

Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2019 General Rate Case
Application: A.17-10-_____
Exhibit: SDG&E-16

SDG&E
DIRECT TESTIMONY OF DANIEL S. BAERMAN
(ELECTRIC GENERATION)

October 6, 2017

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



TABLE OF CONTENTS

I.	INTRODUCTION	1
A.	Summary of Costs.....	1
B.	Summary of Activities	2
1.	Generation Plant	2
2.	Administration.....	7
3.	SONGS-related O&M	7
4.	Resource Planning.....	8
C.	Challenges Facing Operations	8
D.	Summary of Safety and Risk-Related Costs.....	9
E.	Summary of Costs Related to Fueling our Future (FOF)	10
1.	Goods and Services Benefits	11
2.	Water treatment and use programs	11
3.	Optimize the maintenance frequency for gas turbines	12
4.	Install plant cycling damage monitoring and diagnostics tool	12
II.	RISK ASSESSMENT MITGATION PHASE AND SAFETY CULTURE	12
A.	Risk Assessment Mitigation Phase	12
1.	Risk Mitigation.....	14
2.	Voluntary Protection Program.....	15
B.	Safety Culture	16
III.	NON-SHARED COSTS	16
A.	Generation Plant.....	18
1.	Generation Plant Palomar.....	18
2.	Generation Plant Desert Star	19
3.	Generation Plant Miramar	20
4.	Generation plant Cuyamaca	20
5.	Generation Plant Otay Mesa.....	21
B.	Administration	22
1.	Description of Costs	22
2.	Forecast Method	22
3.	Cost Drivers.....	22
C.	SONGS Related O&M.....	23
1.	Description of Costs	23

1.	SONGS Marine Mitigation	23
2.	SONGS Worker’s Compensation Costs.....	24
3.	SONGS Balancing Account (SONGSBA).....	25
IV.	SHARED COSTS	26
A.	Introduction.....	26
B.	Resource Planning	26
1.	Description of Costs and Underlying Activities.....	26
2.	Forecast Method	27
3.	Cost Drivers.....	27
V.	CAPITAL.....	27
A.	Introduction.....	27
B.	Capital Projects	28
1.	Capital Discussion.....	28
2.	Forecast Method	29
3.	Cost Drivers.....	29
VI.	CONCLUSION.....	29
VII.	WITNESS QUALIFICATIONS.....	30

LIST OF APPENDICES

Appendix A - Glossary of Terms.....	DSB-A
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Summary of Costs
Test Year 2019 Summary of Total Costs

ELECTRIC GENERATION & SONGS (In 2016 \$)			
	2016 Adjusted-Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
Total Non-Shared Services	36,435	62,316	25,881
Total Shared Services (Incurred)	747	1,095	348
Total O&M	37,182	63,411	26,229

NEW GENERATION (In 2016 \$)				
Categories of Management	2016 Adjusted-Recorded	Estimated 2017 (000s)	Estimated 2018 (000s)	Estimated 2019 (000s)
A. Generation Capital	22,984	13,314	292,826	17,371
Total	22,984	13,314	292,826	17,371

Summary of Requests

- SDG&E’s electric generation fleet consists of the Palomar Energy Center (PEC), Desert Star Energy Center (DSEC), Miramar Energy Facility (MEF), Cuyamaca Peak Energy Plant (CPEP), Escondido Battery Energy Storage System (Escondido BESS), El Cajon Battery Energy Storage System (El Cajon BESS) and the Ramona Solar Energy Project (RSEP). I describe each of these plants and their forecasted costs in greater detail in my testimony.
- SDG&E’s 2019 test year forecast also assumes that, pursuant to D.06-09-021, SDG&E will acquire ownership of the Otay Mesa Energy Center (OMEC), which Calpine currently owns and operates and which currently is the subject of a power purchase tolling agreement (PPTA) with SDG&E.
- This testimony also includes the San Onofre Nuclear Generating Station (SONGS) related Operations and Maintenance (O&M) costs that are not addressed in other proceedings (e.g., decommissioning) and costs for the Resource Planning group.

- This testimony includes Generation's O&M costs, with plans to include OMEC in 2019. Capital investment requirements for the Generation fleet are generally required to keep the plants up to date technologically, improve efficiency and replace obsolete equipment.

Key Challenges

- Maintaining high reliability and availability of the generation fleet.
- Ensuring the gas-fired generation fleet is able to provide the necessary services required to maintain grid reliability while aiding the integration of intermittent renewable energy.

SDG&E DIRECT TESTIMONY OF DANIEL S. BAERMAN
ELECTRIC GENERATION

I. INTRODUCTION

A. Summary of Costs

My testimony supports the Test Year 2019 forecasts for operations and maintenance (O&M) costs for both non-shared and shared services and capital costs for the forecast years 2017, 2018, and 2019 associated with the Electric Generation area for SDG&E. This testimony covers Generation Plant, Administration, SONGS and Resource Planning. Table DSB-1 summarizes my sponsored costs.

In addition to this testimony, please also refer to my workpapers, Ex. SDG&E-16-WP (O&M) and SDG&E-16-CWP (Capital), for additional information on the activities described herein.

Table DSB-1
Test Year Summary of Costs

ELECTRIC GENERATION & SONGS (In 2016 \$)			
	2016 Adjusted-Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
Total Non-Shared Services	36,435	62,316	25,881
Total Shared Services (Incurred)	747	1,095	348
Total O&M	37,182	63,411	26,229

NEW GENERATION (In 2016 \$)				
Categories of Management	2016 Adjusted-Recorded	Estimated 2017 (000s)	Estimated 2018 (000s)	Estimated 2019 (000s)
A. Generation Capital	22,984	13,314	292,826	17,371
Total	22,984	13,314	292,826	17,371

Organization of Testimony

My testimony is organized as follows:

- Summary of Costs
- Introduction
- Risk Assessment Mitigation Phase and Safety Culture
- Non-Shared Costs
- Shared Costs
- Capital Costs
- Conclusion
- Witness Qualifications

