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Witness: Carl S. LaPeter
Date: May 31, 2019

SAN DIEGO GAS & ELECTRIC COMPANY
PREPARED DIRECT TESTIMONY OF
CARL S. LAPETER

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

May 31, 2019



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ACRONYM GLOSSARY

APCD	San Diego Air Pollution Control District
CARB	California Air Resource Board
CEC	California Energy Commission
CMMS	Computerized Maintenance Management System
CPEP	Cuyamaca Peak Energy Plant
CPUC	California Public Utilities Commission
CT	Combustion Turbine
CTG	Combustion Turbine Generator
CUPA	Certified Unified Program Agencies
GE	General Electric
D	Decision
DAQ	Clark County Department of Air Quality
DSEC	Desert Star Energy Center
ERRA	Energy Resource Recovery Account
ESRB	Electric Safety and Reliability Branch
GO	General Order
HRSRG	Heat Recovery Steam Generator
MEF	Miramar Energy Center
MW	Megawatt
NDEP	Nevada Division of Environmental Protection
NERC	North American Electric Reliability Corporation
NO _x	Nitrous Oxides
OEM	Original Equipment Manufacturer
ORA	Office of Ratepayer Advocates
PEC	Palomar Energy Center
RWQCB	Regional Water Quality Control Board
SCR	Selective Catalytic Reduction
SDG&E	San Diego Gas & Electric
STG	Steam Turbine Generator
UOG	Utility Owned Generation
US EIA	U.S. Energy Information Administration
WECC	Western Electricity Coordinating Council

1 **PREPARED DIRECT TESTIMONY OF**
2 **CARL S. LAPETER**
3 **ON BEHALF OF SDG&E**
4

5 **I. INTRODUCTION**

6 This prepared direct testimony presents San Diego Gas & Electric Company’s
7 (“SDG&E”) compliance with the California Public Utility Commission’s (“Commission” or
8 “CPUC”) Good Utility Practice, as discussed below, and reasonable manager standards as
9 defined in Decision (“D.”) 02-12-069,¹ with respect to Utility Owned Generation (“UOG”)
10 resources planned and unplanned outages during the period of January 1, 2018 through
11 December 31, 2018.

12 **II. DESCRIPTION OF SDG&E-OWNED GENERATION**

13 SDG&E owns and operates two combined-cycle generating facilities, the Palomar
14 Energy Center in Escondido, California and the Desert Star Energy Center in Boulder City,
15 Nevada. SDG&E owns and operates two peaking plants, Miramar Energy Facility in San Diego,
16 California and Cuyamaca Peak in El Cajon, California. SDG&E also added two battery energy
17 storage system projects to its fleet in early 2017; a 30 Megawatt (“MW”)/120 MWh Escondido
18 Battery Energy Storage System (“BESS”) and a 7.5 MW/30 MWh El Cajon BESS. Lastly, a
19 solar energy project located in Ramona, CA was also added to the portfolio that can produce up
20 to 4.32 MW using smart inverters and fixed photovoltaic panels.²

21 **A. Palomar Energy Center (“PEC”)**

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

¹ See D.02-12-069, Attachment A (A-3) at 5 for the definition of “Good Utility Practice.”

² The MW ratings used in this prepared direct testimony are electric generation ratings and may differ from plant interconnect ratings used elsewhere.

1 thermal energy storage tank that allows the plant to produce energy at its capacity during the
2 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, Nevada, is a 480 MW 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 MW (MEF-1 and MEF-2). This site also provides black start services used
12 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 MW. Operations and maintenance personnel based out of the
17 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 MWh energy storage system with a maximum output of 30
20 MW for up to 4 hours. The energy storage system uses lithium-ion batteries. The project
21 construction began Q4/2016 and began to operate commercially Q1/2017. Pursuant to CPUC
22 Resolution E-4791 dated May 26, 2016, SDG&E developed expedited energy storage projects to
23 alleviate reliability issues associated with Aliso Canyon. CPUC approval was requested via Tier
24 3 Advice Letter (“AL”) 2924-E. The AL was approved in its entirety in CPUC Resolution

1 E-4798 on August 18, 2016. Operations and maintenance personnel based out of the Palomar
2 Energy Center provide all plant services to this facility. O&M costs for Escondido BESS are
3 included in PEC O&M costs. Such costs are included as part of SDG&E’s General Rate Case
4 (“GRC”).

