Stationary Engines
Federal Facilities Webinar
40 CFR Part 60 Subparts IIII and JJJJJ
and 40 CFR Part 63 Subpart ZZZZZ
EPA Region 1: Cutler Enforcement Case & Common Violations

Steve Rapp,
Region 1 Air Technical
Unit Manager
Naval Computer and Telecommunications Area Master Station
Located in Cutler, Maine

► Four 4,066 hp & one 906 hp engines
  ► All five of these engines subject to 40 CFR Part 63, Subpart ZZZZ
  ► Navy did not retrofit and test engines before compliance deadline in 2013
  ► As part of 2017 settlement with EPA, Navy:
    • Installed pollution control equipment on all five engines;
    • Completed initial performance tests to demonstrate that the engines meet the national emissions standards;
    • Submitted required notifications and compliance status reports to EPA;
    • Paid a penalty of $811,000 for violations of the Clean Air Act.
Engine Compliance Issues Observed on Inspections

- Lack of pollution controls, e.g., catalyst system
- Incorrect certifications/labels
- Failure to test or testing not performed at challenging loads
- Lack of records: hrs. of use, maintenance, parameter monitoring, etc.

For emergency engines:
- failure to change oil/filter & inspect hoses/belts every 500 hours or annually
- Failure to inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually

Lack of reports and plans:
- notification of compliance status (§63.6645(a) and 63.9(h))
- percent load report (§ 63.6620(i))
- site specific monitoring plan (§ 63.6625(b)(1))
- performance evaluation of continuous parameter monitoring system, e.g., temperature monitor at inlet of oxidation catalyst (§ 63.8(e)(4))
- semiannual reports (§ 63.665)
EPA Region 4: Fort Gordon
Enforcement Case &
Cooperative Federalism

Kevin Taylor,
Region 4 Air Enforcement
Inspector
Cooperative Federalism

- EPA Region 4 and the Georgia Environmental Protection Division

- Together, Creating Tangible Environmental Results for the American People
RICE MACT Engines did not achieve the regulatory CO limit of 23 ppmvd by the October 30, 2013 deadline.

By failing to prove compliance by the October 2013 deadline, compliance was not demonstrated for the RICE MACT compliance date of May 3, 2013.

Did not submit Notification of Compliance Status Report following testing noncompliance in October 2013.
Failing engines were shut down to minimize environmental impact

Catalytic converters were installed on all 9 engines and tested well above the 70% reduction with controls and was also well below the 23 ppmvd initial uncontrolled engine CO regulatory limit.
Stationary Engines
40 CFR Part 60 Subparts IIII and JJJJJ and 40 CFR Part 63 Subpart ZZZZZ

Sara Ayres, EPA Office of Enforcement and Compliance
Melanie King, EPA Office of Air and Radiation
Overview:
- What is a stationary engine?
- Why do we regulate stationary engines?
- Which rules cover stationary engines?

NESHAP:
- RICE NESHAP Background
- Requirements for Emergency RICE at Area Sources of Hazardous Air Pollutants (HAP)
- Requirements for Non-Emergency RICE at Area Sources of HAP
- Requirements for RICE at Major Sources of HAP
- Information needed to evaluate facility compliance

NSPS:
- Compression Ignition NSPS (Subpart IIII)
- Spark Ignition NSPS (Subpart JJJJ)
- Information needed to evaluate facility compliance

Review of Compliance Assistance Resources
What is a stationary engine?

NESHAP: “Stationary reciprocating internal combustion engine (RICE):”
► any reciprocating internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work; and
► is not mobile (is not a nonroad engine as defined at 40 CFR 1068.30 and is not used to propel a motor vehicle or a vehicle used solely for competition).

NSPS: “Stationary internal combustion engine (ICE):”
► any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work; and
► is not mobile (is not a nonroad engine as defined at 40 CFR 1068.30 and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition); and
► include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines.”

Stationary Engines use pistons that alternatively move back and forth to convert pressure into rotating motion. Compression ignition (CI) engines are usually powered by diesel fuel and have no spark plug. Spark ignition (SI) engines have a spark plug and are often powered by natural gas (for stationary engines).
What is a nonroad engine?

