

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Energy and Environment

CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM

TO: Stephen S. Ours, P.E. *SSO*
Chief, Permitting and Enforcement

FROM: Abraham T. Hagos *Abraham T. Hagos 1/17/17*
Environmental Engineer

SUBJECT: **United States Department of the Interior
Permit Nos. 7094 and 7095 to Construct and Operate Two Natural Gas-Fired
MicroTurbines at 1849 C Street NW**

DATE: January 17, 2017

BACKGROUND INFORMATION

On February 17, 2016, the Department of the Interior (DOI) submitted air permit applications to construct and operate five 6.0 MMBTU/hr each boilers (addressed under separate cover), one (200 kW_e) 2.28 MMBTU/hr natural gas-fired Capstone MicroTurbine and one (1) (800 kW_e) 9.12 MMBTU/hr natural gas-fired Capstone MicroTurbine at the United States Department of the Interior facility, located at 1849 C Street, NW. This memorandum addressed the applications for the two MicroTurbines.

DOI has not requested that any of the materials submitted with this application be held confidential.

EMISSION EVALUATION

DOI estimated the maximum annual emissions from each of the MicroTurbines to be as shown in the following table:

Pollutant	Maximum Annual Emissions (tons/Year)	
	Model C200	Model C800
Total Particulate Matter (PM Total)	0.03	0.03
Sulfur Dioxide (SO ₂)	0.03	0.03
Nitrogen Oxides (NO _x)	0.35	1.40
Volatile Organic Compounds (VOC)	0.09	0.35
Carbon Monoxide (CO)	0.96	3.85

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REGULATORY REVIEW

20 DCMR Chapter 2, Section 200: General Permit Requirements

The provisions of this section are applicable to the microturbines as stationary sources of air pollution. A permit is therefore required to operate each microturbine generators pursuant to 20 DCMR 200.1 and 200.2. The operating permits will be valid for five years. It should be noted that, despite a heat input ratings below 5 MMBTU/hr, the Model C200 unit is not eligible for the "fuel burning equipment" exemption from permitting pursuant to 20 DCMR 200.12 because the equipment does not meet the definition of "fuel burning equipment". The definition of "fuel burning equipment" in 20 DCMR 199 is as follows:

Fuel burning equipment - any furnace, boiler, apparatus, stack, and all appurtenances in connection with, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer.

The Capstone MicroTurbine technology uses direct heat transfer, rather than indirect heat transfer, thus it does not qualify for the permit exemption.

20 DCMR Chapter 2, Section 204: Permit Requirements for Sources Affecting Non-Attainment Areas

The review of the Chapter 2 permit applications indicated that the proposed equipment (including the boilers addressed under separate cover) would emit maximum potential emissions of 4.75 tons of NO_x per year. The significance threshold to trigger NSR requirements for NO_x is 25 tons per year per the definition of "significant" in 20 DCMR 299. The proposed project will not generate emission in excess of the significance threshold, and therefore the project is not considered a new major stationary source or a "major modification" as defined in 20 DCMR 299. Therefore, pursuant to 20 DCMR 204.1, a major non-attainment new source review analysis is not required.

20 DCMR Chapter 2, Section 205: New Source Performance Standards

Subsection 205.1 of 20 DCMR adopts the federal New Source Performance Standards (NSPS) as in effect on September 30, 1997. Additionally, in order to be sufficiently protective of public health pursuant to 20 DCMR 201, the Department places all current applicable NSPS standards into all Chapter 2 permits issued.

The microturbines are not subject to NSPS Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, because they are below the 10 MMBTU/hr heat input size threshold for applicability. As stated above, the larger of the two units has a heat input rating of 9.12 MMBTU/hr.

Similarly, the units are not subject to 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, as they are below an identical 10 MMBTU/hr heat input applicability threshold.

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20 DCMR Chapter 2, Section 209: Permit Requirements For Minor New Source Review:

Effective January 1, 2014, the requirements of this section are applicable to any source required to obtain a chapter 2 permit to construct a new stationary source, modify an existing stationary source, or install or modify an air pollution control device on a stationary source that results in an increase of potential to emit rate equal to or greater than five tons per year (5 TPY) from an individual unit of any of the criteria pollutants. Each of the units does not emit at a rate equal to or greater than five tons per year (5 TPY) of any of the covered pollutants. Therefore, DOI is not subject to the requirements of 20 DCMR 209.

20 DCMR Chapter 3: Operating Permits and Acid Rain Programs

The project is not subject to the major source operating permit program or the acid rain program because the facility is not a major source facility.

20 DCMR Chapter 5, Section 500: Source Monitoring and Testing Requirements

Testing, monitoring and record keeping requirements pursuant to 20 DCMR 500.8 and 502 have been included in the permit documents under Conditions IV and V. Due to the low-emitting nature of the technology involved, the type of fuel used (natural gas), and the lack of regulations specific to this type of equipment, few monitoring or testing requirements are appropriate. AQD did include minimal monitoring and testing requirements related to visible emissions, as well as record keeping to ensure that the equipment is being operated and maintained appropriately.

20 DCMR Chapter 6, Section 606: Visible Emissions

20 DCMR 600.1 is not applicable to the equipment. This section covers "fuel burning equipment". As discussed above, this equipment does not meet the definition of "fuel burning equipment" found in 20 DCMR 199.

The MicroTurbines could emit visible emissions during any period of equipment startup, operation or shutdown and as such 20 DCMR 606.1 is applicable. This requirement is contained in Condition II(b) of the proposed permits. Related monitoring, testing, and record keeping requirements are also included in the permits.

20 DCMR Chapter 9, Section 903: Odorous or Other Nuisance Air Pollutants

The microturbines could emit emissions during any period of equipment startup, operation or shutdown and as such 20 DCMR 903.1 is applicable. This requirement is contained in the proposed permits. Minimal monitoring is required as the design of the equipment is unlikely to emit appreciable odors.

Other Regulations :

Maximum Achievable Control Technology (MACT) Standards for Gas Turbines

40 CFR 63 Subpart YYYYY for gas turbines regulates/monitors Hazardous Air Pollutants (HAPs) such as acetaldehyde, acrolein, benzene, toluene, xylene, cadmium, chromium, lead, etc, through

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surrogate compounds such as formaldehyde, carbon monoxide (CO) and/or volatile organic compounds (VOCs).

A facility that emits or has the potential to emit 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs, is considered a major source. The proposed project will produce emissions of HAP that are well under the major source thresholds. The facility as a whole is also a minor source of HAPs. Therefore the microturbines are not subject to this MACT standard.

Compliance Assurance Monitoring (CAM) (40 CFR 64)

The project is not subject to 40 CFR 64 because the pre-control emissions of pollutants for all sources are less than the applicability thresholds of the rule.

RECOMMENDATIONS

The applications to construct and operate the microturbines and the proposed permits comply with all applicable federal and District air pollution control laws and regulations.

Public comments for the permit action will be solicited from January 27, 2017 through February 27, 2017. AQD will resolve any comments received before taking any final action on the permit. If no adverse comments are received, I recommend that permit Nos. 7094 and 7095 be issued in accordance with 20 DCMR 200.2 promptly upon the completion of the public review period.

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