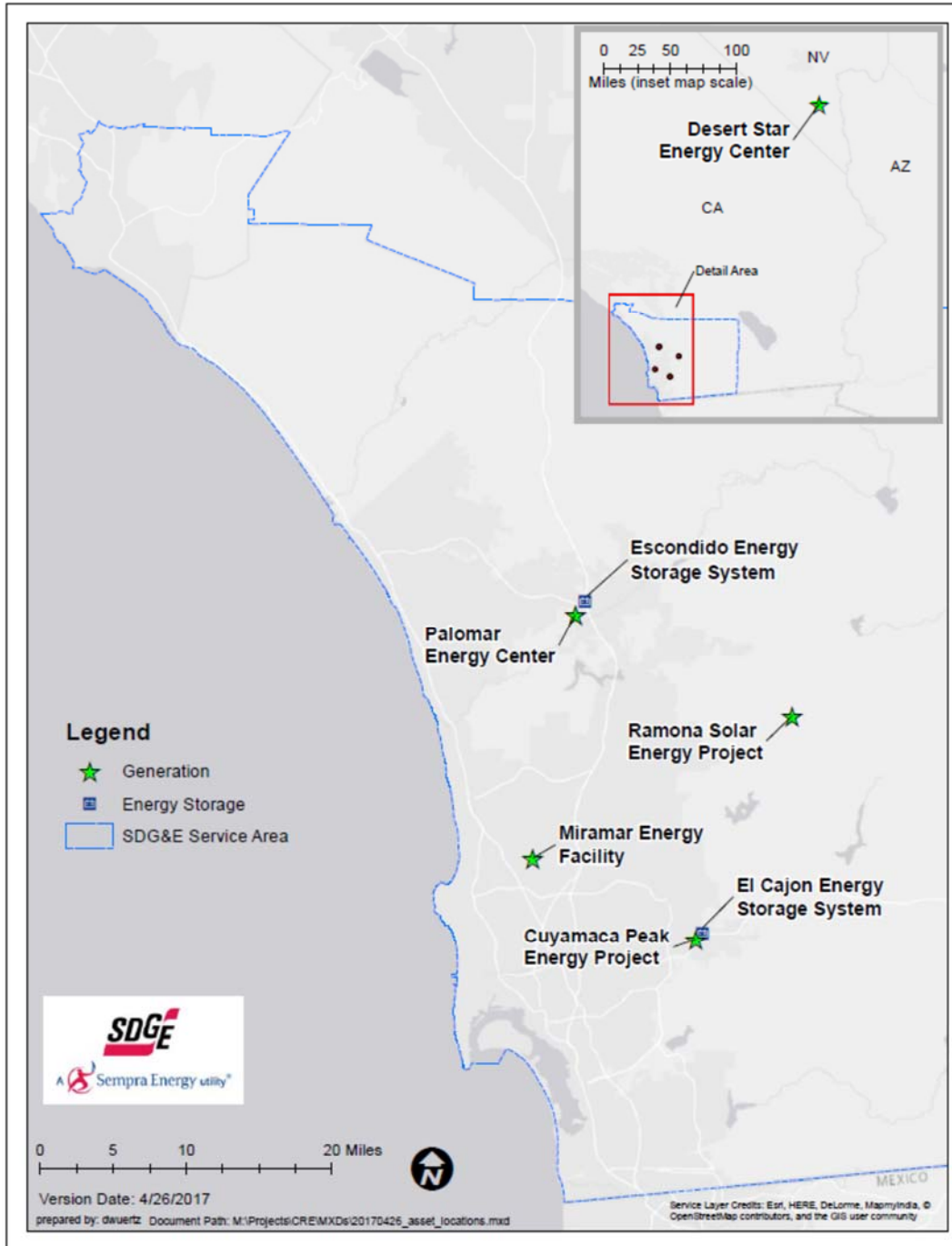
B. Summary of Activities

The Electric Generation testimony covers four primary areas: Generation Plant, Administration, SONGS-related O&M, and Resource Planning.

1. Generation Plant

SDG&E owns and operates two combined-cycle generating facilities, the Palomar Energy Center in Escondido, CA and the Desert Star Energy Center in Boulder City, NV. SDG&E owns and operates two peaking plants, Miramar Energy Facility in San Diego, CA and Cuyamaca Peak in El Cajon, CA. SDG&E also added two battery energy storage system projects to its fleet in early 2017, the 30 megawatt/120 megawatt-hour Escondido project and the 7.5 megawatt/30 megawatt-hour El Cajon project. A solar energy project located in Ramona, CA was also added to the portfolio that can produce up to 4.32 megawatts using smart inverters and fixed photovoltaic panels. In this testimony, SDG&E also will explain why it is including costs associated with the acquisition of OMEC into its test year forecast. Generation plant locations are shown on the map below.

Map of Plant Locations



2

3

a. Palomar Energy Center (PEC)

4

The Palomar Energy Center is a 565 megawatt gas-fired combined-cycle plant with 2 GE 7FA combustion turbines and a GE steam turbine. The plant is equipped with inlet-air chillers

5

1 and a thermal energy storage tank that allows the plant to produce energy at its capacity during
2 the summer months. Recycled water is used for cooling of the plant equipment.

3 **b. Desert Star Energy Center (DSEC)**

4 The Desert Star Energy Center, located in Boulder City, NV, is a 480 megawatt gas-fired
5 combined-cycle plant with 2 Siemens 501-FC combustion turbines and a Westinghouse steam
6 turbine. This plant was acquired by SDG&E in October 2011 pursuant to D.07-11-046. This
7 Decision permitted SDG&E to exercise an option to purchase the facility from El Dorado
8 Energy, LLC, a subsidiary of Sempra Energy.

9 **c. Miramar Energy Facility (MEF)**

10 The Miramar Energy Facility is a peaking plant with two GE LM6000 turbines that
11 together produce 92 megawatts (MEF-1 and MEF-2). This site also provides black start services
12 used for restoration of the electric grid. Operations and maintenance personnel based out of the
13 Palomar Energy Center provide all plant services to this facility.

14 **d. Cuyamaca Peak Energy Plant (CPEP)**

15 The Cuyamaca Peak Energy Plant is a peaking plant with a Pratt & Whitney FT8 turbine
16 generator set that produces 45 megawatts. Operations and maintenance personnel based out of
17 the Palomar Energy Center provide all plant services to this facility.

18 **e. Escondido Battery Energy Storage System (Escondido BESS)**

19 The Escondido BESS is a 120 megawatt-hour energy storage system with a maximum
20 output of 30 megawatts for up to 4 hours. The energy storage system uses lithium-ion batteries.
21 The project construction began Q4/2016 and began to operate commercially Q1/2017. Pursuant
22 to CPUC Resolution E-4791 on May 26, 2016, SDG&E developed expedited energy storage
23 projects to alleviate reliability issues associated with Aliso Canyon. CPUC approval was
24 requested via Tier 3 Advice Letter 2924-E. The Advice Letter was approved in its entirety in
25 CPUC Resolution E-4798 on August 18, 2016. Operations and maintenance personnel based out
26 of the Palomar Energy Center provide all plant services to this facility. O&M costs for
27 Escondido BESS are included in PEC O&M costs.

28 **f. El Cajon Battery Energy Storage System (El Cajon BESS)**

29 The El Cajon BESS was developed and constructed under the same authorization as the
30 Escondido battery project and also uses lithium-ion technology. This energy storage system is
31 rated at 30 megawatt-hours with a maximum output of 7.5 megawatts for up to 4 hours.

1 Operations and maintenance personnel based out of the Palomar Energy Center provide all plant
2 services to this facility. O&M costs for El Cajon BESS are included in PEC O&M costs.

3 **g. Ramona Solar Energy Project (RSEP)**

4 The Ramona Solar Energy Project, located in Ramona, CA, was developed and
5 constructed pursuant to D.10-09-016 and SDG&E's Advice Letter 2374E-A. The project is built
6 with fixed photovoltaic panels and can produce up to 4.32 megawatts. Operations and
7 maintenance personnel based out of the Palomar Energy Center provide all plant services to this
8 facility. O&M costs for RSEP are included in PEC O&M costs.

9 **h. Otay Mesa Energy Center (OMEC)**

10 The Otay Mesa Energy Center is a 608 megawatt¹ combined-cycle power plant that was
11 built and is currently owned by Calpine.² SDG&E has contracted for the plant's local capacity
12 and energy through a Power Purchase Tolling Agreement (PPTA) since October 3, 2009 with the
13 PPTA reaching the end of its term on October 2, 2019. The PPTA has no renewal option but it
14 includes "put" and "call" options. The Put Option - exercisable at OMEC's sole discretion and
15 with OMEC's notice due to SDG&E no later than April 1, 2019 - would require SDG&E to
16 purchase the Otay Mesa plant at a set price. The Call Option, exercisable at SDG&E's sole
17 discretion, "would require OMEC to sell the Otay Mesa plant at a set price." (D.06-09-021 at 5).

18 In the Commission's decision that approved SDG&E's PPTA with Calpine (D.06-09-
19 021), the Commission further described the "put" and "call" options for the OMEC. As noted in
20 D.06-09-021, "Pursuant to the terms of the Put Option, there would be no additional Commission
21 review or approval required before OMEC's potential exercise of the option. Under the price set
22 for the Put Option, SDG&E would own the Otay Mesa plant in 2019 at a price that would be
23 significantly below that of the Net Book Value of the Palomar Energy Center in 2019." *Id.* at 5.
24 Because of the Commission's determination in D.06-09-021 and SDG&E's expectation that

¹ Otay Mesa Energy Center, Calpine, available at: www.calpine.com/otay-mesa-energy-center (stating that Calpine Net Interest Baseload is 513 MW and Calpine Net Interest With Peaking is 608 MW).

² "The Otay Mesa Energy Center near San Diego, California, is a highly efficient, natural gas-fired, combined-cycle facility. The plant consists of two combustion turbine generators with advanced air emissions control technologies, two heat recovery steam generators with duct burners and a single condensing steam turbine generator." (See Otay Mesa Energy Center, Calpine, available at: www.calpine.com/otay-mesa-energy-center).

