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

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

June 1, 2018

SDGE

A Sempra Energy utility®

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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
HRSG	Heat Recovery Steam Generator
MEF	Miramar Energy Center
MW	Megawatt
NDEP	Nevada Division of Environmental Protection
NERC	North American Electric Reliability Corporation
OEM	Original Equipment Manufacturer
ORA	Office of Ratepayer Advocates
PEC	Palomar Energy Center
RWQCB	Regional Water Quality Control Board
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

PREPARED DIRECT TESTIMONY OF

CARL S. LAPETER

ON BEHALF OF SDG&E

I. INTRODUCTION

This testimony presents San Diego Gas & Electric Company's ("SDG&E") compliance with the California Public Utility Commission's ("Commission") Good Utility Practice, as discussed below, and reasonable manager standards as defined in Decision ("D.") 02-12-069,[1] with respect to Utility Owned Generation ("UOG") resources planned and unplanned outages during the period of January 1, 2017 through December 31, 2017.

II. DESCRIPTION OF SDG&E-OWNED GENERATION

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

A. Palomar Energy Center ("PEC")

The Palomar Energy Center is a 565 MW gas-fired combined-cycle plant with 2 GE 7FA 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-3 at 5.
[2] The MW ratings used is this Testimony are electric generation ratings and may differ from plant interconnect ratings used elsewhere.

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

B. Desert Star Energy Center ("DSEC")

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

C. Miramar Energy Facility ("MEF")

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

D. Cuyamaca Peak Energy Plant ("CPEP")

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

E. Escondido Battery Energy Storage System ("Escondido BESS")

The Escondido BESS is a 120 MWh energy storage system with a maximum output of 30 MW for up to 4 hours. The energy storage system uses lithium-ion batteries. The project construction began Q4/2016 and began to operate commercially Q1/2017. Pursuant to CPUC Resolution E-4791 on May 26, 2016, SDG&E developed expedited energy storage projects to alleviate reliability issues associated with Aliso Canyon. CPUC approval was requested via Tier

3 Advice Letter 2924-E. The Advice Letter was approved in its entirety in CPUC Resolution E-4798 on August 18, 2016. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility. O&M costs for Escondido BESS are included in PEC O&M costs. Such costs are included as part of SDG&E's General Rate Case ("GRC").

F. El Cajon Battery Energy Storage System ("El Cajon BESS")

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

G. Ramona Solar Energy Project ("RSEP")

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

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

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

prudent manner, consistent with "Good Utility Practice" and the reasonable manager standard.[3] The Commission defined "Good Utility Practice" in D.02-12-069:[4]

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

Consistent with "Good Utility Practice," during 2017, SDG&E followed an established maintenance program to maximize the availability of the units as a primary "desired result." Specifically, this maintenance program factors in a number of considerations, including manufacturer guidelines, appropriate power industry practices, safety considerations, and good engineering and technical judgment to allocate resources most effectively to maximize availability of its UOG resources. Additionally, the SDG&E maintenance program incorporates practices that are generally accepted within the electric power generation industry and the 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 on 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. 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 2017 record period. The Appendices to this 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-3 at 5.

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

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

[5] Public Utilities Commission of the State of California, 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.

IV. ADDITIONAL REVIEW OF UOG OPERATIONS

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

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

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

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

SDG&E's Generation personnel have communicated with the following agencies in 2017:

- California Energy Commission ("CEC")

- California Public Utilities Commission ("CPUC")
- California Air Resource Board ("CARB")
- U.S. Energy Information Administration ("US EIA")
- Environmental Protection Agency ("EPA") Region 9
- Clark County Department of Air Quality ("DAQ")
- Nevada Division of Environmental Protection ("NDEP")
- San Diego Air Pollution Control District ("APCD")
- Regional Water Quality Control Board ("RWQCB")
- CA-EPA State Water Board
- City of Escondido
- Western Electricity Coordinating Council ("WECC")
- Certified Unified Program Agencies ("CUPA")

V. OUTAGES - UTILITY OWNED GENERATION

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

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

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

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

VI. COMPLIANCE WITH RECORD PERIOD 2016 SETTLEMENT

As per the settlement agreement between SDG&E and Office of Ratepayer Advocates ("ORA"), which was filed with the Commission on April 24, 2018, SDG&E complied with the term of the settlement which dealt with utility-owned generation. Per the settlement:

