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ENGINEERING EVALUATION

Facility Name: SDG&E Palomar Energy Center, LLC
Application Number: APCD2021-APP-007099
Equipment Type: combined cycle gas turbines
Facility ID: APCD2001-SITE-04276
Equipment Address: 2300 Haverson Place
Escondido, CA 92029
Facility Contact: Carl LaPeter
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Permit Engineer:

Recoverable Signature

X Maria Galvez

Maria Galvez
Air Pollution Control Engineer
Signed by: Maria Galvez

Senior Engineer Signature:

X

John Annicchiarico
Senior Air Pollution Control Engineer

1.0 BACKGROUND

1.1 Type of Application: modification to PTO-000623 and PTO-000625

1.2 Permit History: This is a modification to APCD2010-PTO-000623 and APCD2010-PTO-000625. The initial FDOC for these turbines were submitted to the CEC in December 2002. There have been a couple of minor modifications to the PTO's since that time. The applicant is requesting a modification to include hydrogen as a fuel for the turbines. The fuel blend will be a maximum of 2% hydrogen by volume.

1.3 Facility Description: This facility is a combined cycle power plant with a capacity of 565 MW.

1.4 Other Background Information: This facility has a Title V permit. A minor modification application will be required prior to operation.

2.0 PROCESS DESCRIPTION

2.1 Equipment Description:

PTO-000623

Power Station Unit #1 consisting of: one nominal 165 MW natural-gas fired with up to 2% by volume hydrogen gas, combined-cycle General Electric Power Systems Frame 7FA gas turbine generator, S/N 298258, with dry low-NOx combustors, a heat recovery steam generator, a 195 MMBtu/hr (HHV) auxiliary duct burner, a Peerless selective catalytic reduction unit (SCR) [with a Cormetech catalyst block, a Peerless Ammonia Vaporizer Skid], an Engelhart oxidation catalyst, a steam turbine generator shared with Power Station Unit # 2, and an Emerson Ovation control system with low-load emissions and startup fuel gas heating capability.

PTO-000625

Power Station Unit #2 consisting of: one nominal 165 MW natural-gas fired with up to 2% by volume hydrogen gas, combined-cycle General Electric Power Systems Frame 7FA gas turbine generator, S/N 298257, with dry low-NOx combustors, a heat recovery steam generator, a 195 MMBtu/hr (HHV) auxiliary duct burner, a Peerless selective catalytic reduction unit (SCR) [with a Cormetech catalyst block, a Peerless Ammonia Vaporizer Skid], an Engelhart oxidation catalyst, a steam turbine generator shared with Power Station Unit # 1, and and an Emerson Ovation control system with low-load emissions and startup fuel gas heating capability.

2.2 Process: This facility utilizes two 165-MW combined cycle turbines and a shared steam turbine generator to produce power to be sold to the grid.

2.3 Emissions Controls: The turbines are each controlled with a selective catalytic reduction (SCR) unit.

2.4 Attachments: None.

3.0 EMISSIONS

3.1 Emission Estimate Summary: The proposed modification is not expected to result in any emission increases from the gas turbines.

3.2 Emission Estimate Assumptions: Adding hydrogen to the fuel blend would increase the heating value of the fuel, but this increase is expected to be within the normal variability of the heating value of natural gas at these levels of hydrogen mixing. Increased combustion temperatures could increase emissions of NOx, but the SCR is expected to be able to deal with any such increases. At the same time, this increase in NOx emissions could be offset with the decrease in the amount of natural gas being combusted. For these reasons, there is no expected emissions increase associated with adding hydrogen as a fuel source for the gas turbines.

3.3 Emission Calculations:

3.4 Attachments:

4.0 APPLICABLE RULES

4.1 Prohibitory Rules:

Rule 50 – Visible Emissions:

This rule limits air contaminant emissions into the atmosphere of shade greater than Ringlemann Number 1, to a maximum aggregate of three minutes in any consecutive sixty minute time period.

The turbines are expected to comply with this requirement with the proposed fuel blend modification.

Rule 51 – No Nuisance:

This rule prohibits discharge of air contaminants that cause or have a tendency to cause injury, nuisance or annoyance to people and/or the public or damage to business or property.

The proposed fuel blend modification is not expected to affect the turbine compliance with this requirement.

Rule 53 – Specific Air Contaminants:

This rule prohibits the discharge of sulfur compounds, calculated as SO_2 in excess of 0.05% by volume on a dry basis and the discharge of particulate matter from combustion sources in excess of 0.10 grains/dscf standardized to 12% CO_2.

There will be no increase in emissions due to this modification. Continued compliance with this rule is expected.

Rule 62 – Sulfur Content of Fuels:

This rule prohibits the use of any gaseous fuel containing more than 10 grains of sulfur compounds, calculated as H_2S, per 100 dscf of gas, and any liquid fuel containing more than 0.5% sulfur by weight.

The proposed fuel blend modification is not expected to affect compliance with this requirement. Note that no sulfur compounds are added to the hydrogen so a slight decrease in the sulfur content of the blended fuel is expected. Sulfur content of blended fuel will be monitored and recorded as required by the permit.

Rule 68 – Oxides of Nitrogen from Fuel Burning Equipment

This rule limits NOx emissions from any fuel burning equipment to leass than 125 ppmv calculated at 3% oxygen on a dry basis. *Because this equipment is subject to the more stringent requirements of Rule 69.3.1, the equipment is exempt from Rule 68.*

Rule 69.3.1 – Stationary Gas Turbine Engines (BARCT):

From the previous evaluation, this rule limits NOx emissions to less than 11.8 ppmv @ 15% oxygen.

There will be no increase in emission concentration levels due to this modification. Current permit conditions limit NOx emissions to 2.0 ppmv at 15% oxygen. With proper operation of the SCR, continued compliance with this limit is expected. CEMS data and annual renewal testing will confirm compliance. Duration of startups will continue to be limited to 120 minutes and duration of extended startups will continue to be limited to 360 minutes.

Applicable rules for monitoring and recordkeeping, test methods, source test requirements, and compliance determination are outlined below.

<u>Rule 69.3.1(e)</u> - Stationary Gas Turbines – Monitoring and Recordkeeping

Rule 69.3.1(e)(1) requires an owner or operator of a unit subject to requirements of Section (d) standards to install, calibrate, and maintain continuous monitors in accordance with the manufacturer's recommended procedures to monitor and record the operational characteristics of the unit and of any NOx emissions reduction system, as applicable, to demonstrate continuous compliance, including, but not limited to: (i) fuel flow rate, (ii) exhaust gas temperature, (iii) ammonia injection rate, (iv) water injection rate, (v) stack-gas oxygen content, (vi) inlet or outlet SCR catalyst temperature, (vii) operational parameters defining an extended startup

Rule 69.3.1(e)(2) requires an owner or operator of any unit with a power rating of 10 MW or more that operates more than 4,000 hours per calendar year to install and operate a CEMS to measure and record NOx emissions. The CEMS shall be certified, calibrated and maintained in accordance with all applicable federal regulations including, but not limited to, the requirements of Sections 60.7(c), 60.7(d), and 60.13 of Title 40, Code of Federal Regulations, Part 60 (40 CFR Part 60), performance specifications of Appendix B of 40 CFR Part 60, quality assurance procedures of Appendix F of 40 CFR Part 60, Sections 75.10 and 75.12 of 40 CFR Part 75, the specifications and test procedures of Appendix A of 40 CFR Part 75, the quality assurance and quality control procedures of Appendix B of 40 CFR Part 75, and a protocol approved in writing by the San Diego County Air Pollution Control Officer.

Rule 69.3.1(e)(3) requires an owner or operator of any unit with a CEMS which has been installed to monitor and record NOx emissions pursuant to any federal regulation to certify, calibrate and maintain the CEMS in accordance with applicable federal regulations including the requirements of Sections 60.7(c), 60.7(d), and 60.13 of Title 40, Code of Federal Regulations Part 60 (40 CFR Part 60), performance specifications of Appendix B of 40 CFR Part 60, quality assurance procedures of Appendix F of 40 CFR Part 60, and a protocol approved in writing by the San Diego County Air Pollution Control Officer.

The CEMS system of this turbine is required to be properly maintained and calibrated in accordance with an approved CEMS protocol. The CEMS is required to be operated in accordance with the approved CEMS monitoring protocol. A copy of the protocol is required to be maintained on site and made available to the District upon request. The CEMS is required to have a RATA and all the required certification tests performed in accordance with 40 CFR Part 75 Appendix A and B.

Rule 69.3.1(e)(4) requires an owner or operator of any unit subject to this rule to maintain, as applicable, records of dates and times of operation, times of all startups, shutdowns, periods of operation at low load, fuel changes, and records of the type and quantity of each fuel used during each calendar day and calendar year.

Rule 69.3.1(e)(6) requires an owner or operator of a peaking unit to maintain records of dates and times of operation, the hours of operation each calendar day, and the total cumulative hours of operation during each calendar year.

Rule 69.3.1(e)(8) requires an owner or operator of any unit subject to this rule to maintain all records required by Section (e) and records of all source tests required by Subsection(g)(2) or Subsection(g)(3) for a minimum of 2 calendar years. These records shall be maintained on the premises and made available to the District upon request. Records for facilities that are unmanned may be kept at an alternative location approved in writing by the San Diego County Air Pollution Control Officer.

These monitoring and recordkeeping requirements are included with permit conditions.

Rule 69.3.1(f) – Test methods

Rule 69.3.1(f)(1) requires measurement of NOx and stack-gas oxygen content to be conducted in accordance with the U.S. EPA Method 7E and Method 3A, or District Source Test Method 100, as approved by the EPA

Rule 69.3.1(f)(2) requires the higher heating value and lower heating value of a fuel to be determined by the following methods: (i)ASTM Test Method D240-19 or D4809-18 for liquid fuels, or the most current version, and (ii) ASTM Test Method D1826-94(2017) or D1945-14(2019) in conjunction with ASTM Test Method D3588-98(2017)e1 for gaseous fuels, or the most current versions.

Rule 69.3.1(g) – Source Test Requirements and Compliance Determination

Rule 69.3.1(g)(1) requires any required source testing to be performed at no less than 80% of the power rating. If an owner or operator of a gas turbine engine demonstrates to the satisfaction of the San Diego County Air Pollution Control Officer that the turbine cannot operate at these conditions, then emissions source testing shall be performed at the highest achievable continuous power rating.

Rule 69.3.1(g)(2) requires, except as specified in Subsection (g)(3), a unit subject to requirements of Section (d) Standards to be tested for compliance at least once annually in the twelve-calendar-month period ending on the last day of the Permit to Operate expiration month, unless more frequent testing is specified.

