

BEFORE THE UNITED STATES NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA EDISON
COMPANY and SAN DIEGO GAS & ELECTRIC COMPANY
for a Class 104(b) License to Acquire,
Possess, and Use a Utilization Facility as
Part of Unit No. 1 of the San Onofre Nuclear
Generating Station

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DOCKET NO. 50-206
Amendment Application
NO. 200

SOUTHERN CALIFORNIA EDISON COMPANY and SAN DIEGO GAS & ELECTRIC COMPANY,
pursuant to 10 CFR 50.59, hereby submit Amendment Application No. 200.

This amendment consists of Proposed Change No. 249 to the Unit 1 Operating License No. DPR-13. Proposed Change No. 249 modifies the Operating License expiration date from March 2, 2004 to March 27, 2007 to reflect a 40-year operation from the date of issuance of the (Provisional) Operating License. SONGS 1 is currently licensed to operate for a period of 40 years from the date of issuance of the Construction Permit.

The guidelines set forth in 10 CFR 50.51 and Section 103.c of the Atomic Energy Act of 1954 allow issuance of facility operating licenses for up to 40 years measured from the date of issuance of the Operating License. Accordingly, the current Nuclear Regulatory Commission Policy is to issue Operating Licenses for a 40-year period commencing from the date of issuance of the Operating License (instead of the Construction Permit). If approved, the proposed change will extend the license expiration date from March 2, 2004 to March 27, 2007.

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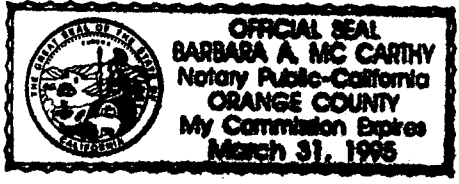
Subscribed on this 1st day of October, 1991.

Respectfully Submitted,
SOUTHERN CALIFORNIA EDISON COMPANY

By: *Harold B. Ray*
Harold B. Ray
Senior Vice President

Subscribed and sworn to before me this
1st day of OCTOBER 1991.

Barbara A. McCarthy
Notary Public in and for the
State of California



James A. Beoletto
Attorney for
Southern California Edison Company

By: *James A. Beoletto*
James A. Beoletto

ATTACHMENT 1

SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

**DESCRIPTION AND SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS
OF PROPOSED CHANGE NO. 249
TO FACILITY OPERATING LICENSE NO. DPR-13**

This is a request to revise the expiration date for the Facility Operating License No. DPR-13 for San Onofre Nuclear Generating Station Unit 1 (SONGS 1) from March 2, 2004 to March 27, 2007, and is submitted in accordance with 10 CFR 50.90. Item 2.F of the license will be revised to reflect the new expiration date.

Description of Change

SONGS 1 has been licensed to operate for a period of 40 years beginning with the issuance of the Construction Permit (March 2, 1964). Accordingly, the current SONGS 1 Operating License expires on March 2, 2004. The proposed change will extend the duration of the Operating License to 40 years from the date of issuance of the Operating License rather than from the date of issuance of the Construction Permit. The SONGS 1 (Provisional) Operating License was issued on March 27, 1967. The proposed change will therefore revise the expiration date of the Operating License from March 2, 2004 to March 27, 2007. Accordingly, Item 2.F of Operating License No. DPR-13 will be revised to state: "This license is effective as of the date of issuance and shall expire at midnight on March 27, 2007."

Discussion

BACKGROUND

SONGS 1 operation was initially authorized by a Provisional Operating License (POL) issued by the NRC's predecessor, the Atomic Energy Commission (AEC), on March 27, 1967. SCE subsequently submitted a request for conversion of the POL to a Full-Term Operating License (FTOL or simply the "Operating License"). The Operating License was issued on September 26, 1991.

The SONGS 1 Operating License authorizes plant operation for a period of 40 years commencing with the date of issuance of the Construction Permit (March 2, 1964). Accounting for the plant construction period, this represents an approximate effective Operating License term of only 37 years. This request for the Operating License amendment will provide for SONGS 1 operation for a period of 40 years from the date of issuance of the Operating License (i.e., in SONGS 1 case, 40 years from the date of issuance of the initial POL). The basis for granting this request for the amendment to SONGS 1 Operating License has been well-established in the NRC's regulations and policies, and practices since 1982.