> SDG&E will conduct an internal review of its Desert Star facility procedures in 2018. In its June 1, 2018 ERRA Compliance review proceeding filing, SDG&E will confirm with ORA in writing that it has completed its review of those procedures and report any anomalous findings. In addition, SDG&E will develop a Foreign Material Exclusion Zone procedure focusing on areas and events that may have a high risk of foreign material entering components or systems.[6]

Regarding SDG&E's review of facility procedures for the Desert Star Energy Center, SDG&E confirms that it has reviewed those procedures and did not discover any anomalous findings. Regarding SDG&E's development of a Foreign Materials Exclusion Zone, SDG&E has also completed this task. SDG&E has fully complied with the settlement term related to utility-owned generation.

VII. CONCLUSION

My testimony describes SDG&E's UOG resources located in San Diego County and Nevada. SDG&E consistently followed the Commission's guidance and "Good Utility Practice" and met the "reasonable manager" standard during the 2017 record period.

This concludes my prepared direct testimony.

[6] Motion of SDG&E and ORA for Approval of Proposed Settlement dated April 24, 2017 (pending decision) at Attachment A at 7.

VIII. QUALIFICATIONS

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

I began employment at SDG&E in 2005 as Plant Engineer, and then Maintenance Manager, for Palomar Energy Center and Miramar Energy. My experience prior to employment at SDG&E (approximately 27 years) includes various positions in the US Nuclear Navy, at Palo Verde Nuclear Generating Station and Gila River Power Station.

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

I have previously testified before the Commission.

APPENDIX A

SDG&E's 2017 UOG Forced Outages Greater Than 24 Hours
For Facilities 25 MW or Larger

1. Cuyamaca Peak Energy Plant ("CPEP") Control System Card Fault Forced Outage – February 26, 2017 through February 27, 2017 – 1.1 Days

On February 26, 2017, while the plant was offline, a plant control system input/output electronic module failed causing false high turbine temperature indications in the plant control system. The failed module and false high temperature indications prevented the plant from starting up. The plant was placed in a forced outage to resolve the issue. SDG&E management called for the Original Equipment Manufacturer ("OEM") to send a field engineer to assist plant personnel to troubleshoot the problem. After some investigation the problem was suspected to be software corruption in one of the control system controllers (industrial computer). The field engineer and plant staff reloaded the controller software and associated input/output modules. The module fault was cleared and the turbine was started to verify proper operation of the control system. The plant was returned to availability on February 27, 2017.

2. Cuyamaca Peak Energy Plant ("CPEP") Control System Module Failure Forced Outage – March 14, 2017 through March 17, 2017 – 3.1 Days

On March 14, 2017, while the plant was offline, a plant control system input/output electronic module failed causing false high turbine temperature indications in the plant control system. The failed module and false high temperature indications prevent the plant from starting up. The plant was placed in a forced outage to resolve the issue. SDG&E management called for the OEM to send a field engineer to assist plant personnel to troubleshoot the problem.

During the inspection and troubleshooting, plant personnel and the OEM field engineer removed electronic components to inspect for possible damage, and found a small amount of

construction debris (some metal shards and a screw) behind the power and signal circuit board. SDG&E management suspected the debris may have fallen behind the circuit board during a control system upgrade, possibly causing erratic control system function. Because of this finding, SDG&E management proactively performed a thorough inspection of the system to ensure that no other construction debris was hidden. The inspection was completed and no other debris or issues were found. The power and signal circuit board were replaced, as well as the associated input/output module base circuit board, to reduce the risk of future failure. The control system was reset and the turbine was started to verify proper control system function. The plant was returned to availability on March 17, 2017.

3. Palomar Energy Center ("PEC") Combustion Turbine Generator ("CTG2") Flame Out Due to Autotune Forced Outage – May 12, 2017 through May 13, 2017 – 1.7 Days

During operation CTG2 experienced a flameout trip. A flameout trip occurs when the fuel to air mixture is insufficient to sustain combustion. CTG2 was placed in a forced outage to investigate the cause of the trip. As part of the investigation, plant personnel performed a borescope inspection of the turbine combustor section to ensure there was no internal damage due to the trip; no damage was found. After further investigation and troubleshooting, plant personnel determined that the turbine autotune function was turned off; this function is normally on while the turbine is operating.