5 **F. El Cajon Battery Energy Storage System (“El Cajon BESS”)**

6 The El Cajon BESS was developed and constructed under the same authorization as the
7 Escondido battery project and also uses lithium-ion technology. This energy storage system is
8 rated at 30 MWh with a maximum output of 7.5 MW for up to 4 hours. Operations and
9 maintenance personnel based out of the Palomar Energy Center provide all plant services to this
10 facility. O&M costs for El Cajon BESS are included in PEC O&M costs. Such costs are
11 included as part of SDG&E’s GRC.

12 **G. Ramona Solar Energy Project (“RSEP”)**

13 The Ramona Solar Energy Project, located in Ramona, CA, was developed and
14 constructed pursuant to D.10-09-016 and SDG&E’s AL 2374-E-A. The project is built with
15 fixed photovoltaic panels and can produce up to 4.32 MW. Operations and maintenance
16 personnel based out of the Palomar Energy Center provide all plant services to this facility.
17 O&M costs for RSEP are included in PEC O&M costs. Such costs are included as part of
18 SDG&E’s GRC.

19 **III. COMMISSION STANDARDS RELATED TO SDG&E-OWNED GENERATION**

20 During the record period, SDG&E operated and maintained its UOG resources (Palomar,
21 Desert Star, Miramar, and Cuyamaca; collectively, SDG&E’s “UOG units”) in a reasonable and

1 prudent manner, consistent with “Good Utility Practice” and the reasonable manager standard.³

2 The Commission defined “Good Utility Practice” in D.02-12-069:⁴

3 [A]ny of the practices, methods and acts engaged in or approved by a significant
4 portion of the electric utility industry during the relevant time period, or any of
5 the practices, methods and acts which, in the exercise of reasonable judgment in
6 light of the facts known at the time the decision was made, could have been
7 expected to accomplish the desired result at a reasonable cost consistent with
8 good business practices, reliability, safety and expedition. Good Utility Practice
9 does not require the optimum practice, method, or act to the exclusion of all
10 others, but rather is intended to include acceptable practices, methods, or acts
11 generally accepted in the Western Electric Coordinating Council region.

12 Consistent with “Good Utility Practice,” during 2018, SDG&E followed an established
13 maintenance program to maximize the availability of the units as a primary “desired result.”

14 Specifically, this maintenance program factors in a number of considerations, including
15 manufacturer guidelines, appropriate power industry practices, safety considerations, and good
16 engineering and technical judgment to allocate resources most effectively to maximize
17 availability of its UOG resources. Additionally, the SDG&E maintenance program incorporates
18 practices that are generally accepted within the electric power generation industry and the
19 Western Electricity Coordinating Council (“WECC”).

³ The Commission has explained the “reasonable manager” standard in ERRA compliance cases, as follows: Under the “reasonable manager standard, utilities are held to a standard of reasonableness based upon the facts that are known or should have been known at the time. The act of the utility should comport with what a reasonable manager of sufficient education, training, experience, and skills using the tools and knowledge at his or her disposal would do when faced with a need to make a decision and act.” D.14-05-023 at 15 (citations omitted). By meeting the “Good Utility Practice” standard and other Commission requirements stated herein, SDG&E maintains that likewise has met the “reasonable manager” standard during the 2018 record period. The Appendices to this prepared direct testimony further provide SDG&E’s primary showing with respect to both standards. In addition, the Commission recently has confirmed that the compliance review to which various SDG&E accounts are subject in ERRA compliance proceedings are not “reasonableness reviews.” D.17-03-016 at 3 and Finding of Fact 2.

⁴ See D.02-12-069, Attachment A (A-3) at 5.

1 Additionally, SDG&E is required to comply with the Commission’s General Order
2 (“GO”) 167 - Enforcement of Maintenance and Operation Standards for Electric Generating
3 Facilities.⁵ Sections 10.0 and 11.0 of GO 167 specifically outline each generator owner’s
4 obligation to provide information and cooperate with Commission audits, investigations and
5 inspections. In addition, each outage may warrant, as necessary and appropriate, the creation of
6 internal documentation, including but not limited to, equipment affected, parts replaced, work
7 required to accomplish outage-related tasks, costs of repairs, other recommended actions that
8 may be taken to mitigate a repeat of the failure, change to operating procedures required to
9 address component or plant issues, changes to maintenance practices to improve reliability,
10 communications with an original equipment manufacturer, and implementation of upgrades to
11 improve reliability. Evidence of the above may be found, as necessary and appropriate, in parts
12 of the Computerized Maintenance Management System (“CMMS”) ordering documents, as well
13 as work orders, vendor invoices, investigation reports, management of change documents, and
14 communications with vendors.

