

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Application of Southern California Edison)
Company (U 338-E) for Authorization: (1) to)
replace San Onofre Nuclear Generating Station)
Unit Nos. 2 & 3 (SONGS 2 & 3) steam)
generators; (2) establish ratemaking for cost)
recovery; and (3) address other related steam)
generator replacement issues.)

A. 04-02-____

PROPONENT'S ENVIRONMENTAL ASSESSMENT

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PROPONENT'S ENVIRONMENTAL ASSESSMENT FOR REPLACEMENT OF THE SONGS 2 & 3 STEAM GENERATORS



Prepared for

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$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
°F	degrees Fahrenheit
ACEC	Area of Critical Environmental Concern
ACOE	Army Corps of Engineers
BACT	Best Available Control Technology
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCGT	combined cycle gas turbine
CDMG	California Department of Mines and Geology
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide
CPUC	California Public Utilities Commission
CRHP	California Register of Historic Places
CWA	Clean Water Act
dB	decibel
dBA	decibel A-weighted
DoD	Department of Defense
DOT	Department of Transportation
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
FAA	Federal Aviation Administration

FESA	Federal Endangered Species Act
HCP	Habitat Conservation Plan
hp	horsepower
HRSRG	heat-recovery steam generator
I	Interstate
ICAPCD	Imperial County Air Pollution Control District
ILRT	Integrated Leak Rate Test
kV	kilovolt
LCAC	Landing Craft Assault Center
L_{dn}	Day-Night Average Noise Level
L_{eq}	Equivalent Noise Level
LLRW	low-level radioactive waste
M	moment magnitude
MBTA	Migratory Bird Treaty Act
MCBCP	Marine Corps Base Camp Pendleton
MHCP	Multiple Habitat Conservation Plan
mph	miles per hour
MRZ	Mineral Resource Zone
MVAR	megavar
MW	megawatt
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NOAA	National Oceanic & Atmospheric Administration
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
O_3	ozone

OCA	Owner-Controlled Area
Pb	lead
PEA	Proponent's Environmental Assessment
PM	particulate matter
ppm	parts per million
PWR	pressurized water reactor
ROW	right-of-way
RFO	refueling and maintenance outage
RSG	replacement steam generator
RV	recreational vehicle
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCR	selective catalytic reduction
SDAPCD	San Diego County Air Pollution Control District
SDG&E	San Diego Gas & Electric Company
SGRP	Steam Generator Replacement Project
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SO _x	sulfur oxide
SONGS	San Onofre Nuclear Generating Station
SR	State Route
SSC	species of special concern
State	State of California
SUV	sport-utility vehicle
SVCs	static var compensators
UPFC	unified power flow controller
URS	URS Corporation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound

WECC Western Electricity Coordinating Council

WSA William Self Associates

ES-1 PROPOSED PROJECT

The purpose of the Project is to replace the San Onofre Nuclear Generating Station 2 and 3 (SONGS 2 & 3) steam generators. SONGS 2 & 3 are pressurized water reactor (PWR) nuclear power units located on the California coast near San Clemente, California. These units are rated 1,070 and 1,080 megawatts, respectively. PWRs use large components called steam generators to transfer energy from the nuclear fuel to the steam turbine, where this thermal energy is converted to electrical energy. There are two steam generators each for SONGS 2 & 3 for a total of four at the site, all of which are proposed to be replaced as part of this Project.

The steam generators have exhibited degradation as a result of a variety of corrosion and mechanical factors associated with the original materials. Almost all other PWRs of similar vintage and materials in the United States have already had their steam generators replaced or are in the process of replacing them.

As explained in detail in Exhibit SCE-2 of this application, the SONGS 2 & 3 steam generators will eventually reach a state where, under applicable Nuclear Regulatory Commission (NRC) regulations, the steam generators must be replaced or the plant must shut down. SCE, the operating agent for SONGS 2 & 3, expects this replacement to occur as early as spring 2009. The Fuel Cycle 16 refueling and maintenance outage (RFO) for SONGS 2 may begin as early as spring 2009. The Fuel Cycle 16 RFO for SONGS 3 may begin as early as fall 2009. Consequently, SCE proposes in this application to replace the steam generators for both units in the Fuel Cycle 16 RFO scheduled to occur as early as 2009.