1 Calpine will exercise its put option, SDG&E is including the \$280M purchase price of the Put
2 option in this application. By way of contrast, the price of the call option would be \$377M.³

3 To help ensure that ratepayers only pay SDG&E for the plant (depreciation, taxes, and
4 return, otherwise known as “capital-related costs”) when and if the ownership of the plant shifts
5 to SDG&E,⁴ SDG&E is proposing to track the revenue requirement for this particular asset in a
6 balancing account so customers are indifferent to the timing of the transfer. SDG&E’s balancing
7 account proposal also would protect ratepayers in the unlikely event that the plant is not put to
8 SDG&E and the PPTA merely expires (which SDG&E does not expect). The annual revenue
9 requirement is necessary to provide SDG&E with the necessary revenue requirement for the
10 OMEC plant when the transfer occurs and for the attrition years beyond it and will ensure that
11 revenues are available to own the plant at the commencement of the transfer date. The balancing
12 account will ensure that no revenue requirement prior to the transfer date of plant ownership
13 would be retained by SDG&E, aside from the PPTA and equity rebalancing costs included in the
14 ERRA. There will be no double counting/collection because the invoices paid through ERRA
15 (with the exception of fuel costs) will cease when SDG&E gains control of the plant and will no
16 longer be balanced or accounted for there. In summary, the balance will be returned to or
17 collected from ratepayers based on the actual date SDG&E obtains control of the plant. Please
18 see the testimony of Norma Jasso (Ex. SDG&E-41) for additional information on how the
19 balancing account would work and the disposition of the balance.

20 To integrate OMEC into SDG&E’s generation fleet, SDG&E estimates that \$5.351M in
21 ongoing capital will be required to address areas such as site physical security, network cyber
22 security, communications, modification of plant licenses and operating permits. On-going O&M
23 costs, including expenses for contracted labor, materials and services for routine maintenance
24 and planned outages, ground lease, and property insurance, are estimated to be \$22.796M for

³ See, e.g., Calpine Corporation Securities and Exchange 10Q filing for the quarter ending March 31, 2009 at 11, available at: <http://d11ge852tjjqow.cloudfront.net/CIK-0000916457/c2a0a247-8370-4d29-b066-805f2e2bc90e.pdf>. (noting “a put option by OMEC to sell the Otay Mesa Energy Center for \$280 million to SDG&E, and a call option by SDG&E to buy for \$377 million at the end of the tolling agreement.”).

⁴ Ratepayers currently pay for the PPTA and rebalancing costs through the Electric Resources Recovery Account (ERRA), which is reviewed annually in ERRA Forecast applications and most recently approved in D.15-12-032 and D.16-12-053. The 2018 ERRA Forecast Application (A.17-04-016) remains pending before the Commission.

1 Test Year 2019. Cost estimates are based on the 5-year forecast for the Palomar Energy Center,
2 which is most similar in size, power plant type, and age to OMEC. Ground lease and property
3 insurance costs are from the 2016 Financial Statements of Otay Mesa Energy Center, LLC.

4 **2. Administration**

5 **a. Generation Plant Administration**

6 Generation Plant Administration provides managerial oversight and analytical support for
7 the generating fleet.

8 **b. Electric Project Development**

9 Electric Project Development supports Generation and Resource Planning, Smart Grid
10 Projects and Distribution Planning.

11 **3. SONGS-related O&M**

12 My testimony requests recovery of the following reasonably incurred SONGS-related
13 O&M costs in this SDG&E TY2019 GRC filing:

- 14 • \$1.015M (2019\$) for SONGS Marine Mitigation; and
- 15 • \$0.461M (2019\$) for Worker’s Compensation under the Master Insurance Program
16 (MIP) (Pre-2000) and SCE’s self-insured Worker’s Compensation (Self-Insured
17 Worker’s Compensation) (Post-1999 through June 7, 2013) programs (collectively
18 “Worker’s Compensation”)
- 19 • Continuation of the SONGS Balancing Account, first authorized in D.06-11-026, and
20 most recently re-authorized in SDG&E’s TY2016 GRC (D.16-06-054).⁵

21 The key changes affecting SDG&E’s SONGS costs during this General Rate Case (GRC)
22 cycle are:

- 23 • After the June 2013 closure of SONGS, most SONGS costs are appropriately
24 considered to be decommissioning costs, and thus will be recovered through
25 mechanisms other than the GRC.
- 26 • Those SONGS costs remaining in Southern California Edison’s (SCE’s) Test Year
27 (TY) 2018 GRC are Marine Mitigation⁶ and Worker’s Compensation. In SCE’s

⁵ D.16-06-054 at 329, Ordering Paragraph (OP) 8(b) (“SDG&E shall continue the two-way balancing account for San Onofre Nuclear Generating Station through this rate cycle.”).

⁶ Forecasted Marine Mitigation costs included in this testimony do not include the Wheeler North Reef Expansion Project required by the California Coastal Commission. Recovery of these costs were

1 GRC, SDG&E traditionally submits intervenor testimony and seeks to establish and
2 recover its 20% portion of SONGS costs in rates. In accordance with this
3 Commission approved practice,⁷ SDG&E intervened in SCE’s TY 2018 GRC (A.16-
4 09-001), and submitted intervenor testimony requesting recovery of these costs.⁸

- 5 • My testimony describes these two costs (i.e., Marine Mitigation and Worker’s
6 Compensation) that SDG&E is requesting in the TY2018 SCE GRC.

7 **4. Resource Planning**

8 Resource Planning is responsible for planning the long-term electric generation needs of
9 SDG&E’s bundled customers as well as planning for adequate resources to meet local capacity
10 requirements of all customers. This group is managed by the Director – Resource Planning and
11 supports the goals of safely delivering reliable power at the lowest possible cost while meeting
12 the state’s policy goals to reduce greenhouse gas emissions. Software-based production cost
13 models are used to achieve this and these models are also used to evaluate resources proposed in
14 request-for-offers, develop CPUC-required filings such as the integrated resource planning
15 process, the annual ERRRA filing, and to forecast greenhouse gas emissions.

16 **C. Challenges Facing Operations**

17 The key challenges facing Generation during the next decade include the following:

- 18 • Maintaining high reliability and availability. As equipment ages and is called on for
19 more frequent starts than originally anticipated, it is important to invest time and
20 resources to ensure that equipment is kept up to date with the best available

requested in the Joint Application of Southern California Edison (U 338-E) and San Diego Gas & Electric (U 902-E) A.16-12-002.

⁷ See, e.g., D.04-07-022 at Finding of Fact (FOF) 43 (“To ensure consistent treatment of SONGS expenditures and to avoid duplicative litigation, the Commission has addressed SONGS-related expenses that SCE bills to SDG&E in SCE’s GRCs.”)

⁸ On May 2, 2017, SDG&E submitted the following testimony in the SCE TY2018 GRC (A.16-09-001): Ex. SDGE-01 (SDG&E witness T. Dalu) and Ex. SDG&E-02 (SDG&E witness S. Li). As summarized in Ex. SDGE-01 (at 7), “SDG&E respectfully requests that the Commission approve SDG&E’s 20% share of SCE’s Marine Mitigation and Worker’s Compensation expenditures. . . In the alternative, if the Commission approves amounts for SCE that differ from SCE’s original request, then SDG&E requests that the Commission approve for SDG&E amounts resulting from the application of SDG&E’s methodology outlined above and in SDGE-02 when applied to SCE’s authorized Marine Mitigation and Worker’s Compensation amounts.” At the time of this submission, SCE’s TY2018 GRC remains pending.

1 technologies and that the latest innovations in monitoring and maintenance practices
2 are employed. Current industry best practice predictive maintenance techniques,
3 predictive data analytics, transformer condition monitoring, vibration monitoring for
4 rotating machinery and high energy pipe weld inspections are used to reduce
5 unplanned failures and forced outages.