REGULATORY GUIDANCE AND PRACTICES

Section 103.c of the Atomic Energy Act of 1954 authorizes issuance of facility operating licenses for a period of up to 40 years. Application of the 40-year period from the date of Operating License issuance is allowed by 10 CFR 50.51 which states, in part: "Where the operation of a facility is involved the Commission will issue the license for the term requested by the applicant or for the estimated useful life of the facility if the Commission determines that the estimated useful life is less than the term requested." Accordingly, the NRC has established that requests for operation for a 40-year term from the date of issuance of the Operating License may be granted, provided the Utility demonstrates that 40-year facility operation poses no safety problems, and that the Environmental Report unambiguously evaluates the environmental effects of 40-year operation.

Operating Licenses were issued for a period of 40 years starting from issuance of the Construction permit for plants licensed prior to 1982. Beginning from 1982, however, the NRC's policy has been to issue Operating Licenses for a 40-year period commencing with the date of issuance of the Operating License. This includes not only plants that were newly licensed, but also those earlier plants that applied for amendments to their Operating Licenses extending their license expiration date to 40 years from the date of the Operating License. Yankee Rowe, Haddam Neck, and Vermont Yankee are plants of similar vintage to SONGS 1 which applied for and received license amendments extending their license expiration dates.

BASIS FOR SONGS 1 LICENSE EXTENSION

In consideration of SCE's request for the conversion of the POL to the FTOL with an expiration date of March 2, 2004, the NRC determined that the conclusions reached in the existing SONGS 1 Final Environmental Statement are still valid. No additional environmental concerns attributable to the Operating License extension from March 2, 2004 to March 27, 2007 have been identified by SCE. Therefore, an extension to the Operating License through March 27, 2007 is not expected to have any impact on the existing SONGS 1 environmental analyses.

The current maintenance, surveillance, inspection, and testing practices at SONGS 1 provide assurance that any degradation of plant equipment will be identified and corrected throughout the operating life of the plant. SONGS 1 is fully expected to remain useful beyond the current Operating License expiration date, and to continue to enhance the economic health and well-being of SCE's service area.

Significant Hazards Consideration Analysis

In accordance with 10 CFR 50.91(a)(1), the following analysis is provided to demonstrate that the proposed change does not represent a significant hazard consideration. According to 10 CFR 50.92(c), the proposed change discussed above is deemed to involve a significant hazards consideration if there is a positive finding in any one of the following areas:

1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The purpose of the proposed license amendment is to provide for a 40-year license period from the date of the Operating License instead of the Construction Permit. No changes to the plant design or operation are involved. No changes to plant procedures or Technical Specifications will be required. Current plant maintenance, surveillance, inspection, and testing procedures and practices will ensure that equipment important to safety will function properly throughout the operating life of the plant. Any age-related degradation will be identified and corrected before it occurs. Therefore, operation of the facility in accordance with this proposed change does not involve a significant increase in the probability of an accident previously evaluated.

Assumptions and conclusions in the existing environmental analyses with regard to impact on the general public will not be altered by the proposed change. Therefore, operation of the facility in accordance with this proposed change does not involve a significant increase in the consequences of an accident previously evaluated.

2. Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any previously evaluated?

Response: No.

As discussed earlier, the proposed change does not alter the design or operation of the plant. Procedures are in place to identify and correct any age-related degradation before it occurs. Therefore, operation of the facility in accordance with this proposed change will not create the possibility of a new or different kind of accident from any previously evaluated.

3. Will operation of the facility in accordance with the proposed change involve a significant reduction in the margin of safety?

Response: No.

The proposed change has no impact on the existing safety analyses, Technical Specifications, or the operating and maintenance procedures. The existing surveillance, inspection, test, and maintenance procedures and practices at SONGS 1 will ensure that any age-related degradation is identified and corrected before it occurs, thus maintaining the existing margins. Therefore, operation of the facility in accordance with the proposed change will not involve a significant reduction in the margin of safety.

Safety and Significant Hazards Determination

Based on the above safety analysis it is concluded that: 1) the proposed change does not provide significant hazards considerations as defined by 10 CFR 50.92; 2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change; and 3) the proposed change will not result in a condition which significantly alters the impact of the station on the environment as described in the NRC Final Environmental Statement.

