

Decision 06-11-024 November 30, 2006

**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.

Application 04-02-026  
(Filed February 27, 2004)

**OPINION ON REHEARING OF DECISION (D.) 05-12-040 AFFIRMING THE ORDERING PARAGRAPHS OF D.05-12-040 AS MODIFIED BY D.06-06-040**

**I. Summary**

By this order, we address the limited rehearing of Decision (D.) 05-12-040 granted by D.06-06-040 concerning the application of Southern California Edison Company (SCE) for approval of its steam generator replacement program (SGRP) for San Onofre Nuclear Generating Station Units 2 and 3 (SONGS). We provide the correct results of the cost-effectiveness calculation in D.05-12-040 and explain the calculation of the greenhouse gas (GHG) adder used therein. Based on the corrected results, we find the SGRP cost-effective, and affirm the ordering paragraphs of D.05-12-040 as modified by D.06-06-040. This proceeding is closed.

**II. Background**

SONGS is currently in operation with a capacity of approximately 2,150 megawatts. It is located on the California coast 62 miles southeast of Los Angeles, in San Diego County, near the City of San Clemente. The site is

located within the boundaries of the Camp Pendleton Marine Corps Base. Each of the two units has two steam generators in which the heat from water circulated through the reactor is used to turn another stream of water into steam to power turbines that turn electric generators.

SONGS is currently licensed by the Nuclear Regulatory Commission (NRC) to operate until 2022. SCE estimated that SONGS will likely be required to shut down because of the degradation of the steam generators in 2009. As a result, SCE requested approval of the SGRP in this application.

Hearings were held from January 30 through February 11, 2005. The application was submitted on June 21, 2005. On December 15, 2005, the Commission issued D.05-12-040 approving the application.

On June 15, 2006, the Commission issued D.06-06-040 in response to an application for rehearing of D.05-12-040 filed by The Utility Reform Network (TURN) and the California Earth Corps (CEC) on January 18, 2006. D.06-06-040 made some modifications to D.05-12-040, and granted limited rehearing to:

1. take into account the correct results of the net present value calculation, which were not included in D.05-12-040; and
2. determine the amount of the GHG adder.

On June 22, 2006, the assigned administrative law judge (ALJ) issued a ruling in response to D.06-06-040. The ruling explained that D.05-12-040 included incorrect cost-effectiveness calculation results for the SGRP, and included the correct results. The ruling also explained the calculation of the GHG adder, and proposed to take official notice of the report titled "Methodology and Forecast of Long Term Avoided Costs for The Evaluation of California Energy Efficiency Programs," dated October 25, 2004, prepared by the

Energy and Environmental Economics (E3) Consulting Group (E3 Report), used in the calculation of the GHG adder.

In the ruling, the ALJ proposed to conduct the limited rehearing through the filing of opening and reply comments, and set the schedule for comments. The parties were instructed to request evidentiary hearings in their opening comments if they thought such hearings were necessary. SCE filed opening comments on July 31, 2006, and did not request hearings. No other party filed comments, and no reply comments were filed.

### **III. SCE Comments**

In its comments, SCE confirms the cost-effectiveness calculations in the ALJ's ruling. However, it recommends that SONGS be assumed to shut down in 2009-10 if the SGRP is not performed rather than 2012 as specified in D.05-12-040. This issue was addressed in D.05-12-040, and SCE provided no new information in support of its recommendation. Therefore, we do not adopt it.

### **IV. GHG Adder**

As explained in the ALJ's ruling, the cost-effectiveness calculations include the amount of gas fired generation that would be required each year if the SGRP is not performed. The GHG adder for each year is the product of the amount of GHG produced by such generation and the GHG dollars per ton rate for that year. The GHG adder used to determine the cost-effectiveness of the SGRP is the present value of the GHG adders for each year of the forecast period.

The dollars per ton rates used to calculate the GHG adder were taken from the E3 Report, which was adopted in D.05-04-024. The dollars per ton rates are as follows.

Greenhouse Gas Adder-Dollars Per Ton Rates<sup>1</sup>

<u>Year</u>	<u>CO2 \$/ton</u>
2009	10.210
2010	10.721
2011	11.257
2012	11.820
2013	12.411
2014	13.031
2015	13.683
2016	14.367
2017	15.085
2018	15.839
2019	16.631
2020	17.463
2021	18.336
2022	19.253

The resulting GHG adder for Scenarios 1 through 5 in the Table of Results shown below, at an 88% capacity factor, ranges from \$307.9 million for a 98.21% ownership share to \$257.1 million for an 82.00% ownership share.<sup>2</sup>

Because no party opposed our doing so, we take official notice of the E3 Report.