The steam generators themselves are large, will be fabricated offsite, and shipped to the Marine Corps Base Camp Pendleton Del Mar Boat Basin by ship and/or barge. Once unloaded, they will be moved to the site by large, special-purpose, heavy duty transport devices by either a Beach and Road Transport Route or an Inland Road Transport Route. The ultimate transport route selected will be the subject of the future permitting process between SCE and the corresponding jurisdictional authorities along the transport route. SCE presents all the transportation routes in this Proponent's Environmental Assessment (PEA) as potential options and seeks California Public Utilities Commission (CPUC) approval in order to allow the maximum flexibility to ultimately choose the best route. Other transportation routes, such as building a barge landing at Red, Gold, or Green Beaches, rail transport

from Long Beach Harbor or the Camp Pendleton Del Mar Boat Basin, and transport via Skull Canyon, were considered but not carried forward.

Given anticipated regulatory approval times and the length of time necessary to design, fabricate, and transport the replacement steam generators (RSGs) to the site, SCE submits this application now and seeks CPUC approval of steam generator replacement by mid 2005. A discussion of the fabrication and transportation process is located in Exhibit SCE-3 to this application. A schedule showing preparation, design, fabrication, transportation, and installation for the Project is located in Exhibit SCE-3 to this application.

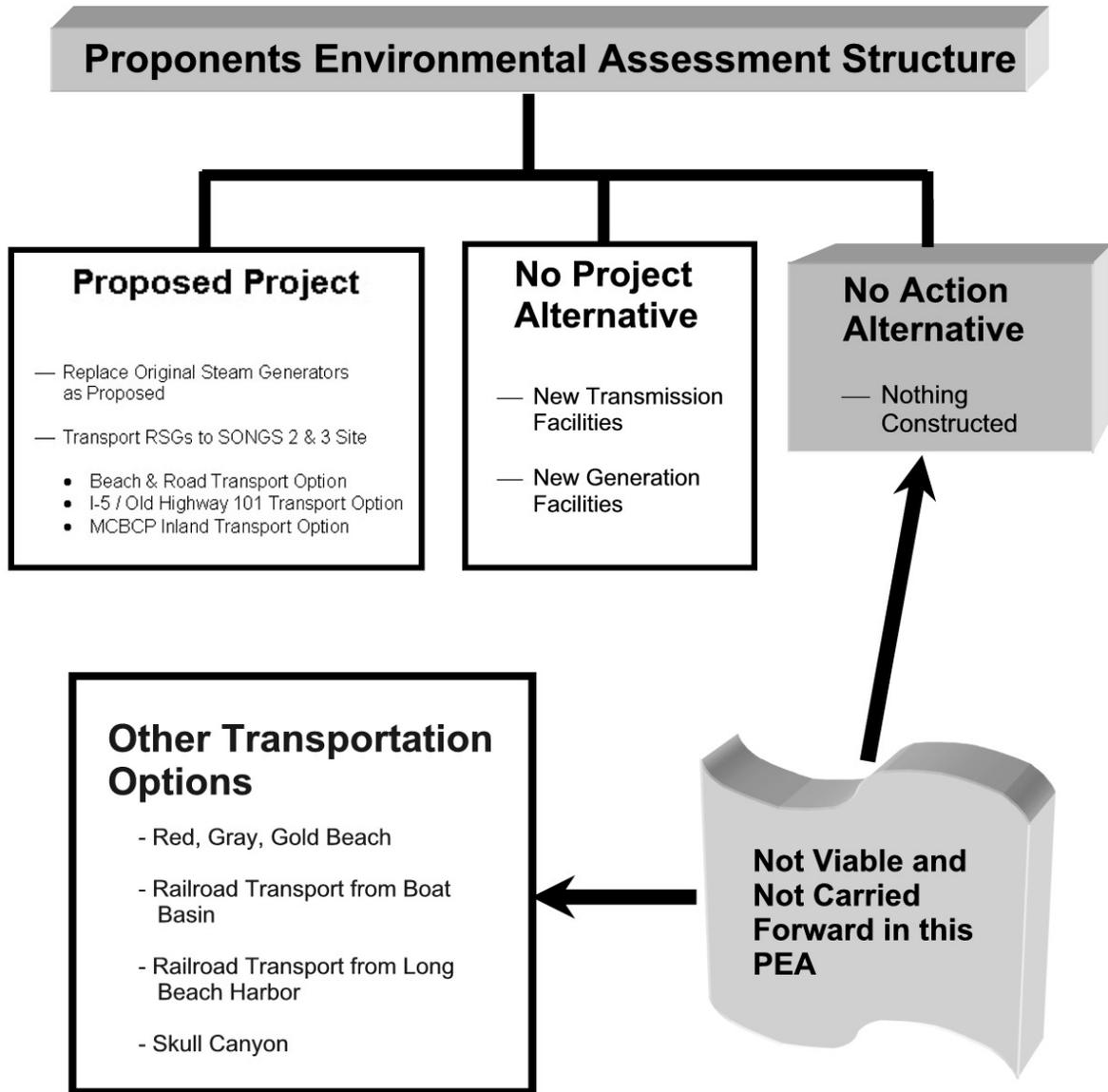
No significant, unmitigatable, adverse environmental impacts are expected to result from the Project. Potential significant, but mitigable, impacts on Interstate 5 traffic will result from use of the Inland Transport Options. No adverse impacts are expected to result from the Beach and Road Route Transport Option. No other adverse, unmitigatable, environmental impacts are expected to result from the Project. Figure ES-1 provides an overview of the PEA structure.