The autotune function provides real-time fine-tuning control of the turbine combustion process to maintain turbine performance and efficiency. With the function turned off, the turbine combustion process was not automatically adjusted to accommodate changes in operating conditions. Eventually the fuel mixture was insufficient to maintain the combustion process, causing the turbine to trip.

The turbine was started, the autotune system was turned on, and CTG2 returned to service on May 13, 2017.

To ensure that this autotune function is turned on, the start-up checklist was changed to include a step for verification that the autotune is turned on. Also, a control system alarm was added that will inform the operator if the autotune function is turned off while the combustion turbine is operating.

4. Desert Star Energy Center ("DSEC") Hot Reheat Stop Valve Failed to Close Forced Outage – July 2, 2017 through July 7, 2017 – 5.46 Days

On July 2, 2017, Unit #1 hot reheat steam stop valve 1HR001 did not fully close when commanded to do so. Upon inspection of 1HR001, which is a large 20-inch diameter horizontally mounted gate valve, plant personnel observed that the valve stem had wear marks consistent with metal to metal rubbing. The plant was declared to be in a forced outage on July 2, 2017 at 07:00 so the valve could be inspected and repaired. Insulation blankets were removed from the valve, and air blowers were directed to blow ambient air over the valve to help cool the valve enough so it could be safely worked on. On July 3, 2017, contracted valve repair technicians arrived on site to begin the repair. Repair technicians removed the valve actuator and disassembled the valve. The valve stem, valve bonnet (breach), and gland bushing all were damaged. The valve repair contractor fabricated a new valve stem, gland bushing and pressure seal ring. The contractor reassembled the valve components, replacing the breach with one DSEC had in stock. The valve actuator was reinstalled, and the valve was tested for proper operation. DSEC was declared fully available July 7, 2017 at 18:00.

It is likely the damage was caused by normal wear over time. As the wear progressed, it allowed movement between the breach and the pressure seal ring during normal valve cycling. This movement would allow the breach to cock at an angle, causing the rubbing on the stem.

Installing a new breach and pressure seal ring should remove the possibility of this type of damage for many years. 2HR001 (the other 20" horizontally mounted gate valve on site) was inspected at the time of this outage, and no signs of wear were noted.

5. Desert Star Energy Center ("DSEC") High Pressure Economizer #1 Leak Forced Outage – August 16, 2017 through August 19, 2017 – 3.17 Days

During an economic shutdown, plant personnel observed a water leak was coming from heat recovery steam generator ("HRSG") #1. After initial investigation it was determined that the leaking water was coming from the HRSG High Pressure ("HP") economizer section, and at 09:00 on August 16, 2017, 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 an upper return tube bend weld on Module 5, Coil A, Row 7, Tube 13 (HP Economizer #1). Due to the difficult location of this weld, it was determined that the prudent course of action was to remove the leaking upper bend from service. This was accomplished by cutting and plugging both ends of tube 13. Leaks of this nature have commonly been attributed to thermal stresses due to plant cycling. Repairs were completed, scaffold was removed, and CT1 was declared available for dispatch August 19, 2017 at 19:00.

6. Miramar Energy Facility 1 ("MEF1") Generator Breaker Failure Forced Outage – September 6, 2017 through September 12, 2017 – 5.8 Days

On September 6, 2017, during a normal shut down at MEF1, a generator bus ground trip occurred; tripping the turbine and generator. Plant personnel investigated the bus ground issue and determined the problem was in the generator circuit breaker. Personnel removed the generator breaker from the switchgear to inspect it. Visual inspection revealed that the B-phase contact assembly connecting rod was sheared, preventing the operating mechanism from opening the B phase contacts; this was the cause of the ground bus trip. The reason for the sheared rod

could not be determined with a visual inspection, and required disassembly of the circuit breaker. The breaker was delivered to the repair facility so the service vendor could perform a closer inspection and repair the breaker.

At the repair facility, in addition to the sheared connecting rod, the vendor found the B phase contact assembly was stuck closed, which most likely caused the connecting rod to shear. No other issues were found.

The stuck B phase contact was most likely due to contact arcing. The contact arcing was most likely a result of wear and tear due to cycling. MEF1 is a peaking power plant and is started and stopped often. The impact force applied by the operating mechanism to open the breaker appears to have caused the connecting rod to shear the connecting rod.

