



GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Energy and Environment

CHAPTER 2 TECHNICAL MEMORANDUM

TO: Stephen S. Ours, P.E. 
Chief, Permitting Branch

FROM: John C. Nwoke 
Environmental Engineer

SUBJECT: **National Archives and Records Administration
Permit Nos. 6344-R1 and 6345-R1 to Operate Two 75 kWe Natural Gas-Fired
Generator Sets as Part of a Combined Heat and Power System, Located at
700 Pennsylvania Avenue NW, Washington DC.**

DATE: July 25, 2019

BACKGROUND INFORMATION

On March 1, 2018 the Air Quality Division (AQD) received two sets of Chapter 2 permit renewal applications to operate two (2) 75 kWe natural gas-fired generators. The generators were permitted on August 25, 2010, but the permits expired on August 25, 2013. To return to compliance with the requirement to maintain a permit to operate, the National Archives and Records Administration (NARA) submitted the renewal applications.

The cogeneration generators have not been modified or changed since their initial permits were issued on August 25, 2010.

In a telephone conversation with James Garland of NARA on July 2, 2018, he confirmed that the generators were not issued a certificate of conformity, because the engines are uncertified. As a result, the permits have been prepared treating the units as uncertified engines. Note that an initial compliance test requirement is included in the permit, despite the equipment having been previously permitted. In a July 1, 2019 call with Stephen Ours, Tim Edwards of NARA reported that they had not performed the initial compliance test required by the previous permit.

The publication of this permit action is planned for August 2, 2019 in the D. C. Register. Public comment for the permit action will be solicited through September 2, 2019.

NARA has not requested that any aspects of the application be held confidential.

ISSUES

As noted above, NARA did not perform initial compliance testing as required by 40 CFR 60.8 and 40 CFR 60.4243(b)(2)(i) for uncertified engines. As such, the permit establishes a reasonable schedule by which the facility must perform the testing in order to return to compliance. This new schedule does not absolve NARA of having previously failed to meet the regulatory testing requirement.

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TECHNICAL INFORMATION

National Archives and Records Administration, (NARA) installed a CHP facility to improve the energy efficiency of their facility under a mandate from the Energy Policy Act of 2005 in 2010. The combined heat and power (CHP) facility is comprised of two natural gas-fired 75 kilowatt stationary engine-driven generators, equipped with heat recovery system. The system uses heat exchangers to capture thermal energy (heat) from both the engine exhaust and the engine cooling jackets, and transferring it to the hot water system for process use.

Six (6) natural gas-fired condensing boilers, rated at 2 MMBtu/hr heat input each, were installed to meet the balance of the thermal load at the facility in a cost effective and energy efficient manner. The six boilers are rated at 2 MMBtu/hr heat input and are therefore exempt from permitting requirements pursuant to 20 DCMR 200.11. They are Hydrotherm KN-20 low NO_x boilers. The vendor information did not provide emission estimates, so the applicant used AP-42 emission factors to estimate a total potential to emit of 5.15 tons per year of NO_x from the six boilers combined, assuming 8,760 hours per year of operation.

An existing 1,000 kW emergency diesel generator, at 500 hours per year of operation, contributes 7.97 tons per year of potential emissions of NO_x. An existing 60 hp diesel fire pump, at 500 hours per year of operation contributes an additional 0.20 tons per year of potential emissions of NO_x.

The 75 kWe natural gas-fired CHP generators are AEGEN Thermopower™ TP-75 LE generators with vendor guaranteed emissions rates of 0.50 g/bhp-hr NO_x, 0.08 g/bhp-hr hydrocarbons, and 1.26 g/bhp-hr CO. This compares with 40 CFR 60, Subpart JJJJ, Table 1 emission limits for these units of 2.0 g/bhp-hr NO_x, 1.0 g/bhp-hr VOC (without formaldehyde), and 4.0 g/bhp-hr CO. The units are not, however, certified pursuant to 40 CFR 60, Subpart JJJJ, and therefore were required to have an initial performance test performed to show compliance with the subpart JJJJ emission limits upon installation. However, despite this having been a requirement in the previously issued permits (Permits 6344 and 6345, both issued August 25, 2010), this testing was not completed. As such the requirement has again been included in the new permit with a deadline to return to compliance.

Based on the vendor guaranteed emissions rates, the generators, combined, have the potential to emit 0.97 tons per year of NO_x, 0.14 tons per of VOC, and 2.56 tons per year of CO. However, since Subpart JJJJ has specified emission limits, these are to be included in the permit rather than the vendor guaranteed rates. Using these emission limits, NO_x emissions could be as high as 3.88 tons per year.

Using the Subpart JJJJ emission limits for the CHP generators, the potential to emit NO_x for the facility is 17.52 tons per year, significantly below the major source threshold of 25 tons per year.

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REGULATORY REVIEW

Chapter 2, Section 200: General Permit Requirements

The units to be permitted have the potential to emit air contaminants. Therefore a permit is required under 20 DCMR 200. The facility has applied for such a permit, a draft of which has been prepared for public comment. It should be noted that the six 2 MMBtu/hr boilers that are part of the CHP project are permit exempt under 20 DCMR 200.12. AQD investigated whether the diesel emergency generator and fire pump had been permitted. It turned out that the two units were not permitted. On January 30, 2018, NARA prepared and submitted two source category permit applications which were received on March 1, 2018. The applications covered the unpermitted emergency generator and the fire pump. The permits were processed and issued on March 23, 2018.

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

Potential emissions of air pollutants do not reach New Source Review permitting thresholds, therefore 20 DCMR 204 is not applicable to this equipment.