Engines in nonroad vehicles and mobile equipment:

40 CFR Part 1068.30: Nonroad engine is an internal combustion engine that is:

► self-propelled;
► intended to be propelled while performing its function;
► capable of being carried or moved on wheels, skids, carrying handles, dollies, trailers, or platforms.

An internal combustion engine is **NOT** a nonroad engine if it:

► propels a motor vehicle, an aircraft, or equipment used for competition;
► is regulated under the NSPS;
► Is a portable engine that remains at a single location for more than 12 consecutive months (or less at a seasonal source).
Why do we regulate Stationary Engines?

► Stationary engines are common combustion sources that can impact air quality and public health.

► They are commonly used:
  ► at power and manufacturing plants to generate electricity or power pumps and compressors,
  ► at oil and gas production facilities and midstream operations,
  ► in emergencies to produce electricity or pump water for flood and fire control.

► Estimates of the number of existing engines are almost 1 million\(^1\) with new engines coming into service all the time.

1. 957,832 per Table 4-7 of the Regulatory Impact Analysis (RIA) for Existing Stationary Compression Ignition Engines NESHAP, February 2010,
Why do we regulate Stationary Engines?

Pollutants emitted from stationary engines include:
- formaldehyde,
- acrolein,
- acetaldehyde,
- methanol,
- carbon monoxide (CO),
- nitrogen oxides (NOx),
- volatile organic compounds (VOCs), and
- particulate matter (PM).

Exposure may cause:
- irritation of the eyes, skin and mucous membranes;
- central nervous system problems; and
- breathing issues, especially asthma among children and seniors.
Which rules cover stationary engines?

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

► New Source Performance Standards (NSPS) for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)
  ► 40 CFR Part 60 Subpart III

► NSPS for Stationary Spark Ignition (SI) ICE
  ► 40 CFR Part 60 Subpart JJJJ
Stationary Engine Rule Applicability

**RICE NESHAP**

40 CFR Part 63 Subpart ZZZZ

- Applies to stationary CI and SI engines

**CI ICE NSPS**

40 CFR Part 60 Subpart IIII

- Applies to stationary CI engines:
  - Ordered after July 11, 2005 and manufactured after April 1, 2006
  - Modified or reconstructed after July 11, 2005

**SI ICE NSPS**

40 CFR Part 60 Subpart JJJJJ

- Applies to stationary SI engines:
  - Ordered after June 12, 2006 and manufactured on/after
    - July 1, 2007 if ≥500 horsepower(HP)
    - January 1, 2008 if lean burn engine 500≤HP<1,350
    - July 1, 2008 if <500 HP
    - January 1, 2009 if emergency engine and >25 HP
  - Modified or reconstructed after June 12, 2006
National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reciprocating Internal Combustion Engines (RICE)

40 CFR Part 63 Subpart ZZZZ
RICE NESHAP Background

- Regulates HAP emissions from stationary RICE at both major and area sources
  - **Major**: $\geq 10$ tons/year single HAP or $\geq 25$ tons/year total HAP
  - **Area**: less than major source threshold for HAP
- All sizes of engines are covered
- Both new and existing engines are covered
- Limited exemption for engines that meet all of the following:
  - Existing emergency engine definition in Subpart ZZZZ
  - Located at residential, institutional, or commercial area sources ([guidance memo](#) has list of common NAICS codes)
  - Not used for local reliability as described in §63.6640(f)(4)(ii).
General Sub-Categorization Approach

- Stationary RICE
  - Compression Ignition (CI)
    - Non-Emergency
    - Emergency
  - Spark Ignition (SI)
    - Non-Emergency Lean Burn
    - Non-Emergency 4-Stroke Rich Burn
    - Landfill/Digester Gas
    - Emergency

- 2-Stroke
- 4-Stroke
Existing vs. New Engines

The date construction commenced determines if the RICE is existing or new:

- **>500 HP at major source**
  - **Existing**: December 19, 2002
  - **New**

- **≤500 HP at major source, and all HP at area source**
  - **Existing**: June 12, 2006
  - **New**

▶ **Determining construction date**: owner/operator has entered into a **contractual obligation** to undertake and complete, within a reasonable amount of time, a continuous program for the **on-site installation** of the engine
  
  ▶ Does not include moving an engine to a new location
Requirements for Emergency RICE at Area Sources of HAP
What is an Emergency Engine?

