1.0 Introduction:
This information sheet covers the National Emission Standards Hazardous Air Pollutants (NESHAP) regulations for existing stationary engines as published in Title 40, Part 63, Subpart ZZZZ (63.6580) of the Code of Federal Regulations (CFR).

This Information Sheet discusses the EPA emission standards to be applicable to existing stationary diesel and spark ignition engines, actions to become compliant and applications that are exempt.

EPA regulates stationary power sources, such as diesel, natural gas or propane-powered generator sets differently to non-road rental or portable (mobile) engine/generators. In addition, emergency and non-emergency generators are also regulated differently.

2.0 Background of Reciprocating Internal Combustion Engines (RICE) rules:
• June 15, 2004. EPA issued rules applicable to several new and existing RICE categories to control toxic air pollutants from existing stationary IC engines, including emission standards for certain stationary SI engines
• Feb. 17, 2010. EPA issued a rule to reduce emissions from existing stationary diesel engine
• Aug. 20, 2010. EPA issued a rule to reduce emissions from existing stationary gaseous-fueled (SI) engines
• March 9, 2011. EPA issued a rule introducing several minor amendments and clarifications to Aug. 20, 2010 regulation. (Continued over)

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<thead>
<tr>
<th>Area Sources</th>
<th>Engine Category</th>
<th>Emission Standard</th>
<th>Alternative CO Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Emergency</td>
<td>300 &lt;hp ≤ 500</td>
<td>49 ppmvd CO</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>&gt; 500 hp</td>
<td>23 ppmvd CO</td>
<td>70%</td>
</tr>
<tr>
<td>Major Sources</td>
<td>Engine Category</td>
<td>Emission Standard</td>
<td>Alternative CO Reduction</td>
</tr>
<tr>
<td>Non-Emergency</td>
<td>100 &lt;hp ≤ 300</td>
<td>230 ppmvd CO</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>300 &lt;hp ≤ 500</td>
<td>49 ppmvd CO</td>
<td>70%</td>
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<tr>
<td>4SLB, Non-Emergency</td>
<td>&gt; 500 hp</td>
<td>47 ppmvd CO</td>
<td>93% CO</td>
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<tr>
<td>4SRB, Non-Emergency</td>
<td>&gt; 500 hp</td>
<td>2.7 ppmvd HCHO</td>
<td>76% HCHO</td>
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<tr>
<td>Major Sources</td>
<td>Engine Category</td>
<td>Emission Standard</td>
<td>Alternative CO Reduction</td>
</tr>
<tr>
<td>2SLB, Non-Emergency</td>
<td>100 &lt;hp ≤ 500</td>
<td>225 ppmvd CO</td>
<td>-</td>
</tr>
<tr>
<td>4SLB, Non-Emergency</td>
<td>100 &lt;hp ≤ 500</td>
<td>47 ppmvd CO</td>
<td>-</td>
</tr>
<tr>
<td>4SRB, Non-Emergency</td>
<td>100 &lt;hp ≤ 500</td>
<td>10.3 ppmvd HCHO</td>
<td>-</td>
</tr>
<tr>
<td>Landfill/Digester Gas</td>
<td>100 &lt;hp ≤ 500</td>
<td>177 ppmvd CO</td>
<td>-</td>
</tr>
<tr>
<td>4SRB, Non-Emergency</td>
<td>&gt; 500 hp</td>
<td>350 ppmvd HCHO</td>
<td>76% HCHO</td>
</tr>
</tbody>
</table>

Key: 2S = Two Stroke; 4S = Four Stroke; LB = Lean Burn; RB = Rich Burn

Other Provisions
Diesel Fuel: The diesel rule requires the use of ultra-low sulfur diesel fuel for stationary non-emergency engines greater than 300 hp with a displacement of less than 30 liters per cylinder. The regulation will be fully implemented by 2013.

Crankcase Filtration: Stationary engines above 300 hp must be equipped with closed or open crankcase filtration system in order to reduce metallic HAP emissions.
The rules, titled NESHAP for RICE are intended to reduce toxic air pollutants such as formaldehyde (HCHO), acetaldehyde, methanol and other air toxins, from several categories of previously unregulated stationary engines. The EPA determined that carbon monoxide (CO) can be often used as an appropriate surrogate for HCHO. As CO testing has many advantages over testing emissions for hazardous air pollutants (HAP), most standards have been finalized in terms of CO as the only regulated pollutant.