- 6 • Efforts to increase the effectiveness of network security, physical security and
7 environmental monitoring are ongoing to address increased risk.

8 **D. Summary of Safety and Risk-Related Costs**

9 Certain costs supported in my testimony are driven by activities described in SoCalGas
10 and SDG&E's November 30, 2016 Risk Assessment Mitigation Phase (RAMP) Report.⁹

11 In the course of preparing the GRC forecasts, the scope, schedule, resource requirements
12 and synergies of RAMP-related projects and programs were evaluated. Therefore, the final
13 representation of RAMP costs may differ from the ranges shown in the original RAMP Report.

14 Table DSB-2 provides a summary of the RAMP-related costs supported by my testimony
15 by RAMP risk:

16 **TABLE DSB-2**
17 **Summary of RAMP O&M Overlay**

ELECTRIC GENERATION (In 2016 \$)			
RAMP Risk Chapter	2016 Embedded Base Costs (000s)	TY2019 Estimated Incremental (000s)	Total (000s)
SDG&E-6 Fail to Black Start	20	20	40
Total O&M	20	20	40

18

⁹ I.16-10-015/I.16-10-016 Risk Assessment and Mitigation Phase Report of San Diego Gas & Electric Company and Southern California Gas Company, November 30, 2016. Please also refer to Exhibit SCG-02 (Diana Day) for more details regarding the utilities' RAMP Report.

Summary of RAMP Capital Overlay

NEW GENERATION (In 2016 \$)			
RAMP Risk Chapter	2017 Estimated RAMP Total (000s)	2018 Estimated RAMP Total (000s)	2019 Estimated RAMP Total (000s)
SDG&E-6 Fail to Black Start	300	806	0
Total Capital	300	806	0

In their testimony, Diana Day and Jamie York (Ex. SCG-02/SDG&E-02) further describe how safety and security risks are assessed and factored into cost decisions on an enterprise-wide basis.

E. Summary of Costs Related to Fueling our Future (FOF)

As described in the testimony of Hal Snyder and Randall Clark (Ex. SCG-03/SDG&E-03), the utilities kicked off the Fueling Our Future (FOF) initiative in May 2016 to identify and implement efficient operations improvements. Generation was able to implement various cost-saving projects in response to the FOF initiative.

**TABLE DSB-3
Summary of FOF Costs**

ELECTRIC GENERATION & SONGS (In 2016 \$)			
FOF O&M	Estimated 2017 (000s)	Estimated 2018 (000s)	Estimated 2019 (000s)
FOF-Ongoing/<Benefits>	-387	-1,947	-2,478
Total O&M	-387	-1,947	-2,478

FOF-Ongoing/<Benefits>	Estimated 2017 (000s)	Estimated 2018 (000s)	Estimated 2019 (000s)
1EG003.000, Generation Plant Palomar	-281	-1,393	-1,526
1EG006.000, Generation Plant Desert Star	-106	-554	-952
Total	-387	-1,947	-2,478

1

Item	Fueling Our Future O&M Projects	Total Estimated 2019 (000s)
1	Goods and Services Benefits	-1,798
2	Water Treatment and use Programs.	-310
3	Optimize the Maintenance Frequency for Gas Turbines	-350
4	Install plant cycling damage monitoring & diagnostics tool	-20
Total O&M Annual Savings (actual savings by Forecasted Year based on Starting Quarter of Savings)		-2,478

2 As explained below, there are four Generation FOF initiatives being implemented. Table
3 DSB-3 above shows total annual savings. Benefits for Years 2017, 2018 and TY2019 vary by
4 year due to different start dates. In addition to this testimony, please also refer to my
5 workpapers, Ex. SDG&E-16-WP (O&M), for additional information on the activities described
6 herein.

7 **1. Goods and Services Benefits**

8 The total benefit to Generation for the Goods and Services FOF O&M Project is
9 \$1.798M. As discussed generally in the testimony of Denita Willoughby (Ex. SDGE-20), this
10 project focuses on optimizing procurement strategies for business units across the companies.
11 The benefit for the Generation area is \$1.598M for Year 2019. Prudent negotiation of goods and
12 services agreements for the generating sites should result in certain benefits when procuring
13 spare parts, materials, consumables and labor. In addition, benefits of \$0.200M for Year 2019
14 are expected for negotiating longer-term contracts for maintenance.

15 **2. Water treatment and use programs**

16 The cooling tower water treatment regimen at the Palomar Energy Center was revised to
17 reflect the latest innovations in chemical treatment programs. The storm water system was also
18 modified to capture rainfall and divert that water to the cooling towers to reduce recycled water
19 consumption. The FOF initiatives associated with water treatment and use programs at PEC
20 reduce water consumption by improving cooling tower chemical control, and modify the storm
21 water drain system at PEC to divert storm water to the cooling tower, shown in above table.

1 **3. Optimize the maintenance frequency for gas turbines**

2 This FOF initiative optimizes the maintenance frequency for gas turbines by extending
3 operational hours from 12,000 to 25,000. The turbine parts last twice as long which reduces
4 refurbishment costs, as shown in the table above.

5 **4. Install plant cycling damage monitoring and diagnostics tool**

6 The installation of a real-time plant cycling damage monitoring and diagnostics tool for
7 the Heat Recovery Steam Generators (HRSGs) and Steam Turbine provides predictive analytics
8 for early warning of equipment issues. Cost benefits are shown in above table.

9 **II. RISK ASSESSMENT MITIGATION PHASE AND SAFETY CULTURE**

10 **A. Risk Assessment Mitigation Phase**

11 Within my funding request are costs associated with risk-mitigation efforts identified in
12 the November 30, 2016 San Diego Gas & Electric Company and Southern California Gas
13 Company Risk Assessment Mitigation Phase (RAMP) Report (I.16-10-015/I-10-016). As
14 discussed in the testimony of Diana Day and Jamie York (Ex. SCG-2/SDG&E-02), the costs of
15 risk-mitigation projects and programs were translated from that RAMP report into the individual
16 witness areas.

17 In the course of preparing my GRC forecasts, we continued to evaluate the scope,
18 schedule, and resource requirements of RAMP-related projects and programs. Therefore the
19 final representation of RAMP costs may differ from the ranges shown in that original RAMP
20 Report.

21 Identifying projects and programs that help to mitigate risks identified in the RAMP
22 report manifest themselves in my testimony as adjustments to my forecasted costs. This
23 adjustment process was used to identify both RAMP mitigation costs embedded as part of
24 traditional and historic activities, as well as RAMP-incremental costs. The Generation RAMP
25 costs can be found in my workpapers, Ex. SDG&E-16-WP.

26 The general treatment of RAMP forecasting is described in the testimony of Ms. Day.
27 There are also a few instances where, in the course of developing the GRC forecast, additional
28 RAMP-like activities were identified; these have been marked as RAMP-Post Filing and treated
29 as if they had been included in the original RAMP Report.

30 SDG&E Electric Grid Operations requested a blackstart resource for the San Diego
31 county south grid, specifically located at the Cuyamaca Peak Energy Plant (CPEP). Electric

1 Generation is responsible for the implementation, operation and maintenance of the blackstart
 2 resource at CPEP.

3 In my testimony, I am addressing the risk of “Fail to Blackstart.” The Fail to Blackstart
 4 (i.e. Blackstart) risk is the inability to restore electric services to customers in the SDG&E
 5 service territory following a disturbance or an event in which the SDG&E service territory
 6 suffers a complete blackout or shut down condition. Table DSB-4 provides a summary of the
 7 RAMP related costs (O&M summary and detail, Capital).

8 For this risk, an embedded 2016 cost-to-mitigate, and any incremental costs expected by
 9 the Test Year 2019, are shown in Table-4 below.