ATTACHMENT 2

SAFETY AND ENVIRONMENTAL ASSESSMENT

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1.0 SUMMARY AND CONCLUSIONS

The guidelines set forth in 10 CFR 50.51 and Section 103.c of the Atomic Energy Act of 1954 allow issuance of facility operating licenses for up to 40 years measured from the date of issuance of the Operating License (OL). Accordingly, the Nuclear Regulatory Commission (NRC) has issued operating licenses for a 40-year period commencing from the date of issuance of the Operating License since 1982. Previously, the 40-year license period commenced with the date of the Construction Permit.

The current OL for San Onofre Nuclear Generating Station Unit 1 (SONGS 1) expires on March 2, 2004, 40 years from the date of issuance of the Construction Permit. An OL commencing from the date of its issuance will extend the OL expiration date from March 2, 2004 to March 27, 2007. An assessment of the impact due to this extension has been performed. The results show that the extension to the SONGS 1 OL would not result in any adverse impact on the public safety or the environment.

2.0 ASSESSMENT OF SAFETY IMPACTS

The purpose of this safety assessment is to confirm that the proposed extended period of operation is bounded by the original plant design and operational considerations. The plant has been either designed for a 40-year operation, or is subject to surveillance and maintenance requirements that provide assurance that any age-related degradation will be detected and corrected. Only the reactor pressure vessel is considered a non-replaceable component during the life of the plant. SCE's evaluation of the vessel demonstrates that the vessel will continue to maintain its integrity during the extended period of operation. The following sections contain discussion on the reactor pressure vessel integrity, requirements for environmental qualification of safety-related electrical components, and continued fuel storage and waste disposal requirements. Most of the information that follows is derived from material previously provided to the NRC.

2.1 Reactor Pressure Vessel Analysis

Criteria for evaluating the effects of radiation on reactor vessel materials are set forth in 10 CFR 50 Appendix G; proposed amendment of the PTS Rule, 10 CFR 50.61; and Regulatory Guide 1.99 Revision 2. SCE has evaluated the impact of the proposed license extension on the requirements of these documents. The results show that the proposed extension to the SONGS 1 license expiration date will not have any significant impact on the reactor vessel or the vessel materials.

Evaluation of SONGS 1 reactor vessel materials for Pressurized Thermal Shock (PTS) considerations included use of plant specific core power distributions for the first ten operating fuel cycles to develop the neutron source distribution in the reactor core. The results of the transport calculations based upon these calculated neutron source distributions were correlated with neutron dosimetry measurements from the first three surveillance capsules withdrawn from the reactor to establish an overall best estimate of the current fluence at the vessel wall. These exposure evaluations accounted for variations in core power level and coolant temperature that have occurred during the plant lifetime. This information was then used to predict vessel material properties for additional exposure.

The PTS evaluation for SONGS 1 used the PTS rule which became effective May 15, 1991. The new reference temperature (RT_{PTS}) values were determined for 27 and 48 Effective Full Power Years (EFPY). The screening criteria are 270°F for plate materials and 300°F for weld materials. The analysis determined that the SONGS 1 reactor vessel RT_{PTS} will remain within the screening criteria values for fluence values equivalent to 48 EFPY.

The estimated EFPY for reactor operation through March 27, 2007 is based upon a production factor of 70% for future cycles and a cycle length of 500 days along with burnup data for Cycles 1 through 11. Based upon these inputs, the estimated equivalent EFPY for operation through the extended period is 22.8. Since the reactor vessel has been evaluated for a fluence equivalent to 48 EFPY and the RT_{PTS} screening criteria are met, the proposed license extension will have no significant impact on RT_{PTS} .

Evaluation of the Adjusted Reference Temperature (ART) was performed for 16 and 24 EFPY in accordance with requirements of Regulatory Guide 1.99, Rev. 2. The calculated ART for the most limiting material is 194°F at a fluence equivalent to 24 EFPY. The acceptable value of ART according to 10 CFR 50 Appendix G and Regulatory Guide 1.99, Rev. 2 is 200°F. Since the equivalent fluence for operation through the extended period corresponds to 22.8 EFPY and the ART criteria are met at this condition, the proposed license extension will have no significant impact on the Adjusted Reference Temperature.

