RICE Rules: What you need to know if you own an engine.

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What is RICE?

- Reciprocating internal combustion engine - (RICE)
- CI = Compression ignition (diesel)
- SI = Spark ignition (natural gas, landfill gas, gasoline, etc.)
  - 2SLB – 2 stroke-lean burn
  - 4SLB – 4 stroke-lean burn
  - 4SRB – 4 stroke-rich burn
Topics of Discussion:

• Background on new rules
  ▫ NESHAP and NSPS
• Do these rules apply to me?
• What do I need to do if I am applicable?
• FAQ on RICE rules
• Determination examples
NESHAP RICE Rules

- Located in 40 CFR 63 Subpart ZZZZ
- Establishes emission and operating limitations for RICE at both major and area sources of HAPs.
- Important to note! Regulations apply for both new and existing RICE units!
NESHAP RICE Rules

- All sizes of stationary RICE are covered by ZZZZ.
  - In addition to new or existing units.
- How do I determine if I am applicable?
  - Engine’s HP
  - Construction commencement date*
  - CI or SI
  - Emergency engine?
  - Yearly hours of operation
  - Engine displacement.

* The construction date is defined as the date the owner/operator 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. This date does not include moving the engine from one location to another.
NSPS ICE Rules

- The provisions of 40 CFR 60 Subpart IIII and JJJJJ are applicable to manufacturers, owners, and operators of stationary CI and stationary spark ignition SI internal combustion engines (ICE)

  ▫ Compression Ignition Engines:
    → 40 CFR 60 Subpart IIII
  ▫ Spark Ignition Engines:
    → 40 CFR 60 JJJJJ
NSPS ICE Rules

- Unlike ZZZZ, IIII and JJJJ are only applicable to “new” sources.
- What does that mean? **It gets complicated!**
  - CI ICE applicability depends on:
    - Engines order and manufacture date.
    - Also have to consider modification or reconstruction dates.
  - SI ICE applicability depends on:
    - Engines order and manufacture date.
    - Varies based on HP of engine and type of SI
    - Have to consider modification or reconstruction dates.
Exemption Determination

• Do these rules even apply to me?
• That depends on the number of hours the engine is in operation and if it is an emergency engine.
• Also, is the engine portable?

Am I exempt from the RICE NESHAP?

Is the engine portable?

Is the engine an emergency engine used or obligated for ≤ 15hr/yr?

What is the horsepower of the engine? Is it at a major source?

What is the date of construction commencement?

≤500 HP at major source & all HP at area source

≤500 HP at major source

>500 HP at major source

Depending on the source, this is an existing RICE unit at a major/area source.

Depending on the source, this is a new RICE unit at a major/area source.

This is a new RICE unit at a major source.

This is an existing RICE unit at a major source.

Before 6/12/06

Before 12/19/02

On or After 6/12/06

On or After 12/19/02
Exemption Determination

• How to determine if it is portable
  ▫ Is the engine on a piece of equipment that is self-propelled or designed to be and capable of being carried or moved from one location to another. Does the engine have wheels, skids, carrying handles, a dolly, a trailer or a platform?

• A portable engine becomes stationary if it stays in one location for more than 12 consecutive months.
Engine Classification

- If you aren’t exempt you are either:
  - An existing RICE at a major/area source or
  - A new RICE at a major/area source

- Depends on the horsepower of the engine and the date of construction commencement
Emergency Engines

• Operation restrictions for emergency engines includes:
  ▫ Unlimited use for emergencies (e.g. power outage, floods).
  ▫ 100 hr/yr operation limitation.
  ▫ 50 hr/yr of the 100 hr/yr can be used for:
    • Non-emergency situations
    • Local reliability as part of a financial agreement with another entity
    • Peak shaving until May 3, 2014

• Emergency engines are still applicable to ZZZZ, IIII and JJJJ. However, certain restrictions may be a bit more lenient.
Recordkeeping and Fuel Requirements

• Potential recordkeeping includes:
  ▫ Records of maintenance, malfunction & operation.