10 **Table DSB-4**
 11 **Summary of RAMP Overlay**

ELECTRIC GENERATION (In 2016 \$)			
RAMP Risk Chapter	2016 Embedded Base Costs (000s)	TY2019 Estimated Incremental (000s)	Total (000s)
SDG&E-6 Fail to Black Start	20	20	40
Total O&M	20	20	40

ELECTRIC GENERATION (In 2016 \$)			
SDG&E-6 Fail to Black Start	2016 Embedded Base Costs (000s)	TY2019 Estimated Incremental (000s)	Total (000s)
1EG002.000, Generation Plant Miramar	20	0	20
1EG007.000, Generation Plant Cuyamaca Peak	0	20	20
Total O&M	20	20	40

NEW GENERATION (In 2016 \$)			
RAMP Risk Chapter	2017 Estimated RAMP Total (000s)	2018 Estimated RAMP Total (000s)	2019 Estimated RAMP Total (000s)
SDG&E-6 Fail to Black Start	300	806	0
Total Capital	300	806	0

1 Table DSB-4 shows the RAMP costs for Generation. For each of these mitigation
2 efforts, an evaluation was made to determine the portion, if any, that was already being
3 performed in our historical activities. A determination was also made of the portion that may be
4 accommodated within a particular forecasting methodology such as averaging or trending, as
5 well as the portion, if any, that represents a true incremental cost increase or decrease from that
6 forecasting methodology.

7 While the starting point for consideration of the risk mitigation effort and cost was the
8 RAMP report submitted in November of 2016, we did not cease our evaluation of those efforts
9 for the preparation of this GRC request. Changes in scope, schedule, and availability of
10 resources, overlaps of mitigation efforts, and shared costs or benefits were also considered.
11 Therefore the incremental costs of risk mitigation sponsored in my testimony may differ from
12 those first identified in the RAMP report. Significant changes to those original cost estimates are
13 discussed further in my testimony or workpapers related to that mitigation effort.

14 **1. Risk Mitigation**

15 Risks related to Electric Generation are generally related to safety, system reliability,
16 physical site and cybersecurity, natural disaster and recovery from grid outages. System
17 reliability risks may include unexpected damage to major generating equipment that could
18 adversely affect the plant rating or ability to produce power. Physical security risks, such as
19 vandalism, theft, sabotage and terrorism, may affect employee safety and plant reliability and
20 could result in down time and costly repairs. Wildfires and earthquakes are types of risks from
21 natural disasters. To mitigate risks to the generating facilities and its workers, SDG&E has
22 implemented the following:

- 23 • Safety and technical training for operations and maintenance staff as well as first
24 responders.
- 25 • Safety reviews, inspections and audits.
- 26 • System warning alarms to alert personnel to an issue.
- 27 • Industry best practices operating procedures and programs, including reliability-
28 centered maintenance programs and procedures.
- 29 • Predictive maintenance practices and condition-based maintenance programs.

- 1 • Installation of modern control systems to maximize efficiencies and keeping the
- 2 controls systems up to date and cyber secure.
- 3 • Use of data collection and trending analysis to identify problems in advance of
- 4 equipment failures.
- 5 • Periodic plant inspections by insurance consultants.
- 6 • Controlling access to all power plants and their associated buildings with card readers
- 7 and cameras.
- 8 • Monitoring of sites with cameras by SDG&E security personnel.
- 9 • Implementation of a cybersecurity program at all sites and on all networks.
- 10 • On-site fire detection and protection.
- 11 • The 24/7 availability of SDG&E's industrial fire brigade, which conducts regular site
- 12 reviews and inspections.
- 13 • Building structures rated to withstand an earthquake.
- 14 • Addition of a critical services engine-generator set at the Palomar plant. This
- 15 increases the likelihood of the Palomar plant being available to assist when needed
- 16 during a system outage and recovery.
- 17 • Black start capability at the peaking plants to assist with system recovery and to help
- 18 start other generators in the area.
- 19 • Maintaining a well-stocked spare parts warehouse to mitigate downtime in the event
- 20 of equipment failure.

21 **2. Voluntary Protection Program**

22 The California Voluntary Protection Program - Star (Cal/VPP) recognizes outstanding
23 safety and health practices. Currently, the DSEC maintains Nevada VPP status (since 2009) and
24 the California plants (PEC, MEF, and CPEP) have applied for Cal/ VPP status. Successful
25 completion of this application process indicates that the employer and employees work together
26 to elevate the safety and health practices beyond the standard requirements. The costs include
27 engineered improvements, additional safety equipment, and additional employee and
28 management time in developing new practices and maintaining the elevated requirements and
29 documentation.

1 **B. Safety Culture**

2 A safety culture includes the integration of an effective risk management process and
3 approach. SDG&E has in place, a well-structured and documented approach to risk
4 management. Risks related to Electric Generation are generally related to safety, system
5 reliability, physical site and cybersecurity, natural disaster and recovery from grid outages.
6 System reliability risks may include unexpected damage to major generating equipment that
7 could adversely affect the plant rating or ability to produce power. Physical security risks, such
8 as vandalism, theft, sabotage and terrorism, may affect employee safety and plant reliability and
9 could result in down time and costly repairs. Wildfires and earthquakes are types of risks from
10 natural disasters.

11 As SDG&E’s generation business has become more complex, the safety and security
12 risks associated with operating the systems have also grown. These dynamics require an
13 evolution in the Company’s approach to managing risks. The integration of risks and their
14 mitigation activities in an ever-changing environment is a way in which Electric Generation
15 builds and maintains SDG&E’s safety culture for both its employees, customers, and the
16 communities in which we serve. Specific examples of safety-related activities in Electric
17 Generation that support and maintain the safety culture at SDG&E are listed in the Introduction
18 section of my testimony, specifically, section D., Summary of Safety and Risk Related Costs.

19 A safety culture also looks externally for benchmarking and verification of its activities.
20 As described previously, the DSEC maintains the Nevada Voluntary Protection Program (VPP)
21 status since 2009. The California plants have also applied for the California VPP status.
22 Obtaining this status in Nevada and applying for it in California provides another example of
23 SDG&E’s safety culture as it shows the importance and engagement of employees and
24 leadership in improving the safety culture at SDG&E.

25 **III. NON-SHARED COSTS**

26 “Non-Shared Services” are activities that are performed by a utility solely for its own
27 benefit. Corporate Center provides certain services to the utilities and to other subsidiaries. For
28 purposes of this GRC. SDG&E treats costs for services received from Corporate Center as Non-
29 Shared Services costs, consistent with any other outside vendor costs incurred by the utility. The
30 historical expenses have been adjusted to more accurately reflect the typical and expected
31 operations of each group within the organization. Forecasted expenses have also been adjusted

1 for various items that will affect the future expenditures of each organization within the group.
2 Table DSB-5 summarizes the total non-shared O&M forecasts for the listed cost categories.

3 In addition to this testimony, please also refer to my workpapers, Ex. SDG&E-16-WP
4 (O&M), for additional information on the activities described herein.

5 **TABLE DSB-5**
6 **Non-Shared O&M Summary of Costs**

ELECTRIC GENERATION & SONGS (In 2016 \$)			
Categories of Management	2016 Adjusted-Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
A. Generation Plant	34,785	60,371	25,586
B. Administration	411	469	58
C. SONGS	1,239	1,476	237
Total Non-Shared Services	36,435	62,316	25,881

7 SDG&E'S TY 2019 Estimated O&M for Electric Generation of \$62.316M is a change of
8 \$25.881M compared to the 2016 Adjusted-Recorded of \$36.435M. The Generation Plant
9 category change is mostly due to added costs for the forecasted addition of the Otay Mesa
10 Energy Center (OMEC).

