



# 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!



I'm not applicable

# 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 JJJJ are applicable to manufacturers, owners, and operators of stationary CI and stationary spark ignition SI internal combustion engines (ICE)



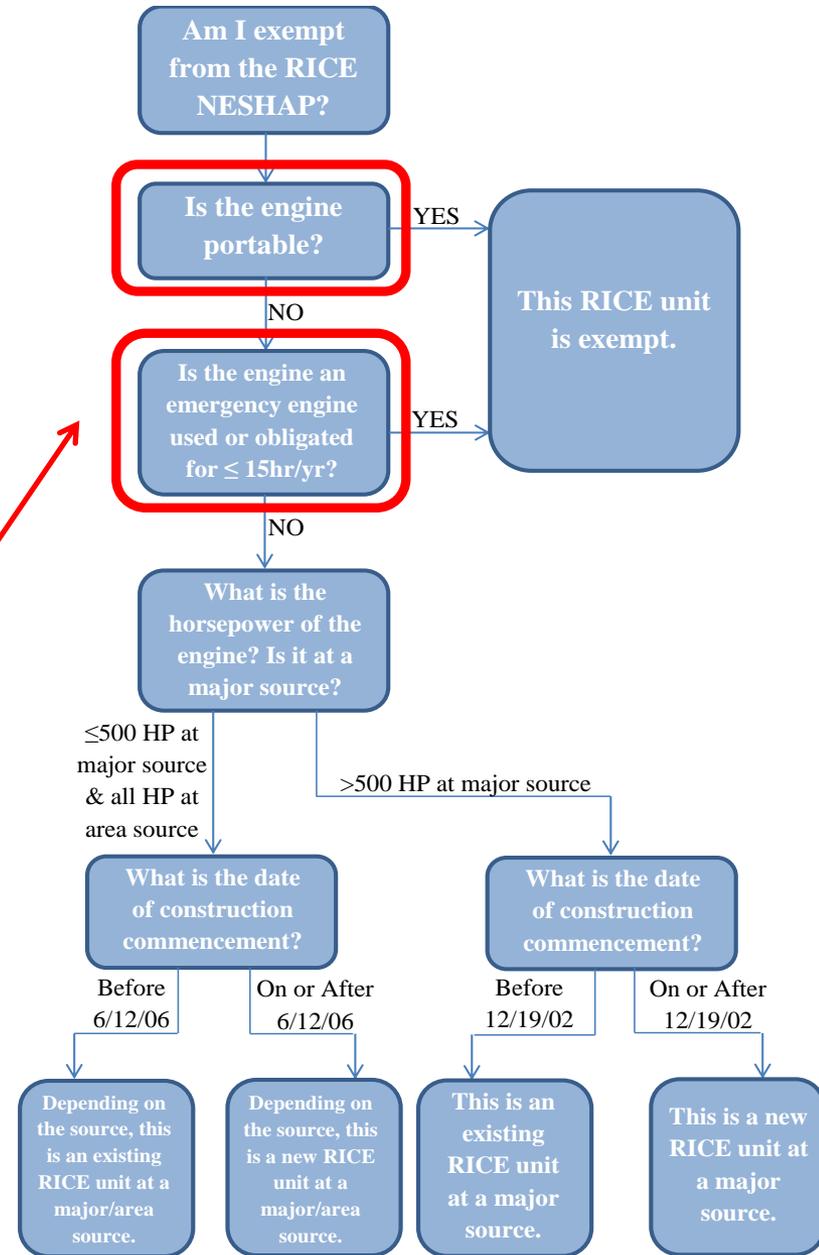
- Compression Ignition Engines:
  - 40 CFR 60 Subpart IIII
- Spark Ignition Engines:
  - 40 CFR 60 JJJJ