Rule 69.3.1(g)(3) requires, unless more frequent testing is specified, a unit equipped with a CEMS, subject to the requirements of Section (d) Standards, and subject to the provisions of the federal Acid Rain Program pursuant to Section 72.6 of 40 CFR Part 72, to be tested for compliance at a frequency in accordance with 40 CFR Part 75 Appendix B Section 2.3.1 and Section 2.3.3.

Rule 69.3.1(g)(4) requires all testing to be conducted in accordance with the requirements of Section (f) Test Methods and a source test protocol approved in writing by the San Diego County Air Pollution Control Officer.

Rule 69.3.1(g)(5) requires all test reports to include the operational characteristics, as described in Subsection (e)(1), of the unit and of all add-on NOx control systems.

Rule 69.3.1(g)(6) requires, for the purposes of a compliance determination based on source testing, the NOx emissions concentration to be calculated as an average of three subtests.

Rule 69.3.1(g)(7) requires, for the purposes of a compliance determination based on CEMS data, the averaging period to calculate NOx emissions concentration to be one clock hour.

Rule 69.3.1(g)(8) states that notwithstanding provisions of Section (g), the Air Pollution Control Officer may require source testing to determine compliance with these Rules and Regulations or to determine emissions at any time.

These source testing requirements are included in permit conditions.

4.2 New Source Review:

Rule 20.3: New Source Review – Major Stationary Sources

Rule 20.3 (a) states that this rule applies to any new or modified major stationary source, to any new or modified federal major stationary source, to any new or modified emission unit, to any replacement emission unit, and to any relocated emission unit being moved to a stationary source if, after completion of the project, the stationary source will be a major stationary source, a federal major stationary source, or a PSD Stationary Source.

Rule 20.1(c)(44) defines a modified emission unit as any physical or operational change, including but not limited to a permit condition change, which results or may result in an increase in an existing unit's potential to emit, including those air contaminants not previously emitted.

This facility is a major stationary source. Adding hydrogen as a fuel source for the turbines is not expected to result in an increase in the units' potential to emit. Adding hydrogen could increase the combustion temperature, which could result in increased NOx generation. However, any increase in the potential to emit for NOx will be controlled under current SCR operation. No change to operations is needed to meet the current permit limits which remain in effect.

Rule 20.3 (d)(1)(i) –New or Modified Emission Units – BACT

This part of the rule requires any new or modified emission unit which has any increase in its potential to emit PM10, NOx, VOC, or SOx and which has a post-project potential to emit 10 pounds per day or more of PM10, NOx, VOC, or SOx to be equipped with BACT for each such air contaminant.

There is no expected increase in potential to emit due to the proposed modification. Nevertheless, emission limits specified in the PTO meet current BACT limits and there will be no increase in the emission limits specified in the PTO due to this modification.

Rule 20.3 (d)(1)(v) –LAER

Subsection (A) requires LAER for each new, modified, relocated, or replacement emission unit and project which results in an emissions increase which constitutes a new major stationary source, a new federal major stationary source, major modification, or federal major modification.

There is no expected increase in potential to emit due to the proposed modification. The modification does not result in any new major stationary source or major modification, so LAER is not triggered.

Rule 20.3 (d)(1)(vi) –New, Modified, Relocated or Replacement Emission Units – PSD Stationary Sources

This is not a PSD stationary source, so this subsection does not apply.

Rule 20.3 (d)(2) –Major Stationary Source AQIA:

This part of the rule requires the applicant to conduct an Ambient Air Quality Impact Analysis of the unit's emissions if the emission threshold values are equaled or exceeded for NOx, CO, SOx, or PM_{10}. The threshold values for NOx and SOx are 25 lbs/hr, 250 lbs/day or 40 tons/yr. The threshold values for CO are 100 lbs/hr, 550 lbs/day or 100 tons/yr. The threshold values for PM_{10} are 100 lbs/day or 15 tons/yr.

There is no expected increase in emissions due to this modification. An AQIA is not required.

Rule 20.3 (d)(3) – Prevention of Significant Deterioration:

This is not a PSD stationary source, so this section does not apply.

Rule 20.2 (d)(4) – Public Notice and Comment:

This part of the rule requires that a public notice and comment period be provided for any project subject to an AQIA or which results in an emissions increase of VOC equal to or greater than 250 pounds per day or 40 tons per year.

No AQIA is required, nor is there any emission increase expected for VOC. Therefore, no public notice and comment period is required.

4.3 Toxics New Source Review:

Rule 1200 – Toxic Air Contaminants, New Source Review

This rule requires that a Health Risk Assessment be performed if emissions of any toxic air contaminant exceed the de minimum values specified in the rule. The cancer risk determined by the HRA must be less than one in a million or less than ten in a million if TBACT is installed. Additionally, both the chronic non-cancer and the acute health hazard indexes determined by the HRA must be less than one.

There will be no increase in toxic emissions due to this modification. Toxics NSR is not applicable.

4.4 AB3205:

This assembly bill requires public notification prior to issuing an Authority to Construct for equipment emitting hazardous air contaminants within 1000 feet of a school (kindergarten through 12th grade).

There are no schools within 1000 feet of this equipment. Therefore AB3205 does not apply.

4.5 Federal and State Regulations:

This application is not subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) since the site is not a major source of hazardous air pollutants (HAPs).

This application is not subject to the Airborne Toxic Control Measure (ATCM).

40 CFR Part 60- Subpart GG - National Standards of Performance for New Stationary Combustion Turbines. *The proposed exhaust modification does not affect the turbine status of compliance with this NSPS.*

40 CFR Part 75 – Continuous Emission Monitoring
This part established requirements for the monitoring, recordkeeping, and reporting of SO2, NOx, and CO2 emissions, volumetric flow, and opacity data from emission units under the Acid Rain Program. The regulations include general requirements for the installation, certification, operation, and maintenance of continuous emission or opacity monitoring systems, certification tests and procedures, and quality assurance tests and procedures. Subpart B on Monitoring Provisions established general operating requirements for the monitoring systems. Subpart C establishes requirements on initial certification and recertification procedures. Subparts F and G establish requirements on recordkeeping and reporting requirements. *All applicable requirements are included in the permit conditions. Hydrogen will be added as a component to be monitored.*

Title V
The facility currently has a Title V Operating Permit (Permit 984839). Discussion with the District Title V engineer indicates that the applicant will need to submit an application for a Minor Modification to the permit. This has been relayed to the applicant.

5.0 RECOMMENDATION

This equipment is expected to comply with all rules and regulations of the San Diego Air Pollution Control District. It is recommended that an Authority to Construct be issued with current permit conditions (APCD2010-CON-000161), with revisions outlined below.

6.0 RECOMMENDED CONDITIONS

2. The unit shall be fired on Public Utility Commission (PUC) quality natural gas blended with up to 2% hydrogen by volume ~~only~~. The permittee shall maintain quarterly records of sulfur content (grains/100 dscf) and higher and lower heating values (Btu/dscf) of the blended fuel and provide such records to the District personnel upon request. 40 CFR 60 subpart GG

37. Continuous emission monitoring system (CEMS) shall be installed and properly maintained and calibrated to measure, calculate and record the following, in accordance with the District approved CEMS protocol:

A) Hourly average concentration of Oxides of Nitrogen (NOX) corrected to 15% oxygen, in parts per million (ppmvd);

B) Concentration of Carbon Monoxide (CO) corrected to 15% oxygen, in parts per million (ppmvd);

C) Percent oxygen (O2) in the exhaust gas (%) for each clock hour period;

D) Average concentration of Oxides of Nitrogen (NOX) for each rolling 3-hour period, in parts per million (ppmv) corrected to 15% oxygen;

E) Hourly and Monthly mass emissions of Oxides of Nitrogen (NOX), in pounds;

F) Rolling 12 month mass emissions of Oxides of Nitrogen (NOX), in tons;

G) Hourly and monthly mass emissions of Carbon Monoxide (CO), in pounds;

H) Annual mass emissions of Carbon Monoxide (CO), in tons.

I) Natural gas flow rate to combustion turbine in scf/hr.

J) Natural gas flow rate to duct burner in scf/hr.

K) Concentration of Volatile Organic Compounds (VOC) corrected to 15% oxygen, in parts per million (pmvd) for each rolling 3-hour period, based upon the approved VOC/CO surrogate relationship.

L~~M~~) Hourly and monthly mass emissions of VOC in pounds

M~~N~~) Rolling 12-month mass emissions of VOC in tons.

N) hydrogen gas flow rate to combustion turbine in scf/hr.

The CEMS shall be in operation in accordance with the District approved CEMS monitoring protocol at all times when the combustion turbine is in operation. A copy of the District approved CEMS monitoring protocol shall be maintained on site and made available to District personnel upon request. [Rule 20.3, 40 CFR 75]

44. Operating logs or Data Acquisition System (DAS) records shall be maintained to record the beginning and end times and durations of all startups, shutdowns, low load operations, and tuning periods to the nearest minute; quantity of ~~fuel~~ natural gas used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet; quantity of hydrogen used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet; hours of daily operation; and total cumulative hours of operation during each calendar year. [Rule 20.3, 69.3.1]

San Diego County Air Pollution Control District

COUNTY OF SAN DIEGO AIR POLLUTION CONTROL DISTRICT
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Application Record ID
APCD2021-APP-007099

Sectors: 2, D
Site Record ID: APCD2001-SITE-04276

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AUTHORITY TO CONSTRUCT

EXPIRES: February 3, 2023

After examination of your Application for an Air Pollution Control District (**hereinafter referred to as** "the District") Authority to Construct and Permit to Operate for equipment located at the above location, the District has decided on the following actions:

Authority to Construct is granted pursuant to Rule 20 of the Air Pollution Control District Rules and Regulations for equipment to consist of:

Modification of equipment on PTO-000623 and PTO-000625 to add hydrogen as a supplemental fuel.

This Authority to Construct is issued with the following conditions:

1. This equipment shall be properly maintained and kept in good operating condition at all times. Rule 10, 20.3.

2. The unit shall be fired on Public Utility Commission (PUC) quality natural gas blended with up to 2% hydrogen by volume only. The permittee shall maintain quarterly records of sulfur content (grains/100 dscf) and higher and lower heating values (Btu/dscf) of the blended fuel and provide such records to the District personnel upon request. 40 CFR 60 subpart GG

3. The permittee shall comply with all the applicable provisions of 40 CFR 73, including requirements to offset, hold and retire SO2 allowances. 40 CFR 73.

4. For purposes of determining compliance based on source testing, the average of three subtests shall be used. For purposes of determining compliance with emission limits based on the CEMS, data collected in accordance with the CEMS protocol shall be used and averaging periods shall be as specified herein. 40 CFR 75.

