

PROPOSED

Diesel fuel no. 2 is the primary fuel burned at this facility. The sulfur content of the diesel fuel is limited to 0.4 percent by weight. The nitrogen content of the fuel for the combustion turbines, units M14 and M16, is limited to 0.015 percent by weight. The DEGs are allowed to burn up to 150,000 gallons of used oil per 12-month period. The feed rate of used oil is limited to 338 gallons per hour and the blending percentage of used oil to diesel fuel cannot exceed 5 percent by volume.

The fixed roof petroleum storage tanks are insignificant activities and are not subject to the New Source Performance Standards (NSPS) Subparts K, Ka and Kb because the true vapor pressure of the fuels stored are less than 3.5 kPa.

This facility is a major covered source based on maximum potential criteria pollutant emissions (NO_x, SO₂, CO, PM and VOC) exceeding 100 tons per year. Cumulative Hazardous Air Pollutant (HAP) emissions are less than 25 tons per year and no single HAP exceeds 10 tons per year.

This permit renewal is based on the renewal application dated May 29, 2002, the additional information provided on July 30, 2002, February 10, 2003, December 9, 2003, March 24, 2004, and May 3, 2004, the initial covered source permit no. 0067-02-C issued on June 23, 1998, and the minor modification issued on September 21, 2001.

Proposed Modification:

MECO completed several test burns with biodiesel in units M12 and M13. The firing of biodiesel in the diesel engine generators has proven to reduce opacity during the start-up, shutdown, and break-in periods.

As an alternate operating scenario, Maui Electric Company, Ltd. (MECO) is allowed to burn biodiesel in diesel engine generators M12 and M13 during start-up, shutdown, and break-in periods. Since MECO intends to burn biodiesel regularly, a modification will change the firing of biodiesel from an alternate operating scenario to an alternate fuel. Emission rates, emission limits, and maximum potential emissions remain unchanged from the initial permit issued on June 23, 1998. As such, the original review and ambient air quality analysis remain valid. MECO is also changing the name of the Black Start Generator from BSG1 to Station Generator SG1.

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Equipment:

<u>Unit No.</u>	<u>Description</u>
M1	2.5 MW General Motors Diesel Engine Generator, Model No. 20-645E4
M2	2.5 MW General Motors Diesel Engine Generator, Model No. 20-645E4
M3	2.5 MW General Motors Diesel Engine Generator, Model No. 20-645E4
M4	5.6 MW Cooper-Bessemer Diesel Engine Generator, Model No. LSV-20-T
M6	5.6 MW Cooper-Bessemer Diesel Engine Generator, Model No. LSV-20-T
M8	5.6 MW Colt Industries Diesel Engine Generator, Model No. C-PPC2V
M9	5.6 MW Colt Industries Diesel Engine Generator, Model No. C-PPC2V
M10	12.5 MW Mitsubishi Heavy Industry Diesel Engine Generator, Model No. 185V52/55A
M11	12.5 MW Mitsubishi Heavy Industry Diesel Engine Generator, Model No. 185V52/55A
M12	12.5 MW Mitsubishi Heavy Industry Diesel Engine Generator, Model No. 185V52/55A
M13	12.5 MW Mitsubishi Heavy Industry Diesel Engine Generator, Model No. 185V52/55A
X1	2.5 MW General Motors Diesel Engine Generator, Model No. 20645E4
X2	2.5 MW General Motors Diesel Engine Generator, Model No. 20645E4
M14	20 MW General Electric Combustion Turbine, Model No. LM 2500
M16	20 MW General Electric Combustion Turbine, Model No. LM 2500
SG1	600 kW Black Start Diesel Engine Generator

Air Pollution Controls:

DEG unit nos. M1 - M11 have no post-combustion air pollution control equipment. Nitrogen oxides (NO_x) are controlled on DEG unit nos. M12, M13, X1 and X2 by the use of fuel injection timing retard (FITR). The FITR setting for unit nos. X1 and X2 is 4 degrees. For unit nos. M12 and M13, the FITR setting can vary from 2 to 5 degrees inclusive.

The combustion turbines, unit nos. M14 and M16, use water injection to control NO_x. M14 and M16 must burn diesel fuel with a nitrogen content less than 0.015 percent.

For all units, sulfur dioxide (SO₂) emissions are controlled by burning fuel with a sulfur content not to exceed 0.4 percent. Particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOC) emissions are controlled by good combustion design and practice and HAP emissions are controlled by fuel selection.

