated dose consequences are a small fraction of 10 CFR Part 100. Decommissioning activities readily meet the above criteria.

Descriptions of potential accidents and results of the accident analyses are documented in the 10 CFR 50.59 evaluations for the subject activities. The assumptions and limitations presented in the evaluations are part of the SONGS 1 licensing basis for Decommissioning. The analyses of specific Decommissioning accidents with dose consequences within the moderate frequency guidelines will not be added to the DSAR.

8.3.3 DELETED

8.3.3.1 DELETED

8.3.3.2 DELETED

8.3.3.3 DELETED

### 8.3.4 ACCIDENTS THAT ARE NO LONGER RELEVANT

#### 8.3.4.1 Loss of Offsite Power (Loss of Spent Fuel Pool Cooling)

The Loss of Offsite Power (LOP) is no longer safety significant to the fuel storage facility since all fuel assemblies have been transferred to the ISFSI and the fuel storage facility has been demolished. Loss of offsite power cannot affect radiological releases and need not be analyzed for consequences in accordance with the criteria of Regulatory Guide 1.70, Revision 3.

8.3.4.1.1 DELETED

8.3.4.1.2 DELETED

#### 8.3.4.2 Operating Basis Accidents

Most of the accidents previously evaluated in UFSAR Chapter 15 for the operating plant were events that were directly related to power operation or the integrity of the reactor coolant system (RCS), such as turbine trip, loss of normal feedwater, rod ejection, fuel handling accident and steam generator tube rupture. Since the plant is permanently defueled and the RCS is demolished, such accidents are no longer applicable to Unit 1.

### 8.3.4.3 Fuel Handling Accident

A Fuel Handling Accident (FHA) is no longer credible since the spent fuel assemblies have been transferred to the ISFSI.

## 8.4 SUPPORTING CALCULATIONS AND STUDIES

The following evaluations were performed:

DC-3779      Removal of CREATS from the Unit 1 Permanently Defueled Technical Specifications

This evaluation determined the impact of not crediting the Control Room Emergency Air Treatment System (CREATS) with Unit 1 permanently defueled. Fuel Handling and SFP Loss of Cooling accidents (Unit 1), and the limiting Unit 2 radiological accident requiring site evacuation (LOCA), were considered. The results are no longer applicable as all spent fuel is stored in the ISFSI and the operational-period control room has been dismantled.

## 8.5 OTHER APPLICABLE EVENTS, NATURAL PHENOMENA, FIRES

Other events, natural phenomena, and fires that were relevant during power operation are not significant for Decommissioning and dismantlement. Natural phenomena (earthquakes, floods, tornadoes, tornado missiles), and fires were considered under the operating license requirements and bound any activity under Decommissioning.

The probability and consequences of these events are either reduced during Decommissioning or remain unchanged from those that applied when the reactor was licensed to operate.

Equipment brought on site for dismantlement activities, such as cranes, hoists, or other heavy vehicles will be located and/or secured when required by procedures, or other evaluations, such that they cannot become missiles during a tornado event. Fire protection for dismantlement activities will be under the same administrative procedures and controls employed throughout the site for construction activities.

In summary, the safety significance of natural phenomena (earthquakes, floods, tornadoes, tornado missiles) and fires is either reduced during Decommissioning or remains unchanged from that which applied when the reactor was licensed to operate.

## 8.6 REFERENCES

1. 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.
2. Letter, Harold B. Ray (SCE) to NRC Document Control Desk, "Docket No. 50-206, Amendment Application No. 211, Permanently Defueled Technical Specifications, San Onofre Nuclear Generating Station, SONGS 1," May 12, 1993.

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3. Letter, W. C. Marsh (SCE) to NRC Document Control Desk, "Docket No. 50-206, Amendment Application No. 211, Supplement 1, Fuel Storage Facility Thermal and Structural Analyses, Permanently Defueled Technical Specifications, San Onofre Nuclear Generating Station, SONGS 1," June 30, 1993.
4. Letter, W. C. Marsh (SCE) to NRC Document Control Desk, "Docket No. 50-206, Amendment Application No 211, Supplement 2, San Onofre Nuclear Generating Station, Unit 1", November 23, 1993.
5. Letter, D. L. Zeiman (NRC) to R. Dietch (SCE) "Systematic Evaluation Program Topic XV-20, Radiological Consequences of Fuel Damaging Accidents Inside and Outside Containment," January 17, 1980.

Table 8-1  
(Deleted)

Table 8-2  
(Deleted)