As summarized in Figure ES-1, the PEA does not study the No Action Alternative or certain options for steam generator transport that are not viable. The No Action Alternative was not studied because it leads to significant impacts on public health and safety, as well as California's economy, because of the possibility of blackouts and other service reductions.

ES-2 NO PROJECT ALTERNATIVE

SONGS 2 & 3 provide energy, capacity, and voltage stability and support to the southern California area. SONGS 2 & 3 cannot be shut down without significant impacts on southern California's energy supply unless certain transmission and generation facilities are constructed and in place before shutdown. An overview of these replacement facilities, to the extent that they are (or can be) currently known, is provided in Exhibits SCE-4 and SCE-5 of this application. Construction of these generation and transmission facilities before SONGS 2 & 3 shutdown is the identified viable alternative to SONGS 2 & 3 operation post-Fuel Cycle 16. Construction of these facilities is labeled the "No Project" alternative in this PEA because it assumes that the proposed steam generator replacement does not occur.

Figure ES-1. PEA Structure



The necessary permitting processes for the transmission facilities would be the subject of separate proceedings at the CPUC, and in the case of California generation facilities, at the California Energy Commission and CPUC. Arizona generation facilities would be subject to permitting processes in that state. Although a preliminary assessment concerning siting of these facilities is included in this PEA, a detailed environmental assessment of project-specific impacts should not be part of the CPUC's review of the Project and is not included in this PEA because these facilities would be subject to their own separate permitting processes.

Replacing SONGS 2 & 3 generation, even with new state-of-the-art, natural gas-fueled, Combined Cycle Gas Turbine (CCGT) units, would result in a net increase in total air emissions. Even though CCGT units can operate at relatively low air emission rates that meet all regulatory requirements, they nonetheless produce unavoidable air emissions. Compared to CCGT units, SONGS 2 & 3 produces almost no air emissions. Assuming the loss of SONGS 2 & 3 output, emissions from replacement CCGT units would increase total annual emissions in the associated air basins by the following approximate amounts:

- Nitrogen oxides – 429 tons
- Carbon monoxide – 423 tons
- Sulfur dioxide – 102 tons
- Particulate matter – 579 tons
- Reactive organic gases – 64 tons
- Ammonia – 356 tons

Therefore, the No Project Alternative would result in an incremental increase in air emissions relative to the Project. Additionally, the siting of new replacement generation in California and Arizona will increase the demand on natural gas supplies and likely lead to higher gas prices for California consumers.