An Emergency Stationary RICE:

► “. . . is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment . . . when electric power from the local utility . . . is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.” (Subpart ZZZZ definitions Section §63.6675)

► Operates in non-emergency situations only as specified in the rule
Emergency Engine Operational Limitations

► Unlimited use for emergencies (e.g., power outage, fire, flood)

► 100 hr/yr for:
  ► maintenance/testing

► 50 hr/yr of the 100 hr/yr allocation can be used for:
  ► non-emergency situations if no financial arrangement
  ► local reliability as part of a financial arrangement with another entity if:
    • it is an existing RICE at an area source;
    • the engine is dispatched by local transmission/distribution system operator;
    • the dispatch intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads;
    • the dispatch follows reliability, emergency operation, or similar protocols that follow specific NERC, regional, state, public utility commission, or local standards or guidelines;
    • Power is provided only to facility or to support local distribution system; and
    • owner/operator identifies and records dispatch and standard that is being followed.
Compliance Requirements:

Existing engine:
- Change oil/filter & inspect hoses/belts every 500 hours or annually; inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually
  - May use oil analysis program
- Operate/maintain per manufacturer’s instructions or owner-developed maintenance plan
- Minimize startup/idle
- Non-resettable hour meter
- Retain records of hours of operation and maintenance for 5 years
- Initial notifications **NOT** required

New engine:
- Meet Stationary Engine NSPS
  - Part 60 Subpart IIII if CI; part 60 subpart JJJJ if SI
## Oil Analysis Programs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condemning Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Base Number (TBN) (CI RICE only)</td>
<td>&lt;30% of the TBN of the oil when new</td>
</tr>
<tr>
<td>Total Acid Number (TAN) (SI RICE only)</td>
<td>Increases by more than 3.0 mg of potassium hydroxide per gram from TAN of the oil when new</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Changed by more than 20% from the viscosity of the oil when new</td>
</tr>
<tr>
<td>% Water Content by volume</td>
<td>&gt;0.5</td>
</tr>
</tbody>
</table>

- Oil analysis must be performed at same frequency specified for oil changes
- If condemned, change oil within 2 business days
  - Owner/operator must keep records of the analysis
Fuel Requirements

Requirements apply to emergency CI RICE >100 HP and displacement <30 liters/cylinder that are:

- Operated for local reliability (up to 50 hr/yr)

Beginning January 1, 2015, these engines were required to begin using ultra low sulfur diesel fuel.

- Existing inventory (purchased prior to 1/1/2015) may be depleted
Reporting Requirements

- Requirements apply to emergency RICE >100 HP that are operated for local reliability (up to 50 hr/yr)

- Beginning with 2015 operation, facilities were required to begin reporting electronically by March 31 of following year:
  - Facility name/address,
  - Engine rating, model year, lat/long
  - Date, start time, end time of operation
  - Entity that dispatched engine for local reliability and situation that necessitated dispatch
  - Deviations from fuel requirement