10 CFR 50 Appendix G requires a material Upper Shelf Energy (USE) of 50 ft-lbs. Applying NRC approved methodology to projections for future fracture toughness, the limiting USE of 50 ft-lbs would occur at approximately 24.7 EFPY. It is noted that the USE of SONGS 1 reactor vessel materials have not changed significantly since the middle of fuel Cycle 3. Since the projected equivalent EFPY for operation through the extended period is 22.8 EFPY, the proposed license extension will have no significant impact on the material Upper Shelf Energy.

2.2 Environmental Qualification Considerations

The Environmental Qualification (EQ) Program at SONGS 1 is established to address the requirements of the DOR Guidelines (Enclosure 4 to IEB 79-01B) and 10 CFR 50.49. The purpose of this program is to establish and maintain the

qualification documentation in order to provide assurance that the equipment is designed to meet, and is compatible with, the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents. Consistent with these regulatory documents, the EQ program for SONGS 1 has established a qualified life for all of the important to safety electrical equipment which are relied on to function during and following design basis accidents. Equipment with a qualified life less than the plant life is systematically rebuilt or replaced to ensure that the EQ equipment will remain operational throughout the operating life of the plant.

The incorporation of any maintenance and replacement requirements needed to maintain the qualified status of equipment has been procedurally defined to ensure that these requirements are integrated into the SONGS Preventive Maintenance Program. Periodic surveillance and testing programs are also used to detect any unanticipated age-related degradation that could affect the functional capability of the equipment. Feedback from these programs is used to modify the designated qualified life. The EQ is therefore considered to be a "living" program.

The EQ program for SONGS 1 currently utilizes a plant design life of 35 years based on the Retrofit General Design Criteria (M37387). The start of the qualified life for original plant equipment is defined as initial criticality, or June 14, 1967 for SONGS 1. For equipment installed after initial criticality, the start of the qualified life is taken as the date of installation to track maintenance activities and end of life replacement requirements. In order to ensure equipment operability through the proposed extended operation, equipment which are currently defined as having a life of 35 years or greater will be reviewed to identify those whose qualified life may expire prior to the proposed end of plant life, March 27, 2007. An evaluation will be performed on any equipment found in this category to either extend the qualified life or to define a replacement requirement to ensure continued operability of the equipment.

2.3 Spent Fuel Storage

SONGS 1 was originally designed to operate on 12-month fuel cycles with annual refueling outages. Advancements in fuel design have allowed the SONGS 1 fuel cycle lengths to be extended to 18 months without increasing the number of fuel assemblies per reload batch. The increased cycle length has reduced the number of refueling outages necessary during the lifetime of the plant, thereby reducing the number of fuel assemblies that will be discharged throughout the 40-year plant operating life. Based on this, the total number of fuel cycles before the current Operating License expiration date (March 2, 2004) is projected to be 16. Extending the Operating License to March 27, 2007 will increase the number of fuel cycles by 2, for a total of 18 cycles over the licensed lifetime.

SONGS 1 is currently operating in Cycle 11. When the refueling outage for Cycle 11 was completed, a total of 508 spent fuel assemblies had been removed from the reactor. Of these, 270 have been shipped to the GE reprocessing

facility in Morris, Illinois (from 1972 to 1980); 70 have been placed in the Unit 2 spent fuel pool; and 69 have been placed in the Unit 3 spent fuel pool. The remaining 99 fuel assemblies are located in the Unit 1 spent fuel pool. The SONGS 1 spent fuel pool has the capacity to store a total of 216 unconsolidated assemblies. With the 99 assemblies currently being stored, the fuel pool has the capacity for an additional 117 fuel assemblies. This available capacity will support two additional refuelings without the need to transfer any spent fuel from the pool. This would sustain operation until 1997.

Under the Nuclear Waste Policy Act, the U. S. Department of Energy (DOE) is obligated to accept spent nuclear fuel from commercial power plants beginning in 1998. Since a permanent Federal repository will not be available before 2010, the DOE has indicated that spent fuel will initially be retained in one or more Monitored Retrievable Storage Facilities. In order to bridge the period from 1997 until spent fuel begins to be accepted by the DOE (whether in 1998 or later), SONGS 1 spent fuel can be: (1) temporarily stored in the SONGS 2 and 3 spent fuel pools, (2) stored in higher density racks which can be installed in the SONGS 1 spent fuel pool, or (3) consolidated so as to occupy less space, thereby increasing the volume of spent fuel which can be stored in the existing SONGS 1 racks. These alternatives provide assurance that sufficient capacity exists to store SONGS 1 spent fuel associated with operation through 2007.

