Covered Source Permit No. 0452-01-C
Review of the Application for Renewal No. 0452-06
and Applications for Minor Modification No. 0452-04 and 0452-05

Company: Kauai Island Utility Cooperative (KIUC)

Facility Name: Kapaia Power Station (KPS)

Equipment Location: 4941-K Maalo Road
Lihue, Kauai 96766
UTM Coordinates: 460,895.6 m E
2,432,847.1 m N
Old Hawaiian Datum

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Proposed Project:

This review is for the renewal and modification of covered source permit no. 0452-01-C issued to Kauai Island Utility Cooperative's Kapaia Power Station (KPS). KPS provides commercial electricity for the island of Kauai. This renewal and modification updates permit language, incorporates changes requested by the applicant and approved by the Clean Air Branch (CAB), and updates permit conditions to reflect the requirements of revised 40 CFR Part 60, Subpart GG - Standards of Performance for Stationary Gas Turbines promulgated on July 8, 2004.

Existing permitted equipment include one 27.5 MW combustion turbine generator (CTG), one 600 kW black start diesel engine generator, and three internal floating roof petroleum storage tanks. The initial covered source permit application defined the CTG peak load as 27.0 MW. The permittee determined from actual operations that the peakload is 27.5 MW. KPS insignificant activities include: one 141 kW diesel fire pump engine, one 150 kW emergency diesel engine generator, and three fixed roof petroleum storage tanks.

Details on the more substantial modifications to the permit are as follows:

1. Minimum operating load:

   Special Condition No. C.1.b.:

   Minimum Operational Loads

Except during combustion turbine generator startup and shutdown, the minimum combustion turbine generator load shall not be less than ~~50~~ 25% of the rated capacity ~~(12.9 MW)~~ (6.875 MW).

The initial permit and the most recent permit modification issued on December 22, 2003 limited the combustion turbine to operating above the 50% load. The permittee has requested to reduce the minimum operating load to 25%.

The applicant performed a unit impact modeling analysis for operation of the CTG at the 6 MW, 7 MW and 8.5 MW loads using actual stack data. The 7 MW load condition results in the highest impacts. A second modeling analysis was performed for the CTG at the 7 MW load, the black start diesel engine generator, and the emergency fire pump. The modeling analysis demonstrates the facility will operate in compliance with the ambient air quality standards at the reduced load. See the **Ambient Air Quality Analysis** section of this review for details.

The emission limits table in the permit is revised to reflect the addition of the minimum operating load.

2. Startup duration:

Special Condition No. C.1.a.1):

The startup time for the combustion turbine generator shall not exceed ~~forty (40)~~ sixty (60) minutes. A startup sequence shall be from the time fuel use at the combustion turbine begins, until the time the combustion turbine generator initially attains ~~50~~25% load (6.875 MW).

The permittee expressed difficulty in meeting the forty minute startup time due to the limitations placed on the startup sequencing of the combustion turbine, heat recovery steam generator, selective catalytic reduction system, steam injection process and the automatic generator control. For a detailed description of the startup procedure, see application no. 0452-05.

The new startup time of sixty minutes along with the minimum operating load of 25% should allow sufficient time to bring the CTG up to the minimum load while meeting emission limits and implementing emission controls. The definition of shutdown will not be affected.

3. Control of NO_x using steam injection alone or steam injection and SCR:

Special Condition No. C.1.c.:

Air Pollution Control Equipment

1) The permittee shall ~~design, install, continuously~~ operate, as necessary, and maintain the following air pollution control equipment to meet the emission limits as specified in ~~this Attachment,~~ Special Condition No. C.1.e.~~1~~2) below:

a) A combustor steam injection system; and

b) A Selective Catalytic Reduction (SCR) system (with urea injection).

2) The combustor steam injection ~~and/or SCR~~ system~~s~~ shall be fully operational immediately after the startup sequence, and shall continue to operate until the commencement of the shutdown sequence of the combustion turbine generator.

The permittee has encountered problems with clogging of the urea injection system. This has prompted the permittee take the SCR offline to clean the system. During these periods the permittee has increased the steam to fuel ratio to control NO_x emissions below permit limits.

The modification will allow KIUC to control NO_x emissions to within permit limits using steam injection alone or steam injection and SCR. In 2005 after receiving approval from the Clean Air Branch KIUC performed source tests on the CTG to demonstrate the control of NO_x emissions using steam injection alone. The permittee was successful in controlling NO_x concentrations within permit levels when operating the CTG above 75% load using only steam injection.

The permittee will be required to operate and maintain the combustor steam injection system and the selective catalytic reduction system.

4. Modification to add biodiesel and ethanol to the list of fuels fired in the CTG.

Special Condition No. C.1.d.:

Fuel Usage and Specifications

1) The combustion turbine generator shall <u>only</u> be fired on Naphtha, Fuel Oil No. 2, Jet-A, ~~or~~ Heavy Straight Run Gasoline<u>, Ethanol, Biodiesel [pure biodiesel (B100)] or any combination thereof</u>. The maximum sulfur content of any fuel shall not exceed 0.4 percent by weight.

2) The combustion turbine generator ~~will~~ shall be fired on Naphtha as a primary fuel and Fuel Oil No. 2, Jet-A, ~~or~~ Heavy Straight Run Gasoline<u>, Ethanol, Biodiesel [pure biodiesel (B100)], or any combination thereof,</u> as alternate fuels. The permittee shall fire a combination of fuels such that sulfur dioxide emissions from the combustion turbine generator does not exceed 200 tons in any rolling twelve (12) month period.

Biodiesel blends of up to 100% biodiesel (B100) would be used in the CTG if sufficient quantities are available. Ethanol would be blended with naphtha at up to 20% ethanol. Ethanol and biodiesel fuels will result in a reduction in sulfur dioxide emissions since ethanol contains no sulfur and a typical biodiesel specification shows a sulfur content of 0.0054% by weight (compared to fuel oil no. 2 at a maximum of 0.4% and naphtha at a maximum of 0.01%). No changes to the permit emission limits are proposed. NO_x, SO_2, and CO emissions are monitored with the continuous emissions monitoring system.

The heating values for ethanol and biodiesel are within the range of heating values of fuels already permitted to be fired in the CTG. It is not expected that there will be any noticeable differences in turbine performance when firing ethanol or biodiesel.