## **V. Cost-Effectiveness**

As stated in D.05-12-040, the calculations are made using SCE's model and the model inputs specified therein. The base case is for SCE only and includes the following adjustments to SCE's cost-effectiveness calculations:

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<sup>1</sup> This table was included in Attachment B to the ALJ's ruling.

<sup>2</sup> These values were included in Attachment A to the ALJ's ruling.

- SGRP cost of \$680 million, excluding Allowance for Funds Used During Construction (AFUDC).
- The cost-effectiveness analysis is for SCE only.
- Operations and maintenance (O&M) costs 10% above SCE's estimate.
- Capital additions 25% above SCE's estimate.
- \$78.8 million for transmission mitigation.
- Unit 2 and Unit 3 shutdown, without the SGRP, in the middle of 2012.
- SDG&E and the City of Anaheim (Anaheim) do not participate in the SGRP.
- The ownership shares for SDG&E and Anaheim are reduced by 0-14% and 0-2.2% respectively. The resulting ownership range for SCE is 82.00-98.21%, with a mid-point of 90.10%.
- Construction financing costs are recovered through inclusion of AFUDC in ratebase after the SGRP is complete.
- SGRP costs are allowed in rates on January 1 of the year following the commercial operation date of each unit.
- SCE is authorized to depreciate a total of 20% of its ownership share of the estimated costs of removal and disposal of the original steam generators over the period 2006-2011.

In order to test the sensitivity of the results to variations in the inputs to the calculations, we include the following changes to the above:

- 92% and 84% capacity factor.
- 10% higher SGRP cost.
- 16% (one standard deviation) higher gas cost.
- 10% higher O&M costs.
- 10% higher capital additions.
- One year outage.

- Split shutdown.<sup>3</sup>

The following corrected table shows the net present value of the revenue requirement resulting from the total net costs and benefits of the SGRP, including the SGRP costs (NPV), in 2004 dollars, of seven scenarios illustrating the results of our cost-effectiveness analysis. An eighth scenario is also included that illustrates the results of our analysis if our base case is revised to utilize the O&M costs and capital additions estimated by SCE. A negative NPV indicates that the SGRP is not cost-effective.

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<sup>3</sup> Under a split shutdown scenario, Unit 2 would shut down in the middle of 2012, and Unit 3 would shut down in January 2016 if the SGRP is not performed.

**TABLE OF RESULTS<sup>4</sup>**

Scenario	Assumptions	Capacity Factor <sup>5</sup>	SCE Ownership Share		
			98.21% (\$millions)	90.10% (\$millions)	82.00% (\$millions)
1	Base	92%	(74.1)	(144.8)	(277.0)
		88%	(249.6)	(304.2)	(420.3)
		84%	(425.1)	(463.6)	(563.6)
2	Base +10% higher SGRP cost	92%	(145.9)	(216.6)	(277.0)
		88%	(321.4)	(376.0)	(420.3)
		84%	(496.9)	(535.4)	(563.6)
3	Base +16% higher gas cost	92%	319.3	230.3	141.6
		88%	166.6	77.6	(11.2)
		84%	13.8	(75.2)	(163.9)
4	Base +10% higher O&M	92%	(289.7)	(343.1)	(394.9)
		88%	(465.2)	(502.5)	(538.2)
		84%	(640.7)	(661.9)	(681.5)
5	Base +10% higher Capital Additions	92%	(117.4)	(186.0)	(254.4)
		88%	(292.9)	(345.4)	(397.7)
		84%	(468.4)	(504.8)	(541.0)
6	Base +one year outage	92%	(180.1)	(334.7)	(489.1)
		88%	(355.6)	(494.1)	(632.4)
		84%	(531.1)	(653.5)	(775.7)
7	Base +split shutdown	92%	308.7	157.3	(16.0)
		88%	155.9	24.3	(129.2)
		84%	3.2	(108.7)	(272.5)
8	Base (using SCE O&M and capital additions)	92%	231.1	(48.1)	(388.7)
		88%	78.4	(200.9)	(541.4)
		84%	(74.4)	(353.6)	(694.2)

For the reasons discussed in D.05-12-040, we do not consider a 92% capacity factor, an 84% capacity factor, or a one-year outage likely. In addition, the above analysis demonstrates that the split shutdown scenario

<sup>4</sup> This table was included in Attachment A to the ALJ's ruling.