5. When the unit is combusting fuel (operating), the concentration of oxides of Nitrogen (NOx), calculated as nitrogen dioxide (NO2) and measured in the exhaust stack, shall not exceed 2.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen, except during periods of startup, shutdown, low load operation, or tuning. The following averaging periods shall apply to CEMS data:
   A) During any clock hour when duct firing above 19.5 MMBTU/hr heat input is occurring (a "duct-fired hour"): 3-clock hour average, calculated as the average of the duct fired hour, the clock hour immediately prior to and the clock hour immediately following the duct-fired hour.
   B) For any clock hour during which the change in gross electrical output produced by the combustion

turbine exceeds 50 MW per minute for one minute or longer (transient hour): 3-clock hour average, calculated as the average of the transient hour, the clock hour immediately prior to and the clock hour immediately following the transient hour.
C) All other hours: 1-clock-hour average.
(NSR)

6. When the unit is operating, the concentration of CO measured in the exhaust stack shall not exceed 4.0 ppmvd corrected to 15% oxygen, except during periods of startup, shutdown, low load operation, or tuning. A 3-clock hour averaging period shall apply to CEMS data. (NSR)

7. When the unit is operating, the VOC concentration, calculated as methane and measured in the exhaust stack, shall not exceed 2.0 ppmvd corrected to 15% oxygen, except during periods of startup, shutdown, low load operation, or tuning. For purposes of determining compliance based on the CEMS, the District approved VOC/CO surrogate relationship, the CO CEMS data, and a 3-clock hour average shall be used in accordance with the CEMS protocol. The VOC/CO surrogate relationship shall be verified and/or modified, if necessary, based on source testing. (NSR)

8. When the unit is operating, the Ammonia concentration (Ammonia slip) measured in the exhaust stack, shall not exceed 5.0 ppmvd corrected to 15% oxygen, except during periods of startup, low load, or tuning. Rule 1200.

9. When the unit is operating, the concentration of Oxides of Nitrogen (NOx), calculated as nitrogen dioxide (NO2) and measured in the exhaust stack, shall not exceed 11.8 ppmvd corrected to 15% oxygen, averaged over each clock hour period, except for exempt periods of operation during startup, combined-cycle gas turbine extended startup, shutdowns, and low load operation, as defined in Rule 69.3.1. All CEMS calculations and averages shall be performed in accordance with the CEMS protocol approved by the District. [Rule 69.3.1(d)(1)]

10. When the unit is operating, the concentration of Oxides of Nitrogen (NOx), calculated as Nitrogen Dioxide (NO2) and measured in the exhaust stack, shall not exceed 42 ppmvd corrected to 15% oxygen, calculated over each clock hour period except for periods of Startup or Shutdown, as defined in Rule 69.3. All CEMS calculations, averages shall be performed in accordance with the CEMS protocol approved by the District. [Rule 69.3.]

11. The emissions of particulate matter less than 10 microns (PM-10) shall not exceed 14.0 lbs/hr for each unit with and without duct burner firing. Rule 20.3.

12. The discharge of particulate matter from the exhaust stack of the unit shall not exceed 0.10 grains per dry standard cubic foot (0.23 grams/dscm). The District may require periodic testing to verify compliance with this standard. (Rule 53)

13. Visible emissions from the lube oil vents and the exhaust stack of the unit shall not exceed 20% opacity for more than three (3) minutes in any period of 60 consecutive minutes. (Rule 50)

14. When operating with the duct burner at or below 19.5 MMBTU/hr heat input, mass emissions from each unit shall not exceed the following limits, except during periods of startup, shutdown, low load operation, or tuning. A 3 clock-hour averaging period for these limits shall apply to CEMS data except for NOx emissions during non-transient hours when a 1 clock-hour averaging period shall apply.
Pollutant - Emission Limit, lbs/hr
A) Oxides of Nitrogen, NOx (calculated as NO2) - 13.4
B) Carbon Monoxide, CO - 16.3
C) Volatile Organic Compounds, VOC - 4.0
[Rule 20.3]

15. When operating with the duct burner firing above 19.5 MMBTU/hr heat input, mass emissions from each unit shall not exceed the following emission limits, except during periods of startup, shutdown, low load

operation, or tuning. A 3-clock-hour averaging period shall apply to CEMS data
Pollutant - Emission Limit, lbs/hr
A) Oxides of Nitrogen, NOx (calculated as NO2) - 14.9
B) Carbon Monoxide, CO - 18.1
C) Volatile Organic Compounds, VOC - 7.3
[Rule 20.3]

16. Total combined NOx emissions from both units shall not exceed 400 pounds per hour, calculated as Nitrogen Dioxide and measured over each 1-clock-hour period. These emission limits shall apply during all times during which one or both units are operating, including, but not limited to, emissions during periods of startup, shutdown, low load operation and tuning. In addition, Unit No. 1 shall not begin operating while Unit No. 2 is already operating in a startup period nor shall Unit No. 2 begin operating while Unit No. 1 is already operating in a startup period unless the unit already operating in a startup period meets all of the following in the clock-minute immediately preceding the clock-minute that the other unit begins operating:
A) Has been operating with a gross electrical output from the combustion turbine of 64 MW or more during the preceding 10 consecutive-clock-minute period;
B) The concentration of NOx, calculated as NO2 and measured in the exhaust stack, does not exceed 2.0 ppmvd corrected to 15% oxygen; and
C) The concentration of CO measured in the exhaust stack does not exceed 4.0 ppmvd corrected to 15% oxygen.
(Rule 20.3(d)(2)(i))

17. Total combined CO emissions from both units shall not exceed 2,000 pounds per hour measured over each 1-clock-hour period. This emission limit shall apply during all times that one or both units are operating, including, but not limited to emissions during periods of startup, shutdown, low load operation and tuning. (Rule 20.3(d) (2)(i))

18. Total aggregate emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), shall not exceed 104.3 tons in each rolling 12-calendar month period. The total aggregate emissions of NOx shall include emissions during all times that the equipment is operating, including but not limited to, emissions during periods of startup, shutdown, low load operation and tuning. [Rule 20.3]

19. Total aggregate emissions of Volatile Organic Compounds (VOC) from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), shall not exceed 50 tons in each rolling 12-calendar month period. The total aggregate emissions of VOC shall include emissions during all times that the equipment is operating, including but not limited to, emissions during periods of startup, shutdown, low load operation and tuning. [Rule 20.3]

20. The permittee shall maintain records, on at least a calendar quarterly basis, of total aggregate mass emissions of NOx and VOC in tons from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), for each rolling 12-calendar month period. These records shall be made available for inspection within 30 calendar days after the end of each calendar quarter. [Rule 20.3]

21. The emissions of any single Federal Hazardous Air Pollutant (HAP) shall not equal or exceed 10 tons, and the aggregate emissions of all Federal HAPs shall not equal or exceed 25 tons in any rolling 12-calendar month period. Compliance with these single and aggregate HAP limits shall be based on a methodology approved by the District for the purpose of calculating HAP emissions for this permit. If emissions exceed these limits, the permittee shall apply to amend permit to reflect applicable Federal Maximum Achievable Control Technology (MACT) standards and requirements in accordance with applicable provisions (including timing requirements) of 40 CFR Part 63.

22. The maximum total dissolved solids (TDS) concentration of the water used in the cooling towers shall not exceed 4,000 mg/l. This concentration shall be verified through quarterly testing of the water by a certified lab using EPA approved methods. [Rule 20.3, 1200]

23. When combusting fuel, Ammonia shall be injected at all times that the SCR outlet temperature is 510 degrees Fahrenheit or greater. [Rule 20.3]

24. The Ammonia injection flow rate shall be continuously measured, recorded and controlled. The Ammonia injection flow control equipment shall be installed, calibrated and maintained in accordance with a District approved protocol. [Rule 20.3]

25. Except during periods when the Ammonia injection system is being tuned or one or more Ammonia injection systems is in manual control (for compliance with applicable permits), the automatic Ammonia injection system serving the SCR shall be in operation in accordance with manufacturer's specifications at all times when Ammonia is being injected into the SCR. Manufacturer specifications shall be maintained on site and made available to District personnel upon request. [Rule 20.3]

26. The concentration of Ammonia solution used in the Ammonia injection system shall be less than 20% ammonia by weight. Records of Ammonia solution concentration shall be maintained on site and made available to District personnel upon request. [40 CFR 68, Rule 1200]

27. For purposes of determining compliance with the emission limits of this permit, a shutdown period is the period of time that begins with the lowering of the gross electrical output of the combustion turbine below 64 MW and that ends five minutes after fuel flow to the combustion turbine ceases, not to exceed 65 consecutive minutes. [Rule 20.3 69.3.1]

28. A startup period is the period of time that begins when fuel flows to the combustion turbine following a non-operational period. For purposes of determining compliance with the emission limits of this permit, the duration of a startup period shall not exceed 120 consecutive minutes if the steam turbine reheat bowl temperature is above 750° F when the startup period begins and shall not exceed 360 consecutive minutes if the steam turbine reheat bowl temperature is less than or equal to 750° F when the startup period begins. [Rule 20.3, 69.3.1]

29. Low load operation is a period of time that begins when the gross electrical output (load) of the combustion turbine is reduced below 64 MW from a higher load and that ends 10 consecutive minutes after the combustion turbine load next exceeds 64 MW provided that fuel is continuously combusted during the entire period and one or more clock hour concentration emission limits specified in this permit are exceeded as a result of the low-load operation. Periods of operation at low load shall not exceed 130 minutes in any calendar day nor an aggregate of 780 minutes in any calendar year, and no period of operation at low load shall begin during a startup period. [Rule 20.3, 69.3.1]

30. Tuning is defined as adjustments to the combustion system that involves operating the unit in a manner such that the emissions control equipment may not be fully effective or operational. Only one combustion turbine will be tuned at any given time. Tuning events shall not exceed 480 minutes in a calendar day nor exceed 40 hours in a calendar year. The District compliance division shall be notified at least 24 hours in advance of any tuning event. [Rule 20.3, 69.3.1]

31. A CEMS Protocol is a document approved in writing by the APCD M&TS division that describes the Quality Assurance and Quality Control procedures for monitoring, calculating and recording stack emissions from the unit. [40 CFR 75]

32. This unit shall be source tested to demonstrate compliance with the NOx, CO, VOC, PM-10, and Ammonia emission standards of this permit, using District approved methods. The source test and the NOx and CO Relative Accuracy Test Audit (RATA) tests shall be conducted in accordance with the applicable RATA frequency requirements of 40 CFR75, appendix B, sections 2.3.1 and 2.3.3. [Rule 20.3, 1200]

33. A Relative Accuracy Test Audit (RATA) and all other required certification tests shall be performed and completed on the CEMS in accordance with applicable provisions of 40 CFR part 75 Appendix A and B performance specifications. At least 30 days prior to the test date, the permittee shall submit a test protocol to the District for approval. Additionally, the District shall be notified a minimum of 21 days prior to the test so that observers may be present. [40 CFR 75]

