Permitting New Emergency Generators in Eastern New England

Introduction

Natural gas or diesel emergency generators are becoming far more common in today's market. Formerly used for only emergency lighting or other life-safety measures, with the rapid expansion of the information technology markets, standby emergency generators are now used to provide backup power to data centers full of sensitive computer equipment, which is essential for businesses to provide their services without interruption. Typical sizes for commercially installed emergency generators run from about 100 kilowatts electrical output power (ekW) to 3000 ekW.

In general, "emergency" generators are those that are NOT used for any other purpose than to provide power when the primary utility feeder is interrupted (e.g., complete interruption or excessive fluctuations in voltage). Uses that typically disqualify permitting as "emergency generators" are peak-shaving, load management, etc., where there is usually financial gain from the owner to run the unit to support the local utility.

The following are permitting requirements for emergency generators nationally as well as for some New England states.

Federal

Federal regulations for emergency generators typically apply to their emission limits, or in the case where the generator is part of a larger source. Federal New Source Performance Standards (NSPS) for both diesel and natural gas engines (40 CFR Part 60, subpart IIII, subpart JJJJ, respectively) provide the emissions limits for stationary internal combustion engines. The federal rules also include National Emission Standards for Hazardous Air Pollutants (NESHAPs) and demonstration of Maximum Achievable Control Technologies (MACT) for certain NESHAPs.

The reciprocating internal combustion engines (RICE) MACT rule 40 CFR 63 Part ZZZZ also applies to facilities that are categorized as major sources (total facility wide emissions of 10 or more tons per year (tpy) of any individual Hazardous Air Pollutant (HAP) or 25 or more tpy of all combined HAPs). For new emergency engines to be installed at major sources, they must be certified to the NSPS for the appropriate size engine. Presumably, a new engine would comply.

However, states have the authority to regulate their installation and use, and these requirements may be more stringent than federal requirements. Permitting of these generators varies from state to state. In New England, Massachusetts requires post-installation registration. Rhode Island, New Hampshire, and Maine require pre-installation permits. Although the registrations appear basic, there are various complexities of the regulations that can make permitting these units a daunting task for a facility owner or their design engineers.

Massachusetts

Massachusetts requires post-installation registration for all emergency generators over 37 kW or 50 brake-horsepower (bhp) of ***engine power, not electrical output power***. This translates to electrical output of threshold of about 30 ekW. Although this appears to be a simple task, specific regulations regarding emission limitations, fuel limits, and stack height requirements exist. For larger units, an air quality dispersion modeling analysis is required.

All emergency engines must meet the applicable "Tier" standards set forth by the U.S. Environmental Protection Agency (EPA) as shown in 40 CFR 89 and the fuel must meet the applicable EPA sulfur limits (0.0015%) as shown in 40 CFR 80. The engines are limited to 300 hours per rolling calendar year and appropriate usage and maintenance records must be kept onsite.

The most complicated section of the Massachusetts emergency generator regulations deals with the generator stack height. All stack exhausts must be oriented vertically, without impediment, located to avoid areas of downwash, and must not cause a "condition of air pollution". Furthermore, for engines between 300 kW (402 bhp) and 1 MW (1,341 bhp), the stack must be at least 10 feet above the roof or generator enclosure, "whichever is lower". This condition works fine for rooftop units, but obviously fails for ground-level units adjacent to taller buildings, as even with a 10 foot stack, the unit would likely be subject to building downwash. For engines over 1 MW, the stack must be 1.5 times the building height, or must show that the unit does not cause an exceedance of any applicable National Ambient Air Quality Standard (NAAQS) through the use of dispersion modeling. Most often, dispersion modeling is the better option than such a tall stack.

Registration is completed by submitting the forms, the EPA Certificate of Conformity, vendor specifications, and, if necessary, the air quality modeling analysis within 60 days of installation to the Massachusetts Department of Environmental Protection (MassDEP). No fee is required. Proper recordkeeping is required thereafter.

So although registration is post-installation, the owner may wish to begin the permitting process well ahead of time to eliminate or reduce the risk of having to modify an installed unit to return to compliance.

Massachusetts rules governing emergency generators are found in 310 CMR 7.26(42).

Rhode Island

In Rhode Island, any emergency generator over 50 bhp is subject to a minor source air permit as stated in Rhode Island's Air Pollution Control Regulation (RIAPCR) #9 unless it meets the requirements for a general permit under RIAPCR #43. The general permit is still a preconstruction permit that must be requested for before installation.

