EPA’s Air Quality Regulations for Stationary Engines

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U.S. Environmental Protection Agency

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Overview of EPA’s emission standards for stationary engines:

- NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE)
- NSPS for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)
- NSPS for Stationary Spark Ignition (SI) ICE

Q&A
What are the Differences?

- **RICE NESHAP**
  - Applies to *existing*, new, and reconstructed stationary engines (both CI and SI)
  - Applies to engine owners/operators
  - Focus is *air toxics* (HAP)
  - Established under CAA section 112

- **CI/SI ICE NSPS**
  - Applies to new, *modified*, and reconstructed stationary CI/SI engines
  - Applies to engine *manufacturers* and owners/operators
  - Focus is *criteria pollutants*
  - Established under CAA section 111
Acronyms

- CAA: Clean Air Act
- CFR: Code of Federal Regulations
- CH₂O: Formaldehyde
- CI: Compression ignition
- CO: Carbon monoxide
- FR: Federal Register
- HAP: Hazardous air pollutants
- HP: Horsepower
- l/cyl: liters/cylinder
- NESHAP: National Emission Standards for Hazardous Air Pollutants
- NOx: Nitrogen oxides
- NSPS: New Source Performance Standards
- PM: Particulate matter
- RICE: Reciprocating internal combustion engine
- SI: Spark ignition
  - 2SLB: 2-stroke lean burn
  - 4SLB: 4-stroke lean burn
  - 4SRB: 4-stroke rich burn
  - LFG/DG: landfill gas/digester gas
- THC: Total hydrocarbons
- VOC: Volatile organic matter
Stationary RICE at a Glance

- ~1.5 million stationary engines in U.S.
  - 78% CI, 22% SI
  - ~900,000 used for emergency power
- Sizes range from 1 kW to >10 MW
- Main HAP emitted:
  - formaldehyde, acetaldehyde, acrolein, methanol, and PAH
- Main criteria pollutants emitted:
  - NOx, CO, VOC, PM
Stationary vs. Mobile

Stationary means not used in a motor vehicle and not a nonroad engine

- Nonroad engines are:
  - Self-propelled (tractors, bulldozers)
  - Propelled while performing their function (lawnmowers)
  - Portable or transportable (has wheels, skids, carrying handles, dolly, trailer, or platform)

- Portable nonroad becomes stationary if it stays in one location for more than 12 months (note different time criteria for seasonal source)
Stationary RICE NESHAP
RICE NESHAP – Overview

- 40 CFR part 63 subpart ZZZZ

- Regulates HAP emissions from stationary RICE at both major and area sources of HAP
  - All sizes of engines are covered

- ONLY EXEMPTION: existing emergency engines located at residential, institutional, or commercial area sources
<table>
<thead>
<tr>
<th></th>
<th>MAJOR SOURCES</th>
<th>AREA SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXISTING</td>
<td>NEW</td>
</tr>
<tr>
<td>&lt; 500 HP</td>
<td>2010 rules</td>
<td>2008 rule</td>
</tr>
<tr>
<td>&gt; 500 HP</td>
<td>2004 rule</td>
<td>2004 rule</td>
</tr>
<tr>
<td></td>
<td>2010 rule (non-emergency CI)</td>
<td></td>
</tr>
</tbody>
</table>
## Existing vs. New

<table>
<thead>
<tr>
<th></th>
<th>&gt;500 HP at major source</th>
<th>≤500 HP at major source or all HP at area source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing</strong></td>
<td>construction commenced before December 19, 2002</td>
<td>construction commenced before June 12, 2006</td>
</tr>
<tr>
<td><strong>New</strong></td>
<td>construction commenced on or after December 19, 2002</td>
<td>construction commenced on or after June 12, 2006</td>
</tr>
<tr>
<td><strong>Reconstructed</strong></td>
<td>reconstruction commenced after December 19, 2002</td>
<td>reconstruction commenced after June 12, 2006</td>
</tr>
</tbody>
</table>

- **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
## Emission Standards: Existing RICE Located 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>CI</td>
<td>SI 2SLB</td>
<td>SI 4SLB</td>
</tr>
<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>47 ppm CO</td>
</tr>
<tr>
<td>300–500</td>
<td>49 ppm CO or 70% CO reduction</td>
<td></td>
<td></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.
<table>
<thead>
<tr>
<th>HP</th>
<th>Engine Subcategory</th>
<th>Non-emergency</th>
<th>Emergency or Black start</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤300</td>
<td>CI</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 1,440 hours of operation or annually</td>
</tr>
<tr>
<td></td>
<td>SI 2SLB</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>
</tr>
<tr>
<td>300-500</td>
<td>49 ppm CO or 70% CO reduction*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;500</td>
<td>23 ppm CO or 70% CO reduction*</td>
<td>47 ppm CO or 93% CO reduction**</td>
<td>2.7 ppm CH₂O or 76% CH₂O reduction**</td>
</tr>
</tbody>
</table>

