

Investigation No.: I.12-10-013
Exhibit No.: SDGE-09
Witness: Andrew Scates

**PREPARED SUPPLEMENTAL DIRECT TESTIMONY OF
ANDREW SCATES
ON BEHALF OF
SAN DIEGO GAS & ELECTRIC COMPANY**

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

May 1, 2013

1 **II. REPLACEMENT ENERGY COST ESTIMATE**

2 SDG&E is a participant in the California Independent System Operator (“CAISO”)
3 organized markets. SDG&E bids or schedules its generation resources into the CAISO’s energy
4 and capacity markets, and purchases its bundled customers’ energy requirements from the
5 CAISO’s energy markets. Concerning SDG&E’s ownership interest in SONGS, while Southern
6 California Edison (“SCE”) bids or schedules the entire output of SONGS into the CAISO’s
7 markets, SDG&E has in place an Inter-Scheduling Coordinator Trade (“IST”) arrangement with
8 SCE. This IST has the effect of treating SDG&E’s ownership share of SONGS generation as
9 though it had bid or scheduled this output into the CAISO markets that is financially settled by
10 the CAISO through the IST arrangement with SCE. As a result, generation output from a
11 resource, including SONGS, does not directly serve SDG&E bundled load, but instead is sold or
12 scheduled into the CAISO’s organized market. Through the IST with SCE, revenue for the
13 energy sale offsets the procurement expense SDG&E incurs for serving its bundled customer
14 demand from the CAISO organized market. The difference between SDG&E’s aggregate
15 energy schedules (including ISTs) for generation and purchases for serving bundled load is
16 considered SDG&E’s net open position. If SDG&E’s awarded supply position is less than its
17 bundled load requirements, the open position is considered “net short”. Conversely, if SDG&E’s
18 awarded supply position is greater than its bundled load requirements, the open position is
19 considered “net long”. For purposes of estimating the cost of replacement energy associated
20 with the SONGS outages that SDG&E have recorded in its OMA, SDG&E has limited the
21 calculation to its ownership share of the energy (measured on a MWh basis) that SONGS could
22 have generated had it been available to operate that would have reduced SDG&E’s net short
23 position. SDG&E proposes the use of CAISO SP-15 Trading Hub day-ahead, hourly prices for
24 purposes of estimating its costs of replacement energy for 2012.³ The CAISO SP-15 Trading
25 Hub is the appropriate pricing point because the SONGS energy that would have otherwise been
26 produced would have generally served demand throughout Southern California, which is best
27 represented by the CAISO SP-15 Trading Hub day-ahead, hourly prices. This pricing point is
28 commonly used to settle financial transactions for energy transacted for delivery in Southern
29 California. Further, as a result of the IST described above, SDG&E is paid the hourly day-ahead

³ The CAISO runs a day-ahead Integrated Forward Market (IFM) and publishes day-ahead prices on an hourly basis.

1 price for its share of SONGS output by the CAISO. The CAISO's day-ahead hourly prices at the
2 SONGS generation nodes are not a useful price benchmark because SONGS is not delivering
3 energy at those nodes during the outage and the published prices are therefore not reflective of
4 what would have happened had SONGS been on-line. Additionally, the SONGS Generating
5 Node is not a liquid traded hub. For these reasons, using the CAISO SP-15 Trading Hub day-
6 ahead, hourly price is an appropriate proxy of SDG&E's foregone CAISO revenues resulting
7 from the outage of SONGS 2 and 3.

8 The estimate of "replacement energy costs" associated with the SONGS outage should
9 also be adjusted to account for the historical availability of the SONGS generators. All power
10 plants experience forced outages from time-to-time, despite the employment of best maintenance
11 practices. To account for the fact that the SONGS Units 2 and 3 likely would have experienced
12 occasional forced outages for reasons unrelated to the current tube wear-related outages, and
13 therefore would not have been available as part of their normal course of operations. The
14 forecasts of replacement energy expense and other market-related costs should be reduced by the
15 historical forced outage rate of the SONGS units. For purposes of this estimate, SDG&E has
16 used a 2.8% annual average forced outage rate, which is reflective of the forced outage rate
17 experienced by SONGS Units 2 and 3 for the ten-year period 2002-2011.

18 The fuel component also needs to be accounted for in SDG&E's estimated replacement
19 energy cost calculations for the cost of nuclear fuel. SDG&E subtracts the cost of nuclear fuel
20 (expressed in a \$/MWh basis) from SDG&E's estimate of "replacement energy costs" because
21 the unused fuel can be used later in the event that the SONGS generators are restarted. Stated
22 differently, the unused nuclear fuel is treated as an avoided cost. Unit 2 nuclear fuel costs were
23 assumed to be \$7.723/MWh and Unit 3 nuclear fuel costs were assumed to be \$6.457/MWh for
24 the period January 1, 2012 through December 31, 2012.⁴

25 The final "replacement energy cost" component consists of several CAISO allocated
26 costs and QF Dispatched Cost described below:

- 27 · Congestion Revenue Rights (CRR) – CRRs manage potential congestion between the
28 source and the sink Pnodes. The CAISO will pay the CRR holder congestion charges

⁴ Nuclear fuel cost estimates are based on the cost of purchasing and manufacturing fuel assemblies for each fuel cycle for the applicable generation unit, divided by the estimated amount of forecast generation that will be delivered in the fuel cycle for the applicable generation unit.