5. Addition of NO_x emission limit, averaged over any four hour period, for all periods of operation including startup, shutdown, and malfunction.

   Special Condition No. C.1.e.1)

   Maximum Emission Limits

   1) The permittee shall not discharge or cause the discharge into the atmosphere from the combustion turbine generator, any unit operating hour of nitrogen oxide (NO_x as NO_2) emissions averaged over any rolling four (4) hour period, in excess of the emission limit specified in 40 CFR §60.332(a)(1). For the purpose of demonstrating compliance with this condition, the four (4) hour averaging period shall include all periods of operation including startup, shutdown, and malfunction.

   This condition is consistent with 40 CFR Part 60, Subpart GG.

6. Modification to a single CO emission limit for all loads and single NO_x emission limit for all loads.

   Special Condition No. C.1.e.2)

	Maximum Emission Limit (3-hour Average)	
Compound	**(lbs/hr)**	**(ppmvd @ 15 percent O_2)**
Nitrogen Oxides (as NO_2) **~~75.01~~ 25% - ≤100% Load** **~~50.01% - ≤ 75% Load~~** **~~50% Load~~**	 **12.92** **~~10.21~~** **~~7.75~~**	 **15** **~~15~~** **~~15~~**
Carbon Monoxide **25% - 100% Load** **~~75% - < 100% Load~~** **~~50% - < 75% Load~~**	 **~~39.34~~** **~~41.44~~** **47.16**	 **~~75~~** **~~100~~** **150**

   An ambient air quality analysis was performed to determine worst case CO and NO_x concentrations with the revised emission limits. See the **Ambient Air Quality Analysis** section of this review for details. The analysis demonstrates the facility will operate in compliance with the ambient air quality standards. The potential to emit for CO and NO_x does not increase with this modification.

7. Modification to increase the number of hours the black start diesel engine generator is permitted to operate on a daily basis, from 1 hour to 8 hours.

   Special Condition No. C.2.a.

   The maximum operating hours of the blackstart diesel engine generator shall not exceed one (~~1~~8) hours per day.

A modeling analysis was performed to demonstrate the facility's compliance with the ambient air quality standards following the increase in daily operating hours. The analysis demonstrates the facility will continue to comply with the ambient air quality standards.

8. KPS requests the removal of the requirement for monitoring the steam-to-fuel ratio.

   Special Condition No. D.1.a.1)c) (permit issued December 22, 2003)

   ~~Steam-to-fuel ratio. The steam-to-fuel monitor/recorder shall be accurate to ± 5 percent;~~

The July 8, 2004 amendment to 40 CFR Part 60 Subpart GG allows the use of a NO_x and O_2 (or CO_2) continuous emissions monitoring system (CEMS) as an alternative to monitoring the steam to fuel ratio as a means of determining compliance with the NO_x standard. The Department approves removing the requirement to monitor the steam to fuel ratio because of the above mentioned amendment to Subpart GG and because the KIUC CTG is equipped with steam injection and the selective catalytic reduction system for NO_x control.

9. Modification to remove the fuel analysis requirement for determining the nitrogen content of each batch of CTG fuel received at the facility:

   Special Condition No. D.2.b.

   Fuel Data. Records on fuel usage and receipt dates of fuel deliveries, type of fuel, quantity of fuel, date batch sample taken, and the analyzed sulfur content (percent by weight), ~~nitrogen content (percent by weight),~~ and higher heating value of the fuel (BTU/gal), including copies of the certificate of analysis for each batch of fuel received shall be maintained.

   1) Sulfur Content, ~~Nitrogen Content,~~ and Higher Heating Value of the Fuel. The sulfur content of the fuel to be fired in the combustion turbine generator shall be tested in accordance with the most current American Society for Testing and Materials (ASTM) methods. ~~ASTM Method D4294-98 is a suitable alternative to Method D129-00 for determining the sulfur content.~~ <u>The samples for total sulfur content of the fuel shall be analyzed using ASTM D129-00, D2622-98, D4294-02, D1266-98, D5453-00, or D1552-01 (all of which are incorporated by reference, see 40 CFR Part 60, §60.17).</u>

   <u>a)</u> For each batch of fuel received, the fuel sulfur content (percent by weight)~~, fuel nitrogen content (percent by weight),~~ and higher heating value of the fuel (BTU/gal) shall ~~each~~ be <u>analyzed by taking an oil sample from</u> ~~verified by either of the following methods~~:

   ~~a) A representative sample of each batch of fuel received shall be analyzed for its sulfur content (percent by weight), nitrogen content (percent by weight), and higher heating value (BTU/gal); or~~

   ~~b) A certificate of analysis on the sulfur content (percent by weight), nitrogen content (percent by weight), and higher heating value~~

~~(BTU/gal), including the supporting laboratory analysis, shall be obtained from the fuel supplier for each batch of fuel received.~~

i) The shipment tank or container upon receipt of each lot of fuel; or

ii) The supplier's storage container which holds the lot of fuel (a supplier need only sample the storage container once for sulfur content, gross calorific value (GCV), and density so long as the fuel sulfur content and GCV do not change and no fuel is added to the supplier's storage container).

A lot is defined as a shipment or delivery (e.g., ship load, barge load, group of trucks, discrete purchase of diesel fuel through a pipeline, etc.) of a single fuel.

b) Oil sampling may be performed either by the permittee, an outside laboratory, or a fuel supplier, provided that samples are representative and that sampling is performed according to either the single tank composite sampling procedure or the all-levels sampling procedure in ASTM D4057-88, "Standard Practice for Manual Sampling of Petroleum and Petroleum Products" (incorporated by reference under 40 CFR §75.6).

Records of the sulfur contents (percent by weight)~~, nitrogen contents (percent by weight)~~ and higher heating value (BTU/gal) of the fuel shall be maintained on a monthly basis.

Monitoring the nitrogen content of the fuel, according to 40 CFR Part 60 Subpart GG, is required if the owner or operator claims an allowance for fuel bound nitrogen. KPS is not claiming an allowance for fuel bound nitrogen. The requirement to perform a fuel analysis to determine the nitrogen content of the fuel for the CTG is deleted from the permit.

10. Modification to revise how SO_2 emissions are determined when the CEMS is down or is not providing valid data:

Special Condition No. D.2.c.