1 **A. Generation Plant**

2 **TABLE DSB-6**

3 **Generation Plant Summary of Costs**

ELECTRIC GENERATION (In 2016 \$)			
A. Generation Plant	2016 Adjusted- Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
1. Generation Plant Palomar	17,583	18,556	973
2. Generation Plant Desert Star	14,419	15,561	1,142
3. Generation Plant Miramar	1,414	2,380	966
4. Generation Plant Cuyamaca Peak	1,369	1,078	-291
5. Generation Plant Otay Mesa	0	22,796	22,796
Total	34,785	60,371	25,586

4 **1. Generation Plant Palomar**

5 **a. Description of costs and Underlying Activities**

6 The O&M request for Palomar as shown in Table DSB-6 includes labor and non-labor
7 costs. The labor component includes salaries for supervision, support staff and maintenance and
8 operations personnel. The non-labor component includes, but is not limited to, industrial gases,
9 chemicals, water, outside services, spare parts, miscellaneous consumables and maintenance
10 activities. Maintenance activities are performed while the plant is operating and during planned
11 maintenance outages. The Palomar costs include Escondido BESS, El Cajon BESS, and RSEP.
12 See workpapers Ex. SDG&E-16-WP for details.

13 **b. Forecast Method**

14 Forecasting for labor and non-labor is based on a 5-year average. This method was
15 selected because it allows for inclusion of a variety of planned (e.g. scheduled maintenance
16 outages and repairs) and unplanned but typical (e.g. steam valve damage, combustion turbine
17 component failures, auxiliary equipment failures) maintenance events and provides a more
18 representative history of recorded spending.

19 **c. Cost Drivers**

20 Maintenance outages are a major portion of the O&M request for the Generation Plant.
21 These outages are scheduled at least annually, with the extent of the maintenance dependent on

1 the accumulated service hours on the equipment and the number of start cycles the equipment
2 experiences. Generally, more starts and more service hours result in more required maintenance.
3 Much of the required maintenance is performed during planned outages. Planned outages are
4 scheduled through the California Independent System Operator (CAISO).

5 **2. Generation Plant Desert Star**

6 **a. Description of Costs and Underlying Activities**

7 Similar to other generation plant, the O&M request for Desert Star as shown in Table
8 DSB-6 includes labor and non-labor costs. The labor component includes salaries for
9 supervision, support staff and maintenance and operations personnel. The non-labor component
10 includes, but is not limited to, industrial gases, chemicals, water, outside services, spare parts,
11 miscellaneous consumables and maintenance activities. Maintenance activities are performed
12 while the plant is operating, and during planned maintenance outages.

13 The non-labor component also includes the payments for the Desert Star Long-Term
14 Service Agreement (LTSA) purchased through Siemens. Costs related to the LTSA with
15 Siemens for the major plant equipment are dependent on the amount of run time for the plant.
16 LTSA costs are generally based on a dollar-per-operating-hour basis so more run time equates to
17 higher LTSA costs.

18 **b. Forecast Method**

19 Forecasting for labor and non-labor is based on a 5-year average. This method was
20 selected because it allows for inclusion of a variety of planned (e.g. scheduled maintenance
21 outages and repairs) and unplanned but typical (e.g. steam valve damage, combustion turbine
22 component failures, auxiliary equipment failures) maintenance events and provides a more
23 representative history of recorded spending.

24 Forecasting for labor and non-labor is based on a 5-year average for O&M expenses
25 excluding the LTSA. The Base Year Record forecasting is used for LTSA expenses and
26 submitted as a Non-Standard Escalation (NSE) cost because the amount is based on contractual
27 amounts and forecasted Run-Hours.

28 **c. Cost Drivers**

29 Again, maintenance outages are a major portion of the O&M request for the Generation
30 Plant. These outages are scheduled at least annually, with the extent of the maintenance
31 dependent on the accumulated service hours on the equipment and the number of start cycles the

1 equipment experiences. Generally, more starts and more service hours result in more required
2 maintenance. Much of the required maintenance is performed during planned outages. Planned
3 outages are scheduled through the CAISO.

4 **3. Generation Plant Miramar**

5 **a. Description of Costs and Underlying Activities**

6 As with other generation plant, the O&M request for Miramar as shown in Table DSB-6
7 includes labor and non-labor costs. The labor component includes salaries for supervision,
8 support staff and maintenance and operations personnel. The non-labor component includes, but
9 is not limited to, industrial gases, chemicals, water, outside services, spare parts, miscellaneous
10 consumables and maintenance activities. Maintenance activities are performed while the plant is
11 operating and during planned maintenance outages.

12 **b. Forecast Method**

13 Forecasting for labor and non-labor is based on a 5-year average. This method was
14 selected because it allows for inclusion of a variety of planned (e.g. scheduled maintenance
15 outages and repairs) and unplanned but typical (e.g. combustion turbine component failures,
16 auxiliary equipment failures) maintenance events and provides a more representative history of
17 recorded spending.

18 **c. Cost Drivers**

19 Once again, maintenance outages are a major portion of the O&M request for the
20 Generation Plant. These outages are scheduled at least annually, with the extent of the
21 maintenance dependent on the accumulated service hours on the equipment and the number of
22 start cycles the equipment experiences. Generally, more starts and more service hours result in
23 more required maintenance. Much of the required maintenance is performed during planned
24 outages. Planned outages are scheduled through the CAISO.

25 **4. Generation plant Cuyamaca**

26 **a. Description of Costs and Underlying Activities**

27 The O&M request for Cuyamaca as shown in Table DSB-6, like other generation plants,
28 also consists of labor and non-labor costs. The labor component includes salaries for
29 supervision, support staff and maintenance and operations personnel. The non-labor component
30 includes, but is not limited to, industrial gases, chemicals, water, outside services, spare parts,

1 miscellaneous consumables and maintenance activities. Maintenance activities are performed
2 while the plant is operating and during planned maintenance outages.

3 **b. Forecast Method**

4 Forecasting for labor and non-labor is based on a 5-year average. This method was
5 selected because it allows for inclusion of a variety of planned (e.g. scheduled maintenance
6 outages and repairs) and unplanned but typical (e.g. combustion turbine component failures,
7 auxiliary equipment failures) maintenance events and provides a more representative history of
8 recorded spending.

9 **c. Cost Drivers**

10 Maintenance outages, as with other facilities, are a major portion of the O&M request for
11 the Generation Plant. These outages are scheduled at least annually, with the extent of the
12 maintenance dependent on the accumulated service hours on the equipment and the number of
13 start cycles the equipment experiences. Generally, more starts and more service hours result in
14 more required maintenance. Much of the required maintenance is performed during planned
15 outages. Planned outages are scheduled through the CAISO.

16 **5. Generation Plant Otay Mesa**

17 **a. Description of Costs and Underlying Activities**

18 The O&M request for Otay Mesa as shown in Table DSB-6 consists of non-labor costs.
19 Labor costs for OMEC Plant operation and maintenance are shown as non-labor costs because it
20 is currently unknown if the Calpine employees operating and maintaining OMEC will be hired as
21 SDG&E employees. Other non-labor costs include, but are not limited to, industrial gases,
22 chemicals, water, outside services, spare parts, miscellaneous consumables and maintenance
23 activities. Maintenance activities are performed while the plant is operating and during planned
24 maintenance outages.

25 **b. Forecast Method**

26 A 5-year average cannot be used directly for OMEC because we do not have access to the
27 detailed O&M costs, as we are not the current owner. Instead the 5-year average forecast for the
28 Palomar Energy Center is used due to its similarities to PEC O&M costs. Costs are also included
29 for ground lease and property insurance costs.

30 The major portion of the O&M request for the Generation Plant is, like the other plants,
31 maintenance outages. These outages are scheduled at least annually, with the extent of the

1 maintenance dependent on the accumulated service hours on the equipment and the number of
 2 start cycles the equipment experiences. Generally, more starts and more service hours result in
 3 more required maintenance. Much of the required maintenance is performed during planned
 4 outages. Planned outages are scheduled through the CAISO.

5 **B. Administration**

6 **Table DSB-7**
 7 **Administration**

ELECTRIC GENERATION & SONGS (In 2016 \$)			
B. Administration	2016 Adjusted- Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
1. Generation Plant Administration	348	348	0
2. Electric Project Development	63	121	58
Total	411	469	58

8 **1. Description of Costs**

9 The O&M request for Administration includes labor and non-labor costs. The labor
 10 component includes salaries for the Generation Plant Administration and Electric project
 11 Development. The non-labor component includes, but is not limited to, employee travel,
 12 supplies, consulting and other miscellaneous administrative activities.