34. If source testing will be performed by an independent contractor and witnessed by the District, a source test protocol shall be submitted to the District for written approval at least 30 days prior to source testing. The source test protocol shall comply with the following requirements:
A) Measurements of NOX, CO, and O2 emissions shall be conducted in accordance with U.S. Environmental Protection Agency (EPA) methods 7E, 10, and 3A, respectively, and District Source Test, method 100, or alternative methods approved by the District and EPA.
B) Measurement of VOC emissions shall be conducted in accordance with EPA Methods 25A and/or 18, or alternative methods approved by the District and EPA.
C) Measurements of ammonia emissions shall be conducted in accordance with Bay Area Air Quality Management District ST-1B or an alternative method approved by the District and EPA.
D) Measurements of PM-10 emissions shall be conducted in accordance with EPA Methods 201A and 202 or alternative methods approved by the district and EPA.
E) Source testing shall be performed with both the combustion turbine and the duct burner in operation. Each duct burner shall operate with a minimum heat input of 97 MMBTU/hr.
F) Source testing shall be performed at the most frequently used load level, as specified in 40 CFR Part 75 Appendix A Section 6.5.2.1.d, provided it is not less than 80% of the unit's rated load unless it is demonstrated to the satisfaction of the district that the unit cannot operate under these conditions . If the demonstration is accepted, then emissions source testing shall be performed at the highest achievable continuous level power level.
G) Measurements of particulate matter emissions shall be conducted in accordance with SDAPCD Method 5 or an alternative method approved by the District and EPA.
H) Measurements of opacity shall be conducted in accordance with EPA Method 9 or an alternative method approved by the District and EPA.
I) Measurement of fuel flow shall be conducted in accordance with an approved test protocol.
[Rule 20.3, 69.3.1, 40 CFR 60 subpart GG]

35. Within 45 days after completion of the renewal source test or RATA, a final test report shall be submitted to the District for review and approval. [Rule 20.3, 69.3.1, 40 CFR 60 subpart GG]

36. The Oxides of Nitrogen (NOx) and Oxygen (O2) CEMs shall be certified and maintained in accordance with applicable federal regulations including the requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of 40 CFR 75 and the CEMs protocol approved by the District. The Carbon Monoxide (CO) CEMs shall be certified and maintained in accordance with 40 CFR 60, Appendices B and F, unless otherwise specified in this permit.
[40 CFR 60, 40 CFR 75]

37. Continuous emission monitoring system (CEMS) shall be installed and properly maintained and calibrated to measure, calculate and record the following, in accordance with the District approved CEMS protocol:
A) Hourly average concentration of Oxides of Nitrogen (NOX) corrected to 15% oxygen, in parts per million (ppmvd);
B) Concentration of Carbon Monoxide (CO) corrected to 15% oxygen, in parts per million (ppmvd);
C) Percent oxygen (O2) in the exhaust gas (%) for each clock hour period;
D) Average concentration of Oxides of Nitrogen (NOX) for each rolling 3-hour period, in parts per million (ppmv) corrected to 15% oxygen;
E) Hourly and Monthly mass emissions of Oxides of Nitrogen (NOX), in pounds;
F) Rolling 12 month mass emissions of Oxides of Nitrogen (NOX), in tons;
G) Hourly and monthly mass emissions of Carbon Monoxide (CO), in pounds;

H) Annual mass emissions of Carbon Monoxide (CO), in tons.
I) Natural gas flow rate to combustion turbine in scf/hr.
J) Natural gas flow rate to duct burner in scf/hr.
K) Concentration of Volatile Organic Compounds (VOC) corrected to 15% oxygen, in parts per million (pmvd) for each rolling 3-hour period, based upon the approved VOC/CO surrogate relationship.
L) Hourly and monthly mass emissions of VOC in pounds
M) Rolling 12-month mass emissions of VOC in tons.
N) Hydrogen gas flow rate to combustion turbine in scf/hr.
The CEMS shall be in operation in accordance with the District approved CEMS monitoring protocol at all times when the combustion turbine is in operation. A copy of the District approved CEMS monitoring protocol shall be maintained on site and made available to District personnel upon request. [Rule 20.3, 40 CFR 75]

38. When the CEMs is not recording data and the unit is operating, hourly NOx emissions annual calculations shall be determined in accordance with 40 CFR 75 Appendix C. Additionally, hourly CO emissions for the annual emission calculations shall be determined using the hourly emission rate recorded by the CEMs during the most recent hours in which the unit operated 3 continuous hours at no less than 80% of full power rating. Alternate CO emission factors shall be determined from compliance source test emissions data. The alternate hourly CO emission rate shall be reviewed and approved by the District, in writing. [Rule 20.3]

39. Any violation of any emission standard as indicated by the CEMs shall be reported to the District's Compliance Division within 96 hours after such occurence. [Rule 20.3]

40. The CEMs shall be maintained and operated, and reports submitted, in accordance with the requirements of Rule 19.2 sections (d), (e), (f)(2),(f)(3), (f)(4) and (f)(5) and CEMs protocol approved by the District. [Rule 19.2]

41. The District shall be notified at least two weeks prior to any changes made in CEMS software that affect the measurement, calculation or correction of data displayed and/or recorded by the CEMS. [40 CFR 75]

42. Fuel flowmeters with an accuracy of +/- 2% shall be maintained to measure the volumetric flow rate corrected for temperature and pressure. Correction factors and constants shall be maintained on site and made available to the District upon request. The fuel flowmeters shall meet the applicable quality assurance requirements of 40 CFR Part 75, Appendix D, and Section 2.1.6. [Rule 20.3, 40 CFR 75]

43. The unit shall be equipped with continuous monitors to measure, calculate and record the following operational characteristics:
A) Ammonia injection rate in lb/hr of solution.
B) Outlet temperature of SCR in degrees Fahrenheit.
C) Combustion turbine power output (MW).
D) Steam turbine reheat bowl temperature in degrees Fahrenheit.
The monitors shall be installed, calibrated, and maintained in accordance with a protocol approved by the District, which shall include any relevant calculation methodologies. The monitors shall be in full operation at all times when the combustion turbine is in operation. Calibration records for the continuous monitors shall be maintained on site and made available to the District upon request. [Rule 69.3.1]

44. Operating logs or Data Acquisition System (DAS) records shall be maintained to record the beginning and end times and durations of all startups, shutdowns, low load operations, and tuning periods to the nearest minute; quantity of natural gas used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet; quantity of hydrogen used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet; hours of daily operation; and total cumulative hours of operation during each calendar year. [Rule 20.3, 69.3.1]

45. All records required by this written permit shall be maintained on site for a minimum of five years and

made available to the District upon request. (Title V - Rule 1421)

46. Access, facilities, utilities and any necessary safety equipment for source testing and inspection shall be provided upon request of the Air Pollution Control District.

47. The District may require one or more of the following compounds, or additional compounds to be quantified through source testing periodically to ensure compliance with rule 1200:
A) Acetaldehyde
B) Acrolein
C) Benzene
D) Formaldehyde
E) Toluene
F) Xylenes

If the District requires the permittee to perform this source testing, the District shall request the testing in writing a reasonable period of time prior to the testing date, and the permittee shall submit a source test protocol to the District for written approval at least 30 days prior to the testing date.

48. This Air Pollution Control District Permit does not relieve the holder from obtaining permits or authorizations required by other governmental agencies.

49. The permittee shall, upon determination of applicability and written notification by the District, comply with all applicable requirements of the Air Toxics "Hot Spots" Information and Assessment Act (California Health and Safety Code Section 44300 et seq.)

This Authority to Construct does not authorize operation of the above-specified equipment until written notification has been provided to the District indicating that construction (or modification) has been completed in accordance with this Authority to Construct. Upon submission of this notification, temporary Permit to Operate shall take effect and will remain in effect, unless withdrawn or modified by the District, until the equipment is inspected by the District and a revised temporary permit (Startup Authorization) is issued or a Permit to Operate is granted or denied.

This Authority to Construct shall be posted on or within 25 feet of the above described equipment or maintained readily available at all times on the operating premises.

Upon completion of construction (or modification) in accordance with this Authority to Construct, and prior to commencing operation, the applicant must complete and mail, deliver or email to APCDPermits@sdcounty.ca.gov the enclosed Construction Completion Notice to the District. After mailing, delivering or emailing the notice, the applicant may commence operation of the equipment. Operation must be in compliance with all the conditions of this Authority to Construct and applicable District Rules.

This Authority to Construct does not relieve the holder from obtaining permits or authorizations, which may be required by other governmental agencies. This Authority to Construct is not authority to exceed any applicable emission standard established by this District or any other governmental agency. This authorization is subject to cancellation if any emission standard or condition is violated.

Within 30 days after receipt of this Authority to Construct, the applicant may petition the Hearing Board for a hearing on any conditions imposed herein in accordance with Rule 25.

This Authority to Construct will expire on 02/03/2023 unless an extension is granted in writing.

This is not a Permit to Operate. Please be advised that installation or operation of this process or equipment without written authorization may be a misdemeanor subject to fines and penalties.

If you have any questions regarding this action, please contact me at 858-692-7281 or via email at Maria.Galvez@sdapcd.org.

Maria Galvez
Asst APC Engineer

CC: Compliance Division

ENGINEERING EVALUATION

Facility Name: SDG&E Palomar Energy Center, LLC
Application Number: APCD2018-APP-006511
Equipment Type: combined cycle gas turbines
Facility ID: APCD2001-SITE-04276
Equipment Address: 2300 Haverson Place
Escondido, CA 92029
Facility Contact: Brian Yim
Contact Title: Senior Environmental Specialist
Contact Affiliation: SDG&E
Contact Phone: (562) 405-6749 (cell)
Contact E-Mail: byim@semprautilities.com

Date CCN Received: N/A
Date Construction Complete: N/A
Date of Inspection: N/A

Recoverable Signature

X Arthur Carbonell

Signed by: Arthur Carbonell

Permit Engineer

Recoverable Signature

X John Annicchiarico

Signed by: b86598c4-9db5-40e7-95e2-d560170dc879

Senior Engineer

1.0 BACKGROUND

1.1 Type of Application: MAL (20F)

1.2 Permit History:
This is a modification to APCD2010-PTO-000623 and APCD2010-PTO-000625. The initial FDOC for these turbines were submitted to the CEC in December 2002. Under APCD2018-APP-005374, the applicant is requesting a modification to Permit Condition 28 by increasing the steam turbine reheat bowl temperature from 500°F to 750°F. This would allow additional six-hour extended startups instead of two-hour regular startups. Note that lower emission limits do not apply during startup conditions. However, data supplied at the time only supported an increase to the reheat bowl temperature up to 650°F. The application was approved with the increase to 650°F in 2019. This application is to increase the reheat bowl temperature limit from 650°F to 750°F.