1 to offset congestion cost incurred. CRRs provide a valuable hedge for price
2 differences between SDG&E's resources and prices for SDG&E's demand. CRRs
3 are acquired through the CAISO's annual and monthly allocation or auction process.

- 4 ○ The CRRs obtained through the CRR allocation process are at no cost to SDG&E.
5 Thus, the CRRs received in the allocation process would have been acquired
6 regardless of the SONGS outage. Furthermore, the majority of CRRs received
7 from CAISO allocation process were acquired in the annual allocation process,
8 which took place prior to the SONGS outage. For this reason SDG&E did not
9 include CRR Costs/Revenues for those CRRs obtained through the CAISO
10 allocation process.
- 11 ○ SDG&E also procured CRRs on a monthly basis after the outage through the
12 CAISO auction process specifically to manage congestion risk related to the
13 SONGS outage. Revenue/Charges of (\$1,675,552) were incurred in 2012 for
14 Songs Units 2 and 3.

- 15 • Standard Capacity Product (SCP) – SCP charges are incurred when a resource fails to
16 meet its availability requirements under the CASIO Resource Adequacy program.
17 SDG&E netted any SCP charges against availability bonus it receives from the
18 CAISO. The total net SCP penalties in 2012 were \$586,765.
- 19 • Imbalance Charges – The auxiliary station power load is served through the CAISO's
20 Real-Time Imbalance energy market. SDG&E's share of station power costs in 2012
21 were \$1,097,459.
- 22 • Grid Management Charges (GMC) – GMC are allocated to load and resources, which
23 include energy usage charges, energy transmission service charges, and reliability
24 services costs. SDG&E incurred \$8,779 of GMC charges related to SONGS extended
25 outage.
- 26 • Participating Intermittent Resource Program (PIRP) Allocation Charges – Charges
27 associated with PIRP which are allocated to net negative Uninstructed Deviations.
28 SDG&E's share of PIRP allocated charges for 2012 were \$17,179.
- 29 • Qualified Facilities (QF) – SDG&E executed short-term agreements to purchase
30 weekend dispatch rights for Goal Line, Naval Station and NTC during August and

September of 2012 to alleviate some of the SDG&E's net short position. The net cost SDG&E incurred for these dispatch rights was \$74,326.

The estimated replacement energy cost in which a net short position is assumed to exist can be expressed using the following formula:

$$Q * (P - F) + O = \text{Replacement Energy Cost}$$

Where,

Q = Portion of SDG&E's forecast hourly net short position which could be attributed to the SONGS outages, adjusted for the 2.8% historical outage rate for SONGS (expressed in MWh);

P = CAISO SP-15 Trading Hub day-ahead price expressed \$/MWh);

F = The avoided cost of nuclear fuel (expressed in \$/MWh).

O = CAISO Allocated costs (CRR, SCP, GMC, Imbalance charges, PIRP) and QF Dispatchable costs.

Table 1 provides SDG&E's estimate of "replacement energy cost" for 2012.

Table 1
SONGS OII - 2012 OMA Entries for Replacement Energy Costs

Month	Replacement Energy Costs	Replacement Energy (MWh)
Jan-12	-\$12,541	1,540
Feb-12	\$2,852,770	123,942
Mar-12	\$4,305,649	278,179
Apr-12	\$3,096,098	195,409
May-12	\$2,368,493	167,577
Jun-12	\$2,685,254	163,380
Jul-12	\$6,317,632	263,347
Aug-12	\$7,813,649	301,579
Sep-12	\$8,732,962	307,445
Oct-12	\$4,365,869	148,317
Nov-12	\$2,859,210	107,691
Dec-12	\$6,060,271	224,598
TOTAL	\$51,445,316	2,283,004

Note:

1. SONGS Units 2 & 3: SDG&E's share (= 440 MW).
2. Includes imbalance energy for January 31, 2012 HE 18 through February 1, 2012 for Unit 3.

1 **III. FOREGONE ENERGY SALES ESTIMATE**

2 SDG&E's uses the same methodology for calculating foregone energy sales as SDG&E's
3 estimate for replacement energy costs, except it is applied only to the hours in which SDG&E
4 had a forecasted net long position had SONGS been generating. SDG&E also includes in its
5 estimate of foregone energy sales, the revenues that otherwise would have been received from
6 RA capacity sold in 2011 from SONGS Units 2 and 3 to a third party for 2012, had SONGS
7 remained online. Due to the unplanned outages for 2012, SDG&E could not deliver this RA
8 capacity from SONGS. The 2012 foregone sales costs associated with the SONGS outages are
9 stated in Table 2.

