

# Emergency generators and stationary engines

## Recommended practices



### Why does it matter?

Stationary engines and diesel generators are a source of periodic but high levels of fine particles, an air pollutant with serious human health concerns. These measures can help your facility save fuel and operating costs while reducing fine particles and other air pollution to protect public health.

### Installation

- ▶ **Select a clean unit using natural gas or ultra-low sulfur diesel fuel.** Diesel fuel with a sulfur content limited to 15 ppm is available and required for some engines. This lowers sulfur dioxide emissions. Check with your dealer to ensure your engines and your fuel delivery systems are compatible with this fuel. You might even consider using a fuel cell instead of a unit powered by an engine.
- ▶ **Vent the emissions upward.** Orient the stack outlet to vent emissions vertically without obstruction. Make the stack high enough that the exhaust can disperse easily. A counterbalanced flapper-type rain cap is a better choice than a fixed rain cap.
- ▶ **Install generators and pumps away from fresh air intakes, windows or doors.** Emissions from testing and running of generator engines can affect indoor air quality.
- ▶ **Size the generator to load.** For diesel engines, the load should be at least 30% of generator capacity to avoid “wet stacking.” This inefficient operation results in higher emissions and unburned fuel in the exhaust. Wet stacking may result in additional maintenance or premature engine failure. Consider specifying engine exhaust temperature monitoring on new units, a relatively inexpensive option, to confirm the engine is operating above the minimum temperature requirement.

### Testing and Maintenance

- ▶ **Make the test runs as short as allowed by manufacturer requirements, insurance and building code considerations, and industry requirements.** Limiting the duration of testing helps minimize the pollution emitted and saves fuel. One hour or less of operation should be sufficient to fulfill most requirements. Locations with utility contracts may be able to do routine testing for only 15 or 20 minutes. Emergency units should follow NFPA 110-2010 Standard for Emergency and Standby Power Systems, which requires monthly tests of not less than 30 minutes.
- ▶ **Pick the best time to test.** Consider testing between 12 p.m. and 4 p.m. Generally, wind increases in the afternoon, so early afternoons are better for testing generators. Avoid testing in the late afternoon – that coincides with rush hour and higher emissions from vehicles. Another option is testing outside of normal business hours such as weekends.
- ▶ **Avoid testing when many people are nearby.** If the engine is located near a building, be aware of when and where people congregate. Avoid operating engines during these peak activity times.
- ▶ **Test units one at a time.** Operating multiple units at the same time leads to higher impacts due to the

combined emissions. Consider staggering the testing on different days as well as at different times on the same day.

- ▶ **Test only on days with good air quality; avoid air alert days.** Avoid testing your generator when the Air Quality Index (AQI) is over 90. The AQI and the forecasted AQI can be found at <http://www.pca.state.mn.us/aqi>. You can also sign up for air pollution health alert notifications by either email or text.
- ▶ **Maintenance:** Routine maintenance helps save fuel and reduces pollution. Change the oil on schedule. Check belts and hoses; maintain air cleaners, PCV valves, and EGR systems.

#### A note about regulatory requirements

Stationary engines may be affected by 2013 revisions to the National Emission Standard. More information is at <http://www.epa.gov/ttnatw01/rice/ricepg.html>.

For more details go to <http://www.pca.state.mn.us/engines>



**Minnesota Pollution Control Agency**

# What's the concern?

Fuel combustion in engines like generators or fire pumps releases pollutants that can directly harm people and that may contribute to regional air quality problems. Because stationary engines like diesel generators typically have long operating lives, many older units with minimal or no emission controls

remain in service. Older units are a particular concern because of their higher emissions.

Many generators operate at businesses, hospitals and schools. Air pollution at these locations may possibly adversely affect large numbers of people, especially those

most susceptible – children, elderly, and those already suffering from respiratory and cardiovascular issues. Evidence shows that exposure to diesel exhaust can result in adverse respiratory effects, aggravate allergies, or exacerbate asthma symptoms. Prolonged exposure can even cause lung cancer.



*A typical diesel generator installation at a nursing home located near resident rooms. Low smokestacks result in poor air dispersion, and people can be exposed to exhaust through windows and building air intake vents.*



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