2.4 Radioactive Waste Management and Disposal

The normal radwaste systems at SONGS 1 are designed and modified to ensure that the exposures from the wastes are kept to a minimum and within regulatory guidelines. These criteria are also followed in processing, storing, and shipping of radioactive wastes at SONGS 1. By virtue of the system capabilities and the waste management practices and procedures, the exposures to the public from radioactive wastes will continue to be maintained within regulatory guidelines during the proposed extended period of operation.

RADWASTE SYSTEMS

The radioactive waste management and disposal systems at SONGS Unit 1 are designed to provide controlled handling and release or disposal of liquid, gaseous, and solid wastes generated during plant operation. The liquid, gaseous, and solid radwaste systems are designed so that plant personnel and the general public are protected from significant exposure to radiation from wastes, in accordance with limits defined in 10 CFR 20. During normal operation, the objective is to meet the numerical guidelines outlined in 10 CFR 50, Appendix I and the concept of "as low as is reasonably achievable" (ALARA). Several modifications to the radwaste systems and procedural changes have been made to incorporate lessons learned from operating experience.

RADWASTE PROCESSING AND STORAGE

Liquids are collected in the containment sphere sump, reactor auxiliary building sump, post-accident sampling system sump, and the reactor coolant system drain tank. The normal processing path includes transfer of liquids to the hold-up tanks, through filters, ion exchangers, and a radiation monitor to the circulating water system outfall. An alternate path includes collection in the monitor tanks, filtration and discharge through a radiation monitor.

Radioactive gaseous wastes generated during plant operation are routed to the waste gas surge tank via the gas collection header. The gases are then compressed into a waste gas decay tank. After sufficient decay time, the gas decay tank is aligned through a pressure control valve, a flow indicator, and a radiation monitor to the plant vent stack. Upon high radiation signal from the radiation monitor, or on loss of vent stack flow, the discharge is terminated.

The solid radioactive waste system collects inputs for processing, packaging and disposal, including spent ion exchange resin, spent filter cartridges and miscellaneous dry active wastes such as contaminated paper, rags, clothing, filter media, tools, etc. Spent resin is accumulated in the spent resin tank until the tank is filled to the appropriate level. At that time, the resin is transferred into High Integrity Containers (HIC), dewatered using a portable unit, and prepared for shipment to a licensed burial facility.

Spent filter cartridges are evaluated to determine the appropriate type of packaging (HIC, compaction, etc.) to meet the applicable regulations for packaging, shipping, and disposal site criteria. Dry active waste is essentially trash from radioactive work areas in the plant and includes both compactible items such as paper, clothing, plastic, etc. and non-compactible items such as used tools, piping, rubble, etc. Compactible items are compacted in drums and non-compactible items are placed into boxes suitable for transport and burial. Packaging of the solid waste is in conformance with the requirements of 10 CFR 61 and 10 CFR 71.

RADWASTE SHIPPING

The quantity of radioactive waste stored onsite for extended periods of time is minimized at SONGS 1. After the waste is properly packaged, it is transported to the Multi-Purpose Handling Facility (MPHF) for staging in preparation for shipment. Upon processing of shipping papers, the waste is loaded onto trucks and shipped to a licensed burial facility. Table 1 contains a summary of information on the volume and curie content of solid radwaste shipped offsite during the years 1968 through 1990.