13 **2. Forecast Method**

14 The Base Year Recorded method is used for the forecast because of changes in the
 15 Administration staffing level during the historical period that are not representative of current
 16 staffing.

17 **3. Cost Drivers**

18 Supervision of Electric Generation activities and the financial management thereof are
 19 the major portion of the O&M request. Also, Electric Generation project management is a
 20 portion of the O&M costs. Administration costs include three FTEs and associated employee
 21 costs for a Generation Plant Director, Plant Accountant, and Project Manager.

1 **C. SONGS Related O&M**

2 **1. Description of Costs**

3 SDG&E's TY2019 request presented in this testimony and shown in Table DSB-8 below
4 presents the portion of SONGS-related direct O&M costs to be established in SCE's pending
5 TY2018.

6 **TABLE DSB-8**

7 **Test Year 2019 Summary of SONGS O&M**

ELECTRIC GENERATION – SONGS			
Categories of Management	2016 Adjusted-Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
Marine Mitigation	\$946	\$1,015	\$69
SONGS Worker's Compensation	\$293	\$461	\$168
Total	\$1,239	\$1,476	\$237

8 **1. SONGS Marine Mitigation**

9 As mentioned previously, SDG&E incurs its 20% share of SONGS Marine Mitigation
10 costs that are derived from values determined in SCE's TY2018 GRC. These costs are incurred
11 for ongoing projects designed to mitigate the turbidity effects caused by the movement of ocean
12 water used to cool SONGS when it was operational. SCE provides its 78.21% of Marine
13 Mitigation expense forecast for SONGS in its TY2018 GRC. SCE will bill SDG&E for its 20%
14 share of these expenses at the 100% level, including contractual overheads.¹⁰

15 One of the Marine Mitigation projects, the San Dieguito Wetlands Restoration, is near
16 completion and pending California Coastal Commission acceptance. The first full year of
17 monitoring for the wetlands was 2012. The other project, creation of the Wheeler North Reef,
18 was completed in 2008. The Wheeler North Reef project met most performance standards, but
19 according to SCE, in order to meet all required performance standards for the reef, more rock
20 will be added to increase the acreage of the reef. This additional work will be performed in the
21 Wheeler North Reef Expansion Project, subject to Commission approval in A.16-12-002. The

¹⁰ See Ex. SDG&E-01 in SCE's 2018 GRC (A.16-09-001) detailing SDG&E's 20% share of the Marine Mitigation forecast at 100% for SONGS in SCE's TY 2018 GRC.

1 costs associated with the Wheeler North Reef Expansion Project are not included in this
2 application.

3 The Marine Mitigation costs provided in SCE's forecast of Marine Mitigation direct costs
4 are determined by SCE's project managers incorporating the assessments and directions of the
5 California Coastal Commission's technical advisors and include the California Coastal
6 Commission monitoring efforts. When billed to SDG&E, these costs are loaded with SCE's
7 contractual overheads (SCE's labor and non-labor Administrative and General (A&G)
8 overheads, and SCE's Pension and Benefits overhead, SCE's payroll taxes). Table DB-8
9 identifies the resulting forecast of SDG&E's expense for use in this proceeding as \$1.015M
10 (2019\$) for SONGS Marine Mitigation. In the event that the Commission approves changed or
11 updated SONGS costs in SCE's 2018 GRC or SCE changes or updates its forecast, SDG&E will
12 likewise adjust its cost forecasts.

13 To ensure that SDG&E's ratepayers pay no more and no less for SONGS Marine
14 Mitigation than what SCE bills SDG&E, SDG&E has established the Commission-approved
15 Marine Mitigation Memorandum Account (MMMA).¹¹ SDG&E filed a motion in SCE's GRC
16 to extend the term of the MMMA to accommodate the period between the end of the current
17 MMMA (Dec 31, 2017) and the decisions in SCE's (and SDG&E's) pending GRC.¹²

18 **2. SONGS Worker's Compensation Costs**

19 SCE continues to bill SDG&E for SCE's Master Insurance Program (MIP)/Self-Insured
20 Worker's Compensation expenses resulting from SONGS worker's compensation related
21 accident and injury claims while SONGS was operating. The MIP program was active from
22 1972 to 1999. It provided insurance coverage for all of SCE, including the owners, contractors
23 and subcontractors at SONGS, under one insurance program for General Liability and Worker's
24 Compensation. The program was terminated in 1999, so premiums are no longer paid into the
25 program. However, there are still open claims that are the responsibility of SONGS' co-owners.

¹¹ Marine Mitigation Memorandum Account, SDG&E, *available at*: http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-PRELIM_MMMA.pdf.

¹² Motion of San Diego Gas and Electric Company to Amend Its Memorandum Account for Marine Mitigation, A.16-09-001 (filed May 2, 2017), *available at*: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M189/K135/189135984.PDF>. On September 1, 2017, the ALJs in the SCE GRC denied SDG&E's motion on the grounds that SDG&E should have filed a petition for modification instead of a motion. SDG&E filed a petition for modification on September 15, 2017 to address this issue.

1 For periods after 1999 through June 7, 2013, SCE maintained a self-insured worker's
2 compensation program under California's worker's compensation laws. That program included
3 SCE workers at SONGS while it was operational. Collectively with the MIP, this program is
4 referred to as "Worker's Compensation."

5 Current and former SONGS workers can initiate a claim under California's worker's
6 compensation laws even after the employment related to the claim has ended. Thus, SONGS-
7 related claims for 1972 through 1999 under MIP continue, as do claims under the Self-Insured
8 Worker's Compensation from 2000 until June 7, 2013. Both the MIP and Self-Insured Worker's
9 Compensation will remain open until all claims are closed.

10 The SONGS-related Worker's Compensation costs are included in SCE's worker's
11 compensation revenue requirement forecast for the entire company. SCE provided SDG&E with
12 a breakout of SONGS related Worker's Compensation for SCE's TY2018 GRC.¹³ Table DSB-8
13 identifies the resulting forecast of SDG&E's expense for use in this proceeding as \$.461M
14 (2019\$) for SONGS Workers Compensation. In the event that the Commission approves
15 changed or updated SONGS costs or SCE changes or updates its forecast, SDG&E will likewise
16 adjust its cost forecasts.

17 **3. SONGS Balancing Account (SONGSBA)**

18 In D.06-11-026, the Commission authorized SDG&E to establish the SONGSBA, which
19 allows SDG&E to recover no more and no less than the non-decommissioning SONGS costs
20 billed by SCE. In SDG&E's TY 2016 GRC, SDG&E was granted continued balancing treatment
21 of SONGS O&M costs billed by SCE through the end of the 2016 GRC cycle.¹⁴ Refer to the
22 testimony of Ms. Jasso (Ex. SDG&E-41) for details regarding costs associated with the
23 SONGSBA. SDG&E respectfully requests continuation of the SONGSBA for this GRC cycle as
24 well.

¹³ See Ex. SDG&E-01 (Appendix C) in A.16-09-001.

¹⁴ See D.16-06-054 at 329, OP 8(b) ("SDG&E shall continue the two-way balancing account for San Onofre Nuclear Generating Station through this rate cycle.").

1 **IV. SHARED COSTS**

2 **A. Introduction**

3 As described in the testimony of James Vanderhye, Shared Services are activities
4 performed by a utility shared services department (*i.e.*, functional area) for the benefit of: (i)
5 SDG&E or SoCalGas, (ii) Sempra Energy Corporate Center, and/or (iii) any unregulated
6 subsidiaries. The utility providing Shared Services allocates and bills incurred costs to the entity
7 or entities receiving those services.