*Except engines in rural Alaska
**If engine used >24 hrs/yr
# Emission Standards – New RICE Located 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>≤250</td>
<td>CI</td>
<td>Comply with CI NSPS</td>
<td>Comply with CI NSPS</td>
</tr>
<tr>
<td></td>
<td>SI 2SLB</td>
<td>Comply with SI NSPS</td>
<td>Comply with SI NSPS</td>
</tr>
<tr>
<td></td>
<td>SI 4SLB</td>
<td>Comply with SI NSPS</td>
<td>Comply with SI NSPS</td>
</tr>
<tr>
<td></td>
<td>SI 4SRB</td>
<td>Comply with SI NSPS</td>
<td>Comply with SI NSPS</td>
</tr>
<tr>
<td></td>
<td>SI LFG/DG</td>
<td>Comply with SI NSPS</td>
<td>Comply with CI/SI NSPS</td>
</tr>
<tr>
<td>250–500</td>
<td></td>
<td>14 ppm CH(_2)O or 93% CO reduction (also comply with SI NSPS)</td>
<td>No standards (also comply with CI/SI NSPS)</td>
</tr>
<tr>
<td>&gt;500</td>
<td>580 ppb CH(_2)O or 70% CO reduction (also comply with CI NSPS)</td>
<td>12 ppm CH(_2)O or 58% CO reduction (also comply with SI NSPS)</td>
<td>350 ppb CH(_2)O or 76% CH(_2)O reduction (also comply with SI NSPS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No standards (also comply with SI NSPS)</td>
</tr>
</tbody>
</table>

Notes: New limited use engines >500 HP at major sources do not have to meet any emission standards under the NESHAP. New engines may also be subject to the NSPS.
Emission Standards – New RICE Located at Area Sources

- Meet Stationary Engine NSPS
  - CI: part 60 subpart IIII
  - SI: part 60 subpart JJJJ
## Oil Analysis Programs

<table>
<thead>
<tr>
<th></th>
<th>CI RICE Condemning Limits</th>
<th>SI RICE Condemning Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Base #</td>
<td>&lt;30% of the TBN of the oil when new</td>
<td>NA</td>
</tr>
<tr>
<td>Total Acid #</td>
<td>NA</td>
<td>Increases by more than 3.0 mg of KOH 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>
<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>
<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 days
  - Owner/operator must keep records of the analysis
Startup and Shutdown

- Startup and idling time must be kept to 30 minutes or less, after which, normal emission standards apply
- Normal emission standards apply during shutdowns
**HAP Emission Controls**

- **CI and SI lean burn engines**
  - Oxidation catalyst
    - Estimated capital cost:
      - CI: $27.4*HP – $939
      - SI 4SLB: $12.8*HP + $3,069
    - Estimated annual cost:
      - CI: $4.99*HP + $480
      - SI 4SLB: $1.81*HP + $3,442

- **SI 4SRB engines**
  - Non-selective catalytic reduction (3-way catalyst)
    - Estimated capital cost: $24.9*HP + $13,118
    - Estimated annual cost: $4.77*HP + $5,679
## Emergency Engine Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Yearly Limit</th>
<th>Exceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Service</td>
<td>No limits</td>
<td>None</td>
</tr>
<tr>
<td>Maintenance Checks &amp; Readiness</td>
<td>100 hours</td>
<td>If engine is &gt;500 HP, at a major source, and installed prior to June 12, 2006, no limit on maintenance/testing</td>
</tr>
<tr>
<td>Testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Emergencies</td>
<td>50 hours</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Counts as part of the 100 hr/yr maintenance limit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak shaving not allowed</td>
<td></td>
</tr>
<tr>
<td>Demand Response</td>
<td>15 hours in emergency situations</td>
<td>Engines &gt;500 HP, at a major source, and installed prior to June 12, 2006 do not have the allowance for 15 hours of demand response</td>
</tr>
<tr>
<td></td>
<td>Counts as part of the 50 hr/yr non-emergency limit</td>
<td></td>
</tr>
</tbody>
</table>
# Compliance Requirements