Sulfur Dioxide Emissions. For the purpose of monitoring compliance with the emission limitation specified in Special Condition No. C.1.e.~~2~~3) the total tons of SO_2 emitted by the combustion turbine generator shall be monitored and recorded as follows:

1) The Continuous Emissions Monitoring System (CEMS) shall record SO_2 emissions; and

2) During all periods the CEMS is not in operation or is not providing valid data, except periods of routine daily calibration checks and zero and span adjustments, the permittee shall provide SO_2 emissions as follows:

a) ~~For periods greater than one hour or an individual hour with varied load, SO_2 emissions shall be calculated using the following mass balance~~

~~equation:~~ For periods when the fuel tank has not been refilled or for periods when the tank supplying fuel to the turbine has not been changed, the permittee shall calculate an hourly SO2 emission factor in lb/MMBtu using the average of the hourly SO2 emission rates recorded by the CEMS for the unit operating hour immediately before and the unit operating hour immediately after the missing data period. This emission factor shall be used along with the recorded actual quantity of fuel fired during the missing data period, in gallons/hour, and the higher heating value of the fuel, in MMBtu/gallon, to calculate SO2 emissions for the missing data period. The higher heating value of the fuel shall represent the highest of the twelve (12) most recent fuel analyses for the type of fuel fired during the missing data period. The substitute emission rate used shall represent use of the same fuel tank and same tank contents (i.e. the tanks must not have been refilled or changed during the missing data period).

b) During periods of missing data when the fuel tank supplying the combustion turbine generator is being refilled or when the tank supplying fuel to the turbine has changed, SO_2 emissions shall be calculated using the following mass balance calculation:

SO_2 = a x b x S x c

SO_2 = sulfur dioxide emissions, in pounds

a = volume of fuel fed to the turbine, in gallons

b = maximum projected unit weight of the fuel fed to the turbine, in pounds per gallon

S = fuel sulfur content in percent by weight (for example, for fuel having 0.4% sulfur content, S = 0.004)

S shall represent the highest of the twelve (12) most recent fuel analyses (for the type of fuel fired during the missing data period) determined by the methods specified in Special Condition No. D.1.b.1) or, the maximum sulfur content for the fuel as shown on fuel specification sheets

c = 2, the ratio of pounds of sulfur dioxide to pounds of sulfur

~~b) For an individual hour with constant load, the permittee shall substitute the average of the hourly SO_2 emission rate recorded by the CEMS for the unit operating hour immediately before and the unit operating hour immediately after the missing data period.~~

c) ~~For a partial day of missing data, the permittee may calculate SO_2 emissions for the day using the mass balance equation of Special Condition No. D.1.c.2)a) and the quantity of fuel consumed over the subject 24-hour period.~~ In lieu of the procedures of Special Condition Nos. D.2.c.2)a) and D.2.c.2)b), the permittee may use a value of 0.41 lb SO2/MMBtu. This value along with the recorded actual quantity of fuel

used during the missing data period, in gallons/hour, and the higher heating value of the fuel, in MMBtu/gallon, shall be used to calculate SO2 emissions for the missing data period. The higher heating value of the fuel shall represent the highest of the twelve (12) most recent fuel analyses for the type of fuel fired during the missing data period.

All back-up data, calculations, and the resulting sulfur dioxide emissions shall be maintained.

SO2 emissions measured by the CEMS before and after the missing period, in lb/MMBtu, can be used to determine SO2 emissions during the missing data period as long as the fuel supply does not change (i.e. the tanks must not have been refilled or changed during the missing data period).

Calculation of the 0.41 lb/MMBtu emission factor:
0.41 lb SO_2/MMBtu x 0.14 MMBtu/gal (assumed) = 0.0574 lb SO_2/gal fuel
0.0574 lb SO_2/gal fuel ÷ 2 = 0.0287 lb sulfur/gal fuel
0.0287 lb sulfur/gal fuel ÷ 7.05 lb fuel/gal (assumed) = 0.00407 or 0.407%

11. Modification to require RATA test results to be reported to the Department within sixty (60) days after completion of testing.

Special Condition No. E.5.

Quarterly Accuracy Audits

a. The test reports for CGA ~~and RATA~~ shall be submitted by the 30th day following the end of each semi-annual calendar period.

b. The test reports for the RATA shall be submitted within 60 days after completion of the RATA.

The permit originally required the RATA be submitted by the 30th day following the end of each semi-annual calendar period. The change, for the most part, will result in RATA results being submitted earlier than required by the original permit language since RATA tests are typically performed as part of the annual source test and source test results are required to be submitted within 60 days after completion of the source test.

12. Modification to perform source tests for NO_x and CO at a single load.

Special Condition No. F.2.a.

The performance test shall be conducted for nitrogen oxides (NO_x) and carbon monoxide (CO) at 100 percent of peak load;

The December 22, 2003 permit required that the permittee test the CTG for NO_x and CO at the 50%, 75%, and 100% loads. The permittee is requesting to test for NO_x and CO at a single load.

The CTG is equipped with a continuous emissions monitoring system (CEMS) that measures and records NO_x and CO emissions to verify compliance with the emission limits.

The CEMS is subject to 40 CFR Part 60, Appendix B Performance Specifications and Appendix F Quality Assurance Procedures which requires the performance of a RATA. The permit has one concentration and one mass emission limit for NO_x and one concentration and one mass emission limit for CO for all loads.

13. Modification to remove the requirement to source test for SO_2 at all loads.

    Special Condition No. F.2.d.

    d. Although not required at this time, the Department of Health, if so desires, may at any time require the permittee to conduct source performance tests for SO2.

    The initial permit and the permit modification issued December 22, 2003 requires annual source testing for SO_2 at three loads (50, 75, and 100%) and testing for the fuel sulfur content (% by weight). The Department is approving the modification for the following reasons: the CTG has previously performed the source test for SO_2 at each load, the CTG is equipped with an SO_2 continuous emissions monitoring system that is subject to 40 CFR Part 60, Appendix B Performance Specifications and Appendix F Quality Assurance Procedures which requires the performance of a RATA, and the source is required to test for the fuel sulfur content (% by weight).

14. Modification allowing the use of the in-situ multi point CEMS sample probe during performance tests and RATA:

    Special Condition No. F.2.e.

    The permittee may use a multi-hole probe, designed and documented to sample equal volumes from each hole, to sample simultaneously at the required sampling points in accordance with 40 CFR §60.335(a)(4).