### 3.0 Emissions Regulations Issued

In addition to the Air Quality Management federal emission standards imposed by New Source Performance Standards (NSPS), the US Environmental Protection Agency (EPA) issues emission requirements for certain categories of new stationary engines as specified by NESHAP.

Such emission regulations for stationary diesel engines are published in Title 40, Chapter 1, Part 60 of the Code of Federal Regulations (CFR). Tier 1 standard for new, modified and reconstructed engines (existing in-use engines are exempt) apply as from April 1, 2006.


### 4.0 Applicability

The NSPS standards apply to stationary compression ignition internal combustion engines (CI ICE) – see below. Emission standards depend on classification of the source of Air Toxins (AT) emissions. “Major sources” are defined as those that emit 10 short tons per year of a single AT or 25 short tons per year of a mixture of AT’s. “Area sources” are those sources that are not major sources.

NESHAP rules apply to “existing” diesel and SI engines, as determined by date of construction or reconstruction:

1. **Area Sources of AT emissions:**
   a) Engines constructed or reconstructed before June 12, 2006
   b) Engines of 500 hp or less, constructed or reconstructed before June 12, 2006
   c) Engines above 500 hp, constructed or reconstructed before December 19, 2002

2. **Major Sources of AT emissions:**
   a) engines of 500 hp or less, constructed or reconstructed before June 12, 2006
   b) engines above 500 hp, constructed or reconstructed before December 19, 2002

3. **Any stationary ICE (except combustion turbines) used for non-emergency purpose:**
   An ICE that converts heat energy to mechanical work and is not mobile, nor is it a spark ignition (SI) engine fueled by gasoline, natural gas or liquefied petroleum gas. See table 1 overleaf. The diesel rule requires use of ultra-low sulfur diesel fuel for stationary non-emergency engines greater than 300 hp with a displacement of less than 30 liters per cylinder. The regulation will be fully implemented by May 3, 2013.

4. **For spark ignition (SI) engines:** – see table 2 overleaf.

NESHAP standards are expressed as volumetric, dry CO concentrations ppmvd (parts per million, volumetric dry) at 15% O2 (with the exception of standards for rich-burn SI engines, expressed as volumetric concentrations of HCHO at 15% O2). These standards must be met during any operating conditions, except during periods of start-up (max. of 30 minutes). Emissions are tested at 100% load. Alternative compliance options are available in certain engine categories, expressed as percentage CO or HCHO emissions reductions.

### 5.0 After-Treatment Options

- **Oxidation catalysts (OC):** A technology that can achieve AT reductions up to 90% from diesel engines, but only reduce fine particle pollution (FPP) by about 25 – 30%.

- **Catalyzed diesel particulate filters (CDPF):** To reduce AT’s and FPP’s (including black carbon) from diesel engines by over 90%.

### 6.0 Requirements of Owners or Operators of Existing Engines

EPA states that there are over 900,000 stationary engines in the US that are affected by this ruling. Many of these however, will not be subject to this rule due to the stationary “emergency duty” exemption.

Owners or operators of existing engines that are subject to NESHAP would be required to:

- Install emission control equipment that would limit AT emissions by up to 70%
- Perform emission tests to demonstrate engine performance and compliance with rule requirements
- Use ultra-low sulfur fuel in non-emergency engines with site rating greater than 300 hp

### 7.0 Useful Sites

Users of existing generator systems should reference the appropriate governing body and/or the manufacturer of their system to verify is the impending EPA RICE NESHAP regulations requirement retrofitting of equipment as described in this information sheet in order to meet emissions standards to be introduced. The following are useful reference sites:

- [www.epa.gov/tnn/atw/rice/ricepg.html](http://www.epa.gov/tnn/atw/rice/ricepg.html)
- [www.epa.gov/eogapti1/course422/apc4c.htm](http://www.epa.gov/eogapti1/course422/apc4c.htm)
- [www.dieselforum.org/news.../NESHAP_for_RICE_Summary_FINAL.pdf](http://www.dieselforum.org/news.../NESHAP_for_RICE_Summary_FINAL.pdf)