1.3 Facility Description:
This facility is a combined cycle power plant with a capacity of 565 MW.

1.4 Other Background Information:
The applicant has submitted an application for a minor modification to their Title V permit.

2.0 PROCESS DESCRIPTION

2.1 Equipment Description:

PTO-000623

Power Station Unit #1 consisting of: one nominal 165 MW natural-gas fired combined-cycle General Electric Power Systems Frame 7FA gas turbine generator, S/N 298258, with dry low-NOx combustors, a heat recovery steam generator, a 195 MMBtu/hr (HHV) auxiliary duct burner, a selective catalytic reduction unit, an oxidation catalyst, and a steam turbine generator shared with Power Station Unit # 2.

PTO-000625

Power Station Unit #2 consisting of: one nominal 165 MW natural-gas fired combined-cycle General Electric Power Systems Frame 7FA gas turbine generator, S/N 298257, with dry low-NOx combustors, a heat recovery steam generator, a 195 MMBtu/hr (HHV) auxiliary duct burner, a selective catalytic reduction unit, an oxidation catalyst, and a steam turbine generator shared with Power Station Unit # 1.

2.2 Process:

This facility utilizes two 165-MW combined cycle turbines and a shared steam turbine generator to produce power to be sold to the grid.

2.3 Emissions Controls:

The turbines are each controlled with a selective catalytic reduction (SCR) unit.

2.4 Attachments:

None.

3.0 EMISSIONS

3.1 Emission Estimate Summary:

Table 1: Estimated Emission Increases

	NOx	CO	VOC	SOx	PM_{10}
lbs/hr	+0	+0	+0	+0	+0
lbs/day	+0	+0	+0	+0	+0
tons/yr	+0	+0	+0	+0	+0

3.2 Emission Estimate Assumptions:

There will be no increase in emissions due to this modification.

3.3 Emission Calculations:

NA

3.4 Attachments:

None.

4.0 APPLICABLE RULES

4.1 Prohibitory Rules:

Rule 50 – Visible Emissions:

This rule limits air contaminant emissions into the atmosphere of shade greater than Ringlemann Number 1, to a maximum aggregate of three minutes in any consecutive sixty-minute time period.

With proper maintenance and operation as required by ATC conditions, visible emissions are expected to be well below this limit.

Rule 51 – No Nuisance:

This rule prohibits discharge of air contaminants that cause or have a tendency to cause injury, nuisance or annoyance to people and/or the public or damage to business or property.
With proper maintenance and operation as required by ATC conditions, no nuisance complaints are expected from the operation of this equipment.

Rule 53 – Specific Air Contaminants:

This rule prohibits the discharge of sulfur compounds, calculated as SO_2 in excess of 0.05% by volume on a dry basis and the discharge of particulate matter from combustion sources in excess of 0.10 grains/dscf standardized to 12% CO_2.
There will be no increase in emissions due to this modification. Continued compliance with this rule is expected.

Rule 62 – Sulfur Content of Fuels:

This rule prohibits the use of any gaseous fuel containing more than 10 grains of sulfur compounds, calculated as H_2S, per 100 dscf of gas, and any liquid fuel containing more than 0.5% sulfur by weight.
Rule 20 of the Public Utility Commissions (PUC) requires the sulfur content of natural gas sold in San Diego County to be less than 0.25 grains of H_2S per 100 dscf and less than 0.75 grains of total sulfur per 100 dscf. California diesel fuel contains 0.05% sulfur by weight or less.

Rule 69.3.1 – Turbines (BARCT):

From the previous evaluation, this rule limits NOx emissions to less than 11.8 ppmv @ 15% oxygen.
There will be no increase in emission concentration levels due to this modification. Current permit conditions limit NOx emissions to 2.0 ppmv at 15% oxygen. With proper operation of the SCR, continued compliance with this limit is expected. CEMS data and annual renewal testing will confirm compliance. Duration of startups will continue to be limited to 120 minutes and duration of extended startups will continue to be limited to 360 minutes. Note that this modification will specify that extended startups will be redefined as when the startup period begins when the steam turbine reheat bowl temperature is above 750°F instead of 650°F.

4.2 New Source Review:

Rule 20.3 (a) – Applicability:

This part of the rule specifies that this rule applies to any new or modified major stationary source, to any new or modified emission unit and to any relocated emission unit being moved from a stationary source provided that after completion of the project, the stationary source will be a major stationary source.
Potential to emit from this facility to exceed major source thresholds. Therefore, this rule is applicable.

Rule 20.3 (d)(1)(i) – Major Stationary Source BACT and LAER:

This part of the rule requires the installation of best available control technology on the equipment if the modification results in an emission increase and the post-project emission threshold value of 10 lbs/day is equaled or exceeded for NOx, CO, VOC, SOx, or PM_{10}.
Rule 20.1(d)(1)(i)(C) states that if actual emissions of a modified emission unit located at a major stationary source are less than 80% of the emission unit's potential to emit, then pre-project potential to emit shall be the same as actual emissions. However, Rule 20.1(d)(1)(i)(C)(3) states that if previous emissions were offset in accordance the NSR rules in effect at that time, then pre-project emissions shall be based on potential to emit and permitted emission limits. Major source thresholds are exceeded for NOx, CO, and PM_{10}. Offsets were provided for all NOx emissions at the time this equipment was initially installed. There are no changes to permitted NOx limits, therefore there are no increases in NOx emissions due to this modification. From Emissions Inventory data, the actual emissions from the turbines were

14.95 tons/yr and 14.76 tons/yr of CO in 2018 and 2019, respectively. Actual emissions of PM_{10} were 8.05 tons/yr and 5.09 tons/yr in 2018 and 2019, respectively. From the Final Determination of Compliance (FDOC) issued for this facility, the potential to emit is 313.7 tons/yr of CO for both turbines and 104.8 tons/yr of PM_{10} for both turbines. Since the actual emissions of CO and PM_{10} are less than 80% of the potential to emit, pre-project emissions must be considered the same as actual emissions for these pollutants.

Regarding the proposed increase in the maximum reheat bowl temperature, current permit conditions allow an extended startup if the steam turbine reheat bowl temperature is below 650°F at the beginning of the startup. This application requests an increase of the bowl temperature from 650°F to 750°F to qualify for an extended startup (6 hours). Granting this request would likely increase the number of extended startups and therefore potentially increase daily emissions. Therefore, since post-project emissions exceed 10 lbs/day, a BACT review is triggered.

In practice the applicant has not consistently achieved emission standards within the regular (120-minute) startup period when the bowl temperature is below 750°F. If above 750°F, the site is allowed an extended startup period of 360 minutes. During instances when the turbine does not achieve regular emission standards within 2 hours, the applicant has been doing a "double start" in which they shut off the equipment to avoid a violation of their permit conditions and then re-start the equipment. Alternatively, in order to meet emission limits within a 120-minute startup period, the site sometimes has to deviate from recommended manufacturer's procedures which causes excessive wear on the turbines.

An extended startup occurred on 2/16/20 which lasted a total of 176 minutes. A double start occurred on 4/19/20 with lasted a total of 200 minutes. Potentially, if allowed an extended start, actual operating time may have been lower than the double start. A forced start occurred on 2/24/20 in which the turbine was ramped to 70 MW to meet the 120-minute limit but this caused the turbine to go into an automated failsafe hold for approximately 50 minutes because the difference in the steam temperature and metal temperature exceeded safety limit. So, while the 120-minute limit was reached, a total of 170 minutes was needed before power could be supplied to the grid, which is only slightly lower than the extended startup time of 176 and the engine was operated in a manner in which it was not designed. Since the equipment cannot consistently achieve compliance within 120 minutes at bowl temperatures below 750°F, it is not considered to be technologically feasible and cannot be considered BACT. Allowing an increase of extended starts at up to 750°F, would eliminate the need for double starts and forced starts which could potentially lead to lower emissions overall and decreased wear and tear on the turbine. Therefore, this modification would be considered BACT.

Rule 20.3 (d)(1)(v) – Major Stationary Source LAER:

Rule 20.3(d)(2)(v)(A): This part of the rule requires that the lowest achievable emission rate (LAER) shall be required for each new, modified, relocated or replacement equipment which constitutes a new major stationary source, new federal major stationary source, major modification, or federal major modification. LAER shall only be applicable for those air contaminants for which the stationary source is major and for which the District is classified as non-attainment of a national ambient air quality standard. Rule 20.1(d)(1)(i)(C) specifies the methods used to calculate pre-project and post-project potential to emit for modified emission units at existing major stationary sources. This subsection states that if actual emissions are less than 80% of potential emissions, then pre-project emissions shall be the same as actual emissions. Note that Rule 20.1(d)(1)(i)(C)(3) states that if the emissions from this facility have been offset, then the pre-project emissions shall be based on maximum potential to emit and enforceable permit limits.

The District is classified as non-attainment only for ozone for which NOx and VOC emissions are precursors. Of these two pollutants, major source thresholds are exceeded only for NOx emissions. As stated above, offsets were provided for the entire potential to emit of NOx

emissions so pre-project emissions shall be based on permitted limits which are unchanged due to this modification. Therefore, there are no increases in emissions and LAER is not triggered.

Rule 20.3(d)(2)(v)(B): This part of the rule states that if emission reductions of VOC or NOx, as applicable, are provided from within the stationary source at a ratio of at least 1.3 to 1.0 for the emission increases of VOC or NOx, then such emission increases shall be exempt from the requirements of LAER and from further emission offset and shall instead be subject to BACT.
During the initial installation of these turbines, offsets were provided for the entirety of the potential to emit for NOx. Therefore, LAER is not applicable and the equipment is subject to BACT. Current emission limits comply with BACT and, as stated above, the proposed reheat bowl temperature increase to 750°F also meets BACT requirements.

Rule 20.3(d)(2)(v)(c): This part of the rule states that new, modified, relocated, or replacement emission units or projects at an existing major stationary source or federal major stationary source which results in an emission increase of VOC or NOx subject to LAER shall instead be subject to BACT provided that the stationary source's post-project aggregate potential to emit is less than 100 tons/yr of VOC or NOx. This provision shall not be applicable if the District is designated by EPA as an extreme ozone non-containment area.
The potential to emit of NOx for this facility, as specified in the permit conditions, is 104.3 tons/yr. However, the emission increases of VOC and NOx are not subject to LAER as per Rule 20.3(d)(2)(v)(A) so this subsection is not applicable.