- Submit report electronically through the Compliance and Emissions Data Reporting Interface (CEDRI) on EPA’s Central Data Exchange at [http://www.epa.gov/cdx](http://www.epa.gov/cdx)
Requirements for Non-Emergency RICE at Area Sources of HAP
<table>
<thead>
<tr>
<th>HP</th>
<th>Engine Subcategory</th>
<th>Non-emergency</th>
<th>Spark Ignition 2SLB</th>
<th>Spark Ignition 4S in remote areas</th>
<th>Spark Ignition 4S not in remote areas</th>
<th>SI LFG/DG</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤300</td>
<td>Compression Ignition</td>
<td>Change oil/filter &amp; inspect air cleaner every 1,000 hours or annually; inspect hoses/belts every 500 hours or annually</td>
<td>Change oil/filter, inspect spark plugs, &amp; inspect hoses/belts every 4,320 hours or annually</td>
<td>Change oil/ filter, inspect spark plugs, &amp; inspect hoses/belts every 1,440 hours of operation or annually</td>
<td>Change oil/ filter, inspect spark plugs, &amp; inspect hoses/belts every 1,440 hours of operation or annually</td>
<td></td>
</tr>
<tr>
<td>300-500</td>
<td>49 ppm CO or 70% CO reduction</td>
<td>Change oil/filter, inspect spark plugs, &amp; inspect hoses/belts every 4,320 hours or annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;500</td>
<td>23 ppm CO or 70% CO reduction</td>
<td>Change oil/ filter, inspect spark plugs, &amp; inspect hoses/belts every 2,160 hours of operation or annually</td>
<td></td>
<td>If engine used &gt;24 hrs/yr:</td>
<td>If engine used &gt;24 hrs/yr:</td>
<td></td>
</tr>
</tbody>
</table>

New Non-Emergency RICE Located at Area Sources: meet Stationary Engine NSPS
• Part 60 Subpart III if CI; Part 60 Subpart JJJJ if SI
## Compliance Requirements:

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
</table>
| • Existing non-emergency CI >300 HP at area source | • Initial emission performance test  
  • Subsequent performance testing every 8,760 hours of operation or 3 years for engines >500 HP (5 years if limited use)  
  • Operating limitations - catalyst pressure drop and inlet temperature for engines >500 HP  
  • Notifications  
  • Semiannual compliance reports (annual if limited use)  
  • Ultra low sulfur diesel (ULSD)  
  • Crankcase emission control requirements |
| • Existing non-emergency SI 4SLB/4SRB >500 HP at area source used >24 hours/year and not in remote area | • Initial and annual catalyst activity checks  
  • High temperature engine shutdown or continuously monitor catalyst inlet temperature  
  • Notifications  
  • Semiannual compliance reports |
## Compliance Requirements:

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing non-emergency:</strong></td>
<td>• Operate/maintain engine &amp; control device per manufacturer’s instructions or owner-developed maintenance plan</td>
</tr>
<tr>
<td>• black start at area source</td>
<td>• May use oil analysis program instead of prescribed oil change frequency</td>
</tr>
<tr>
<td>• CI ≤300 HP at area source</td>
<td>• Keep records of maintenance</td>
</tr>
<tr>
<td>• SI ≤500 HP at area source</td>
<td>• Notifications not required</td>
</tr>
<tr>
<td>• SI 2SLB &gt;500 HP at area source</td>
<td></td>
</tr>
<tr>
<td>• SI LFG/DG &gt;500 HP at area source</td>
<td></td>
</tr>
<tr>
<td>• SI 4SLB/4SRB &gt;500 HP at area source</td>
<td></td>
</tr>
<tr>
<td>used ≤24 hours/year or in remote area</td>
<td></td>
</tr>
</tbody>
</table>
Requirements for RICE at Major Sources of HAP
# Emission Standards: Existing RICE at Major Sources

<table>
<thead>
<tr>
<th>HP</th>
<th>Engine Subcategory</th>
<th>Non-emergency</th>
<th>Emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100</td>
<td>Change oil and filter and inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours of operation or annually; inspect hoses and belts every 500 hours of operation or annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-300</td>
<td>230 ppm CO</td>
<td>225 ppm CO</td>
<td>177 ppm CO</td>
</tr>
<tr>
<td>300-500</td>
<td>49 ppm CO or 70% CO reduction</td>
<td>47 ppm CO</td>
<td>10.3 ppm CH₂O</td>
</tr>
<tr>
<td>&gt;500</td>
<td>23 ppm CO or 70% CO reduction</td>
<td>No standards</td>
<td>350 ppb CH₂O or 76% CH₂O reduction</td>
</tr>
</tbody>
</table>

Note: Existing limited use engines >500 HP at major sources do not have to meet any emission standards. Existing black start engines ≤500 HP at major sources must meet work practice standards.
# Emission Standards – New RICE at Major Sources