15. The permit was revised to update storage tank permit conditions pursuant to 40 CFR Part 60, Subpart Kb and the tank capacity of Special Condition No. A.1. was revised to reflect the reported tank capacity.

Other proposed modifications:

KIUC proposed a modification to delete the requirement for the NOx CEMS upstream of the SCR. The Department is denying the request to delete the requirement. The upstream NOx CEMS measures the NOx concentration before the SCR and is a good indicator for determining ammonia injection rates and the potential for ammonia slip (using the ammonia injection rate, inlet NO_x concentration, and outlet NO_x concentration). Using the outlet NOx CEMS to regulate ammonia injection rates potentially results in the over-injection of ammonia and an increase in ammonia slip. The application of Appendices B and F ensures the upstream NO_x CEMS is providing valid data.

Equipment:

Combustion Turbine Generator with Heat Recovery Steam Generator

Turbine Manufacturer	General Electric
Model	LM2500-PH STIG
Power output	27.5 MW
Permitted fuel types	naphtha, fuel oil no. 2, jet-A, heavy straight run gasoline, biodiesel blends of up to 100% biodiesel, ethanol blended with naphtha at up to 20% ethanol
Fuel sulfur content	maximum of 0.4% by weight
Heat input	234 MMBtu/hr (full load naphtha) 235.6 MMBtu/hr (full load heavy straight run gasoline)

600 kW Black Start Diesel Engine Generator

Manufacturer	Caterpillar, Inc.
Model	3412C (TTA)
Serial number	BCW00520
Power output	600 kW
Permitted fuel types	fuel oil no. 2
Heat input	6.356 MMBtu/hr (based on maximum fuel consumption of 46.4 gal/hr and fuel heat rate of 0.140 Btu/gal of fuel)

Internal Floating Roof Petroleum Storage Tanks

storage capacity	one 6,043 barrel (nominal) and two 2,887 barrel (nominal) tanks
tank height	32 feet
product	naphtha, heavy straight run gasoline, ethanol

Air Pollution Controls:

The combustion turbine is equipped with steam injection into the turbine's combustion zone and a selective catalytic reduction unit for NO_x control. The initial covered source permit application reported that steam injection provided NO_x control to a level of 75 ppmvd @ 15% O_2 at the inlet of the heat recovery steam generator (HRSG). The permittee determined through actual operations that NO_x emissions can be controlled below the 75 ppmvd at 15% O_2 by increasing the steam to fuel ratio. The unit is also equipped with a selective catalytic reduction system which controls NO_x emissions to a maximum of 15 ppmvd @ 15% O_2. The SCR system injects urea into the HRSG where the heat of the exhaust gases converts urea into ammonia. The ammonia, in the presence of the catalyst, reacts with NO_x in the turbine exhaust to produce N_2 and H_2O. Ammonia slip from the SCR is limited to 10 ppmvd @ 15% O_2.

Three of the storage tanks are equipped with internal floating roofs to control volatile organic compound emissions from the storage of naphtha, heavy straight run gasoline, or ethanol.

Applicable Requirements:

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1 Air Pollution Control
- Subchapter 1, General Requirements
- Subchapter 2, General Prohibitions
  - 11-60.1-31 Applicability
  - 11-60.1-32 Visible Emissions
  - 11-60.1-38 Sulfur Oxides from Fuel Combustion
  - 11-60.1-39 Storage of Volatile Organic Compounds
- Subchapter 5, Covered Sources
- Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
  - 11-60.1-111 Definitions
  - 11-60.1-112 General Fee Provisions for Covered Sources
  - 11-60.1-113 Application Fees for Covered Sources
  - 11-60.1-114 Annual Fees for Covered Sources
- Subchapter 7, Prevention of Significant Deterioration Review
- Subchapter 8, Standards of Performance for Stationary Sources
  - 11-60.1-161 (1) Subpart A, General Provisions
  - 11-60.1-161(15) Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
  - 11-60.1-161 (20) Subpart GG, Standards of Performance for Stationary Gas Turbines
- Subchapter 9, Hazardous Air Pollutant Sources

Annual Emission Reporting Applicability:

As a covered source the facility is subject to annual emissions reporting for all permitted equipment.

Applicability of Part 51, Subpart A, Emission Inventory Reporting Requirements - Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines compliance emissions reporting (CER) based on the emissions of each air pollutant from the facility that emits at the CER triggering levels as shown in the table below.

Minimum Point Source Reporting Thresholds by Pollutant

Pollutant	Annual Cycle type A sources (tpy)	Three-year cycle type B sources (tpy)	All KIUC emission sources (tpy)
SO_x	≥ 2500	≥ 100	204
VOC	≥ 250	≥ 100	92
NO_x	≥ 2500	≥ 100	77
CO	≥ 2500	≥1000	218
Pb		≥ 5	5.78e-02
PM_{10}	≥ 250	≥ 100	34

Pollutant	Annual Cycle type A sources (tpy)	Three-year cycle type B sources (tpy)	All KIUC emission sources (tpy)
SO_x	≥ 2500	≥ 100	204
$PM_{2.5}$	≥ 250	≥ 100	34
Ammonia	≥ 250	≥ 100	14

Based on the potential annual emission rates, the facility is subject to three-year type B source reporting for SO_x.

NSPS/NESHAP Applicability:

NSPS/NESHAP Applicability

40 CFR Part 60 Subpart	subject (yes/no)	discussion
D - Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971	no	Affected facilities: each fossil-fuel fired steam generating unit of more than 250 MMBtu/hr; fossil-fuel fired steam generating unit means a furnace or boiler used in the process of burning fossil fuel for the purpose of producing steam by heat transfer. Fuel is not combusted in the HRSG.
Da - Standards of Performance for Electric Utility Steam Generating Units for Which Construction is commenced After September 18, 1978	no	Affected facilities: each electric utility steam generating unit capable of combusting more than 250 MMBtu/hr heat input of fossil fuel or electric utility combined cycle gas turbines capable of combusting more than 250 MMBtu/hr heat input of fossil fuel in the steam generator. Fuel is not combusted in the HRSG.
Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	no	Applies to steam generating units which is defined as a device that combusts any fuel or by product/waste to produce steam or to heat water or any other heat transfer medium; this term includes any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. Fuel is not combusted in the HRSG.
Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	no	Applies to steam generating units defined as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. Fuel is not combusted in the HRSG.
GG - Standards of Performance for Stationary Gas Turbines	yes	All stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (10.1 MMBtu/hr), based on the lower heating value of the fuel fired. The maximum heat input of the combustion turbine is greater than 10.1 MMBtu/hr, based on the lower heating value of the fuel fired.
K - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978	no	The three tanks were constructed after May 19, 1978.
Ka - Standards of Performance for Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984	no	The three tanks were constructed after July 23, 1984.

