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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, 2017

#313773

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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, 2016 through December 31, 2016.

II. 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.[2] The Commission defined "Good Utility Practice" in D.02-12-069:[3]

> [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

[1] *See* D.02-12-069, Attachment A-3 at 5.

[2] 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 2016 record year. 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 page 3 and Finding of Fact 2.

[3] *See* D.02-12-069, Attachment A-3 at 5.

> 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 2016, 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 Electric Coordinating Council ("WECC").

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. Sections 10 and 11 of GO 167 specifically outlines 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 ESRB. The certification documentation includes a summary list of maintenance, operations and safety procedures that describe the programs and processes used in generation.

III. 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 2016:

- 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 Electric Coordination Council ("WECC")
- Certified Unified Program Agencies ("CUPA")

IV. 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 provides narratives for forced outages 24 hours or longer for all facilities 25 MW or larger. Appendix B 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.

V. 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 2016 record year.

This concludes my prepared direct testimony.

VI. 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 (about 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 2016 UOG Forced Outages Greater Than 24 Hours For Facilities 25 MW or Larger

1. Miramar Energy Facility Unit 2 ("MEF2") Forced Outage – January 5, 2016 through January 7, 2016 – 1.76 Days

On January 5, 2016, an MEF2 ammonia flow instrument indication failed. The operating air permit requires that the ammonia flow indication to be continuously monitored and recorded on the Continuous Emissions monitoring System ("CEMS"). MEF2 was placed in a forced outage to troubleshoot and repair the problem. SDG&E determined the loss of indication was due to a failure in the ammonia flow transmitter output signal card. The ammonia flow transmitter was replaced, and MEF2 was returned to availability on January 7, 2016.

2. Palomar Energy Center ("PEC") Forced Outage – January 26, 2016 through January 29, 2016 - 3.64 Days

During a plant startup on January 26, 2016, the pH (chemistry measure of the acidity or basicity of an aqueous solution) in the high pressure steam drum decreased from the normal caustic range to the acidic range. The plant was shut down and placed in a forced outage to prevent corrosive damage to boiler tubes by continued operation with low pH in the boiler systems.

SDG&E determined that the cause of the low pH was coolant leaking from the boiler feed-water pump cooling system, through failed seals, into the boiler feed-water system.

Due to system design, this leakage will only occur while the plant is shut-down. PEC was shut-down (dispatched off by CAISO) for a few days before January 26, 2016. When the plant was restarted, the low pH problem appeared. When the problem was identified, the systems were flushed to remove the low pH water. SDG&E was able to restart the plant by

using the alternate feed-water pump, which did not have a failed seal. PEC was returned to availability on January 29, 2016.

After analysis of the nature of the failure, SDG&E determined that the issue could be avoided by modifying the seal system with an improved design. This modification was made to all the feed-water pumps in the 2016 annual outage.

3. Palomar Energy Center ("PEC") Forced Outage – February 28, 2016 through February 29, 2016 - 1.23 Days

On February 28, 2016 plant operators observed water leaking out of the bottom case of the Heat Recovery Steam Generator 2 ("HRSG2"). Combustion Turbine Generator 2 ("CTG2") was placed into a forced outage to allow maintenance personnel to access HRSG2 to identify the source of the leak. PEC remained available for operation with Combustion Turbine Generator 1 ("CTG1") and the Steam Turbine Generator ("STG").

The leak was identified at a small weld on the upper boiler tube header of the low pressure feed-water preheater. The leak was due to an improper weld made during the plant construction that eventually failed. The weld was removed and replaced. PEC was returned to availability on February 29, 2016.

4. Desert Star Energy Center ("DSEC") Forced Outage – May 3, 2016 through May 4, 2016 – 1.32 Days

On May 3, 2016, during start up after the spring planned outage, plant operators observed that the fuel gas throttle valve on Combustion Turbine 2 ("CT2") was acting erratically. During investigation, maintenance and operations personnel found that the gas valve control oil sump had been contaminated with rainwater, causing the erratic operation. The rainwater leaked into the control oil system through a damaged sump gasket. CT2 was shut down and placed in a forced outage on May 3. DSEC remained available for operation, on Combustion Turbine 1 ("CT1") and the Steam Turbine Generator ("STG).

