

Air Pollution Compliance

for Heating Systems & Emergency Generators

Heating systems and auxiliary equipment, like back-up generators, emergency water pumps, water heaters and heat pump air pre-heaters are potential sources of air pollution and, thus, are subject to air pollution regulations and permitting requirements. The federal Clean Air Act Amendments (CAAA) of 1990 require state environmental agencies to develop strategies to maintain National Ambient Air Quality Standards (NAAQS). As part of those strategies, states must account for all sources of air pollution. Facility owners and operators must properly register and permit equipment that can contribute to air pollution.

Because federal enforcement policy places the responsibility for meeting CAAA provisions on the states, each state has the authority to develop its own compliance standards—which may be stricter than federal regulations (40 CFR 60.10). However, no national policy or reliable metric currently exists against which owners/operators can evaluate fuel-burning equipment permit requirements.

For example, California state environmental regulations require local building-permit-granting agencies to evaluate the air permit compliance of a new project (CA GC 65850.2). In Texas, an emergency generator is “permitted by rule” provided

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the engine falls below a 240 hp threshold (TX § 106.512); in Ohio, the limit is 50 hp (OH 3745-31-03(A)(4)(a)). Indiana permits by rule provided the pollution source limits its actual emissions to less than 20 percent of the emissions level of a major source (326 IAC 2-10). Clearly, owners/operators of a fuel-burning source must determine what conditions apply within the state.

In many states, in addition to pre-installation permitting or registering, owners/operators must evaluate renovations/repairs to air-emissions-producing equipment in order to assess potential impact on NAAQS. Some states require annual reporting if criteria thresholds are exceeded.

For example, in Massachusetts, if the potential to emit air pollutants of an existing facility is increased by one ton per year, some type of reporting or permitting is required (310 CMR 7.02(c)(8)). Finally, fuel-burning equipment installations may feature storage, transfer and distribution systems that are subject to other regulatory requirements.

This article provides guidance to help owners/operators of regulated facilities comply with provisions of the CAAA as they relate to heating systems and emergency engines.

REGULATORY BACKGROUND

CAAA requires that each state establish air emissions inventories to provide data that will help states meet NAAQS. Environmental Protection Agency (EPA), the federal agency responsible for administering provisions of CAAA, requires each state to develop a state implementation plan (SIP). This plan outlines what steps a state will take to comply with federal regulations that stipulate attainment of air quality limits.

Federal air pollution regulations apply to facilities that emit—or have the potential to emit—air contaminants above thresholds set by EPA (40 CFR 60, 61). To meet NAAQS, most states have implemented reporting and permitting requirements for emergency generators and heating systems. As noted, in general, these requirements are more-stringent than federal standards.

Any facility that installs or modifies process or fuel-burning equipment must evaluate its potential to pollute the air. If all equipment at a site collectively exceeds state emissions threshold limits, the facility may be required to register with the state EPA or apply for an air permit (also known as an operating permit) as a source of air pollution. This responsibility falls to the owner/operator, a term that refers to any person who owns, leases, operates, controls or supervises a stationary source.