TABLE 1
SOLID RADWASTE SHIPMENTS

	Resin, filters	Dry Active Waste	Other
1967	None	None	None
1968	None	10.83 m ³ , 1.46 Ci	None
1969	None	19.96 m ³ , 4.05 Ci	None
1970	2.12 m ³ , 2.0 Ci	38.49 m ³ , 8.47 Ci	0.623 m ³ , Note 1
1971	None	22.83 m ³ , 1.19 Ci	None
1972	5.66 m ³ , 72.0 Ci	130.9 m ³ , 7.67 Ci	None
1973	None	112.7 m ³ , 381 Ci	None
1974	None	68.1 m ³ , 230 Ci	None
1975	None	79.6 m ³ , 26 Ci	None
1976	None	144.4 m ³ , 698 Ci	None
1977	None	369 m ³ , 60.2 Ci	None
1978	None	182.8 m ³ , 8.78 Ci	None
1979	None	83.5 m ³ , 92.4 Ci	None
1980	Note 2	712 m ³ , 383 Ci	None
1981	16 m ³ , 13.5 Ci	1602 m ³ , 623 Ci	None
1982	6.22 m ³ , 63.0 Ci	489 m ³ , 12.17 Ci	431.7 m ³ , .067 Ci
1983	19.8 m ³ , 217 Ci	176.9 m ³ , 6.35 Ci	135.9 m ³ , 3.26 Ci
1984	None	194.2 m ³ , 15.1 Ci	97.3 m ³ , 0.239 Ci
1985	None	136.3 m ³ , 5.05 Ci	44.0 m ³ , 1.0 Ci
1986	4.02 m ³ , 370 Ci	240.7 m ³ , 11.6 Ci	5.94 m ³ , 0.43 Ci
1987	4.02 m ³ , 25.7 Ci	29.98 m ³ , 22.5 Ci	2.90 m ³ , 1.64 Ci
1988	None	28.9 m ³ , 2.70 Ci	1.912 m ³ , 1.37 Ci
1989	39.4 m ³ , 1693 Ci	72.8 m ³ , 2.42 Ci	6.48 m ³ , 23.8 Ci
1990	None	58.05 m ³ , 4.40 Ci	.0567 m ³ , 8.34 Ci

Note 1: Contaminated wood, activity included in Dry Active Waste total
 Note 2: For 22 resin shipments in 1980 and 1981, no volume or activity reported

3.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS

SONGS 1 had been operating under a Provisional Operating License (POL) since March 27, 1967 until a Full-Term Operating License (FTOL) was issued in September of 1991. In consideration of SCE's request for the conversion of the POL to the FTOL with an expiration date of March 2, 2004, the NRC determined that the conclusions reached in the existing SONGS 1 Final Environmental Statement (FES) are still valid. No additional environmental concerns attributable to the Operating License extension from March 2, 2004 to March 27, 2007 have been identified by SCE. Therefore, an extension to the Operating License through March 27, 2007 is not expected to have any impact on the existing SONGS 1 environmental analyses.

3.1 Environmental Report/Final Environmental Statement

Both the SONGS 1 Environmental Report (ER) and the NRC's Final Environmental Statement were issued in accordance with applicable regulations implementing the requirements of the National Environmental Policy Act (NEPA) of 1969. A 40-year plant life was assumed in these reports in evaluating the impact of plant operation on the surrounding environment.

SONGS 1 impact on the environment due to the extended operation will continue to be minimal, since the assumptions in the ER and the FES with regard to land uses and the population projections are still valid. The low population zone for SONGS 1 is 1.95 miles, established to ensure that the guidelines of 10 CFR 100 are met with respect to the low population zone and the population center. Land uses within this low population zone are expected to remain unchanged from the FES evaluation until 2010. Assumptions in the FES with regard to population estimates around SONGS 1 will also remain unchanged. A more detailed discussion of this subject is contained in Section 3.2.

The FES was issued by the NRC in 1973. In connection with SCE's request to convert SONGS 1 Provisional Operating License to an FTOL, SCE provided in February 1986 and August 1991 updated information relevant to the findings and conclusions contained in the 1973 FES. Based on the updated information, the NRC issued an Environmental Assessment in September 1991 which updated the 1973 FES. In this assessment, the NRC determined that the conclusions reached in the FES with regard to the license conversion are still valid. Based on this determination, the NRC issued an FTOL for SONGS 1 authorizing operation until March 2, 2004, 40 years from the issuance date of the Construction Permit.

3.2 Impact on General Public

Assumptions made in the FES with regard to population estimates in the vicinity of SONGS 1 remain unchanged. This section contains a discussion on the population projections and dose consequences from effluents.

POPULATION PROJECTIONS

The nearest population center to SONGS 1 as defined in 10 CFR 100 is the city of San Clemente. The nearest residence within the city limits of San Clemente is the Cotton Point housing project (former Richard Nixon estate). It is located approximately 2.6 miles from the SONGS 1 reactor. According to the San Clemente Planning Department, there is no potential for future residential population south of Cotton Point.