# 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?



# 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.

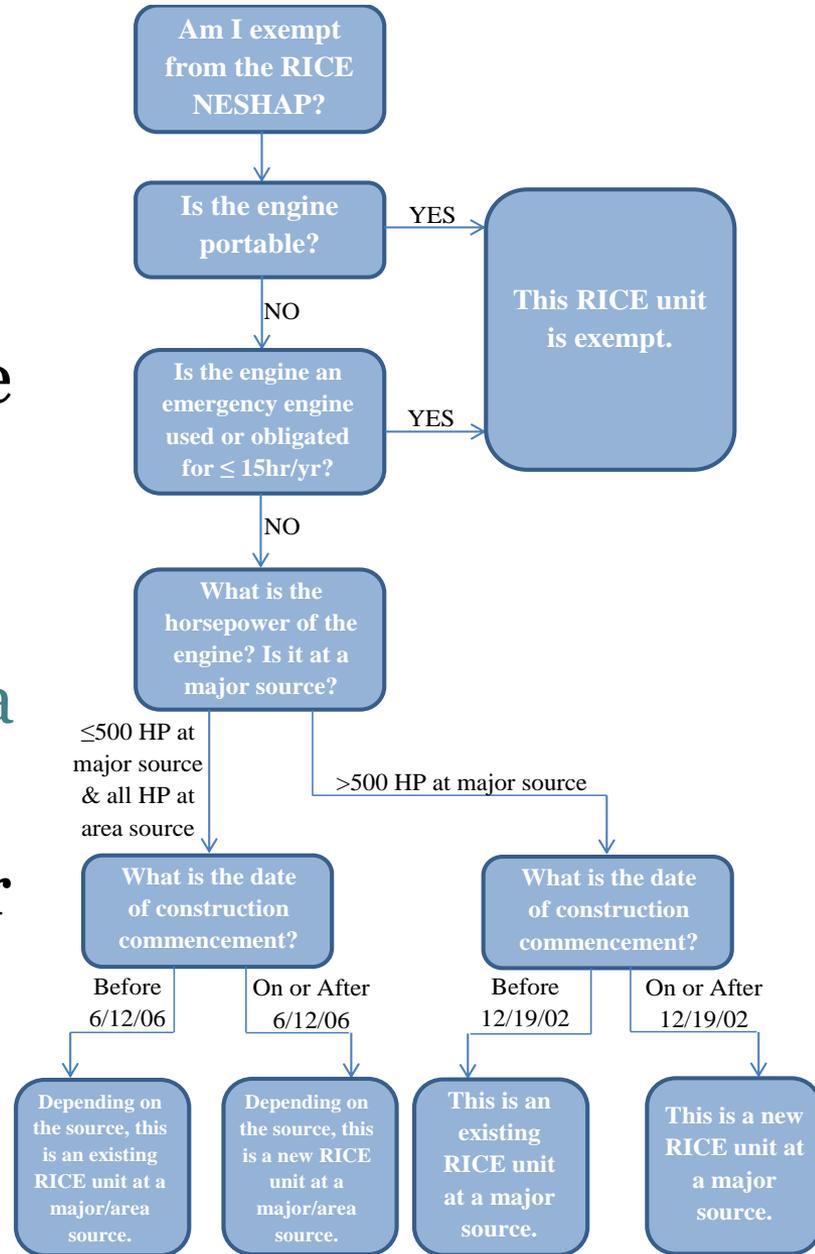


vs.



# 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

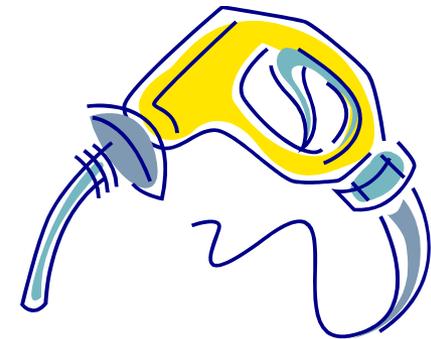
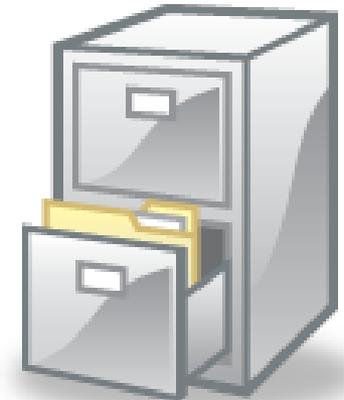


# Emergency Engines

- 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<sub>2</sub>O mixing ratio limitations or percent reductions.



HP	Engine Subcategory				
	Non-emergency				
	CI	SI 2SLB	SI 4SLB	SI 4SRB	SI LFG/DG
300-500	49 ppm CO or 70% CO reduction				

- Some ZZZZ emission standards point to IIII and JJJJ for compliance requirements.

HP	Engine Subcategory				
	Non-emergency				
	CI	SI 2SLB	SI 4SLB	SI 4SRB	SI LFG/DG
<250	Comply with CI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS
250-500			14 ppm CH <sub>2</sub> O or		

# 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?!?! 

Emission Standards: Existing RICE Located at Area Sources

HP	Engine Subcategory					
	Non-emergency					Emergency or Black start
	CI	SI 2SLB	SI 4S in remote areas	SI 4S not in remote areas	SI LFG/DG	
≤300	Change oil/filter & inspect air cleaner every 1,000 hours or annually; inspect hoses/belts every 500 hours or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 4,320 hours or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 1,440 hours of operation or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 1,440 hours of operation or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 1,440 hours of operation or annually	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
300-500	49 ppm CO or 70% CO reduction					
>500	23 ppm CO or 70% CO reduction	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 2,160 hours of operation or annually	If engine used >24 hrs/yr: 4SLB: Install oxidation catalyst 4SRB: Install NSCR			

# 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.

New RICE Located at Major Sources:

HP	Engine Subcategory					
	Non-emergency					Emergency
	CI	SI 2SLB	SI 4SLB	SI 4SRB	SI LFG/DG	
<250	Comply with CI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with CI/SI NSPS
250-500			14 ppm CH <sub>2</sub> O or 93% CO reduction			
>500	580 ppb CH <sub>2</sub> O or 70% CO reduction	12 ppm CH <sub>2</sub> O or 58% CO reduction	14 ppm CH <sub>2</sub> O or 93% CO reduction	350 ppb CH <sub>2</sub> O or 76% CH <sub>2</sub> O reduction	No standards	No standards

# 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 + NO<sub>x</sub>, 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 website<sup>1</sup>.



1: <http://www.epa.gov/ttnatwo1/rice/ricepg.html>

# Questions?

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