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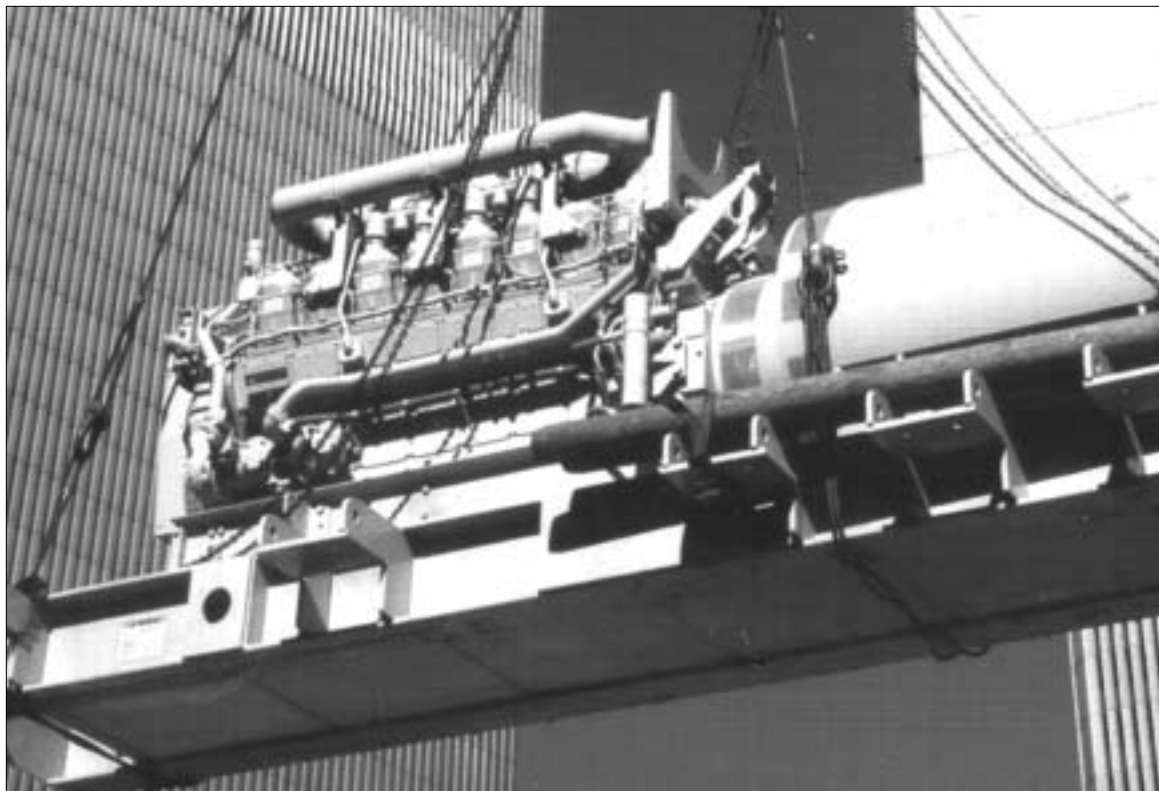


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SOURCE REGISTRATION

Source registration refers to initial registration of a source of air pollution and the periodic reporting process required by most states. An owner/operator that installs or modifies equipment which could contribute to a condition of air pollution must notify the state by registering as a potential source of air pollution. State regulators use this information to inventory emissions and develop air pollution response strategy.

State regulations may require an owner/operator to submit a source registration annually, triennially or every five years, to verify equipment emissions and update information. If a facility has an air permit plan approval, that approval may specify the reporting frequency. To ensure compliance, those responsible for submitting source registration reports should consult the facility's operating permit or air permit plan approval.

Some facilities must submit source registrations even if they are not required to apply for an air permit plan approval. In some cases, a facility may exceed state SIP reporting thresholds without exceeding the threshold for an air permit plan approval or operating permit. This is common in the case of heating systems and emergency engines.

EMERGENCY ENGINES

An emergency or stand-by engine is a stationary internal combustion engine that operates as an emergency or stand-by mechanical or electrical power source (NH 1200-2(o)). A load-shaving unit, peaking-power production unit or stand-

by engine in an energy assistance program is not generally considered to be an emergency or stand-by engine for air permitting purposes (310 CMR 7:00).

Many facilities use emergency engines to power backup electric generators. Emergency generators may be used as part of a facility's emergency contingency plan to provide power to ensure safe egress in the event of a power failure or as backup generators to ensure an uninterrupted power supply (UPS). The UPS may provide power for ongoing business activities, or to protect computer files and ensure reliable communications. Some emergency engines are also used to power firefighting equipment such as water pumps.

OPERATING RESTRICTIONS

Regardless of its purpose, an emergency engine must comply with air pollution registration and permitting requirements. Even if the engine falls below state permitting thresholds, many states have established energy-input or fuel-use thresholds for such equipment in order to control the emission of air contaminants. For example, states may require that these engines:

- have an energy-input capacity not greater than 10 million British thermal units (Btus) per hour (NY);
- not use more than 32,000 gallons of diesel fuel per year (FL);
- feature an exhaust silencer so that sound emissions from the generator will not cause or contribute to a condition of air pollution (MA);
- exhaust emissions in excess of 20 percent opacity (NH);

- not operate more than 500 hours per 12-month period (KY);

- burn distillate oil that has sulfur content less than or equal to 0.5 percent by weight (OH).

Operating limits generally include maintenance and testing procedures as recommended by the manufacturer and documented in a facility's written operations and maintenance procedures manual. Periods when a facility's primary power source has been lost during an emergency—such as power outage, on-site disaster or act of God—also count toward maximum run-time and fuel-use restrictions. Therefore, owners/operators must be aware of their state's specific limits and restrictions.

RECORDKEEPING

In addition to design and operating restrictions imposed on emergency engines, most states require facilities to maintain accurate records that document compliance and facilitate periodic reporting. Many states stipulate that such records be retained for a specific period of time, ranging from two years (TX) to three years (NH) to five years (NY).