Technicians drained the contaminated oil, and then flushed the system to ensure removal of the contamination. The damaged gasket was replaced, and then the control oil system was refilled with clean oil. All other sump gaskets in the plant were inspected for damage. All other sump gaskets were found in acceptable condition. On May 4, 2016, CT2 was declared available for dispatch.

5. Desert Star Energy Center ("DSEC") Forced Outage – August 16, 2016 through August 19, 2016 – 3.26 Days

On August 16, 2016, during startup, plant operators were unable to open the #1 Intermediate Pressure bypass valve to the condenser. A full plant forced outage was declared on August 16, because operation of this valve is needed to complete the plant startup.

The bypass valve was disassembled, and technicians determined that the valve plug and stem were damaged. The valve plug and stem were replaced, and the valve operator was rebuilt. While the valve repair was in progress, DSEC operations staff conducted borescope examination upstream of the bypass valve and located an unidentified 3" x ¼" piece of metal, 3 – 4 feet down the steam bypass pipe. The team was able to extract the metal and match it up with marks on the damaged plug, identifying the object as the definite cause of the stuck valve.

All valve repair activities were completed, and the valve tested for proper operation. DSEC was declared available for dispatch on August 19, 2016.

6. Desert Star Energy Center ("DSEC") Forced Outage – September 5, 2016 through September 7, 2016 – 2.175 Days

On September 5, 2016 during a period that the plant was offline due to dispatch, plant operators noticed a significantly lower than normal plant service water pressure. Operators investigated and found an underground service water pipe leak. A full plant forced outage was declared and service water to the plant was isolated. Over the next 2 days the leak was excavated, and a portion of the underground 10" water main was replaced.

During the investigation of this event, plant operations noted that service water had been erratically high before the leak started. Further investigation found that a faulty service water pressure reducing regulator was the cause of the erratic high water pressure; the faulty regulator was replaced. The cause may have been a pipe manufacturing defect that was aggravated by the high pressure spikes. On September 7, 2016, DSEC was declared available for dispatch.

7. Palomar Energy Center ("PEC") Forced Outage – November 29, 2016 through November 30, 2016 – 1.27 Days

During a plant startup on November 29, 2016 the Steam Turbine Generator ("STG") hydraulic control oil system indicated insufficient pressure to permit a startup. Plant personnel investigated the problem and determined that there was an internal leak in a Main Steam Control Valve ("MSCV") servo-valve. The STG was shut-down, and placed in a forced outage, to replace the servo-valve to eliminate the source of the internal leak. While the STG was in a forced outage, Combustion Turbine Generators 1 & 2 ("CTGs 1 & 2") continued to operate with the plant in a reduced power forced outage.

The replacement of the servo-valve requires a calibration of the MSCV; the plant must be shut-down to perform this calibration. After the servo-valve was replaced, CTGs 1 & 2 were shut-down, placing the entire plant in a forced outage. After a successful calibration, PEC was returned to availability on November 30, 2016.

APPENDIX B

Planned Outages During 2016 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. Miramar Energy Facility Unit 1 ("MEF1") Extended Outage – August 31, 2015 through January 22, 2016 – 144.8 Days

Note: This outage was reported on the 2015 ERRA filing, but it extended into January of 2016. The quoted text, below, is from my 2015 ERRA Testimony (A.16-06-002, Appendix B, p. CLP-B-1).

"On August 31, 2015, MEF1 was shut down for a planned outage to perform a routine periodic borescope inspection of the turbine internals. The inspection revealed indications of internal damage in the compressor section of the turbine, specifically, a broken low pressure compressor ("LPC") blade tip. SDG&E removed the turbine and sent it to the turbine manufacturer's repair facility to investigate the problem and perform repairs. The manufacturer determined that the blade experienced a common case of "light case rub" and also had various visual cracks. It recommended review of the control system. During this review, SDG&E requested that certain damaged blades be sent to labs for analysis.

One of the labs indicated that the major contributors to the failure of the blade tips are erosion due to particulate and rubbing of the blade tip, causing high cycle fatigue failure. No control systems issues were detected.

In the future, SDG&E will utilize a new model blade that is not subject to the same failure as the old design. SDG&E will continue to perform regularly scheduled borescope inspections to monitor turbine internal conditions."

In fact, SDG&E now utilizes the new model blades, that are not subject to the same failure as the old design, in this application.

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

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.