Impacts of the RICE Rule

- Over 900,000 existing CI engines estimated to be impacted
- 80% of those are emergency engines
Emission Reductions for 2013 (Estimated)

Reductions, tons

Pollutants

VOC (27,000)

CO (14,000)

PM (2,800)

HAP (1,010)
Estimated Control Costs

• For the year 2013:
  – Capital costs: $744 million
  – Annual costs: $373 million
Estimated Annual Benefits
(based on PM$_{2.5}$ & precursor reductions)

• ~ 110 - 270 fewer premature deaths
• Dozens fewer
  – Hospital/ER visits
  – Cases of severe health effects (e.g., chronic bronchitis, heart attacks)
• Thousands fewer minor respiratory symptoms
• These benefits ≈ $940M to $2.1B annually
Emergency Engine Requirements

- No limits on hours of operation for emergency service
- Maintenance checks & readiness testing limited to 100 hrs/yr
Emergency Engine Requirements

- 50 hrs/yr allowed for non-emergencies, but:
  - Counts as part of the 100 hr/yr maintenance & testing limit
  - Not for peak shaving, or generating income
  - Up to 15 of the 50 hrs/yr can be used for demand response in emergency situations (e.g., imminent blackout)
RICE = Reciprocating Internal Combustion Engines

• There are two types of RICE:
  – CI = Compression Ignition (diesel)
  – SI = Spark Ignition (gas-fired)

• Stationary version of car/truck engines

• Used to drive compressors, pumps, electric generators & other equipment
Examples of RICE
Examples
Examples
Examples
(soundproofed generator)
### RICE NESHAP: 2004

<table>
<thead>
<tr>
<th>AREA SOURCES</th>
<th>MAJOR SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEW</td>
<td>NEW</td>
</tr>
<tr>
<td>EXISTING</td>
<td>EXISTING</td>
</tr>
</tbody>
</table>

- **New engines > 500 HP** located at major sources

**Covered engines > 500 HP located at major sources**
RICE NESHAP: 2008

Added new engines ≤ 500 HP located at major sources, plus all new engines at area sources
This newest rule covers

• Existing engines:
  – < 500 HP at major sources
  – Of any size at area sources
  – Non-emergency engines > 500 HP at major sources (due to a consent decree)
Just to clarify . . .

- Proposed rule (March 5, 2009) covered both CI & SI engines
- Final rule issued in two parts:
  - CI engines: covered by rule we’re discussing today
  - SI engines: covered by rule to be signed August 10, 2010
Standards and Requirements: Three Groups

• Non-emergency engines > 300 HP
• Non-emergency engines 100 - 300 HP at major sources
• Engines that are
  – < 100 HP at major sources
  – < 300 HP at area sources
  – All emergency engines (major / area sources)
Non-emergency engines > 300 HP: 
Emission Standards

- Numerical CO emission limits
  - based on oxidation catalyst controls
- Operating limitations for engines >500 HP
  - Catalyst pressure drop & inlet temperature
- Ultra-low sulfur diesel (15 ppm S content)
  - if displacement <30 liters/cylinder
- Crankcase emission control requirements
Non-emergency Engines > 300 HP

Performance Testing

• Initial performance test to show compliance
• Initial test + subsequent testing every 8,760 hours of operation or 3 years for engines >500 HP
Non-emergency engines > 300 HP
Monitoring & O/M Requirements

• Operate/maintain crankcase controls per manufacturer’s instructions

• For engines > 500 HP:
  – Continuous monitoring of catalyst inlet temperature
  – Monthly catalyst pressure drop checks
Non-emergency Engines
100 - 300 HP at Major Sources:

• Emission Standards: numerical CO emission limits
• Initial performance test required
< 100 HP @ Major Source, 
≤ 300 HP @ Area Source, & All Emergency Engines

• At major sources, work practice standards for:
  – Engines < 100 HP
  – Emergency engines

• At area sources, management practice standards for:
  – Engines ≤ 300 HP
  – Emergency engines
What Are Work/Management Practices?

- Change oil/filter, inspect air cleaner, hoses & belts on prescribed schedule
- Operate/maintain engine & control device per mfr’s instructions or owner-developed maintenance plan
- May use oil analysis program instead of prescribed oil change frequency
- Emergency engines must keep records of hrs of operation & install hour meter
Recordkeeping & Reporting for Non-emergency Engines*

• Submit:
  – Semi-annual compliance report
  – Initial notification
  – Notification of performance test
  – Notification of compliance

• Keep records of maintenance

*For engines ≥ 100 HP at major sources and >300 HP at area sources
Recordkeeping & Reporting

• For emergency engines:
  – Record hours of operation
  – Keep maintenance records
  – No notifications required

• If $<100$ HP at major source / $\leq 300$ HP at area source:
  – Keep records of maintenance
Emergency Engines at Residential, Institutional, or Commercial Area Sources

- Guidance for determining if a facility is one of these types of sources coming soon
- Engine **must** meet definition of an emergency engine
Startup, Shutdown, & Malfunction Requirements

• Initially, compliance was not required in such circumstances

• Dec 2008 D.C. Circuit Court vacated exemption in General Provisions
Startup, Shutdown, & Malfunction: Response to Court Decision

- Emission standards apply during shutdowns & malfunctions
- Startup & idling time must be kept to 30 minutes or less
- Also applies to engines covered by 2004 and 2008 RICE rules
- Removed requirement for S/S/M plan
Key Dates:

- Compliance date: May 3, 2013
- Existing sources must comply with startup/shutdown/malfunction requirements as of May 3, 2010
Implementation Materials

• Go to http://www.epa.gov/ttn/atw/rice/ricepg.html
  – Sample notification available now
  – Flow charts & compliance requirement summaries coming this summer
REMEMBER . . .

• Final rule on spark ignition engines to be signed 8/10/10