Rule 20.3 (d)(1)(vi) –PSD Stationary Sources:
This part of the rule requires any new, modified, relocated, or replacement emission unit at a PSD stationary source, which emission unit has an emission increase of one or more air contaminants which constitutes a new PSD stationary source or PSD modification, shall be equipped with BACT for each such air contaminant.
This site is an existing PSD stationary source for NOx, CO and PM_{10}. From Table 20.1-10, PSD modification thresholds are triggered for CO and PM_{10} emissions. Current emission limits and the use of PUC-quality natural gas satisfy BACT requirements. Additionally, the proposed reheat bowl temperature increase to 750°F also meets BACT requirements.

Rule 20.3 (d)(2) –Major Stationary Source AQIA:
Rule 20.3(d)(2)(i)(A) and 20.3(d)(2)(i)(B) requires the applicant to conduct an Ambient Air Quality Impact Analysis of the unit's emissions if the emission threshold values are equaled or exceeded for NOx, CO, SOx, or PM_{10}. The threshold values for NOx and SOx are 25 lbs/hr, 250 lbs/day or 40 tons/yr. The threshold values for CO are 100 lbs/hr, 550 lbs/day or 100 tons/yr. The threshold values for PM_{10} are 100 lbs/day or 15 tons/yr. The AQIA shall show that emission increases will not cause a violation of a national ambient air quality standard (NAAQS) or any California ambient air quality standard (CAAQS) anywhere that does not already exceed such a standard, will not cause additional violations of a NAAQS or CAAQS anywhere the standard is already being exceeded, prevent of interfere with the attainment or maintenance of any NAAQS or CAAQS, nor, by itself, result in an increase in ambient concentrations of any air contaminant for which the District is in attainment of applicable NAAQS or CAAQS greater than the applicable air quality increment above baseline concentration for that air contaminant in any Class I or Class II area.
When comparing actual to potential emissions, the emission increases due to this modification exceed AQIA thresholds for CO and PM_{10}. An AQIA for this equipment was already performed during the initial evaluation which included commissioning period and startup emissions which are much higher than normal emissions. The AQIA demonstrated compliance with this subsection at the time of initial installation in 2002. Additionally, NAAQS and CAAQS have not changed for CO or PM_{10}. For CO, the maximum modeled impacts were 10.6 $\mu g/m^3$ for an 8-hr average and 30.1 $\mu g/m^3$ for a 1-hr average. The ambient air quality standards for CO are 100,000 $\mu g/m^3$ and 23,000 $\mu g/m^3$ for the 8-hr and 1-hr standards, respectively. As these impacts are negligible, new modeling for CO emissions will not be required. For PM_{10}, the maximum modeled impacts were 0.8 $\mu g/m^3$ for an annual average and 4.8 $\mu g/m^3$ for a 24-hr

average. The ambient air quality standards for PM_{10} are 50 $\mu g/m^3$ and 20 $\mu g/m^3$ for the annual and 24-hr standards, respectively. It was noted in the FDOC that all particulate matter emissions (including those from the cooling tower) could double and still not violate any ambient air quality standard. Therefore, new modeling for PM_{10} emissions will also not be required. The District's Meteorology Group has reviewed the previous AQIA and has agreed that new modeling is not necessary.

Rule 20.3(d)(2)(ii) states that in determining if a $PM_{2.5}$ or PM_{10} AQIA is required, emission increases shall include both directly emitted $PM_{2.5}$ and PM_{10} including condensibles. If an AQIA is required, the AQIA shall include both $PM_{2.5}$ and PM_{10} including condensibles. Any permit conditions limiting particulate matter emissions shall apply to the combination of both $PM_{2.5}$ and PM_{10} including condensibles. The provisions of this subsection shall apply to $PM_{2.5}$ and PM_{10} separately.

It will be assumed that all PM_{10} emissions are also $PM_{2.5}$. Using the previous modelling results for PM_{10}, impacts from $PM_{2.5}$ will be assumed to be 0.8 $\mu g/m^3$ for an annual average and 4.8 $\mu g/m^3$ for a 24-hr average. Ambient air quality standards for $PM_{2.5}$ are 35 $\mu g/m^3$ and 12 $\mu g/m^3$ for the 24-hour and annual standards, respectively. The District's Meteorology Group has reviewed the previous AQIA and has determined that the site is in compliance with all NAAQS and CAAQS. Therefore, new modeling will not be required for $PM_{2.5}$.

Rule 20.3(d)(2)(iii) states that when a project consists of multiple emission units, the determination of whether an AQIA is required shall be based on the aggregate total of emission increases from all project emission units, excluding any concurrent actual emission reductions at the same stationary source. Additionally, if an AQIA is required, the impacts of the project shall be based on the aggregate of the air quality impacts from each unit's emission increases. Air quality impact reductions may be included to determine the net air quality impacts.

When this project was initially modelled, it included all emission that were part of the project including both turbines and the cooling tower. Therefore, the requirements of this subsection are satisfied.

Rule 20.3 (d)(3) – Prevention of Significant Deterioration:

This part of the rule requires that notification be given to the Federal Land Manager, Federal EPA, ARB, SCAQMD and ICAPCD for any project which is expected to have a significant impact on any Class I area as determined by an AQIA. The threshold level for a PSD Modification is 40 tons/yr of NOx emissions.

When comparing actual to potential emissions, the emission increases due to this modification exceed PSD thresholds for CO and PM_{10}. However, a PSD analysis for this equipment was already performed during the initial evaluation. Additionally, this PSD analysis included commissioning period and startup emissions which are expected to be much higher than normal emissions. As no other exhaust parameters are being altered, the existing PSD analysis and modeling are still valid and there will be no significant impacts on any Class I or Class II areas.

Rule 20.3 (d)(4) – Public Notice and Comment:

This part of the rule requires that a public notice and comment period be provided for any project subject to an AQIA.

As revised AQIA and PSD analyses are not necessary, no public notice or comment period is required.

Rule 20.3 (d)(5) – Emission Offset Requirements:

This part of the rule requires that for any new or modified emission unit or project which results in an emission increase that constitutes a new major stationary source or a major modification for NOx or VOC, emission offsets shall be provided for such emission increases. Subsection (d)(5)(ii)(B) states that emission increases that have already been approved to be in compliance with the emission offset requirements of this rule shall not thereafter be included in the amount of emission increases from the new or modified emission unit or project.

Offsets have already been provided for NOx emissions and VOC emissions do not exceed major source thresholds. Therefore, no additional offsets are required.

Rule 20.3 (e)(1) – Compliance Certification:

This part of the rule requires that all major stationary sources owned or operated by the applicant in the state are in compliance, or on an approved schedule for compliance, with all applicable emission limitations and standards under the federal Clean Air Act.

The applicant has provided a letter that listed the major sources operated by SDG&E and Southern California Gas in California and has certified that these facilities are in compliance with all applicable emission limitations and standards under the federal Clean Air Act. Brian Yim from Sempra Utilities verified that the facilities listed in the letter encompass all the major sources owned and operated in California by SDG&E and Sempra Energy. Therefore, the site is in compliance with this subsection.

Rule 20.3 (e)(2) – Alternative Siting and Alternatives Analysis:

This part of the rule requires that the applicant conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for the proposed source or modification which demonstrates that the benefits of the proposed source or modification outweigh the environmental and social costs imposed as a result of its location or construction.

An analysis was provided during the initial certification of this project which included a no project alternative, alternative sites, and alternative technologies determination. Since all of San Diego County is currently classified as non-attainment for ozone, an alternative location within San Diego would not avoid the project being located in a non-attainment area. This analysis has been approved by the District and the California Energy Commission.

Rule 20.3 (e)(3) – Analysis of Visibility Impairment in Class I Areas:

This part of the rule requires that for any new or modified emission unit or project which results in an emission increase that constitutes a new major stationary source or a major modification and which may have an impact on visibility in a Class I area shall provide an initial screening analysis of the impairment to visibility, including any integral vista, in each affected Class I area as a result of the emission increases from the new source or modification, and any general commercial, residential, industrial, and other growth associated with the new source or modification.

During the initial certification for this project, as part of the PSD analysis, the District performed an assessment of the visibility impairment attributable to the project in Class I areas within 100 kilometers of the project. This assessment determined that the plume perceptibility and contrast were well below screening thresholds. The requirements for this rule have been met.

4.3 Toxics New Source Review:

Rule 1200 – Toxic Air Contaminants, New Source Review

This rule requires that a Health Risk Assessment be performed if emissions of any toxic air contaminant exceed the de minimum values specified in the rule. The cancer risk determined by the HRA must be less than one in a million or less than ten in a million if TBACT is installed. Additionally, both the chronic non-cancer and the acute health hazard indexes determined by the HRA must be less than one.

There will be no increase in toxic emissions due to this modification. Toxics NSR is not applicable.

4.4 AB3205:

This assembly bill requires public notification prior to issuing an Authority to Construct for equipment emitting hazardous air contaminants within 1000 feet of a school (kindergarten through 12th grade).

There are no schools within 1000 feet of this equipment. Therefore, AB3205 does not apply.

4.5 Federal and State Regulations:

40 CFR Part 60 Subpart GG
This subpart applies to all stationary gas turbines with a heat input equal to or greater than 10 MMBtu/hr and which commenced construction, modification, or reconstruction after October 3, 1977. The purpose of this subpart is to set standards for the concentration of NOx and SOx from the emissions of stationary gas turbines.
This modification will not change the concentration of NOx or SOx in the turbine exhaust. Continued compliance with this subpart is expected.

40 CFR Part 60 Subpart KKKK
This subpart applies to any stationary combustion turbine with a heat input equal to or greater than 10 MMBtu/hr which commenced construction, modification, or reconstruction after February 18, 2005. A modification is defined in Subpart A as any physical change or change in the method of operation of an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted by that facility, or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.
Construction of this equipment commenced prior to February 18, 2005, so this subpart was not initially applicable. As stated in the BACT determination of Section 4.2 of this evaluation, since increasing the extended startup parameter of the steam reheat bowl temperature to 650°F will result in less "double starts" by the applicant, it is reasonable to assume that actual duration of startup times will decrease due to this modification so no increase in actual emissions is expected. Therefore, as defined by 40 CFR Subpart A, the turbines are not being modified and Subpart KKKK is still not applicable.

5.0 ATC RECOMMENDATION

This modification is expected to comply with all applicable rules and regulations of the San Diego Air Pollution Control District. As no construction is required for this modification. It is recommended that a combined Authority to Construct / Startup Authorization be issued with the conditions specified below.

6.0 RECOMMENDED CONDITIONS

It is recommended that the existing conditions of APCD2010-CON-000161 be used except with a steam turbine reheat bowl temperature of 750°F.

7.0 INSPECTION REPORT

No physical modification is being made to this equipment. An on-site inspection is not required.