Applicable Requirements:

Hawaii Administrative Rules (HAR):

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

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

11-60.1-115 Basis of Annual Fees for Covered Sources

Subchapter 7, Prevention of Significant Deterioration Review

Subchapter 8, Standards of Performance for Stationary Sources

11-60.1-161 New Source Performance Standards

CERR (Consolidated Emission Reporting Rule):

40 CFR part 51, Subpart A – Emission Inventory Reporting Requirements, determines applicability based on the emissions of each pollutant from any individual emission point within the facility that emits at the triggering levels. The emissions from each unit exceed the trigger level for NO_x and thus, are subject to CERR.

CDS (Compliance Data System)

CDS is an inventory system for covered sources subject to annual inspections. CDS requirements apply because the facility is a covered source

NSPS:

40 CFR Part 60 - New Source Performance Standard (NSPS)

Subpart A - General Provisions

Subpart GG - NSPS for Stationary Gas Turbines

PSD:

Prevention of Significant Deterioration (PSD) applies to Unit Nos. M1, M2, M3, M10, M11, M12, M13, M14, M16, X1, X2 and SG1. A new PSD review is not applicable.

Non-Applicable Requirements:

BACT:

A Best Available Control Technology (BACT) analysis is required for new or modified sources if the net increase in pollutant emissions exceeds significant levels as defined in HAR §11-60.1-1. This is a renewal for an existing source with no proposed modifications. Therefore, a BACT analysis was not required.

CAM:

The purpose of Compliance Assurance Monitoring (CAM) is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM. CAM is applicable, however, the periodic monitoring requirements are met because the emissions from the units that use a control device are monitored by CEMs.

NSPS:

The fixed roof petroleum storage tanks are insignificant activities and are not subject to the New Source Performance Standards (NSPS) Subparts K, Ka and Kb because the true vapor pressure of the fuels stored are less than 3.5 kPa.

NSR:

NSR is not applicable since the facility is located in an attainment area and PSD applicability has been reviewed.

NESHAP/MACT:

40 CFR Part 63, Subpart YYYY National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines is not applicable to the combustion turbines M14 and M16 because the facility is not a major source of HAPs and the construction occurred prior to January 14, 2003.

40 CFR 63, Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines is not applicable to the diesel engines because the facility is not a major source of HAPs.

Synthetic minor:

A synthetic minor is a facility that without limiting conditions, physical or operational, emits above the major source triggering levels as defined by HAR 11-60.1-1 for either criteria pollutant(s) or hazardous air pollutant(s). This facility is a major source and thus, is not a synthetic minor.

Insignificant Activities/Exemptions:

No new insignificant activities were identified for this permit renewal. The facility has six fixed roof storage tanks and 18 day tanks that store diesel fuel. These tanks are not subject to permitting due to the low vapor pressure of the diesel fuel.

Project Emissions:

Emissions from burning biodiesel were estimated by using emission estimates listed in the biodiesel industry publications. Biodiesel industry tests show that on average, emissions from burning biodiesel are 47 percent lower for CO and PM, 67 percent lower for hydrocarbons, and 100 percent lower, i.e. zero emissions, for SO₂. According to the industry publications, NO_x emissions on average were 10 percent higher.

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CEMs data from MECO's biodiesel test burns showed an average NO_x emission rate of 8.7 lb/hr at 0 MW output to 166 lb/hr at 10 MW output. The emissions from burning biodiesel are well below the permitted emission limit of 256.1 lb/hr. Since biodiesel will be used only during the start-up, shutdown, and break-in periods of units M12 and M13, further evaluation of the biodiesel emission rates at full load were not done.

Aside from adding biodiesel as an alternate fuel for units M12 and M13 during start-up, shutdown, and break-in periods, the operation of the emissions units at the Maalaea Generating Station are unchanged from the initial permit application. As such, the no new emission calculations were necessary. The estimated emissions from the units can be found in the initial permit review.

Air Quality Assessment:

The air quality impacts of the Maalaea Generating Station were predicted in the initial permit application using the BEEST-X and IGM/RTDM air quality dispersion models. Since the emission rates measured during the test burn were below the permitted emission rate and there are no new modifications being proposed, an ambient air quality assessment was not required and the original modeling results remain valid. Model inputs and a summary of the results can be found in the initial permit application and review.

Conclusion and Recommendation:

For the most part, the facility has been operating in compliance. Units M12 and M13 have been experiencing opacity exceedences. MECO is currently working to eliminate the opacity exceedences and is detailed in the compliance plan. The biodiesel test burn on units M12 and M13 during start-up, shutdown, and break-in periods has shown promise as an effective means to reduce opacity and is currently an alternate operating scenario. Since MECO intends to fire biodiesel in units M12 and M13 the during start-up, shutdown, and break-in periods, this renewal will incorporate biodiesel as an alternate fuel in lieu of an alternate operating scenario.