15 GO 167 also requires SDG&E to meet specific maintenance and operations standards,
16 which also suggest guidance detailed for maintenance and operations programs. These standards
17 and guidance are based on accepted power industry good practices. SDG&E is required to
18 document and certify to these standards every two years and submit the documentation to the
19 Commission Electric Safety and Reliability Branch (“ESRB”). The certification documentation
20 includes a summary list of maintenance, operations and safety procedures that describe the
21 programs and processes used in generation.

⁵ California Public Utilities Commission, General Order No. 167, Enforcement of Maintenance and Operation Standards for Electric Generating Facilities (Effective September 02, 2005), *available at* http://docs.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/108114.htm.

1 **IV. ADDITIONAL REVIEW OF UOG OPERATIONS**

2 Additional review of SDG&E’s UOG operations is provided through Sempra Energy
3 Internal Audit Department’s audits of SDG&E’s generating facilities. Consistent with auditing
4 standards and industry best practices, the frequency and nature of such audits is determined
5 based on the Internal Audit Department’s annual risk assessment, which determines the areas of
6 the company, including utility operations, to be audited. This risk-based analysis may change
7 from year to year.

8 Further, SDG&E’s Insurance Risk Consultants conduct site inspections to review and
9 evaluate the plant’s physical condition, maintenance, and operations processes. These
10 inspections are performed from a risk perspective and cover maintenance practices, operations
11 practices, material condition, and fire protection. The report may offer recommendations for
12 improvement to systems, facilities, and processes.

13 SDG&E is also required to meet certain electric reliability standards from the North
14 American Electric Reliability Corporation (“NERC”) and WECC. NERC and WECC perform
15 periodic audits of SDG&E to ensure compliance with the reliability standards.

16 Furthermore, SDG&E generation plants are subject to site visits from various regulators
17 concerning implementation of permits. There are periodic onsite inspections and data requests
18 concerning the implementation of requirements for air permits, water permits, and water
19 discharge permits. SDG&E’s Palomar Energy Center is also required to meet permit conditions
20 detailed in the California Energy Commission (“CEC”) Operating Permit.

21 SDG&E’s Generation personnel have communicated with the following agencies in
22 2018:

- 23 • California Energy Commission

- 1 • California Public Utilities Commission
- 2 • California Air Resource Board (“CARB”)
- 3 • U.S. Energy Information Administration (“US EIA”)
- 4 • Environmental Protection Agency (“EPA”) Region 9
- 5 • Clark County Department of Air Quality (“DAQ”)
- 6 • Nevada Division of Environmental Protection (“NDEP”)
- 7 • San Diego Air Pollution Control District (“APCD”)
- 8 • Regional Water Quality Control Board (“RWQCB”)
- 9 • CA-EPA State Water Board
- 10 • City of Escondido
- 11 • Western Electricity Coordinating Council (“WECC”)
- 12 • Certified Unified Program Agencies (“CUPA”)

13 **V. OUTAGES - UTILITY OWNED GENERATION**

14 Many preventive and corrective maintenance work activities require planned outages,
15 whereas unplanned corrective maintenance is performed under short-notice or forced outages.

16 Appendix A, below, provides narratives for forced outages 24 hours or longer for all
17 facilities 25 MW or larger. Appendix B, below, provides narratives for planned outages that are
18 24 hours or longer for all facilities 25 MW or larger, where the outage was extended by two
19 weeks or fifty percent longer, whichever is greater, from its planned schedule. The narratives
20 address, as applicable, the following points:

- 21 1. The nature of the outage.
- 22 2. The cause(s) of the outage, if known.
- 23 3. Possible steps to prevent similar occurrences.

1 4. Whether the outage may have prevented (or minimized the duration of) a future
2 outage.

3 **VI. CONCLUSION**

4 My prepared direct testimony describes SDG&E’s UOG resources located in San Diego
5 County and Nevada. SDG&E consistently followed the Commission’s guidance and “Good
6 Utility Practice” and met the “reasonable manager” standard during the 2018 record period.