Federal and state air pollution thresholds refer to the "potential to emit" contaminants. EPA defines the potential to emit as the maximum capacity of a stationary source to emit a pollutant under its physical and operational design (40 CFR 52.21). Owners/operators must calculate potential emissions based on 24-hour, 365-day operations, unless they can document "federally enforceable" operational or design restrictions. Each

state has established potential-to-emit criteria to comply with federal law (Hunt). To ensure compliance, owners/operators should consult with the local permitting agency or a qualified expert for guidance.

Typically, states require that owners and operators maintain:

- information about equipment type, make and model, and maximum input/output (in Btu, gal/hr or kW/hr) (CA);

- monthly log of hours of operation, gallons of fuel used, fuel type, heating value and sulfur content of the fuel; in addition, owners/operators must keep a monthly calculation of total hours operated and track gallons of fuel used over the previous 12 months (OH);

- purchase orders, invoices and other supporting documentation for the monthly log (MA).

In most states, owners/operators must maintain a copy of the monthly log onsite for inspection. In some states, they must submit operating records along with the source registration. Facility operating permits may specify submittal requirements. A responsible person must consider all fuel-burning and process emission sources when registering equipment for air pollution inventory purposes; this encompasses emergency engines, water heaters, boilers, process equipment and storage tanks. If total energy input capacity or emission potential exceeds limits outlined in a state's SIP, owners/operators must notify the state regulatory agency through source registration.

SOURCE REGISTRATION VS. AIR PERMIT

If source registration can be thought of as the process of reporting smaller emission sources, air permitting is a means of controlling larger sources. Air permitting is more complex and its requirements vary by equipment type and energy input capacity.

In general, air permitting is required for fuel-burning sources that emit criteria or hazardous air emissions which exceed thresholds stipulated in a state's SIP. (For a complete list of criteria and hazardous air pollutants, see CAA 1990, Sec. 112.) Because large heating systems and emergency or peak-shaving engines may require air permits, facilities with a fuel-burning heating system that has a combined energy input capacity above 1 million Btus should evaluate permitting requirements and verify all applicable thresholds.

HEATING SYSTEMS VS. EMERGENCY ENGINES

How energy input is calculated is important to the permitting process. A key difference among state regulations is the method used to calculate energy input for different equipment. In some states, energy capacity for heating systems is cumulative, while back-up gener-

ators are considered individually. In other states, both generators and heating systems are evaluated by total energy input.

For example, in Massachusetts, a building with three fuel-fired boilers, each of which has an energy-input capacity of 4 million Btus, has a total energy input capacity of 12 million Btus. This system requires an air permit (310 CMR 7.02(4)(a)(7)).

The same building with an electric-powered heat pump (not fuel-fired) and three emergency engines of the same energy input capacity would not require an air permit. The generators must be registered as a stationary source of air pollution, a more-simple—and less-expensive—process (310 CMR 7.03(7)). In New Hampshire, generator energy input is cumulative, so facility owners/operators must calculate total Btu input capacity of all generators in order to determine permit requirements (Env-A 607.01(d)(1-3)).

PERMITTING OPTIONS

Individual states offer many options to owners/operators of large heating systems and emergency engines. These range from complex comprehensive plan approvals (CPAs) and restricted emissions status applications to 50-percent or 25-percent notifications, synthetic minor designations, temporary permits and source registration.

With federal EPA guidance, most states have developed a means to reduce a facility's potential to emit air pollution by placing operating restrictions in the air permit plan approval. Some applications require analysis of reasonably available control technology (RACT) or best available control technology (BACT). The latter analysis must be performed according to strict guidelines (NESCAUM). In such cases, owners/operators should work with a qualified specialist who can best determine which permit option is best for the facility.

RELATED REGULATIONS

Many facilities with emergency engines or heating systems install fuel storage tanks to supply those systems, which may be subject to federal pollution prevention regulations, as well as to provisions of the Clean Water Act (CWA) and CAAA.

For example, oil spill prevention, containment and countermeasure (SPCC) plans may be needed if tank capacities exceed established thresholds. If a facility's underground oil tank storage capacity exceeds 42,000 gallons, or if its total aboveground storage is 1,321 gallons or higher, it should be evaluated for SPCC compliance (40 CFR 112.1-112.7).

If a storage tank services two pieces of equipment, such as a heating system and an emergency backup generator, some CWA provisions may apply as well, par-

ticularly with respect to tank configuration and secondary containment. Under SARA Title III, toxics release inventory reporting may be required if storage capacity exceeds stated thresholds.