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing non–emergency:</td>
<td></td>
</tr>
<tr>
<td>• CI ≥100 HP at major source</td>
<td></td>
</tr>
<tr>
<td>• CI &gt;300 HP at area source</td>
<td></td>
</tr>
<tr>
<td>• SI 100–500 HP at major source</td>
<td></td>
</tr>
<tr>
<td>• SI 4SLB/4SRB &gt;500 HP at area source used &gt;24 hours/year</td>
<td></td>
</tr>
<tr>
<td>• Initial emission performance test</td>
<td></td>
</tr>
<tr>
<td>• Subsequent performance testing every 8,760 hours of operation or 3 years for engines &gt;500 HP (5 years if limited use)</td>
<td></td>
</tr>
<tr>
<td>• Operating limitations – catalyst pressure drop and inlet temperature for engines &gt;500 HP</td>
<td></td>
</tr>
<tr>
<td>• Notifications</td>
<td></td>
</tr>
<tr>
<td>• Semiannual compliance reports (annual if limited use)</td>
<td></td>
</tr>
</tbody>
</table>

Existing non–emergency CI >300 HP:  
• Ultra low sulfur diesel (except rural Alaska)  
• Crankcase emission control requirements
# Compliance Requirements

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing emergency/black start:</strong></td>
<td>• Operate/maintain engine &amp; control device per manufacturer’s instructions or owner-developed maintenance plan</td>
</tr>
<tr>
<td>• &lt;100 HP at major source</td>
<td>• May use oil analysis program instead of prescribed oil change frequency</td>
</tr>
<tr>
<td>• ≤500 HP at major source</td>
<td>• Emergency engines must have hour meter and record hours of operation</td>
</tr>
<tr>
<td>• at area source</td>
<td>• Keep records of maintenance</td>
</tr>
<tr>
<td><strong>Existing non-emergency:</strong></td>
<td>• Notifications not required</td>
</tr>
<tr>
<td>• &lt;100 HP at major source</td>
<td></td>
</tr>
<tr>
<td>• CI ≤300 HP at area source</td>
<td></td>
</tr>
<tr>
<td>• SI ≤500 HP at area source</td>
<td></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>• at area source used ≤24 hours/year</td>
<td></td>
</tr>
</tbody>
</table>
## Compliance Requirements

<table>
<thead>
<tr>
<th>Engine Subcategory</th>
<th>Compliance Requirements</th>
</tr>
</thead>
</table>
| **Existing non-emergency:**  
  • SI 4SRB >500 HP at major source |  
  • Initial emission performance test  
  • Subsequent performance testing semiannually (can reduce frequency to annual)*  
  |  
| **New non-emergency:**  
  • SI 2SLB >500 HP at major source  
  • SI 4SLB >250 HP at major source  
  • SI 4SRB >500 HP at major source  
  • CI>500 HP at major source |  
  • Operating limitations – catalyst pressure drop and inlet temperature  
  • Notifications  
  • Semiannual compliance reports  

*Subsequent testing required for 4SRB engine complying with CH2O % reduction 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>• New emergency/limited use &gt;500 HP at major source</td>
<td>• Initial notification only</td>
</tr>
<tr>
<td>• New non-emergency LFG/DG &gt;500 HP at major source</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>
Determining RICE NESHAP Requirements for your Engine

- **RICE NESHAP TTN website**
  - [http://www.epa.gov/ttn/atw/rice/ricepg.html](http://www.epa.gov/ttn/atw/rice/ricepg.html)
    - Example notifications and compliance reports
    - Applicability flow chart
    - Summary table with applicable requirements
    - Regulation Navigation tool

- **Electronic CFR**
  - [http://www.gpoaccess.gov/ecfr](http://www.gpoaccess.gov/ecfr)
## Key Dates

<table>
<thead>
<tr>
<th>Engine Type</th>
<th>Compliance Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing RICE &gt;500 HP at major sources</td>
<td>June 15, 2007</td>
</tr>
<tr>
<td>Existing CI RICE (except emergency CI &gt;500 HP at major sources)</td>
<td>May 3, 2013</td>
</tr>
</tbody>
</table>
| Existing SI RICE:  
  • ≤500 HP at major sources  
  • all HP at area sources | October 19, 2013 |
| New engines | Upon startup |

- Initial applicability notifications were due:  
  - August 31, 2010 for existing CI RICE  
  - February 16, 2011 for existing SI RICE
Compliance Extension [§63.6(i)]