<sup>5</sup> Reducing the capacity factor reduces the replacement energy costs because SONGS is generating less energy that needs to be replaced.

(Scenario 7) is more costly than shutting both units down when one unit reaches the plugging limit.<sup>6</sup> This means that, if the SGRP is not performed, both units would be shut down when either unit reaches the plugging limit.

As discussed in D.05-12-040, we find it prudent to use Scenario 3. The above analysis shows that the Scenario 3 case has an NPV of between \$166.6 and (\$11.2) million, depending on SCE's ownership share. However, this does not include a GHG adder that would decrease the net cost of the SGRP by \$307.9 million to \$257.1 million depending on SCE's ownership share, thus increasing its NPV by that amount. Since the record does not quantify any additional safety, public health, and environmental risks and effects associated with SONGS, beyond those addressed in D.05-12-040, none is included in the NPV calculation. We also note that the above table demonstrates that variations in the gas price, capacity factor, ownership percentage, O&M costs, capital additions, and SGRP costs could make the SGRP more or less cost effective. Under Scenario 3 the SGRP is cost-effective regardless of the ownership share as long as the GHG adder is at least \$11.2 million. Since the GHG adder is considerably in excess of \$11.2 million, we find the SGRP cost-effective.<sup>7</sup>

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<sup>6</sup> The base case scenario (Scenario 1) is less cost-effective than the base case scenario with the split shutdown (Scenario 7). The only difference between the two scenarios is the split shutdown. For the NPV to increase due to inclusion of the split shutdown, the net cost of operating SONGS without the SGRP would have to increase. Therefore, the split shutdown scenario is more costly than shutting down both units at the same time.

<sup>7</sup> Even if SCE's ownership share were as low as 75%, the SGRP would be cost effective under this methodology.

## **VI. Conclusion**

As demonstrated above, the SGRP is cost-effective. Thus, we have no reason to change the ordering paragraphs of D.05-12-040 as modified by D.06-06-040. Therefore, we affirm them.

## **VII. Comments on Proposed Decision**

The proposed decision of the ALJ in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and Rule 14.2(a) of the Commission's Rules of Practice and Procedure. No comments were filed.

## **VIII. Assignment of Proceeding**

Geoffrey F. Brown is the assigned Commissioner and Jeffrey P. O'Donnell is the assigned ALJ in this proceeding.

## **Findings of Fact**

1. The cost effectiveness calculations shown in the Table of Results in D.05-12-040 are incorrect.
2. No party filed comments opposing the validity of the cost-effectiveness calculations attached to the June 22, 2006 ALJ ruling.
3. SCE provided no new or additional evidence in support of its recommendation that SONGS be assumed to shut down in 2009-10 if the SGRP is not performed rather than 2012 as specified in D.05-12-040.
4. The GHG adder calculation as explained herein utilizes the E3 Report.
5. The SGRP is cost-effective.

## **Conclusions of Law**

1. SCE's recommendation that SONGS be assumed to shut down in 2009-10 if the SGRP is not performed rather than 2012 as specified in D.05-12-040 should not be adopted.
2. Official notice should be taken of the E3 Report.

3. The ordering paragraphs of D.05-12-040, as modified by D.06-06-040, should be affirmed.

**O R D E R**

**IT IS ORDERED** that:

1. After limited rehearing of Decision (D.) 05-12-040, as ordered by D.06-06-040, the ordering paragraphs of D.05-12-040, as modified by D.06-06-040, are affirmed.

2. Official notice is taken of the report titled "Methodology and Forecast of Long Term Avoided Costs for The Evaluation of California Energy Efficiency Programs," dated October 25, 2004, prepared by the Energy and Environmental Economics Consulting Group.

3. Application 04-02-026 is closed.

This order is effective today.

Dated November 30, 2006, at San Francisco, California.

MICHAEL R. PEEVEY  
President  
GEOFFREY F. BROWN  
DIAN M. GRUENEICH  
JOHN A. BOHN  
RACHELLE B. CHONG  
Commissioners