A set of slightly used (about 300 cycles) replacement contact assemblies (phases A, B, and C) was purchased from a supplier and expedited for delivery to the vendors repair facility. SDG&E management proactively replaced all three contact assemblies to reduce the risk of future failures.

The vendor made the necessary repairs and delivered the breaker to the MEF site for installation by plant personnel. The repaired breaker was installed and tested for proper operation. MEF1 was returned to service on September 12, 2017.

7. Palomar Energy Center ("PEC") Hydrogen Leak Forced Outage – November 21, 2017 through November 22, 2017 – 1.1 Days

While the plant was shut-down, plant operators observed a significant decrease in hydrogen storage tank pressure. Plant personnel investigated the unusual loss in pressure and discovered that the source was a hydrogen leak from the steam turbine generator ("STG"). Hydrogen is used as an efficient cooling medium in the generator. To provide safe conditions for locating and repairing the leak, the hydrogen was removed from the generator and replaced

with pressurized air. Plant personnel continued investigating and eventually located the source of the leak from one of four STG hydrogen coolers. A close inspection revealed the leak was due to loose bolts allowing hydrogen to leak through a gasket on the cooler. Plant personnel tightened the bolts and proactively checked the other three hydrogen coolers for loose bolts, and found none. The hydrogen gas was then returned to the generator cooling system and the STG was returned to availability.

8. Miramar Energy Facility 1 ("MEF1") Generator Breaker Failure Forced Outage – December 17, 2017 through December 21, 2017. – 3.8 Days

On December 17, 2017, while shutting down MEF1, the generator breaker failed to open, causing a generator bus ground trip which tripped the turbine and generator. Plant personnel removed the breaker from the switchgear to determine the cause. Visual inspection revealed that the B-phase contact appeared to be stuck in the closed position, which likely held the breaker closed. The cause of the stuck contact could not be determined with a visual inspection, and required disassembly of the circuit breaker. Also, there were some secondary issues, caused by the breaker not opening, primarily trip coil and wiring overheating damage. SDG&E plant management sent the circuit breaker to a repair service vendor (a different vendor than in outage 6 above) to inspect and repair the breaker.

Technicians at the repair facility determined the initial cause was improper adjustment of the connecting rod assemblies for the contacts. This caused excessive wear to the breaker components due to cycling of the breaker during plant operation, which prevented the breaker from opening.

In addition, the vendor identified that the part number for the contact assembly (previously replaced in outage 6 above) was not an exact replacement, though the contact assembly appeared to be physically the same as the original. Given the difference in the part

numbers, and the concern that this event may have reduced the reliability and longevity of the contact assemblies, SDG&E management proactively installed new contact assemblies that are a designated replacement part for this circuit breaker.

The vendor replaced all the necessary parts, repaired the wiring, properly adjusted the circuit breaker, and tested the final product. The circuit breaker was returned to the MEF1 site. Plant personnel installed and tested the circuit breaker, for proper operation. MEF1 was returned to availability on December 21, 2017.

9. Miramar Energy Facility 1 ("MEF1") Generator Breaker Failure Forced Outage – December 27, 2017 through January 4, 2018. – 7.9 Days

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 8) 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 4, 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.

APPENDIX B

Planned Outages During 2017 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

1. Cuyamaca Peak Energy Plant ("CPEP") Extended Outage – October 1, 2016 through February 24, 2017 – 146.8 Days

Note: This outage was reported on the 2016 record period ERRA filing, which extended into February of 2017. The quoted text, below, is from my 2016 record period ERRA Testimony (A.17-06-006, Appendix B, p. CLP-B-2).

"CPEP entered a planned outage on October 1, 2016, to perform annual maintenance which included a routine borescope inspection of the turbine internals. The borescope inspection revealed turbine internal damage.

SDG&E evaluated the damage and determined the turbines needed to be sent to the original equipment manufacturer (OEM) facility for repair. Both turbines were removed and sent to the manufacturer's repair facility to perform repairs. After detailed inspection by the OEM, SDG&E determined the damage was due to wear and tear, caused by a combination of equipment age (operating hours) and cycling. The OEM recommended improved parts for some of the repairs to prolong the operating life of the turbine; these improvements were incorporated in the repairs.

Repairs were made and the turbines were returned to the plant site, and installed. CPEP was returned to availability on February 24, 2017."