Within a 10-mile radius from SONGS 1, most of the population is projected to reside between 5 and 10 miles. In 1980, approximately 64% of the residents within 10 miles of the plant site were living at least 5 miles from the site. The remainder of the area within the 10-mile radius falls within the boundaries of the U. S. Marine Corps (USMC) base at Camp Pendleton. Population forecast at the base shows that the increase will be slight through 2020.

Within a 5-mile radius of SONGS 1, the USMC boundary contains military housing. The plant site is surrounded by Camp Pendleton on the landward side. Agricultural activity within a 10-mile radius of the station includes San Clemente ranch at a distance of 1.9 miles from SONGS 1. Within Camp Pendleton, over 1,000 acres are under lease for cultivation of crops. Conversion of this land for park and campground use is not expected.

The following is a table of cities nearest to SONGS 1 and their population.

<u>CITY</u>	<u>DISTANCE (MILES)</u>	<u>POPULATION (1970)</u>	<u>POPULATION (1980)</u>	<u>POPULATION (1990)</u>	<u>POPULATION CHANGE(1)</u>
San Clemente	4.0, NW	17,063	27,325	40,400	4.31
Mission Viejo	10.0, NW	12,073	-	75,500	9.17
SJ Capistrano	10.5, NW	3,781	18,959	25,250	9.49
Oceanside	17.0, SE	39,100	76,698	125,800	5.84
USMC	12.0, SE	11,000	-	33,758	5.61

(1) This represents actual population change per year from 1970 in percent.

Based on the 1970 population figure, populations for 1980, 1990, 2000, 2010, and 2020 within the 50-mile radius from the plant are projected as follows:

<u>YEAR</u>	<u>TOTAL POPULATION</u>
1980	5,555,185
1990	6,929,040
2000	7,327,750
2010	8,356,850
2020	9,755,850

DOSE CONSEQUENCES FROM EFFLUENTS

Calculations for doses at the site boundary due to liquid and airborne effluent releases have been performed since the adoption of 10 CFR 50 Appendix I criteria in 1985. These data are contained in Semiannual Radioactive Effluent Release Reports, and have been submitted to the NRC. The data on curies of liquid and airborne effluent discharged since 1967 have also been submitted. There have been no occurrences of liquid or airborne noble gas releases exceeding the instantaneous limits contained in SONGS I Technical Specifications.

The activity in the liquid and airborne effluents has been maintained below the Technical Specification limits, and overall, the trend has been downward. This reflects SCE's increased emphasis on equipment leakage reduction, improved waste segregation, enhanced waste processing, and aggressive failed fuel identification efforts utilizing RCS fission product monitoring and failed fuel locating techniques. The downward trend in the liquid and airborne effluent activity is expected to continue during the remainder of the life of the plant.

The calculated doses from liquid and airborne effluents have also been maintained below the Technical Specification limits, and below 10 CFR 50 Appendix I guidelines since their issuance. The trend in the liquid and airborne effluent doses have also been downward, and is expected to continue during the remainder of the life of the plant.

During the period from 1971 (when spectrometric analyses began) to 1990, 936 samples of marine species have been analyzed. Approximately 10% of the samples analyzed were found to contain concentrations of station related radionuclides greater than the lower limit of detection (LLD) of the equipment. However, the average doses for the period 1971-1990 were much lower than the guidelines of 10 CFR 50, Appendix I. Since environmental samples of the airborne pathway are generally lower than those for the waterborne path, the doses from that pathway are also expected to be insignificant.

3.3 ALARA Considerations

SCE has implemented a health physics program to ensure that personnel radiation exposure and offsite doses are kept as low as is reasonable achievable (ALARA) and within regulatory guidelines. The ALARA policies and practices are implemented through a training program and through operating, maintenance, and health physics procedures.

PROGRAM OBJECTIVES

The objectives of the health physics and effluents programs are as follows:

- A. To provide administrative control of persons on the site to ensure that personnel exposure to radiation and radioactive materials is within the guidelines of 10 CFR 20 and that such exposure is kept ALARA;
- B. To provide administrative control over station effluent releases to ensure that these releases are below 10 CFR 20 values and that they do not exceed the values given in the plant Technical Specifications; and
- C. To provide technical support during plant emergencies to limit any radiological consequences of those emergencies.