8.0 PTO RECOMMENDATION

When a startup period begins when the steam turbine reheat bowl temperature is between 650°F and 750°F, the applicant has submitted data that shows it is not technologically feasible to achieve compliance with applicable emission limits within a 120-minute time frame. Therefore, it is recommended that the equipment be allowed a 360-minute extended startup period when the steam reheat bowl temperature is less than or equal to 750°F instead of 650°F.

This equipment is expected to comply with all rules and regulations of the San Diego Air Pollution Control District. It is recommended that APCD2010-PTO-000623 and APCD2010-PTO-000625 be approved with the modified conditions of APCD2010-CON-000161.

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Site Record ID: APCD2001-SITE-04276
Application Record ID: APCD2020-APP-006511

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SDG&E Palomar Energy Center
Moses Peram
2300 Harveson Place
Escondido CA 92029

EQUIPMENT ADDRESS
SDG&E Palomar Energy Center
Moses Peram
2300 Harveson Place
Escondido CA 92029

STARTUP AUTHORIZATION

After examination of your Application APCD2020-APP-006511 for an Air Pollution Control District (hereinafter referred to as "the District") Authority to Construct and Permit to Operate for equipment located at 2300 Harveson Place Escondido CA 92029 in San Diego County, the District has decided on the following actions:

This Startup Authorization is granted pursuant to Rule 21 of the Air Pollution Control District Rules and Regulations for equipment to consist of:

PTO-000623
Power Station Unit #1 consisting of: one nominal 165 MW natural-gas fired combined-cycle General Electric Power Systems Frame 7FA gas turbine generator, S/N 298258, with dry low-NOx combustors, a heat recovery steam generator, a 195 MMBtu/hr (HHV) auxiliary duct burner, a selective catalytic reduction unit, an oxidation catalyst, and a steam turbine generator shared with Power Station Unit # 2.

PTO-000625
Power Station Unit #2 consisting of: one nominal 165 MW natural-gas fired combined-cycle General Electric Power Systems Frame 7FA gas turbine generator, S/N 298257, with dry low-NOx combustors, a heat recovery steam generator, a 195 MMBtu/hr (HHV) auxiliary duct burner, a selective catalytic reduction unit, an oxidation catalyst, and a steam turbine generator shared with Power Station Unit # 1.

This Startup Authorization is issued with the following conditions:

1. This equipment shall be properly maintained and kept in good operating condition at all times.
2. The unit shall be fired on Public Utility Commission (PUC) quality natural gas only. The permittee shall maintain quarterly records of sulfur content (grains/100 dscf) and higher and lower heating values (Btu/dscf) of the natural gas and provide such records to the District personnel upon request.
3. The permittee shall comply with all the applicable provisions of 40 CFR 73, including requirements to offset, hold and retire SO2 allowances.
4. For purposes of determining compliance based on source testing, the average of three subtests shall be used. For purposes of determining compliance with emission limits based on the CEMS, data collected in accordance with the CEMS protocol shall be used and averaging periods shall be as specified herein.
5. When the unit is combusting fuel (operating), the concentration of oxides of Nitrogen (NOx), calculated as nitrogen dioxide (NO2) and measured in the exhaust stack, shall not exceed 2.0 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen, except during periods of startup, shutdown, low load operation, or tuning. The following averaging periods shall apply to CEMS data:

   A. During any clock hour when duct firing above 19.5 MMBTU/hr heat input is occurring (a "duct-fired hour"): 3-clock hour average, calculated as the average of the duct fired hour, the clock hour immediately prior to and the clock hour immediately following the duct-fired hour.

B. For any clock hour during which the change in gross electrical output produced by the combustion turbine exceeds 50 MW per minute for one minute or longer (transient hour): 3-clock hour average, calculated as the average of the transient hour, the clock hour immediately prior to and the clock hour immediately following the transient hour.
C. All other hours: 1-clock-hour average. (NSR)

6. When the unit is operating, the concentration of CO measured in the exhaust stack shall not exceed 4.0 ppmvd corrected to 15% oxygen, except during periods of startup, shutdown, low load operation, or tuning. A 3-clock hour averaging period shall apply to CEMS data. (NSR)
7. When the unit is operating, the VOC concentration, calculated as methane and measured in the exhaust stack, shall not exceed 2.0 ppmvd corrected to 15% oxygen, except during periods of startup, shutdown, low load operation, or tuning. For purposes of determining compliance based on the CEMS, the District approved VOC/CO surrogate relationship, the CO CEMS data, and a 3-clock hour average shall be used in accordance with the CEMS protocol. The VOC/CO surrogate relationship shall be verified and/or modified, if necessary, based on source testing. (NSR)
8. When the unit is operating, the Ammonia concentration (Ammonia slip) measured in the exhaust stack, shall not exceed 5.0 ppmvd corrected to 15% oxygen, except during periods of startup, low load, or tuning.
9. When the unit is operating, the concentration of Oxides of Nitrogen (NOx), calculated as nitrogen dioxide (NO2) and measured in the exhaust stack, shall not exceed 11.8 ppmvd corrected to 15% oxygen, averaged over each clock hour period, except for exempt periods of operation during startup, combined-cycle gas turbine extended startup, shutdowns, and low load operation, as defined in Rule 69.3.1. All CEMS calculations and averages shall be performed in accordance with the CEMS protocol approved by the District. [Rule 69.3.1(d)(1)]
10. When the unit is operating, the concentration of Oxides of Nitrogen (NOx), calculated as Nitrogen Dioxide (NO2) and measured in the exhaust stack, shall not exceed 42 ppmvd corrected to 15% oxygen, calculated over each clock hour period except for periods of Startup or Shutdown, as defined in Rule 69.3. All CEMS calculations, averages shall be performed in accordance with the CEMS protocol approved by the District. [Rule 69.3.]
11. The emissions of particulate matter less than 10 microns (PM-10) shall not exceed 14.0 lbs/hr for each unit with and without duct burner firing.
12. The discharge of particulate matter from the exhaust stack of the unit shall not exceed 0.10 grains per dry standard cubic foot (0.23 grams/dscm). The District may require periodic testing to verify compliance with this standard. (Rule 53)
13. Visible emissions from the lube oil vents and the exhaust stack of the unit shall not exceed 20% opacity for more than three (3) minutes in any period of 60 consecutive minutes. (Rule 50)
14. When operating with the duct burner at or below 19.5 MMBTU/hr heat input, mass emissions from each unit shall not exceed the following limits, except during periods of startup, shutdown, low load operation, or tuning. A 3 clock-hour averaging period for these limits shall apply to CEMS data except for NOx emissions during non-transient hours when a 1 clock-hour averaging period shall apply.

    Pollutant - Emission Limit, lbs/hr
    A) Oxides of Nitrogen, NOx (calculated as NO2) - 13.4
    B) Carbon Monoxide, CO - 16.3
    C) Volatile Organic Compounds, VOC - 4.0
15. When operating with the duct burner firing above 19.5 MMBTU/hr heat input, mass emissions from each unit shall not exceed the following emission limits, except during periods of startup, shutdown, low load operation, or tuning. A 3-clock-hour averaging period shall apply to CEMS data

    Pollutant - Emission Limit, lbs/hr
    A) Oxides of Nitrogen, NOx (calculated as NO2) - 14.9
    B) Carbon Monoxide, CO - 18.1
    C) Volatile Organic Compounds, VOC - 7.3

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16. Total combined NOx emissions from both units shall not exceed 400 pounds per hour, calculated as Nitrogen Dioxide and measured over each 1-clock-hour period. These emission limits shall apply during all times during which one or both units are operating, including, but not limited to, emissions during periods of startup, shutdown, low load operation and tuning. In addition, Unit No. 1 shall not begin operating while Unit No. 2 is already operating in a startup period nor shall Unit No. 2 begin operating while Unit No. 1 is already operating in a startup period unless the unit already operating in a startup period meets all of the following in the clock-minute immediately preceding the clock-minute that the other unit begins operating:
A) has been operating with a gross electrical output from the combustion turbine of 64 MW or more during the preceding 10 consecutive-clock-minute period;
B) the concentration of NOx, calculated as NO2 and measured in the exhaust stack, does not exceed 2.0 ppmvd corrected to 15% oxygen; and
C) the concentration of CO measured in the exhaust stack does not exceed 4.0 ppmvd corrected to 15% oxygen. (Rule 20.3(d)(2)(i))
17. Total combined CO emissions from both units shall not exceed 2,000 pounds per hour measured over each 1-clock-hour period. This emission limit shall apply during all times that one or both units are operating, including, but not limited to emissions during periods of startup, shutdown, low load operation and tuning. (Rule 20.3(d) (2) (i))
18. Total aggregate emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), shall not exceed 104.3 tons in each rolling 12-calendar month period. The total aggregate emissions of NOx shall include emissions during all times that the equipment is operating, including but not limited to, emissions during periods of startup, shutdown, low load operation and tuning.
19. Total aggregate emissions of Volatile Organic Compounds (VOC) from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), shall not exceed 50 tons in each rolling 12-calendar month period. The total aggregate emissions of VOC shall include emissions during all times that the equipment is operating, including but not limited to, emissions during periods of startup, shutdown, low load operation and tuning.
20. The permittee shall maintain records, on at least a calendar quarterly basis, of total aggregate mass emissions of NOx and VOC in tons from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), for each rolling 12-calendar month period. These records shall be made available for inspection within 30 calendar days after the end of each calendar quarter.
21. The emissions of any single Federal Hazardous Air Pollutant (HAP) shall not equal or exceed 10 tons, and the aggregate emissions of all Federal HAPs shall not equal or exceed 25 tons in any rolling 12-calendar month period. Compliance with these single and aggregate HAP limits shall be based on a methodology approved by the District for the purpose of calculating HAP emissions for this permit. If emissions exceed these limits, the permittee shall apply to amend permit to reflect applicable Federal Maximum Achievable Control Technology (MACT) standards and requirements in accordance with applicable provisions (including timing requirements) of 40 CFR Part 63.
22. The maximum total dissolved solids (TDS) concentration of the water used in the cooling towers shall not exceed 4,000 mg/l. This concentration shall be verified through quarterly testing of the water by a certified lab using EPA approved methods.
23. When combusting fuel, Ammonia shall be injected at all times that the SCR outlet temperature is 510 degrees Fahrenheit or greater.
24. The Ammonia injection flow rate shall be continuously measured, recorded and controlled. The Ammonia injection flow control equipment shall be installed, calibrated and maintained in accordance with a District approved protocol.
25. Except during periods when the Ammonia injection system is being tuned or one or more Ammonia injection

systems is in manual control (for compliance with applicable permits), the automatic Ammonia injection system serving the SCR shall be in operation in accordance with manufacturer's specifications at all times when Ammonia is being injected into the SCR. Manufacturer specifications shall be maintained on site and made available to District personnel upon request.