40 CFR Part 60 Subpart	subject (yes/no)	discussion
Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After July 23, 1984	yes	The three tanks were constructed after July 23, 1984.

Compliance Assurance Monitoring Applicability:

40 CFR Part 64 Compliance Assurance Monitoring (CAM) rule. To be subject to this rule a unit must meet all of the following criteria, the unit:

1. must be located at a major source that is required to obtain a Part 70 or 71 permit;
2. is subject to an emission limitation or standard for the applicable pollutant;
3. uses a control device to achieve compliance;
4. potential pre-control emissions of the pollutant are at least 100% of major source amount; and
5. unit is not otherwise exempt, exemptions include:

    a. emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act;

    b. stratospheric ozone protection requirements;

    c. acid rain program requirements;

    d. emission limitations, standards, or other requirements that apply solely under an approved emission trading program;

    e. emissions cap that meets requirements of 40 CFR §70.4(b)(12);

    f. emission limitations or standards for which a part 70 or 71 permit specifies a continuous compliance determination method (defined as a method which is used to determine compliance with an emission limitation or standard on a continuous basis, consistent with the averaging period established for the emission limitation or standard). The exemption provided in this paragraph shall not apply if the applicable compliance method includes an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device;

    g. backup utility power units that meet certain criteria.

The control devices (see no. 3 above) on the combustion turbine generator are the steam injection system and the selective catalytic reduction system for the control of nitrogen oxide emissions. The unit is exempt from the CAM rule for NO_x because it meets exemption no. 5.f. above. A continuous emission monitoring system (CEMS) is used to monitor NO_x emissions over a three hour averaging period. The blackstart diesel engine generator is not subject to the CAM rule since no control device is used to achieve compliance with any emission limit.

The facility is not subject to the CAM requirements.

Insignificant Activities:

There are no proposed changes to the list of insignificant activities. Existing insignificant activities include:

1. An electrically driven fire pump is the primary pump for the fire hydrant system at the facility; during power outages a diesel fire pump will be used in place of the electrically driven pump. The basis for deeming the pump insignificant is Hawaii Administrative Rules §11-60.1-82(g)(6): Fire water system pump engines dedicated for fire-fighting and maintaining fire water system pressure, which are operated only during fire fighting and periodically for engine maintenance, and fired exclusively by natural or synthetic gas; or liquefied petroleum gas; or fuel oil no. 1 or no. 2; or diesel fuel no. 1D or no. 2D.

   Fuel type: diesel no. 2
   Heating value: 137,000 Btu/gal
   Fuel usage: 15.4 gal/hr
   Heat input: 2,109,800 Btu/hr
   Power output: 300 hp

2. A 150 kW emergency diesel engine generator used to provide electricity during power outages and during emergency equipment maintenance and testing is fired exclusively on diesel no. 2. The generator is considered an insignificant activity in the Hawaii Administrative Rules §11-60.1-82(f)(5): Standby generators used exclusively to provide electricity, standby sewage pump drives, and other emergency equipment used to protect the health and welfare of personnel and the public, all of which are used only during power outages, emergency equipment maintenance and testing, and which: (A) Are fired exclusively by natural or synthetic gas; or liquified petroleum gas; or fuel oil No. 1 or No. 2; or diesel fuel oil No. 1D or No. 2D; and (B) Do not trigger a Prevention of Significant Deterioration (PSD) or covered source review, based on their potential to emit regulated or hazardous air pollutants.

   Fuel type: diesel no. 2
   Heating value: 137,000 Btu/gal
   Fuel usage: 11.6 gal/hr
   Heat input: 1,589,200 Btu/hr
   Power output: 219 hp

3. Three fixed roof tanks each with a capacity of 3,500 barrels for the storage of diesel no. 2 or jet-A. The tanks are an insignificant activity due to projected low levels of emissions from each tank. Estimated emissions from each tank: 296 lbs or 0.148 tons of VOC each year. The true vapor pressure for the storage of diesel no. 2 and jet-A is 0.02 psia.

Summary of Emissions[a]
Permitted Equipment and Insignificant Activities

pollutant	fire pump (tons/yr)	emergency generator (tons/yr)	three fixed roof tanks (tons/yr)	three IFR tanks (tons/yr)	CTG (tons/yr)	blackstart deg (tons/yr)	total (tons/yr)
PM_{10}	0.72	0.13	---	---	33	0.036	34
SO_2	3.77	0.16	---	---	200	0.262	204
NO_x	17.03	1.79	---	---	57	1.239	77
CO	10.26	0.39	---	---	207	0.057	218
VOC	2.11	0.15	4.44e-01	1.93	87	0.198	92
HAPS	5.89e-02	2.53e-03	---	---	4.17	3.07e-03	4

[a] See September 25, 2000 review for detailed emissions calculations.

Alternate Operating Scenario:

No alternate operating scenarios are proposed.

Project Emissions:

Potential criteria pollutant emissions from the GE LM2500 are based on the permit limits. Emissions shown below represent the maximum emission rate of any load. The only change is the PM_{10} emission concentration from 0.043 gr/dscf to 0.047 gr/dscf at 12% CO_2. The emission rates are from the original review and are manufacturer provided rates:

GE LM2500 Criteria Pollutant Emissions

Pollutant	Emission Concentration (ppmvd @ 15% O_2)	Emission Rate (lbs/hr)	Emission Rate at 8,760 hrs/yr (tons/yr)
NO_x[a]	15	12.92	57
SO_2	79.3	94.3[b]	200[c]
CO	150	47.16	207
VOC[d]	65.8	19.8	87
PM_{10}[e]	0.047 gr/dscf	7.5	33

[a] Emission limit based on control by steam injection and SCR.
[b] Based on maximum fuel sulfur content of 0.4% by weight.
[c] Permit limit is 200 tons of SO_2 per year.
[d] VOC assumed to be 100% of TOC.
[e] 100% PM emissions assumed to be emitted as PM_{10}.