<table>
<thead>
<tr>
<th>HP</th>
<th>Engine Subcategory</th>
<th>Non-emergency</th>
<th>Emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CI</td>
<td>SI 2SLB</td>
</tr>
<tr>
<td>&lt;250</td>
<td>Comply with CI NSPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>250-500</td>
<td>Comply with SI NSPS</td>
<td>14 ppm CH₂O</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>or 93% CO reduction</td>
<td></td>
</tr>
<tr>
<td>&gt;500</td>
<td>580 ppb CH₂O or 70% CO reduction</td>
<td>12 ppm CH₂O or 58% CO reduction</td>
<td>350 ppb CH₂O or 76% CH₂O reduction</td>
</tr>
</tbody>
</table>

Note: New limited use engines >500 HP at major sources do not have to meet any emission standards under the NESHAP.
## Compliance Requirements:

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing non-emergency:</td>
<td>• Initial emission performance test with</td>
</tr>
<tr>
<td>• CI ≥100 HP at major source</td>
<td>• % load report and</td>
</tr>
<tr>
<td>• SI 100-500 HP at major source</td>
<td>• performance evaluation of continuous monitoring system associated with test</td>
</tr>
<tr>
<td></td>
<td>• Subsequent performance testing every 8,760 hours of operation or 3 years for engines &gt;500 HP (5 years if limited use)</td>
</tr>
<tr>
<td></td>
<td>• Operating limitations - catalyst pressure drop and inlet temperature for engines &gt;500 HP</td>
</tr>
<tr>
<td></td>
<td>• Notifications</td>
</tr>
<tr>
<td></td>
<td>• Semiannual compliance reports (annual if limited use)</td>
</tr>
</tbody>
</table>

Existing non-emergency CI >300 HP also need to use:
• Ultra low sulfur diesel (ULSD)
• Crankcase emission control requirements
## Compliance Requirements:

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing non-emergency:</strong></td>
<td>• Initial emission performance test</td>
</tr>
<tr>
<td>• SI 4SRB &gt;500 HP at major source</td>
<td>• Subsequent performance testing semiannually (can reduce frequency to annual)*</td>
</tr>
<tr>
<td><strong>New non-emergency:</strong></td>
<td>• Operating limitations - catalyst pressure drop and inlet temperature</td>
</tr>
<tr>
<td>• SI 2SLB &gt;500 HP at major source</td>
<td>• Notifications</td>
</tr>
<tr>
<td>• SI 4SLB &gt;250 HP at major source</td>
<td>• Semiannual compliance reports</td>
</tr>
<tr>
<td>• SI 4SRB &gt;500 HP at major source</td>
<td></td>
</tr>
<tr>
<td>• CI &gt;500 HP at major source</td>
<td></td>
</tr>
<tr>
<td><strong>New emergency/limited use &gt;500 HP at major source</strong></td>
<td>• Initial notification</td>
</tr>
<tr>
<td><strong>New non-emergency LFG/DG &gt;500 HP at major source</strong></td>
<td>• Initial notification</td>
</tr>
<tr>
<td></td>
<td>• Monitor/record fuel usage daily</td>
</tr>
<tr>
<td></td>
<td>• Annual report of fuel usage</td>
</tr>
</tbody>
</table>

*Subsequent testing required for 4SRB engine complying with formaldehyde % reduction standard only if engine is ≥5,000 HP*
## Compliance Requirements:

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Existing emergency/black start ≤500 HP at major source</td>
<td>• Operate/maintain engine &amp; control device per manufacturer’s instructions or owner-developed maintenance plan</td>
</tr>
<tr>
<td>• Existing non-emergency &lt;100 HP at major source</td>
<td>• May use oil analysis program instead of prescribed oil change frequency</td>
</tr>
<tr>
<td></td>
<td>• Emergency engines must have hour meter and record hours of operation</td>
</tr>
<tr>
<td></td>
<td>• Keep records of maintenance</td>
</tr>
<tr>
<td></td>
<td>• Notifications not required</td>
</tr>
</tbody>
</table>
New Source Performance Standards for Stationary Internal Combustion Engines