26. The concentration of Ammonia solution used in the Ammonia injection system shall be less than 20% ammonia by weight. Records of Ammonia solution concentration shall be maintained on site and made available to District personnel upon request
27. For purposes of determining compliance with the emission limits of this permit, a shutdown period is the period of time that begins with the lowering of the gross electrical output of the combustion turbine below 64 MW and that ends five minutes after fuel flow to the combustion turbine ceases, not to exceed 65 consecutive minutes.
28. A startup period is the period of time that begins when fuel flows to the combustion turbine following a non-operational period. For purposes of determining compliance with the emission limits of this permit, the duration of a startup period shall not exceed 120 consecutive minutes if the steam turbine reheat bowl temperature is above 750° F when the startup period begins and shall not exceed 360 consecutive minutes if the steam turbine reheat bowl temperature is less than or equal to 750° F when the startup period begins. [Rule 20.3, 69.3.1]
29. Low load operation is a period of time that begins when the gross electrical output (load) of the combustion turbine is reduced below 64 MW from a higher load and that ends 10 consecutive minutes after the combustion turbine load next exceeds 64 MW provided that fuel is continuously combusted during the entire period and one or more clock hour concentration emission limits specified in this permit are exceeded as a result of the low-load operation. Periods of operation at low load shall not exceed 130 minutes in any calendar day nor an aggregate of 780 minutes in any calendar year, and no period of operation at low load shall begin during a startup period.
30. Tuning is defined as adjustments to the combustion system that involves operating the unit in a manner such that the emissions control equipment may not be fully effective or operational. Only one combustion turbine will be tuned at any given time. Tuning events shall not exceed 480 minutes in a calendar day nor exceed 40 hours in a calendar year. The District compliance division shall be notified at least 24 hours in advance of any tuning event.
31. A CEMS Protocol is a document approved in writing by the APCD M&TS division that describes the Quality Assurance and Quality Control procedures for monitoring, calculating and recording stack emissions from the unit.
32. This unit shall be source tested to demonstrate compliance with the NOx, CO, VOC, PM-10, and Ammonia emission standards of this permit, using District approved methods. The source test and the NOx and CO Relative Accuracy Test Audit (RATA) tests shall be conducted in accordance with the applicable RATA frequency requirements of 40 CFR75, appendix B, sections 2.3.1 and 2.3.3.
33. A Relative Accuracy Test Audit (RATA) and all other required certification tests shall be performed and completed on the CEMS in accordance with applicable provisions of 40 CFR part 75 Appendix A and B performance specifications. At least 30 days prior to the test date, the permittee shall submit a test protocol to the District for approval. Additionally, the District shall be notified a minimum of 21 days prior to the test so that observers may be present.
34. If source testing will be performed by an independent contractor and witnessed by the District, a source test protocol shall be submitted to the District for written approval at least 30 days prior to source testing. The source test protocol shall comply with the following requirements:

    A. Measurements of NOX, CO, and O2 emissions shall be conducted in accordance with U.S. Environmental Protection Agency (EPA) methods 7E, 10, and 3A, respectively, and District Source Test, method 100, or alternative methods approved by the District and EPA.
    B. Measurement of VOC emissions shall be conducted in accordance with EPA Methods 25A and/or 18, or alternative methods approved by the District and EPA.
    C. Measurements of ammonia emissions shall be conducted in accordance with Bay Area Air Quality Management District ST-1B or an alternative method approved by the District and EPA.
    D. Measurements of PM-10 emissions shall be conducted in accordance with EPA Methods 201A and 202 or alternative methods approved by the district and EPA.
    E. Source testing shall be performed with both the combustion turbine and the duct burner in operation. Each

duct burner shall operate with a minimum heat input of 97 MMBTU/hr.
F. Source testing shall be performed at the most frequently used load level, as specified in 40 CFR Part 75 Appendix A Section 6.5.2.1.d, provided it is not less than 80% of the unit's rated load unless it is demonstrated to the satisfaction of the district that the unit cannot operate under these conditions . If the demonstration is accepted, then emissions source testing shall be performed at the highest achievable continuous level power level.
G. Measurements of particulate matter emissions shall be conducted in accordance with SDAPCD Method 5 or an alternative method approved by the District and EPA.
H. Measurements of opacity shall be conducted in accordance with EPA Method 9 or an alternative method approved by the District and EPA.
I. Measurement of fuel flow shall be conducted in accordance with an approved test protocol.

35. Within 45 days after completion of the renewal source test or RATA, a final test report shall be submitted to the District for review and approval.

36. The District may require one or more of the following compounds, or additional compounds to be quantified through source testing periodically to ensure compliance with rule 1200:

    A) Acetaldehyde
    B) Acrolein
    C) Benzene
    D) Formaldehyde
    E) Toluene
    F) Xylenes

    If the District requires the permittee to perform this source testing, the District shall request the testing in writing a reasonable period of time prior to the testing date, and the permittee shall submit a source test protocol to the District for written approval at least 30 days prior to the testing date.

37. The Oxides of Nitrogen (NOx) and Oxygen (O2) CEMs shall be certified and maintained in accordance with applicable federal regulations including the requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of 40 CFR 75 and the CEMs protocol approved by the District. The Carbon Monoxide (CO) CEMs shall be certified and maintained in accordance with 40 CFR 60, Appendices B and F, unless otherwise specified in this permit.

38. Continuous emission monitoring system (CEMS) shall be installed and properly maintained and calibrated to measure, calculate and record the following, in accordance with the District approved CEMS protocol:

    A. Hourly average concentration of Oxides of Nitrogen (NOX) corrected to 15% oxygen, in parts per million (ppmvd);
    B. Concentration of Carbon Monoxide (CO) corrected to 15% oxygen, in parts per million (ppmvd);
    C. Percent oxygen (O2) in the exhaust gas (%) for each clock hour period;
    D. Average concentration of Oxides of Nitrogen (NOX) for each rolling 3-hour period, in parts per million (ppmv) corrected to 15% oxygen;
    E. Hourly and Monthly mass emissions of Oxides of Nitrogen (NOX), in pounds;
    F. Rolling 12 month mass emissions of Oxides of Nitrogen (NOX), in tons;
    G. Hourly and monthly mass emissions of Carbon Monoxide (CO), in pounds;
    H. Annual mass emissions of Carbon Monoxide (CO), in tons.
    I. Natural gas flow rate to combustion turbine in scf/hr.
    J. Natural gas flow rate to duct burner in scf/hr.
    K. Concentration of Volatile Organic Compounds (VOC) corrected to 15% oxygen, in parts per million (pmvd) for each rolling 3-hour period, based upon the approved VOC/CO surrogate relationship.
    M. Hourly and monthly mass emissions of VOC in pounds
    N. Rolling 12-month mass emissions of VOC in tons.

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The CEMS shall be in operation in accordance with the District approved CEMS monitoring protocol at all times when the combustion turbine is in operation. A copy of the District approved CEMS monitoring protocol shall be maintained on site and made available to District personnel upon request.

39. When the CEMs is not recording data and the unit is operating, hourly NOx emissions annual calculations shall be determined in accordance with 40 CFR 75 Appendix C. Additionally, hourly CO emissions for the annual emission calculations shall be determined using the hourly emission rate recorded by the CEMs during the most recent hours in which the unit operated 3 continuous hours at no less than 80% of full power rating. Alternate CO emission factors shall be determined from compliance source test emissions data. The alternate hourly CO emission rate shall be reviewed and approved by the District, in writing.
40. Any violation of any emission standard as indicated by the CEMs shall be reported to the District's Compliance Division within 96 hours after such occurence.
41. The CEMs shall be maintained and operated, and reports submitted, in accordance with the requirements of Rule 19.2 sections (d), (e), (f)(2),(f)(3), (f)(4) and (f)(5) and CEMs protocol approved by the District.
42. The District shall be notified at least two weeks prior to any changes made in CEMS software that affect the measurement, calculation or correction of data displayed and/or recorded by the CEMS.
43. Fuel flowmeters with an accuracy of +/- 2% shall be maintained to measure the volumetric flow rate corrected for temperature and pressure. Correction factors and constants shall be maintained on site and made available to the District upon request. The fuel flowmeters shall meet the applicable quality assurance requirements of 40 CFR Part 75, Appendix D, and Section 2.1.6.
44. The unit shall be equipped with continuous monitors to measure, calculate and record the following operational characteristics:

    A. Ammonia injection rate in lb/hr of solution.
    B. Outlet temperature of SCR in degrees Fahrenheit.
    C. Combustion turbine power output (MW).
    D. Steam turbine reheat bowl temperature in degrees Fahrenheit.

    The monitors shall be installed, calibrated, and maintained in accordance with a protocol approved by the District, which shall include any relevant calculation methodologies. The monitors shall be in full operation at all times when the combustion turbine is in operation. Calibration records for the continuous monitors shall be maintained on site and made available to the District upon request.
45. Operating logs or Data Acquisition System (DAS) records shall be maintained to record the beginning and end times and durations of all startups, shutdowns, low load operations, and tuning periods to the nearest minute; quantity of fuel used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet; hours of daily operation; and total cumulative hours of operation during each calendar year.
46. All records required by this written permit shall be maintained on site for a minimum of five years and made available to the District upon request. (Title V)
47. Access, facilities, utilities and any necessary safety equipment for source testing and inspection shall be provided upon request of the Air Pollution Control District.
48. This Air Pollution Control District Permit does not relieve the holder from obtaining permits or authorizations required by other governmental agencies.
49. The permittee shall, upon determination of applicability and written notification by the District, comply with all applicable requirements of the Air Toxics "Hot Spots" Information and Assessment Act (California Health and Safety Code Section 44300 et seq.)

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This authorization is for temporary operation of the above-specified equipment. This temporary Permit to Operate will remain in effect, unless withdrawn or modified by the District or a Permit to Operate is granted or denied.

This Startup Authorization shall be posted on or within 25 feet of the described equipment or maintained readily available at all times on the operating premises.

This Startup Authorization does not relieve the holder from obtaining permits or authorizations, which may be required by other governmental agencies.This Startup Authorization is not an authorization to exceed any applicable emission standard established by this District or any other governmental agency. This authorization is subject to cancellation if any emission standard or condition is violated.

Within 30 days after receipt of this Startup Authorization, the applicant may petition the Hearing Board for a hearing on any conditions imposed herein in accordance with Rule 25.

This Startup Authorization will expire on March 17, 2022, unless an extension is granted in writing.

If you have any questions regarding this action, please contact me at (858) 586 2741 or via email at arthur.carbonell@sdapcd.org.

Arthur Carbonell

Arthur Carbonell

Associate Engineer

CC: Compliance Division