• Potential fuel requirements include:
  ▫ Maximum sulfur content of 15 ppm.
  ▫ Minimum cetane index of 40 or maximum aromatic content of 35%, volume.
  ▪ These requirements may already be applicable!
Maintenance Requirements, Installation and Other Misc. Requirements

• Potential maintenance includes:
  ▫ Changing oil and filter every 500 hours of operation or annually.
  ▫ Inspecting air cleaner or spark plugs every 1,000 hours of operation or annually.
  ▫ Inspecting all hoses and belts every 500 hours of operation or annually.

• Potential installation requirements:
  ▫ A non-resettable hour meter
  ▫ A back pressure monitor

• Potential Misc. Requirements:
  ▫ Limiting idle time
  ▫ Annual reports
Basic Emission Standards

- CO and CH$_2$O mixing ratio limitations or percent reductions.

- Some ZZZZZ emission standards point to IIII and JJJJJ for compliance requirements.
Frequently Asked RICE Questions

• What if I move my engine around my quarry?
  ▫ A portable RICE unit that is used within a quarry fulfills the 12 consecutive month movement caveat if it is moved within the quarry. However, its movement does not satisfy this requirement if it is moved solely for the purposes of fulfilling this part of the rule. In other words, its movement must be due to need or function.*

• What is reconstruction defined as?
  ▫ Replacement of components of an existing engine to such an extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost of a comparable entirely new engine.

* U.S. EPA determination made on 12/05/2008.
Determination Example 1

- Engine details: A 350 HP, compression ignition engine located at an area source of HAP’s. The engine was constructed onsite in 2004. It is classified as an emergency engine and operates 85 hours a year.

Oh no, am I applicable to emission standards?!?!
Determination Example 1

• Engine details: A 350 HP, compression ignition engine located at an area source of HAP’s. The engine was constructed onsite in 2004. It is classified as an emergency engine and operates 85 hours a year.

• No! There are no applicable emission standards because the engine is an emergency engine and operates less than 100 hours/year.

• However, there are fuel, maintenance, installation, operation and record keeping requirements!
Determination Example 2

- Engine details: A 300 HP, compression ignition engine located at a major source of HAP’s. The engine was constructed onsite in 2010, operates 200 hours a year and has a displacement of 8 liters/cylinder.

<table>
<thead>
<tr>
<th>HP</th>
<th>Engine Subcategory</th>
<th>Non-emergency</th>
<th>Emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;250</td>
<td>Comply with CI NSPS</td>
<td>Comply with SI NSPS</td>
<td>Comply with SI NSPS</td>
</tr>
<tr>
<td>250-500</td>
<td>580 ppb CH₂O or 70% CO reduction</td>
<td>12 ppm CH₂O or 58% CO reduction</td>
<td>Comply with CI/SI NSPS</td>
</tr>
<tr>
<td>&gt;500</td>
<td>350 ppb CH₂O or 76% CH₂O reduction</td>
<td>No standards</td>
<td>No standards</td>
</tr>
</tbody>
</table>
Determination Example 2

• Engine details: A 300 HP, compression ignition engine located at an major source of HAP’s. The engine was constructed onsite in 2010, operates 200 hours a year and has a displacement of 8 liters/cylinder.

• **ZZZZ emissions requirements:** Comply with CI NSPS!
  ▫ Comply with Tier 3 emission standards. This includes NMHC + NOx, CO and PM emission standards.

• Must limit time engine is spent idle during startup, not to exceed 30 minutes.

• Also, must keep certain recordkeeping requirements.
Conclusions:

- The RICE NESHAP and NSPS rules are complex.
  - Am I even applicable?
  - What is my engine classification?
  - The NESHAP rules apply to all stationary ICE. NSPS rules only apply to “new” stationary ICE.

- Certain emissions standards, as well as fuel, maintenance, testing, operation, installation and recordkeeping requirements may be applicable.

- Various tools and resources to help determine applicability can be found on EPA’s website⁠¹.

¹: http://www.epa.gov/ttnatwo1/rice/ricepg.html
Questions?

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