40 CFR Part 60 Subparts IIII and JJJJ
Stationary Compression Ignition
Internal Combustion Engine
NSPS Subpart IIII
CI ICE NSPS Applicability

CI Engines:

- constructed (ordered) after July 11, 2005 and manufactured after April 1, 2006 (July 1, 2006 for fire pump engines)
- modified/reconstructed after July 11, 2005
Engine manufacturers must certify 2007 model year and later engines with a displacement <30 liters/cylinder

Certification = EPA Certificate of Conformity
Owner/Operator Compliance Requirements

► 2007 model year and later*
  ► Purchase **certified** engine
    • Emission standards generally equivalent to “Tier” standards for nonroad engines
  ► Install, configure, operate and maintain engine per manufacturer’s instructions or manufacturer-approved procedures
    • Owner/operator performance testing not required
  ► If operated differently than manufacturer’s recommendations, must do performance test to show compliance
  ► Use ultra low sulfur diesel fuel

*For CI fire pump engine, 2008-2011 model year and later (depending on engine size)
## Monitoring/Recordkeeping/Reporting

<table>
<thead>
<tr>
<th>Engine Type</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Engines</td>
<td>• Non-resettable hour meter and records of operation if engine does not meet non-emergency engine standards</td>
</tr>
<tr>
<td>Equipped with diesel particulate filter (DPF)</td>
<td>• Backpressure monitor and records of corrective actions</td>
</tr>
</tbody>
</table>
| Non-emergency >3,000 HP or with displacement >10 liters/cylinder             | • Submit initial notification  
• Keep records of notifications and engine maintenance  
• If certified, keep records of documentation of engine certification  
• If not certified, keep records of compliance demonstrations                |
Stationary Spark Ignition Internal Combustion Engine NSPS Subpart JJJJ
SI ICE NSPS Applicability

- SI engines constructed (ordered) after June 12, 2006 and

<table>
<thead>
<tr>
<th>Manufactured On/After</th>
<th>Engine Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1, 2007</td>
<td>≥500 HP (except lean burn 500≤HP&lt;1,350)</td>
</tr>
<tr>
<td>January 1, 2008</td>
<td>Lean burn 500≤HP&lt;1,350</td>
</tr>
<tr>
<td>July 1, 2008</td>
<td>&lt;500 HP</td>
</tr>
<tr>
<td>January 1, 2009</td>
<td>Emergency &gt;25 HP</td>
</tr>
</tbody>
</table>

- Modified/reconstructed after June 12, 2006

Note: engine manufacturers must certify stationary SI engines ≤25 HP and engines >25 HP that are gasoline or rich burn LPG
### Emission Standards (In General)

<table>
<thead>
<tr>
<th>Engine</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤25 HP (all engines)</td>
<td>Part 90 or Part 1054 standards for new nonroad SI engines</td>
</tr>
<tr>
<td>Non-emergency gasoline and rich burn LPG</td>
<td>Part 1048 standards for new nonroad SI engines</td>
</tr>
<tr>
<td>Non-emergency natural gas and lean burn LPG</td>
<td>Part 1048 standards for new nonroad SI engines (or other options)</td>
</tr>
<tr>
<td>25&lt;HP&lt;100</td>
<td>Part 1048 standards for new nonroad SI engines (or other options)</td>
</tr>
<tr>
<td>≥100 HP and not gasoline or rich burn LPG</td>
<td>Standards in Table 1 of subpart JJJJ, Part 1048 standards for some engines</td>
</tr>
</tbody>
</table>

Owners/operators of gasoline engines must use gasoline that meets the sulfur limit in 40 CFR Part 80.195 – cap of 80 ppm
Certified engines

Install, configure, operate and maintain engine according to manufacturer’s instructions

If a facility does not operate/maintain according to manufacturer’s instructions, they must:

- keep maintenance plan and maintenance records
- operate consistent with good air pollution control practices
- \(100 \leq HP \leq 500\) – initial performance test
- \(>500\) HP – initial performance test and subsequent every 8,760 hours or 3 years, whichever is first
Compliance Requirements for Owners/Operators