7 This concludes my prepared direct testimony.

1 **VII. QUALIFICATIONS**

2 My name is Carl S. LaPeter. My business address is 2300 Harveson Place, Escondido,
3 California 92029. I am currently employed by SDG&E as a Plant Manager for Palomar Energy
4 Center, Miramar Energy Facility and Cuyamaca Peak Energy Plant. My responsibilities include
5 overseeing a staff that operates and maintains these power plants.

6 I began employment at SDG&E in 2005 as Plant Engineer, and then Maintenance
7 Manager, for Palomar Energy Center and Miramar Energy. My experience prior to employment
8 at SDG&E (approximately 28 years) includes various positions in the US Nuclear Navy, at Palo
9 Verde Nuclear Generating Station and Gila River Power Station.

10 I hold a Bachelor's of Science degree in Nuclear Engineering Technology from Excelsior
11 College in New York State.

12 I have previously testified before the Commission.

APPENDIX A

**SDG&E'S 2018 UOG FORCED OUTAGES GREATER THAN 24 HOURS
FOR FACILITIES 25 MW OR LARGER**

APPENDIX A

SDG&E's 2018 UOG Forced Outages Greater Than 24 Hours For Facilities 25 MW or Larger

1. Miramar Energy Facility 1 (“MEF1”) Generator Breaker Failure Forced Outage – December 27, 2017 through January 5, 2018. – 8.8 Days

Note: This outage was reported on the 2018 ERRA filing, but it extended into January of 2019. The quoted text, included in Appendix C, is from my 2018 ERRA Testimony (A.18-06-002, Appendix A, p. CSL-A-8 and CSL-A-9). On [date], Cal PA represented to ALJ Gerald Kelly that it does not seek a disallowance with respect to this outage. There have been no material developments relative to this outage since this representation was made. Thus, SDG&E finds that ERRA compliance review with respect to this outage has been concluded and does not warrant further investigation in this cycle.

On December 27, 2017, while shutting down MEF1, a generator bus ground trip occurred; tripping the turbine and generator. Plant personnel removed the breaker from the switchgear and determined that the B-phase contact was closed, while the A and C-phase contacts were open. A visual inspection of the circuit breaker did not reveal any other damaged components. SDG&E management sent the circuit breaker to a repair service vendor (the same vendor as in outage 9) to perform an inspection, and repair the breaker.

Technicians at the repair facility found that the B-phase connecting rod locking nut had failed, causing the nut to unthread from the connecting rod after repetitive operation. The result was that the connecting rod became non-functional, and was not able to contact. SDG&E Management requested a thorough inspection of the circuit breaker to uncover any other potential issues. A replacement connecting rod assembly, which includes a factory set locking

nut, was expedited, while the facility technicians performed a thorough inspection. The repair facility technicians did not find any other issues.

The repair facility technicians replaced the connecting rod assembly and reassembled the circuit breaker, performing all necessary adjustments. As a precaution, SDG&E management directed that the B-phase contact assembly be replaced to eliminate the risk of reduced reliability of the contact assembly due to the failure event. The repair facility technicians tested the circuit breaker before it was returned to the MEF site.

Plant personnel installed the circuit breaker and performed functional testing. MEF1 was returned to availability on January 5, 2018. SDG&E purchased a spare generator circuit breaker to be kept in inventory to minimize plant downtime in the event of a future failure of this part.

2. Desert Star Energy Center (“DSEC”) HRSG #2 Reheater Tube Leak: CT2 forced outage – April 17, 2018 Through April 23, 2018 – 6.35 Days

On April 17, 2018, while CT2 was shutdown for economic reasons, large amounts of steam began to discharge from the HRSG #2 stack, and a forced outage was declared to determine the cause of the situation and to make necessary repairs. After an initial investigation, it was determined that the leaking steam was coming from the HRSG Reheater section. At 09:30am on April 17, 2018, a forced outage was declared to repair the leak. Mechanical contractors and scaffold constructors arrived on site later that day. The leak was determined to be from a severed tube to upper header connection in reheater section #3. Due to the difficult location of this weld, plant personnel decided to remove the tube from service. This was accomplished by cutting and plugging both ends of the reheater tube. Leaks of this nature are rare but can be attributed to thermal stresses due to plant cycling. Repairs were completed, scaffold was removed, and CT1 was declared available for dispatch April 23, 2018 at 16:00.