- Under 40 CFR 63.6(i),
  - EPA can grant up to 1 year if necessary to install controls
- State can also approve if
  - Delegated the NESHAP, or
  - The source is required to obtain a Title V operating permit, and state has an approved permit program
- Application process
  - Submit written request to EPA regional office or state 120 days in advance of the compliance date (unless the need arose later due to circumstances beyond reasonable control)
  - Include a schedule for construction and final compliance and description of the controls
RICE NESHAP – Next Steps

- After promulgation of the 2010 amendments, EPA received several petitions for reconsideration, petitions for judicial review, and other communications regarding several issues with the final rules

- Proposed amendments on June 7, 2012 (77 FR 33812)
Stationary ICE NSPS
Stationary CI Engine NSPS

- 40 CFR part 60 subpart III
- Affects new, modified, and reconstructed stationary CI engines
- Originally promulgated July 11, 2006
- Amended June 28, 2011
Who is Subject to the CI NSPS?

- Manufacturers of 2007 model year or later stationary CI engines <30 liters/cylinder displacement
  - Model years differ for fire pump engines

- Owners/operators of stationary 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
Modification/Reconstruction

- **Modification**
  - Physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of a regulated pollutant
  - See 40 CFR 60.14

- **Reconstruction**
  - Replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost of a comparable entirely new facility, and it is technologically and economically feasible to meet the applicable standards
  - See 40 CFR 60.15 and 63.2
Emission Standards
Engines with displacement <10 liters/cylinder

- Pre-2007 model year engines
  ◦ Meet emission standards equivalent to Tier 1 standards for nonroad CI engines

- 2007 model year and later
  ◦ Meet emission standards equivalent to Tier standards for nonroad CI engines
    • Tier 2/3 in part 89, Tier 4 in part 1039
  ◦ Emergency engines >50 HP only have to meet Tier 3 standards (or Tier 2 if no Tier 3)

- Fire pump engines
  ◦ Same emission standards, delayed schedule
Emission Standards
Engines with displacement 10–30 liters/cylinder

- Meet emission standards equivalent to Tier standards for marine CI engines
  - Tier 2 in part 94, Tier 3/4 in part 1042
  - Emergency engines do not have to meet the most stringent (Tier 4) standards
Emission Standards

Engines with displacement ≥30 liters/cylinder

- NOx and PM limits
  - NOx limits (g/kW–hr): equivalent to EPA standards for large marine engines
  - PM limit:
    - 60% reduction or 0.15 g/kW–hr for non-emergency
    - 0.40 g/kW–hr for emergency

- Non-emergency limits based on use of SCR and electrostatic precipitator
## Fuel Requirements

<table>
<thead>
<tr>
<th>Date</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1, 2007</td>
<td>Low sulfur diesel (LSD)</td>
</tr>
<tr>
<td>October 1, 2010</td>
<td>Ultra low sulfur diesel (ULSD)</td>
</tr>
</tbody>
</table>
| Engines <30 liters / cylinder displacement | • Max sulfur content 15 ppm  
• Minimum cetane index of 40 or max aromatic content of 35 volume % |
| June 1, 2012       | 1,000 ppm sulfur diesel                                                     |

Note: engines not subject to subpart III are **not** subject to these requirements
Requirements for Engine Manufacturers

- Certify 2007 model year and later engines with displacement <30 liters/cylinder
  - Fire pump engines certified beginning model year 2008–2011
  - Certification = EPA Certificate of Conformity

- Not required to certify engines with displacement ≥30 liters/cylinder
CI Engine NSPS – Compliance

- 2007 model year and later CI engine with displacement <30 liters/cylinder (except fire pump engines)
  - purchase certified engine
  - for CI fire pump engine, 2008–2011 model year and later (depending on engine size)
  - Install, configure, operate and maintain engine per manufacturer’s instructions or manufacturer-approved procedures
    - Owner/operator performance testing not required
  - Per June 28, 2011 amendments (76 FR 37954), can operate differently than manufacturer’s recommendations, but must do performance test to show compliance
CI Engine NSPS – Compliance

- Engines <30 liters/cylinder not required to be certified (Pre-2007 model year, earliest fire pump engines):
  - Choose 1 of 5 options for demonstrating compliance:
    - Purchase certified engine
    - Keep records of performance test conducted on similar engine
    - Keep records of engine manufacturer data indicating compliance
    - Keep records of control device vendor data indicating compliance
    - Conduct initial performance test
CI Engine NSPS – Compliance