Potential hazardous air pollutant emissions from the GE LM2500 (no change from September 25, 2000 review):

GE LM2500 Hazardous Air Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (g/sec)	Emission Rate (tons/yr)
Benzene [a]	1.23e-01	2.09e-01	0.03	9.16e-01
Toluene [b]	2.81e-04	6.58e-02	0.01	2.88e-01
Xylenes [b]	1.93e-04	4.52e-02	0.01	1.98e-01
Formaldehyde [c]	4.71e-04	1.10e-01	0.01	4.83e-01
Acetaldehyde [b]	2.52e-05	5.90e-03	0.00	2.58e-02
Acrolein [b]	7.88e-06	1.84e-03	0.00	8.08e-03
Total PAH [b]	2.12e-04	4.96e-02	0.01	2.17e-01
Antimony [d]	2.20e-05	5.15e-03	0.00	2.25e-02
Arsenic [d]	4.90e-06	1.15e-03	0.00	5.02e-03
Beryllium [e]	3.00e-03	3.53e-05	4.45e-06	1.55e-04
Cadmium [d]	4.20e-06	9.83e-04	0.00	4.30e-03
Chromium [d]	4.70e-05	1.10e-02	0.00	4.82e-02
Cobalt [d]	9.10e-06	2.13e-03	0.00	9.33e-03
Lead [e]	1.12	1.32e-02	1.66e-03	5.78e-02
Manganese [d]	3.40e-04	7.96e-02	0.01	3.48e-01
Mercury [e]	1.00e-02	1.18e-04	1.48e-05	5.16e-04
Nickel [d]	1.20e-03	2.81e-01	0.04	1.23e+00
Phosphorus [d]	3.00e-04	7.02e-02	0.01	3.07e-01
Selenium [d]	5.30e-06	1.24e-03	0.00	5.43e-03
HAPs total		9.53e-01		4.17

[a] South Coast Air Quality Management District emission factor in units of lb/1000 gallons. 1.23e-01 lb/1000 gal x 1,700 gal/hr = 2.091 lb/hr. AP-42 Table 3.4-3 Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines results in lower ton/yr emissions (7.76e-04 lb/MMBtu x 234 MMBtu/hr = 1.82 lb/hr or 0.80 tons/yr).

[b] Emission factor from AP-42 Table 3.4-3 Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines and Table 3.4-4 PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines.

[c] Source of emission factor: EPRI PISCES Air Toxics Database. AP-42 Table 3.4-3 Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines provides smaller emission rates with the emission factor of 7.89e-05 lb/MMBtu.

[d] Emission factor from AP-42 Table 3.1-4 Trace Element Emission Factors for Distillate Oil-Fired Turbines.

[e] MECO fuel analysis, emission factor units in ppmw. Fuel use is 11,782 lbs/hr.

Blackstart Diesel Engine Generator Criteria Pollutant Emissions

Pollutant	hp rating	Emission Rate (g/hp-hr)	Emission Rate (lbs/hr)	Emission Rate (g/sec)	Emission Rate at 200 hrs/yr (tons/yr)
NO_x[a]	896	6.27	12.39	1.561	1.239
SO_2[b]	896	na	2.62	0.330	0.262
CO[a]	896	0.29	0.57	0.072	0.057
VOC[a]	896	1.00	1.98	0.249	0.198
PM_{10}[a]	896	0.18	0.36	0.045	0.036

[a] Emission rate from manufacturer's literature.

[b] Derivation of lbs/hr SO_2 emission rate:

46.4 gal fuel/hr x 7.05 lbs fuel/gal = 327.12 lbs fuel/hr
maximum fuel sulfur content = 0.40% by weight
ratio of SO_2 to S in fuel = 2
327.12 lbs fuel/hr x 0.004 x 2 = 2.62 lbs SO_2/hr

Blackstart Diesel Engine Generator Hazardous Air Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate at 200 hours per year (tons/yr)
Pb [a]	1.12	3.66e-04	3.66e-05
Benzene[c]	7.76e-04	4.93e-03	4.93e-04
Toluene[c]	2.81e-04	1.79e-03	1.79e-04
Xylenes[c]	1.93e-04	1.23e-03	1.23e-04
Propylene[c]	2.79e-03	1.78e-02	1.78e-03
Formaldehyde [b]	4.71e-04	3.00e-03	3.00e-04
Acetaldehyde[c]	2.52e-05	1.60e-04	1.60e-05
Acrolein[c]	7.88e-06	5.02e-05	5.02e-06

Total PAH[c]	2.12e-04	1.35e-03	1.35e-04
Beryllium compounds [a]	3.00e-03	9.81e-07	9.81e-08
Mercury [a]	1.00e-02	3.27e-06	3.27e-07
HAPs total	---	3.07e-02	3.07e-03

[a] MECO fuel analysis, emission factor units in ppmw. Fuel use is 46.4 gal/hr x 7.05 lbs/gal = 327.12 lbs fuel oil no. 2/hr. AP-42 emission factor not available.

[b] Source of emission factor: EPRI PISCES Air Toxics Database. AP-42 Table 3.4-3 Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines provides smaller emission rates with the emission factor of 7.89e-05 lb/MMBtu.

[c] AP-42 Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines (10/96)

Emissions from storage tanks:

The following information has not changed from the September 25, 2000 review. Emissions from three internal floating roof tanks storing naphtha and heavy straight run gasoline were estimated by the applicant using EPA's Tanks 4.0 program.

Naphtha and Heavy Straight Run Gasoline Storage Tank Emissions

Tank Description	Volume (barrels)	Fuel Type	Emissions (lbs/yr)	Emissions (tons/yr)
naphtha tank no. 1	6000	naphtha	1440	0.72
naphtha tank no. 2	3000	naphtha	1213	0.61
naphtha tank no. 3	3000	naphtha	1213	0.61
total			3866	1.93

Ambient Air Quality Assessment:

The permittee submitted an ambient air quality assessment for the CTG at the 50%, 75%, and 100% loads as part of the initial covered source permit application. The following proposed modifications affect the ambient air quality analysis and are addressed in a revised model:

1. 25% minimum operating load: the initial permit limits the CTG to operating at or above the 50% load. The permittee is proposing to change the minimum operating load to 25%.

2. Carbon monoxide emissions: the initial covered source permit has different pound per hour limits and ppmvd limits for CO at each load. The permittee is proposing to change the CO limit to a single pound per hour emission rate and a single ppmvd @ 15% O_2 rate for all loads.