3. Cuyamaca Peak Energy Plant (“CPEP”) GSU C-Phase High Side Bushing Replacement – July 17, 2018 through July 25, 2018 – 7.9 Days

On July 16, 2018, the SDG&E substation group received an alarm indicating an issue with the 69 kilovolt C phase bushing of the Bank 34 transformer; the Generator Step-up transformer for CPEP. The alarm indicated that the Phase C High Side Bushing had a high power factor reading that could be an indication of deterioration in the bushing. Following the identification of the issue, plant management placed CPEP in a forced outage until a new bushing could be obtained and installed. On July 21, 2019, after the SDG&E substation group replaced the C Phase bushing, CPEP was determined ready for service.

4. Desert Star Energy Center (“DSEC”) Steam Turbine Turning Gear Failed to Start: Total Plant Forced Outage – July 29, 2018 Through July 31, 2018 – 2.07 Days

On July 29, 2018, while the steam turbine was being shutdown for economic reasons, the steam turbine turning gear failed to start when needed. Plant staff determined that the cause of the turning gear failure to start was a shorted engaged light relay. The short was cleared and the relay was replaced. However, when turning gear start was attempted, the rotor would not turn. After discussion with Siemens Energy (the steam turbine manufacturer) Engineering, it was determined that the steam turbine was bowed to the point of contact between rotating and stationary parts due to being stopped while surrounded by high residual heat from the shutdown. Plant personnel followed an engineering recommendation to follow the procedure of rolling and resting the turbine for several days until the bow is reduced and the steam turbine can remain on gear. The recommended procedure was followed, and the plant was declared available on July 31 at 09:00 am.

5. Miramar Energy Facility 2 (“MEF2”) HPT 2nd Stage Nozzle Repair – October 1, 2018 through October 21, 2018 – 22.3 Days

On September 8, 2018 a scheduled borescope inspection was performed on MEF2. This inspection found indications of cracking on the 2nd Stage Nozzle of the High Pressure Turbine. It was determined that we could operate for at least another month and follow up with another borescope inspection. On October 1, 2018 MEF2 was placed in a forced outage to perform another borescope inspection of the engine. The result of the borescope inspection indicated that the engine needed to be removed from service and the High Pressure Turbine 2nd Stage Nozzle should be replaced. The engine was removed and repair work was completed on site. After the repairs the engine was installed and returned to service on October 8, 2018.

6. Desert Star Energy Center (“DSEC”) Main Steam Stop Valve Leak: Total Plant Forced Outage – October 21, 2018 Through October 22, 2018 – 1.35 Days

On October 19, 2018, plant personnel determined that the unit #1 main steam stop valve was leaking steam. This leak continued to become larger, so plant personnel decided to shut down the plant and make repairs to prevent possible additional damage from the escaping steam. The plant was shut down on October 21, 2018 at 00:13. Our valve repair contractor was immediately contacted and mobilized, and insulation was removed from the area surrounding the valve to assist in cooling. The contractor disassembled the upper half of the main steam stop and determined that the valve stem packing had failed. The valve stem packing was replaced, and the plant was declared available on October 22, 2018 at 08:30am.

7. Desert Star Energy Center (“DSEC”) HRSG #2 IP Superheater Tube Leak: CT2 Forced Outage – October 30, 2018 Through October 31, 2018 – 1.23 Days

On October 30, 2018, plant personnel discovered a tube leak in HRSG #2, while the unit was in an economic shutdown. A forced outage was declared to determine the cause and make necessary repairs. After an initial investigation, plant personnel determined that the leak was

coming from the HRSG IP superheater section. Mechanical contractors arrived on site later that day. The leak was determined to be from a crack in an IP superheater tube leading to the lower header connection. Leaks of this nature are typically attributed to thermal stresses due to plant cycling. Repairs were promptly completed, and CT2 was declared available for dispatch October 31, 2018 at 12:30pm.

APPENDIX B

PLANNED OUTAGES DURING 2018 THAT WERE 24 HOURS OR LONGER FOR ALL FACILITIES 25 MW OR LARGER THAT WERE EXTENDED BY TWO WEEKS OR FIFTY PERCENT LONGER, WHICHEVER IS GREATER, FROM ITS PLANNED SCHEDULE

APPENDIX B

Planned Outages During 2018 That Were 24 Hours or Longer for All Facilities 25 MW or Larger
That Were Extended by Two Weeks or Fifty Percent Longer,
Whichever is Greater, From its Planned Schedule

There were no outages in this reporting period that meet these criteria.