For APCR #43 to be applicable, the unit must meet the applicable Tier 2 or Tier 3 emission limits set forth by EPA and have carbon dioxide (CO_2) emissions lower than 1,900 lbs/MWh. The certification requirement for diesel engines is satisfied with the EPA Certificate of Conformity, while for gas, the manufacturer must certify that the unit meets the equivalent Tier standards for a similarly sized diesel unit. Fuel sulfur limitations are also required (15 ppm for diesel, and 10 gr/dscf for natural gas. The owner must limit the operation to 500 hours per year and appropriate records must be kept. A form and backup information must be provided to the Rhode Island Department of Environmental Management (RIDEM) before construction begins. There is no fee for the general permit in Rhode Island.

If the unit does not meet the requirements of APCR #43, then a minor source permit is required. The minor source permit application process is significantly more complex, requiring a full Best Available Control Technology (BACT) evaluation, a full air quality dispersion modeling analysis for criteria and air toxic pollutants, and potentially a health risk assessment. Any specific desired permit conditions should also be noted in the application. The application should include the appropriate forms, BACT analysis, modeling analysis, backup information, calculations, and any other pertinent information. The RIDEM has no specified review time requirements for minor source permit applications, so depending on their current workload, receiving a permit to construct could take on the order of six to nine months. The fee for a minor source permit in Rhode Island is currently $1,271.

Ironically, some of the smaller gas-fired emergency generators do not meet the emission limits of the RIAPCR #43.4.1(c) (40 CFR 89). Thus, they are required to obtain a minor source permit, rather than the general permit.

New Hampshire

Much like Rhode Island, New Hampshire has a general permit for internal combustion engines used as emergency generators that would operate no more than 500 hours per rolling calendar year. For engines under 0.15 MMBtu/hr (roughly generators under 10 ekW), nothing needs to be done. For all other engines, if the total heat input is greater than 1.5 MMBtu/hr of liquid fuel (e.g., diesel) or 10 MMBTU/hr of natural gas/propane a general permit would apply. Thus, a single diesel engine under 1.5 MMBtu/hr (roughly 150 ekW) would not require a general permit, but multiple engines (over 0.15 MMBtu/hr) totaling over 1.5 MMBtu/hr would require a general permit. New engines would be presumed to meet all applicable EPA emissions standards. An air quality dispersion modeling analysis is not required.

Forms GSP-1 and GSP-2 must be submitted to the New Hampshire Department of Environmental Services (NHDES), along with generator specifications and the NHDES has 15 days to either issue the permit or deny and identify the reason for disapproval. There is no fee to apply for the general permit in New Hampshire. However, annual emissions fees are levied in New Hampshire every April. The 2013 rate was $235.50 per ton with a minimum fee of $235.50 for emissions less than 1 ton. The New Hampshire general state permit program is reevaluated

every 5 years. If for some reason the general state permit program for emergency generators is discontinued, the owner must file for a permit to operate the unit.

New Hampshire's rules governing emergency generators are found in NH CAR ENV-A600.

Maine

Maine currently provides two methods to permit emergency generators. The first is under Chapter 148 (Smaller Scale Electric Generating Resources) of the Maine Department of Environmental Protection (MEDEP) regulations and the second is under Chapter 115 (minor source licenses).

According to Chapter 148, emergency generators in Maine are defined as those greater than 50 kW (per Chapter 148). There is no upper limit, but units with a heat input greater than 5 MMBtu/hr are bumped into the Chapter 115 minor source license program. Registration of the emergency generator is required prior to operation. There are no specified stack requirements. Diesel units are limited to 15 ppm of sulfur. Units are limited to 500 hours per year with only 50 hours maximum to be used for maintenance and testing. All generators must meet prescribed emission standards stated in Chapter 148. To register, owners must submit a form with supporting documentation including the EPA Certificate of Compliance, emissions data, and vendor specifications. There is no registration fee for Chapter 148 registrations.

Required recordkeeping for the generator includes fuel shipment information, and the date, duration and type of emergency when the generator is operated. Testing and maintenance hours must also be logged.

For emergency generators larger than 5 MMBtu/hr (roughly a 500 ekW generator or larger), or if the heat input for all fuel burning equipment located at a facility totals 10 MMBtu/hr or more, then a minor source license must be obtained. The minor source license application process involves the completion of the required forms, a BACT analysis, an air quality modeling analysis, public notice, and fees.

Like New Hampshire, there is no fee to apply for the minor source license in Maine. However, annual emissions fees are levied based on annual actual emissions. The current fee for a minor source license is $8.40 per ton with a minimum fee of $385.

Recap

Regardless on which state the project may be in, it is worthwhile to understand the permitting requirements early in the design process. For some projects, especially in Massachusetts, stack configurations are extremely important. In other states, the difference between a general permit and a minor source permit could mean costly schedule delays.

Additionally, in every application, it is in everyone's best interest to site the generator in a location that minimizes any adverse exposures to operational windows and doors, and air

intakes, as well as to avoid locations of building downwash. Finally, minimizing noise impacts should also be considered in the design and location of the proposed generator.

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