3. Nitrogen oxide emissions: the initial covered source permit has different pound per hour limits for NO_x at each load. The permittee is proposing to change the NO_x limit to a single pound per hour emission rate for all loads.

3. The initial permit limits the black start diesel engine generator to operating a maximum of one (1) hour per day and two-hundred (200) hours per rolling twelve month period. The permittee is proposing to increase the daily operating limit to eight (8) hours per day. The operating limit of two-hundred (200) hour per rolling twelve months will remain unchanged.

The following parameters were used in the ISCST3 modeling analysis.

- Rural dispersion parameters
- Meteorological data from Puhi Station, 1993-1994
- Lihue airport upper air data

Terrain:

- Simple and complex terrain from USGS DEM data.

Potential downwash effect:

- Potential downwash inducing structures associated with the facility:

Table 7
Potential Downwash-Inducing Structures

structure	height (m)	width (m)	length (m)
HRSG Tier 1	3.29	3.87	13.79
HRSG Tier 2	13.64	3.87	10.50
Gas Turbine Tier 1	6.89	3.22	20.30
Gas Turbine Tier 2	13.21	3.22	15.94
Gas Turbine Tier 3	13.72	3.22	5.30
Control/Maintenance Building	7.62	15.48	30.48
Fire Pump Enclosure	2.44	6.17	9.14
Blackstart DEG	2.44	3.07	5.81
Turbine Control Enclosure	3.66	6.43	11.13
Urea Tank	6.71	3.1 (diameter)	---
Deionized Water Tank	10.97	9.1 (diameter)	---
Treated Water Tank	10.36	15.2 (diameter)	---
Distillate Tank No. 1	10.36	8.6 (diameter)	---
Distillate Tank No. 2	10.36	8.2 (diameter)	---
Distillate Tank No. 3	10.36	8.2 (diameter)	---

structure	height (m)	width (m)	length (m)
Naphtha Tank No. 1	10.36	12.1 (diameter)	---
Naphtha Tank No. 2	10.36	8.5 (diameter)	---
Naphtha Tank No. 3	10.36	8.5 (diameter)	---

A GEP program was used to analyze the structures to derive 36 wind-direction-specific building heights and projected widths for use in the model.

Receptor locations:

- Receptors were placed at the fence-line surrounding the facility.
- Coarse grid receptors were spaced at 180 meters with a finer grid spaced at 25 meters near the fence line. A 30 meter receptor grid was used in areas where the coarse grid indicated the maximum would occur.

Background air quality data:

- NO_x, SO_2, and PM_{10} background concentrations are from West Beach, Oahu 2005. CO is from Kapolei, Oahu 2005.

To address lowering the CTG minimum operating load from 50% to 25% (6.875 MW) a unit impact analysis was performed at the 6 MW, 7 MW, and 8.5 MW loads to determine the load resulting in the highest impacts. Actual stack conditions were used in the unit impact analysis. Next, actual stack conditions and the corresponding permit concentration limits (ppmvd @ 15% O_2) were used to determine gram/second emission rates for the three loads. The concentrations generated by the unit impact model combined with the gram per second emission rates show the 7 MW load results in the highest impacts.

CTG Unit Impact Emission Rates and Stack Parameters
Low Load

	Emission Rates				Stack Parameters			
load (MW)	PM_{10} (g/s)	SO_2 (g/s)	NO_x (g/s)	CO (g/s)	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)
8.5	1	1	1	1	21.95	455	12.91	2.41
7.0	1	1	1	1	21.95	451	12.76	2.41
6.0	1	1	1	1	21.95	470	12.55	2.41

CTG Unit Impact Results
Low Load

averaging period	load		
	8.5 MW ($\mu g/m^3$)	7.0 MW ($\mu g/m^3$)	6.0 MW ($\mu g/m^3$)
1 hour	29.14	29.57	28.76
3 hour	22.73	22.86	22.63
8 hour	10.60	10.68	10.54
24 hour	6.75	6.94	6.78
annual	0.71	0.74	0.70

CTG Gram/Second Emission Rates
Low Load

pollutant	averaging period	8.5 MW (gram/second)	7.0 MW (gram/second)	6.5 MW (gram/second)
NO_x[a]	short and long term	0.714	0.711	0.667
SO_2	short term	5.255	5.233	4.913
	annual	5.753	5.753	5.753
CO[b]	short and long term	5.94	5.94	5.94
PM_{10}	short and long term	0.945	0.945	0.945

[a] Reflects permit limit of 15 ppmvd for all loads.
[b] Reflects permit limit of 47.16 lb/hr for all loads.

CTG Ambient Air Quality Impacts
Low Load

pollutant	averaging period	load		
		8.5 MW ($\mu g/m^3$)	**7.0 MW** ($\mu g/m^3$)	6.0 MW ($\mu g/m^3$)
NOx	annual	0.51	**0.52**	0.46
SO_2	3 hour	119.47	**119.60**	111.16
	24 hour	35.46	**36.30**	33.33
	annual	4.10	**4.24**	4.00
CO	1 hour	173.09	**175.65**	170.83
	8 hour	62.96	**63.44**	62.61
PM_{10}	24-hour	6.38	**6.56**	6.41
	annual	0.67	**0.70**	0.66

In order to address the change in the daily operating limit for the black start diesel engine generator, the CTG load condition (25%, 50%, 75%, and 100%) resulting in the highest concentration needs to be determined first (since the 25% load condition was added). The CTG load with the highest concentrations will then be combined with the DEG in the model. A unit impact analysis is performed for all load conditions. The results of the unit impact analysis are combined with load specific pollutant emission rates to determine the worst case operating load. The analysis uses a single CO emission limit for all loads and a single NO_x emission limit for all loads to address the modification to a single emission limit for CO and NO_x.

