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

PREPARED SUPPLEMENTAL DIRECT TESTIMONY
OF
ANDREW SCATES

I. INTRODUCTION

The purpose of this testimony is to present San Diego Gas & Electric Company's ("SDG&E") estimate of market-related costs associated with the San Onofre Nuclear Generating Station ("SONGS") Units 2 and 3 outages which occurred in 2012. SONGS did not operate for most of 2012 due to a tube leak in one of the Unit 3 replacement steam generators ("RSGs"). Unit 2 commenced with a scheduled refueling and maintenance outage on January 9, 2012,[1] which was subsequently extended through 2012 as a result of a tube leak in one of the Unit 3 steam generators. Unit 3 experienced a small tube leak on January 31, 2012, and remained out of service through 2012 because of this tube leak. The timing for the restart of Unit 2 is subject to prior Nuclear Regulatory Commission ("NRC") approval under the NRC's Confirmatory Action Letter and its issuance of a license amendment requested by the Southern California Edison Company.

Pursuant to the California Public Utilities Commission's ("CPUC" or Commission") Order Instituting Investigation Regarding SONGS Units 2 and 3 (I.12-10-013), SDG&E has recorded in its SONGS Outage Memorandum Account ("OMA") its estimated market-related costs necessary to serve SDG&E's bundled customer demand that resulted from the SONGS outage. The Commission in D.04-01-050 at page 177 has directed SDG&E to file its ERRA compliance application for the prior calendar year in June of the subsequent year. Accordingly, in compliance with this directive SDG&E had intended to submit its ERRA compliance application for 2012, including an estimate of market-related power costs associated with the RSG outages in June 2013. In light of Administrative Law Judge ("ALJ") Darling's April 19, 2013 Ruling on Various Motions and Consolidating Proceedings, it became apparent that the ALJ intended that SDG&E's 2012 estimate of SONGS outage market related power costs be

[1] A gradual ramp-down of SONGS Unit 2 commenced in December 2011, with full shut-down occurring in Hour-Ending 21 on January 9, 2012. The Unit 2 outage commenced on January 10, 2012, because this was the first full day of the planned outage.

severed from SDG&E's 2012 ERRA compliance application that would otherwise be filed in June 2013, and consolidated into Phase 1 of I.12-10-013.

The balance of this testimony identifies the cost components that SDG&E estimated and/or quantified for purposes of recording market-related costs associated with the SONGS outages in SDG&E's OMA. SDG&E presents these amounts in compliance with the Commission's direction in I.12-10-013.[2] SDG&E has provided in this testimony estimates and/or quantified "replacement power costs" that the Commission instructed SDG&E to track in the SONGS OMA, but SDG&E reserves the right to present an alternative cost impact methodology in a subsequent phase of I.12-10-013 if such a calculation is necessary.

[Remainder of page intentionally left blank]

[2] SDG&E anticipates that the Commission will consolidate this testimony on 2012 SONGS market-related costs into its I.12-10-013 proceeding.

II. REPLACEMENT ENERGY COST ESTIMATE

SDG&E is a participant in the California Independent System Operator ("CAISO") organized markets. SDG&E bids or schedules its generation resources into the CAISO's energy and capacity markets, and purchases its bundled customers' energy requirements from the CAISO's energy markets. Concerning SDG&E's ownership interest in SONGS, while Southern California Edison ("SCE") bids or schedules the entire output of SONGS into the CAISO's markets, SDG&E has in place an Inter-Scheduling Coordinator Trade ("IST") arrangement with SCE. This IST has the effect of treating SDG&E's ownership share of SONGS generation as though it had bid or scheduled this output into the CAISO markets that is financially settled by the CAISO through the IST arrangement with SCE. As a result, generation output from a resource, including SONGS, does not directly serve SDG&E bundled load, but instead is sold or scheduled into the CAISO's organized market. Through the IST with SCE, revenue for the energy sale offsets the procurement expense SDG&E incurs for serving its bundled customer demand from the CAISO organized market. The difference between SDG&E's aggregate energy schedules (including ISTs) for generation and purchases for serving bundled load is considered SDG&E's net open position. If SDG&E's awarded supply position is less than its bundled load requirements, the open position is considered "net short". Conversely, if SDG&E's awarded supply position is greater than its bundled load requirements, the open position is considered "net long". For purposes of estimating the cost of replacement energy associated with the SONGS outages that SDG&E have recorded in its OMA, SDG&E has limited the calculation to its ownership share of the energy (measured on a MWh basis) that SONGS could have generated had it been available to operate that would have reduced SDG&E's net short position. SDG&E proposes the use of CAISO SP-15 Trading Hub day-ahead, hourly prices for purposes of estimating its costs of replacement energy for 2012.[3] The CAISO SP-15 Trading Hub is the appropriate pricing point because the SONGS energy that would have otherwise been produced would have generally served demand throughout Southern California, which is best represented by the CAISO SP-15 Trading Hub day-ahead, hourly prices. This pricing point is commonly used to settle financial transactions for energy transacted for delivery in Southern 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.

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

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

The fuel component also needs to be accounted for in SDG&E's estimated replacement energy cost calculations for the cost of nuclear fuel. SDG&E subtracts the cost of nuclear fuel (expressed in a $/MWh basis) from SDG&E's estimate of "replacement energy costs" because the unused fuel can be used later in the event that the SONGS generators are restarted. Stated differently, the unused nuclear fuel is treated as an avoided cost. Unit 2 nuclear fuel costs were assumed to be $7.723/MWh and Unit 3 nuclear fuel costs were assumed to be $6.457/MWh for the period January 1, 2012 through December 31, 2012.[4]

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

- Congestion Revenue Rights (CRR) – CRRs manage potential congestion between the 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.

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

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

- Standard Capacity Product (SCP) – SCP charges are incurred when a resource fails to meet its availability requirements under the CASIO Resource Adequacy program. SDG&E netted any SCP charges against availability bonus it receives from the CAISO. The total net SCP penalties in 2012 were $586,765.
- Imbalance Charges – The auxiliary station power load is served through the CAISO's Real-Time Imbalance energy market. SDG&E's share of station power costs in 2012 were $1,097,459.
- Grid Management Charges (GMC) – GMC are allocated to load and resources, which include energy usage charges, energy transmission service charges, and reliability services costs. SDG&E incurred $8,779 of GMC charges related to SONGS extended outage.
- Participating Intermittent Resource Program (PIRP) Allocation Charges – Charges associated with PIRP which are allocated to net negative Uninstructed Deviations. SDG&E's share of PIRP allocated charges for 2012 were $17,179.
- Qualified Facilities (QF) – SDG&E executed short-term agreements to purchase 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 = 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 imablance energy for January 31, 2012 HE 18 through February 1, 2012 for Unit 3.

III. FOREGONE ENERGY SALES ESTIMATE

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

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

Q * (P - F) + O = Foregone Energy Revenue

Where,

Q = Portion of SDG&E's forecast hourly net long 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 = Lost revenue from RA sales

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

[Remainder of page intentionally left blank]

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.

IV. CAPACITY-RELATED COSTS

The SONGS outages have resulted in certain capacity-related costs[5]. 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.

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

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**

[Remainder of page intentionally left blank]

V. PLANNED REFUELING AND MAINTENANCE OUTAGES

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

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

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.