SCE, as well as other utilities, would likely construct some of the transmission facilities (e.g., the Reinforced 230 kV SCE/SDG&E Interface, the Imperial Valley-Ramona Transmission Line System, or the Valley-Rainbow Transmission Line System). The generation facilities may be constructed by some yet-to-be determined mix of investor-owned utilities, municipal utilities, and third parties. This alternative assumes that the replacement transmission and generation facilities would be in service by 2009 and 2010. There is a risk that one or more components may not be available for service in this timeframe. This risk is based on a concern that the lead time, after a CPUC decision in mid 2005, may

be inadequate to develop preliminary design, obtain all necessary governmental authorizations to construct, procure capital equipment, and construct and commission the proposed facilities by the in-service date. To the extent that SCE has control, it will make a good-faith effort to take all reasonable actions necessary to enable it to add the new facilities. Some of the facilities, however, must be developed, permitted, and constructed by other regulated utilities and independent power producers. The priority for other utilities to build system components coordinated with the SONGS 2 & 3 Steam Generator Replacement Project decision; market motivation for independent power producers to site, permit, and build new facilities; and associated regulatory approval process time needed for each component may create delays that cannot currently be predicted or controlled.

Specific impacts for the No Project Alternative would have to be determined at some future time when a specific project is proposed. It is certain, however, that there would be a substantial and relatively significant increase in air emissions when compared to the Project. Impacts on other resources would vary. It is possible that significant, unmitigable impacts could result from the No Project Alternative.

ES-3 SONGS 2 & 3 LICENSE EXTENSION IS NOT ANALYZED

The Project assumes that SONGS 2 & 3 will operate until their NRC operating licenses terminate in 2022. SONGS 2 & 3 co-owners may seek license extensions at some future date. This application does not contemplate license extension and is not analyzed in this PEA.

ES-4 A NO ACTION ALTERNATIVE IS NOT VIABLE

A No Action Alternative was analyzed briefly but not carried further in the PEA. The No Action Alternative assumes SONGS 2 & 3 shutdown in Fuel Cycle 16, which could occur as early as spring 2009, and that the transmission or generation facilities in the No Project Alternative are not constructed. This results in severe degradation of transmission system performance under certain conditions (potential voltage collapse for N-1, loss of single transmission component), as described in Exhibit SCE-1 and SCE-5. If there is severe transmission system voltage instability, there could be blackouts and other service reductions resulting in customer load being dropped and not served. This violates Western Electricity and Coordinating Council, California Independent System Operator, and SCE Transmission Planning criteria. This No Action Alternative is not a viable alternative to the Proposed Project. It is not analyzed further in this PEA because it would lead to significant impacts on

public health and safety, California's economy, and the environment if implemented. Nonetheless, as discussed above, it may be impossible to construct all facilities identified in the No Project Alternative to avoid some or all of these significant No Action Alternative impacts.

Certain options for transportation of the new steam generators to the SONGS 2 & 3 site are not viable and, therefore, are not studied in this PEA. These options are not viable primarily because they would not accommodate structures of the size and weight of the replacement SONGS 2 & 3 steam generators.

ES-5 CONCLUSION

Although not a major focus of this PEA or the CPUC's environmental review, the Project will provide substantial economic benefits to ratepayers. As discussed in detail in Exhibit SCE-4, the Project has a benefit-to-cost ratio ranging from 2.16 – 2.56 : 1 for California ratepayers under the cost-effectiveness analysis. Moreover, when these substantial benefits are weighed against the findings of this PEA (i.e., that there are no significant impacts on the environment from the Project and that there are potentially significant impacts associated with the No Project Alternative), the Project should be approved.