10 The estimated net energy revenue in which a net open position is assumed to exist can be
11 expressed using the following formula:

12
$$Q * (P - F) + O = \text{Foregone Energy Revenue}$$

13 Where,

14 Q = Portion of SDG&E's forecast hourly net long position which could be
15 attributed to the SONGS outages, adjusted for the 2.8% historical outage rate
16 for SONGS (expressed in MWh);

17 P = CAISO SP-15 Trading Hub day-ahead price expressed \$/MWh);

18 F = The avoided cost of nuclear fuel (expressed in \$/MWh).

19 O = Lost revenue from RA sales

20
21 Table 2 provides SDG&E's estimate of foregone energy sales revenue for 2012.

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Table 2
SONGS OII - 2012 OMA Entries for Foregone Energy Sales Revenue

Month	Foregone Energy Sales Costs	Foregone Energy Sales (MWh)
Jan-12	\$0	0
Feb-12	\$598,144	29,179
Mar-12	\$419,885	27,622
Apr-12	\$2,531,349	121,391
May-12	\$3,957,829	159,783
Jun-12	\$3,276,133	153,420
Jul-12	\$1,459,105	64,013
Aug-12	\$625,381	25,781
Sep-12	\$365,042	9,355
Oct-12	\$1,201,673	47,043
Nov-12	\$1,318,838	50,707
Dec-12	\$2,683,178	102,762
TOTAL	\$18,436,558	791,056

Note:

1. SONGS Units 2 & 3: SDG&E's share (= 440 MW).
2. Includes lost revenues from Resource Adequacy (RA) sales.

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IV. CAPACITY-RELATED COSTS

The SONGS outages have resulted in certain capacity-related costs⁵. CAISO Capacity Procurement Mechanism (CPM) charges were incurred as a result of the outages at Units 2 and 3. CPM charges are allocated to Scheduling Coordinators for LSEs that serve load in the Transmission Access Charge (TAC) areas in which the need for the CPM arose. These charges are allocated on the actual load of each LSE represented by a Scheduling Coordinator in the applicable TAC areas as a percentage of total load in the applicable TAC areas. SDG&E's customers were allocated their load ratio share of these CPM charges associated with the SONGS outages for TAC South (TAC_SOUTH).

⁵ The costs CAISO incurred to return the Huntington Beach units 3&4 to service in 2012. These costs were allocated to SDG&E in the form of Capacity Procurement Mechanism (CPM). Encina 4 was exceptionally dispatched during March and April of 2012 and Huntington Beach unit 1 was exceptionally dispatched during February through June 2012, both were allocated to SDG&E as a CPM charge.

1 SDG&E also procured replacement RA capacity for some of the SONGS RA capacity. A
 2 summary of the other capacity-related costs incurred in 2012 as a result of the SONGS outages is
 3 stated in Table 3.

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Table 3
SONGS Unit 2 & 3: Summary of Capacity-Related Costs for OMA Reporting

Month	Unit 2 Total Capacity Cost	Unit 3 Total Capacity Cost	Total Capacity Cost
Jan-12	\$0	\$0	\$0
Feb-12	\$0	\$6,265	\$6,265
Mar-12	\$102,638	\$102,638	\$205,275
Apr-12	\$58,159	\$58,159	\$116,319
May-12	\$205,286	\$205,286	\$410,572
Jun-12	\$139,709	\$139,709	\$279,418
Jul-12	\$212,628	\$212,628	\$425,255
Aug-12	\$204,755	\$204,755	\$409,510
Sep-12	\$339,206	\$339,206	\$678,413
Oct-12	\$192,455	\$192,455	\$384,909
Nov-12	\$0	\$0	\$0
Dec-12	\$0	\$0	\$0
TOTAL	\$1,454,836	\$1,461,100	\$2,915,936

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 7 [Remainder of page intentionally left blank]

1 **V. PLANNED REFUELING AND MAINTENANCE OUTAGES**

2 Pursuant to I.12-10-013, SDG&E recorded its estimated “replacement energy costs”,
3 opportunity costs, capacity-related costs, and other costs identified above in its SONGS OMA for
4 the entire duration of the outages of both SONGS units in 2012. For Unit 2 those costs were
5 calculated for the period beginning March 5, 2012, the first full day following the scheduled
6 refueling and maintenance outage for the unit. For Unit 3 those costs were calculated for the
7 period beginning Hour-Ending 18 on January 31, 2012, which was the commencement of the
8 forced outage event for the unit.⁶

9 SDG&E has estimated and recorded its replacement energy costs in its SONGS OMA as
10 required I.12-10-013, which does not include costs for time periods during which the units would
11 have otherwise been unavailable due to normally planned refueling and maintenance outages. In
12 the case of SONGS Unit 2, the scheduled refueling and maintenance outage period was from
13 January 10, 2012, through March 5, 2012. Similarly, Unit 3 was scheduled for refueling and
14 maintenance for the period from October 7, 2012, through November 30, 2012. Replacement
15 energy cost would have been incurred regardless of the operating status of SONGS to
16 accommodate the required refueling and maintenance outages.

17 This concludes my prepared supplemental direct testimony.

⁶ Total costs for the planned outages for Unit 2 and Unit 3 in 2012 are \$13,470,803.