Chapter 2, Section 205: New Source Performance Standards

20 DCMR 205 is not applicable to this facility as none of the NSPSs current as of September 30, 1997 is applicable. However, 40 CFR 60, Subpart JJJJ is applicable (promulgated after the aforementioned date). The applicability of that regulation is discussed below.

Chapter 3: Operating Permits and Acid Rain Programs

As discussed above, the potential to emit of all air pollutants at the facility are less than major source thresholds. Therefore Chapter 3 (Title V) is not applicable to the facility.

20 DCMR Chapter 5: Testing, Monitoring and Record keeping 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 type of fuel used (natural gas), few monitoring or testing requirements are appropriate, outside of the requirement to determine compliance with Subpart JJJJ emission limits, for which testing is required. AQD also included 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.

Chapter 6: Particulates

20 DCMR 606.1, which states: "Visible emissions shall not be emitted into the outdoor atmosphere from this generator, except that discharges not exceeding forty percent (40%) opacity (unaveraged) shall be permitted for two (2) minutes in any sixty (60) minute period and for an aggregate of twelve (12) minutes in any twenty-four (24 hr) period during start-up, cleaning, adjustment of combustion controls, or malfunction of the equipment" is the only part of 20 DCMR, Chapter 6 that is applicable to this equipment. This requirement is included in Condition II(b) of the permit. Monitoring for visible emissions is required under Condition IV(c) of the permit. Conditions VI(b)(1) and (2) require records to be kept of the results of monthly

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monitoring and any other exceedances of the standard. AQD has included a note in the permit indicating that an EPA-issued “SIP call” may result in a revision to the visible emissions standard, in which case the new regulation would supersede the existing permit language.

Chapter 7: Volatile Organic Compounds and Hazardous Air Pollutants

The equipment covered consists of internal combustion engines burning natural gas. Therefore VOC emissions are minimal and are not regulated under 20 DCMR, Chapter 7.

Chapter 8: Asbestos, Sulfur, Nitrogen Oxides, and Lead

The fuel sulfur provision of 20 DCMR 801 is not applicable because the unit will not use fuel oil. The NO_x RACT provision of 20 DCMR 805 is not applicable because the facility is a minor source of NO_x and not located at a major source. Thus, none of the requirements of 20 DCMR, Chapter 8 are applicable to these sources. While the asbestos requirements of Section 800 are applicable to the facility, they are irrelevant for the generators covered by this permit document, therefore they are not included.

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

20 DCMR 903 states “An emission into the atmosphere of odorous or other air pollutants from any source in any quantity and of any characteristic, and duration which is, or is likely to be injurious to the public health or welfare, or which interferes with the reasonable enjoyment of life or property is prohibited.” This requirement is specified in Condition II(c) of the permit. Condition IV(c) requires general monitoring for compliance with this requirement. Records of any deviations from this standard must be kept and corrective action taken pursuant to Condition VI(b)(2) of the permit document.

Other Regulations

There are two federal regulations applicable to these generators. They are discussed below.

40 CFR 60, Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

This regulation specifies the emission limits included in Condition II(a) of this permit in 40 CFR 60.4233(e) and the referenced Table 1 of the subpart. These particular requirements are applicable due to the size of the units (75 kWe) and the fuel they use (natural gas).

The installed units are not “certified according to the procedures in this subpart” [40 CFR 63.4243(b)(1)], therefore, under 40 CFR 60.4243(b)(2)(i), the facility must:

- a) Keep a maintenance plan (contained in Condition III(c) and VI(a)(4) of the permit);
- b) Perform initial performance testing (contained in Condition IV(a) of the permit);
- c) Keep records of maintenance conducted (contained in Condition VI(a)(2) of the permit); and

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- d) Must, to the extent practicable, maintain and operate the engine[s] in a manner consistent with good air pollution control practices for minimizing emissions (contained in Condition III(d) of the permit);

40 CFR 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

This is an area source maximum achievable control technology (MACT), and is therefore applicable despite the fact that hazardous air pollution (HAP) emissions from the units are quite small. However, 40 CFR 63.6590(c) states:

"An affected source that is a new or reconstructed stationary RICE located at an area source, or is a new or reconstructed stationary RICE located at a major source of HAP emissions and is a spark ignition 2 stroke lean burn (2SLB) stationary RICE with a site rating of less than 500 brake HP, a spark ignition 4 stroke lean burn (4SLB) stationary rice with a site rating of less than 250 brake HP, or a 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP, a stationary RICE with a site rating of less than or equal to 500 brake HP which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, an emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP, must meet the requirement of this part by meeting the requirements of 40 CFR part 60 Subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part."

Because this is a new stationary RICE located in an area source, complying with 40 CFR 60, Subpart JJJJ (previously discussed) meets the requirements of 40 CFR 63, Subpart ZZZZ.

Practical Enforceability

For each of the emission and operational limits and standards contained in the permit, sufficient monitoring, testing, record keeping, and reporting requirements have been specified in the permit to ensure that the emission and operational limits and standards are enforceable as a practical matter.

RECOMMENDATIONS

The application is scheduled for posting in the D.C. Register on August 2, 2019 and is available for public comment through Tuesday, September 3, 2019.

The proposed permit renewal complies with all applicable federal and District air pollution control laws and regulations. Subject to receiving no adverse public comments with regard to a segment of this project or all of it, I recommend, based on this regulatory review that the attached permit numbers 6344-R1 and 6345-R1 be issued to NARA following completion of the public review period. If comments are received during the public review period, they will be addressed before any final action is taken on the permit applications.

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