CONCLUSION

Facility owners, operators, project managers and site managers must evaluate fuel-burning equipment to determine what federal, state and local regulations apply. This can be achieved via regular site inspections; onsite audits by qualified professionals; compliance inspections by regulatory agencies; and during installation of new equipment, or repair and modification of existing equipment.

Many sources offer assistance with permitting and reporting. However, owners/operators must inform these consultants if adding or modifying a single piece of equipment may trigger reporting thresholds. Owners/operators must also be aware of other regulations that may impact fuel storage and transfer systems. Added to other onsite equipment, one fuel-burning source may cause a facility to exceed permit or reporting thresholds, or require permit or registration changes. It is the owners'/operators' responsibility to ensure compliance. ■

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Logan Airport Fined for Installing Emergency Generators

In 1999, the Massachusetts Port Authority (Massport) finalized an Administrative Consent Order with Penalty (ACOP). Issued by the Massachusetts Dept. of Environmental Protection (DEP), the ACOP cited Massport for installing emergency generators (to be used for heating and cooling systems at Logan Airport) without first submitting a comprehensive plan application (CPA). This application documents equipment and installation specifications; stipulates intended use of the equipment; and proposes operational limits (310 CMR 7.02(2)(a)). It also quantifies air and noise emissions and presents DEP with an evaluation of BACT that will be used to limit emissions. Massport's experience is illustrative of how the state enforces air permitting regulations—as well as the consequences of non-compliance.

An emergency or stand-by engine is a stationary internal combustion engine that operates as an emergency mechanical or electrical power source. A load-shaving unit, peaking-power production unit or stand-by engine in an energy assistance program is not considered an emergency or stand-by engine (310 CMR 7.00). Emergency engines that qualify under Massachusetts's regulations are exempt from air permitting requirements. Therefore, facility owners who install exempt emergency engines must notify the regional DEP office and maintain maintenance and operational records, but need not apply for an air permit.

According to Massachusetts regulations, emergency engines must:

- have a per-hour energy input capacity of 3 million to less than or

equal to 10 million Btus (310 CMR 7.02(14)(a));

- feature an exhaust silencer so that sound emissions from the generator will not cause or contribute to a condition of air pollution (310 CMR 7.03(7)(b));

- utilize an exhaust stack that discharges so as to not cause or contribute to a condition of air pollution (310 CMR 7.03(7)(c));

- not operate more than 300 hours per rolling 12-month period, including manufacturer-recommended normal maintenance and testing procedures and periods when a facility's primary power source has been lost during an emergency (e.g., power outage, onsite disaster) (310 CMR 7.02(14)(b));

Under state law, an owner/operator must maintain the following records, which must be made available upon request (310 CMR 7.02(14)(d)).

- 1) information on equipment type, make and model, and maximum input/output;

- 2) a monthly log of hours of operation, gallons of fuel used, fuel type and heating value, as well as a monthly calculation of total hours operated and gallons of fuel used in the previous 12 months;

- 3) purchase orders, invoices and other supporting documentation for the monthly log (310 CMR 7.02(14)(c));

The Massport generators are powered by diesel fuel and their engines can produce up to 1,500 kW of electrical power. Since the energy input capacity of each unit is 14.2 million Btu/hr, they do not qualify for the emergency exemption (310 CMR 7.03(7)(a)). As a result, according to Massachusetts law,

Massport should have submitted a CPA before installing the units. Because it did not, the ACOP issued by DEP in 1999 included a fine of \$30,000 under the Massachusetts Supplemental Environmental Policy.

The resultant plan approval issued by DEP sets "federally enforceable" restrictions that limit conditions under which the airport equipment may be operated. The plan approval allows DEP to inspect the facility, its records and equipment, and to test equipment to ensure that components of the permit are enforced (310 CMR 7.02(4)(c)). In this case, the final approval included the following restrictions:

- Massport will operate the generators only when the primary power source has been lost or during normal maintenance and testing.

- NOx emissions rate from each generator shall not exceed 6.57 g/bhp/hr.

- Fuel use shall be limited to only transportation diesel fuel oil having a maximum sulfur content of 0.05 percent by weight.

- Massport will maintain required records for five years.

- Upon DEP request, Massport will demonstrate that the generators maintain emissions limits.

Based on file review of Massachusetts Port Authority, Logan International Airport, at DEP's Metropolitan Boston/Northeast Regional Office, Wilmington, MA; a search of the DEP website (state.ma.us/dep/enf/pastenf.htm#1999); and the final approval letter to Massachusetts Port Authority, Logan International Airport, from Metropolitan Boston/Northeast Region DEP. Transmittal No. P24636, Appl. No. MBR-99-COM-007.

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