PROGRAM IMPLEMENTATION

The health physics program objectives are accomplished by means of a Radiation Protection Program consisting of specific rules, practices, and procedures. The Radiation Protection Program was initiated at SONGS 1 when radioactive material licensed to SCE was first brought into SONGS 1, and will remain in effect continuously until the unit is decommissioned. The program is consistent with the recommendations of NRC Regulatory Guides 8.2 and 8.8.

The practices used to implement the program are as follows:

- Personnel monitoring
- Radioactive Materials Safety Program
- Radiation Protection Training
- Radiation and Contamination Surveys
- Procedures and Methods to Maintain Exposures ALARA
- Access and Stay Time Control
- Contamination Control
- Airborne Activity Control

3.4 Personnel Radiation Exposure

The total average annual collective exposure and dose per worker for SONGS 1 is given in Table 2 for 1969 through 1990. These data for other commercial pressurized water reactors (PWRs) and commercial light water reactors (LWRs)

are also given for the same time period for comparison.

Personnel radiation exposure at SONGS 1 has generally been lower than industry averages for Pressurized Water Reactors (PWR's). As can be seen from Table 2, personnel exposures from 1969 through 1975 (no data are available prior to 1969) and during the years 1978, 1979, 1983, 1985, 1987, and 1989 were well below industry averages. The higher exposures during the other years of SONGS 1 operation can be attributed to repairs, upgrades, and other NRC-mandated backfits during extended outages. Even with major outages, exposures at SONGS 1 have averaged 298 person-rem per year since 1983, well below the industry PWR average of 407 person-rem per year.

Major seismic support upgrades and significant steam generator repairs contributed to the higher exposures in 1976 and 1977. The high personnel exposures in 1980 and 1981, were due to a major refueling outage in which NRC-mandated post-TMI backfits and dose intensive steam generator tube sleeving project were implemented. During 1982 through 1984, further NRC-mandated backfits were implemented including post-TMI improvements and RCP lube oil collection system modification. During this period, more upgrades to seismic supports were completed, in addition to steam generator inspections and repairs. Work during the refueling outage in 1986 included addition of a dedicated safe shutdown system and significant environmental qualification efforts. There was a major mid-cycle outage and a refueling outage in 1988. Finally, activities during the Cycle XI refueling outage in 1990 included thermal shield repairs and replacement of a RCP shaft.

TABLE 2
COLLECTIVE EXPOSURES AND DOSE PER WORKER

YEAR	COLLECTIVE EXPOSURE (PERSON-REM)			DOSE PER WORKER (REM)		
	SONGS 1	PWR's	LWR's	SONGS 1	PWR's	LWR's
1969	42	165	178	0.34	0.80(1)	0.89(1)
1970	155	684	350	0.62	0.82(1)	0.60(1)
1971	50	307	280	0.41	1.01(1)	0.71(1)
1972	256	464	365	0.79	1.11(1)	1.02(1)
1973	353	783	582	0.62	1.00	0.94
1974	71	331	404	0.32	0.70	0.75
1975	292	318	475	0.69	0.76	0.82
1976	880	460	499	0.66	0.79	0.75
1977	847	396	570	0.86	0.65	0.77
1978	401	429	497	0.52	0.64	0.69
1979	139	516	597	0.27	0.56	0.62
1980	2387	578	791	0.78	0.52	0.67
1981	3223	652	773	1.11	0.61	0.66
1982	823(2)	578	705	0.27(3)	0.53	0.62
1983	110(2)	592	753	0.09(3)	0.56	0.66
1984	474(2)	552	708	0.13(3)	0.49	0.56
1985	158(2)	424	525	0.13(3)	0.41	0.46
1986	506(2)	391	479	0.23(3)	0.37	0.42
1987	123(2)	371	423	0.33(3)	0.38	0.39
1988	381(2)	336	400	0.34(3)	0.36	0.40
1989	234(2)	292	342	0.25(3)	-	-
1990	399(2)	294	-	0.37(3)	-	-

(1) Corrected for plants that did not report number of personnel who received measurable doses

(2) Based on Pocket Ion Chamber (PIC) readings adjusted for PIC over-response

(3) Average doses for SONGS 1, 2, and 3

4.0 REFERENCES

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