8 Table DSB-9 summarizes the total shared O&M forecasts for the listed cost categories.

9 **TABLE DSB-9**
10 **Shared O&M Summary of Costs**

ELECTRIC GENERATION & SONGS (In 2016 \$)			
(In 2016 \$) Incurred Costs (100% Level)			
Categories of Management	2016 Adjusted- Recorded (000s)	TY2019 Estimated (000s)	Change (000s)
A. Resource Planning	747	1,095	348
Total Shared Services (Incurred)	747	1,095	348

11 I am sponsoring the forecasts on a total incurred basis, as well as the shared services
12 allocation percentages related to those costs. Those percentages are presented in my shared
13 services workpapers, along with a description explaining the activities being allocated. See Ex.
14 SDG&E-16-WP. The dollar amounts allocated to affiliates are presented in Mr. Vanderhye's
15 (Ex. SCG-34/SDG&E-32).

16 **B. Resource Planning**

17 **1. Description of Costs and Underlying Activities**

18 Resource Planning is responsible for providing oversight of the Resource Planning
19 organization. The Resource Planning workforce utilizes a software package that enables them to
20 model the electric system. These types of models are commonly referred to as production cost
21 models. This model is used to develop CPUC-required filings in proceedings including the
22 integrated resource planning process, evaluating resources in request for offers, the annual
23 ERRA filing and to forecast greenhouse gas emissions. Southern California Gas Company
24 (SoCalGas) also uses a similar model to develop the demand for natural gas service from electric

1 generators. A single contract has been negotiated with a vendor for models used by both
2 companies. By having one contract, we are able to obtain these programs at a lower cost than by
3 contracting for them separately. SDG&E is responsible for processing the contract payments. A
4 portion of the expenses, equal to the programs utilized by SoCalGas, are allocated to SoCalGas.
5 Resource Planning supports the company's goal of safely delivering reliable power at the lowest
6 possible cost while meeting the State's policy goals of reducing greenhouse gases. This is
7 accomplished through ensuring the availability of the tools required to evaluate resource needs
8 and prudently maintaining required infrastructure for the resources needed to meet all reliability
9 requirements.

10 **2. Forecast Method**

11 Forecasting for labor and non-labor are based on the 5-year average. This method was
12 selected because it represents a reasonable foundation for forecasting the future needs of the
13 organization.

14 **3. Cost Drivers**

15 The level of labor and non-labor spend for this is area is expected to remain consistent
16 throughout the forecast years.

17 **V. CAPITAL**

18 **A. Introduction**

19 All capital projects being considered improve the overall safety, reliability and
20 operability of the plants. Table DSB-10 summarizes the total capital forecasts for 2017, 2018,
21 and 2019.

22 In addition to this testimony, please also refer to my capital workpapers, Ex. SDG&E-16-
23 CWP, for additional information on the activities described herein.

TABLE DSB-10

Capital Expenditures Summary of Costs

NEW GENERATION (In 2016 \$)				
A. Generation Capital	2016 Adjusted- Recorded (000s)	Estimated 2017(000s)	Estimated 2018(000s)	Estimated 2019(000s)
1. Capital Tools & Test Equipment	151	275	275	275
2. Miramar Energy Facility	83	2,580	2,580	2,580
3. Palomar Energy Center	4,757	5,351	5,351	5,351
4. Desert Star Energy Center	3,352	3,361	3,361	3,361
5. Cuyamaca Peak Energy Plant	1,185	453	453	453
6. South Grid - Black Start CPEP	0	300	806	0
7. Otay Mesa Energy Center – Acquisition	0	0	280,000	0
8. Otay Mesa Energy Center - Ongoing Capital	0	0	0	5,351
9. Solar Photovoltaic Plant	13,456	994	0	0
Total	22,984	13,314	292,826	17,371

B. Capital Projects

This general capital project request covers the Generation assets listed in Table DSB-10 above.

1. Capital Discussion

The forecasts for 2017, 2018, and 2019 are shown in Table DSB-10 above. SDG&E does not propose a specific list of capital projects, but instead will plan, schedule and perform capital projects, as appropriate, to best support the safe and reliable operation for Generation plants. To effectively meet this goal, SDG&E will use a general capital project budget, rather than proposing specific projects. The general capital budget allows flexibility and adaptability in capital projects to meet the current and future plant needs.

Projecting capital projects years in advance is difficult for a variety of reasons, such as changes in costs and technology from the time of planning to the time of implementation. Most importantly, power plant needs may change, resulting in different or unexpected priorities. Resources are then reallocated to accommodate the new priorities.

1 For example, various unplanned turbine repairs have been required in the past due to
2 wear and tear or greater than expected start cycles. For example:

- 3 • In 2016, the CPEP turbines required an unplanned repair due to wear and tear
4 damage. This extensive repair was made with upgraded turbine parts, improving the
5 reliability of the turbines.
- 6 • In 2016, the PEC Steam Turbine Last Stage Blades, which are life limited by the
7 number of turbine starts, required replacement due to greater than expected start
8 cycling. Upgraded blades were installed, which have a greatly increased start cycle
9 life.
- 10 • In 2014, the MEF1 turbine experienced extensive damage in one of the compressor
11 sections. Due to the extent of the damage, as well as wear and tear issues from high
12 cycling, SDG&E decided to replace the turbine with a rebuilt upgraded one, instead
13 of repairing the existing machine.

14 **2. Forecast Method**

15 The 5-year average is used to forecast capital expenditures. The average has been
16 adjusted by removing some large, one-time, capital projects from the history. This method is
17 appropriate because it reflects the operational needs of the assets, through the averaging period.

18 **3. Cost Drivers**

19 The underlying cost drivers for these capital projects relate to maintaining the clean, safe,
20 and reliable operation of the Generation assets. Capital improvements provide for equipment
21 upgrades to keep up with current technologies for meeting the Company goals for safety and
22 reliability.

23 **VI. CONCLUSION**

24 This testimony describes the activities of SDG&E's Electric Generation, and presents the
25 forecast for both existing and reasonably anticipated new expenses for the GRC test year 2019.
26 This testimony and my workpapers demonstrate the justification for the requested funding so that
27 SDG&E can continue to meet its obligations to comply with applicable regulations and provide
28 safe and reliable service. I request the Commission to approve funding for the expenses and
29 projects presented here.

30 This concludes my prepared direct testimony.

1 **VII. WITNESS QUALIFICATIONS**

2 My name is Daniel S. Baerman. My business address is 2300 Harveson Place,
3 Escondido, CA 92029. I am employed by SDG&E as Director – Electric Generation. I joined
4 SDG&E in 2005 and have been working in the power generation/utility industry for more than
5 30 years in positions of increasing responsibility. I have experience with operations and
6 maintenance, construction management, commissioning, mobilization and plant outfitting both in
7 the United States and abroad. I have managed 7 power plants and commissioned 13 plants of
8 varying technologies. I am familiar with several technologies including coal-fired boilers,
9 internal combustion reciprocating engines, aero derivative gas turbines and heavy industrial gas
10 turbines in peaking and combined-cycle configurations.

11 I have also held the position of Director – Origination & Portfolio Design. My
12 responsibilities included procurement of generation and other long-term supply side resources
13 such as storage and demand response. I hold a Bachelor of Science degree in Marine
14 Engineering from the United States Merchant Marine Academy at Kings Point, New York. I
15 have previously testified before the Commission.

APPENDIX A – Glossary of Terms

BESS	Battery Energy Storage System
CAISO	California Independent System Operator
CPEP	Cuyamaca Peak Energy Plant
DSEC	Desert Star Energy Center
ERRA	Energy Resource Recovery Account
GHG	Green House Gas
GRC	General Rate Case
HRSR	Heat Recovery Steam Generator
LTSA	Long Term Service Agreement
MEF	Miramar Energy Facility
MIP	Master Insurance Program
MMMA	Marine Mitigation Memorandum Account
NSE	Non Standard Escalation
O&M	Operations and Maintenance
OMEC	Otay Mesa Energy Center
PEC	Palomar Energy Center
PPTA	Power Purchase Tolling Agreement
RAMP	Risk Assessment Mitigation Phase
RSEP	Ramona Solar Energy Project
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric Company
SoCalGas	Southern California Gas Company
SONGS	San Onofre Nuclear Generating Station
SONGSBA	SONGS Balancing Account