CTG Unit Impact Emission Rates and Stack Parameters
All Loads

	Emission Rates				Stack Parameters			
load	PM_{10} (g/s)	SO_2 (g/s)	NO_x (g/s)	CO (g/s)	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)
case 1 (100% load 85 ˚F)	1	1	1	1	21.946	455.22	22.17	2.41
case 2 (75% load 85 ˚F)	1	1	1	1	21.946	516.33	21.01	2.41
case 3 (50% load 85 ˚F)	1	1	1	1	21.946	577.44	19.03	2.41
case 4 (100% load 55 ˚F)	1	1	1	1	21.946	416.89	20.21	2.41
case 5 (75% load 55 ˚F)	1	1	1	1	21.946	480.22	19.46	2.41
case 6 (50% load 55 ˚F)	1	1	1	1	21.946	543.00	17.79	2.41
case 7 (25% load actual stack conditions)	1	1	1	1	21.946	450.78	12.76	2.41

CTG Unit Impact Results
All Loads

	case						
averaging period	1 ($\mu g/m^3$ per g/s)	2 ($\mu g/m^3$ per g/s)	3 ($\mu g/m^3$ per g/s)	4 ($\mu g/m^3$ per g/s)	5 ($\mu g/m^3$ per g/s)	6 ($\mu g/m^3$ per g/s)	7 ($\mu g/m^3$ per g/s)
1 hour	24.59	23.07	22.71	27.51	25.20	24.08	29.54
3 hour	19.98	19.32	19.19	21.44	20.15	19.83	22.84
8 hour	9.33	9.06	8.97	9.97	9.44	9.26	10.67
24 hour	5.30	5.06	4.99	5.68	5.38	5.26	6.93
annual	0.363	0.307	0.297	0.495	0.381	0.350	0.740

CTG Gram/Second Emission Rates
All Loads

		case						
pollutant	averaging period	1 (gram/ second)	2 (gram/ second)	3 (gram/ second)	4 (gram/ second)	5 (gram/ second)	6 (gram/ second)	7 (gram/ second)
NO_x	short and long term	1.63	1.63	1.63	1.63	1.63	1.63	1.63
SO_x	short term	11.9	9.38	7.13	11.4	9.05	6.91	5.23
	annual	5.753	5.753	5.753	5.753	5.753	5.753	5.753
CO[a]	short and long term	5.94	5.94	5.94	5.94	5.94	5.94	5.94
PM_{10}	short and long term	0.945	0.945	0.945	0.945	0.945	0.945	0.945

CTG Ambient Air Quality Impacts
All Loads

pollutant	averaging period	case						
		1 ($\mu g/m^3$)	2 ($\mu g/m^3$)	3 ($\mu g/m^3$)	4 ($\mu g/m^3$)	5 ($\mu g/m^3$)	6 ($\mu g/m^3$)	7 ($\mu g/m^3$)
NO_x	annual	0.59	0.50	0.48	0.81	0.62	0.57	**1.20**
SO_2	3 hour	237.76	181.22	136.82	**244.42**	182.36	137.03	119.43
	24 hour	63.07	47.46	35.58	**64.75**	48.69	36.35	36.24
	annual	2.09	1.77	1.71	**2.85**	2.19	2.01	4.26
CO	1 hour	146.06	137.04	134.89	163.41	149.69	143.04	**175.47**
	8 hour	55.42	53.82	53.28	59.22	56.07	55.00	**63.38**
PM_{10}	24-hour	5.01	4.78	4.72	5.37	5.08	4.97	**6.55**
	annual	0.34	0.29	0.29	0.47	0.36	0.33	**0.70**

The CTG Ambient Air Quality Impacts All Loads table shows case 4 having the highest concentrations for SO_2 and case 7 having the highest concentrations for NO_x, CO and PM_{10}. The CTG is modeled with the black start to determine if the facility will continue to demonstrate compliance with the ambient air quality standards following the increase in the black start's daily operating hours.

CTG and Black Start DEG Emission Rates and Stack Parameters

	Emission Rates				Stack Parameters			
unit	NOx (g/s)	SO_2 (g/s)	CO (g/s)	PM_{10} (g/s)	Height (m)	Temp (K)	Velocity (m/s)	Diam. (m)
CTG case 4 – short term	---	11.429	---	---	21.95	416.89	20.21	2.41
CTG case 4 – long term	---	5.753	---	---	21.95	416.89	20.21	2.41
CTG case 7	1.628	---	5.942	0.945	21.95	450.78	12.76	2.41
BS DEG - 1 hr	1.56	0.327	0.249	0.135	4.57	758.56	72.56	0.203
BS DEG - 3 hr	---	0.327	---	---	4.57	758.56	72.56	0.203
BS DEG -8 hr	---	---	0.249	---	4.57	758.56	72.56	0.203
BS DEG - 24 hr[a]	---	0.109	---	0.045	4.57	758.56	72.56	0.203
BS DEG – Annual[a]	0.036	0.007	---	0.003	4.57	758.56	72.56	0.203

[a] The blackstart diesel engine generator is limited to operating 8 hours per day and 200 hours per year. The g/s emission rate reflects these operating limits.

CTG and Black Start DEG Ambient Air Quality Impacts

Air Pollutant	Averaging Time	model concentration ($\mu g/m^3$)	background concentration ($\mu g/m^3$)	total impact ($\mu g/m^3$)	State [a] Ambient Air Standard ($\mu g/m^3$)	Percent Standard
NO_x	annual	9.79	6	15.79	70	23
SO_2	3-hour	429.64	40	469.64	1,300	36
SO_2	24-hour	94.24	11	105.24	365	29
SO_2	annual	2.86	2	4.86	80	6
CO	1-hour	2031.75	1710	3741.75	10,000	37
CO	8-hour	283.63	1055	1338.63	5,000	27
PM_{10}	24-hour	38.91	33	71.91	150	48
PM_{10}	annual	0.67	12	12.67	50	25

The CTG and Black Start DEG Ambient Air Quality Impact table demonstrates the facility will operate in compliance with the ambient air quality standards following the addition of the CTG 25% operating load, changing to a single CTG emission limit for NO_x and CO for all loads, and increasing the daily operating limit for the black start diesel engine generator from 1 hour to 8 hours per day.

Significant Permit Conditions:

Permit modifications are highlighted in the **Proposed Project** section of this review.

Conclusion:

This review is for the renewal and modification of CSP 0452-01-C for the 27.5 MW combustion turbine generator and blackstart diesel engine generator. The facility is subject to the new source performance standards 40 CFR Part 60, Subpart K_b - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984, and GG - Standards of Performance for Stationary Gas Turbines.

The ambient air quality analysis performed for the review demonstrates the combustion turbine generator and blackstart diesel engine generator will operate in compliance with State and National ambient air quality standards. Renewal and modification of the covered source permit is recommended based on the review of the information provided by the applicant and subject to the permit conditions, thirty day public comment period, and forty-five day EPA review.