► **Non-certified engines:**
   - Maintenance plan
   - Performance testing
     - $25<\text{HP} \leq 500$ – initial test
     - $>500 \text{ HP}$ - initial test and subsequent every 8,760 hours or 3 years, whichever is first
     - Conduct within 10% of peak (or highest achievable) load

► **Monitoring/recordkeeping/reporting includes:**
   - Non-resettable hour meter and records of operation for emergency engines
   - Documentation of certification
   - Records of engine maintenance
   - Initial notification for non-certified engines $>500 \text{ HP}$
   - Results of performance testing within 60 days of test
## Important Emission Control Information

(Certificate of Conformity)

The Biogas / Digester Gas Engine incorporated into this CHP (Combined Heat & Power) Module complies with United States EPA Emissions Regulations and Standards for SI Engines > 100HP (except Gasoline and Rich-Burn LPG), Stationary SI Landfill / Digester Gas Engines and Lean-Burn Gas Engines, 40 CFR Part 60, Table I to Subpart JJJJ of Part 60 (73 FR 3591, Jan. 18, 2008, as amended by 73 FR 59176, Oct. 8, 2008).

<table>
<thead>
<tr>
<th>Engine Model:</th>
<th>Core:</th>
<th>Displacement:</th>
<th>21.93 Liter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Family:</td>
<td>2G® CHP MAN E2842 LE322</td>
<td>Arrangement:</td>
<td>V12</td>
</tr>
<tr>
<td>Exhaust Emissions</td>
<td>2G® GEM Control</td>
<td>Compression:</td>
<td>12,0:1</td>
</tr>
<tr>
<td>Control System:</td>
<td>Bachmann MX213</td>
<td>Fuel:</td>
<td>Digester Gas</td>
</tr>
<tr>
<td>Load Output Rating</td>
<td>370 KW</td>
<td>NOx:</td>
<td>below EPA Max Limits</td>
</tr>
<tr>
<td>Rated Speed:</td>
<td>1800 RPM</td>
<td>CO:</td>
<td>below EPA Max Limits</td>
</tr>
<tr>
<td>Application:</td>
<td>Continuous / Digester Gas</td>
<td>VOC:</td>
<td>below EPA Max Limits</td>
</tr>
<tr>
<td>Valve Lash:</td>
<td>In. 0.50 mm / Ex. 0.50 mm</td>
<td>Idle Speed:</td>
<td>No other Adjustments needed</td>
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<tr>
<td>Serial Number:</td>
<td>SK0912C-BMLB-370188</td>
<td>Ignition Timing:</td>
<td>20 Degrees BTDC</td>
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<tr>
<td>ID Number</td>
<td>G3223</td>
<td>Date Of Manufacture:</td>
<td>17.01.2013</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>2G Energietechnik GmbH</td>
<td>Country of Origin:</td>
<td>Germany</td>
</tr>
</tbody>
</table>

**WARNING**

INJURY MAY RESULT AND WARRANTY IS VOIDED IF FUEL TYPE, RATE, RPM, TUNE UP SPECIFICATIONS, OR OPERATING CONDITIONS, OR ALTITUDES EXCEED PUBLISHED MAXIMUM VALUES FOR THIS MODEL AND APPLICATION.

2G Energietechnik GmbH
Benzstr. 3 - D-48619 Heek - Germany
Compliance Resources

► RICE compliance assistance materials on EPA’s website:
  ► This site includes a regulation navigation tool that allows you to input the specifications of your engine and the tool provides regulatory citations that apply to your engine subcategory.
  ► The site also provides sample notification and reporting forms, frequently asked questions, and presentations/webinars.
  ► The site contains information on the NESHAP and the two NSPS rules.
  ► The main site: [https://www.epa.gov/stationary-engines/](https://www.epa.gov/stationary-engines/) also provides general information about engine regulations and contact information for RICE experts in each EPA region.
  ► Link to spreadsheets listing which engine families have been certified: [https://www.epa.gov/compliance-and-fuel-economy-data/annual-certification-data-engines-and-equipment](https://www.epa.gov/compliance-and-fuel-economy-data/annual-certification-data-engines-and-equipment)
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