- Engines $\geq 30$ liters/cylinder displacement
  - Initial performance test
  - Annual performance test for non-emergency engine
  - Continuously monitor operating parameters
# 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>
<tr>
<td>Non-emergency &gt;3,000 HP or having a displacement &gt;10 liters/cylinder</td>
<td>• Submit initial notification</td>
</tr>
<tr>
<td></td>
<td>• Keep records of notifications and engine maintenance</td>
</tr>
<tr>
<td></td>
<td>• If certified, keep records of documentation of engine certification</td>
</tr>
<tr>
<td>Pre-2007 model year &gt;175 HP that are not certified</td>
<td>• If not certified, keep records of compliance demonstrations</td>
</tr>
</tbody>
</table>
Provisions for Engines in Remote Alaska

- Pre-2014 model year engines exempted from NSPS fuel requirements

- Allow use of engines certified to marine engine standards, rather than land-based nonroad engine standards

- Engines not required to meet Tier 4 NOx standards

- Engines not required to meet Tier 4 PM standards until 2014 model year

- Allow blending of used lubricating oil
  - In volumes of up to 1.75 percent of the total fuel,
  - If the sulfur content of the used lubricating oil is less than 200 ppm and the used lubricating oil is “on-spec”
Stationary SI Engine NSPS

- 40 CFR part 60 subpart J
- Affects new, modified, and reconstructed stationary SI engines
- Initially promulgated on January 18, 2008
- Amended June 28, 2011
Who is Subject to the SI NSPS?

Manufacturers of stationary SI engines:
- \( \leq 25 \) HP and manufactured on/after July 1, 2008
- \( >25 \) HP, gasoline or rich burn LPG, manufactured on/after July 1, 2008 (on/after January 1, 2009 if emergency engines)
- Voluntarily certified engines manufactured on or after:

<table>
<thead>
<tr>
<th>Date</th>
<th>Engine Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1, 2007</td>
<td>( &gt;500 ) HP (except lean burn ( 500 \leq \text{HP} &lt; 1,350 ))</td>
</tr>
<tr>
<td>January 1, 2008</td>
<td>lean burn ( 500 \leq \text{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 engines</td>
</tr>
</tbody>
</table>
Who is Subject to the SI NSPS? (cont’d)

Owners/operators of 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**
Emission Standards

- Phased in over time with increasing levels of stringency
- Output-based, units of g/KW–hr (g/HP–hr)
- ppmvd@15% O₂ standards for some engines
- Pollutants: NOx, CO, VOC
- Some standards modeled after EPA’s standards for nonroad SI engines
## 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 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>
Fuel Requirements

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

Note: engines not subject to subpart JJJJ are not subject to these requirements.
Compliance Requirements for Engine Manufacturers

- Engine manufacturers must certify engines ≤25 HP, gasoline engines, and rich burn LPG engines
  - Certification = EPA Certificate of Conformity

- Engine manufacturers can elect to certify other engines
Compliance Requirements for Owners/Operators

- Certified engines
  - Install, configure, operate and maintain engine according to manufacturer’s instructions
  - If you do not operate/maintain according to manufacturer’s instructions:
    - keep maintenance plan and maintenance records
    - operate consistent with good air pollution control practices
    - $100 \leq \text{HP} \leq 500$ – 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
    - $> 500$ 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 Requirements for Owners/Operators

- Install non-resettable hour meter:
  - emergency engine $\geq 500$ HP built on/after July 1, 2010
  - emergency engine $130 \leq \text{HP} < 500$ built on/after January 1, 2011
  - emergency engine $< 130$ HP built on/after July 1, 2008

This is required only if engine does not meet standards for non-emergency engines.
Recordkeeping/Reporting

Requirements include:

- Documentation of certification
- Records of engine maintenance
- Records of hours of operation for emergency engines
- Initial notification for non-certified engines >500 HP
- Results of performance testing within 60 days of test
NSPS Emergency Engine Requirements

- No limits on hours of operation for emergency service

- Maintenance checks/readiness testing limited to 100 hrs/yr
  - Can be more if mandated by Federal, State, or local standards
  - Owner/operator can also petition for more hours

- 50 hrs/yr allowed for non-emergencies
  - Counts as part of the 100 hr/yr maintenance & testing limit

- Engine cannot be used for peak shaving, to supply power to the electric grid, or to supply power as part of financial arrangement with another entity
Contact Information

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It's QUESTION TIME!!