HRP Associates, Inc.

Compliance Webinar

Reciprocating Internal Combustion Engines – "RICE"

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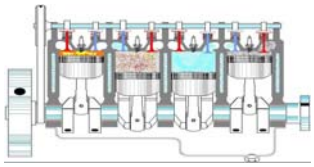
ENVIRONMENTAL • CIVIL ENGINEERING • HYDROGEOLOGY

OVERVIEW

- What is RICE Unit
- Rule Overview
- Requirements
- What You Need to Do
- Compliance Strategies

WHAT IS A RICE UNIT?

- EPA defines a **Stationary RICE unit** as:
  - "means any reciprocating internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition."



WHAT RICE UNITS ARE IMPACTED?

RICE applies to all existing, new and reconstructed non-road stationary Reciprocating Internal Combustion Engines (both CI and SI) EXCEPT:

- Mobile Units (non-road)-
  - Built to be mounted on skids, wheels, dolly or a trailer, etc.
- Emergency Engines-
  - Located at institutional, residential, and commercial facilities.

EXAMPLES OF RICE UNITS

- Subject to RICE?

WHY IS THE EPA REGULATING RICE?

- EPA determined Stationary Internal Combustion Engines contribute to air pollution that may endanger public health (NSPS) and air toxic in urban areas (NESHAP).
  - HAPs and PM-2.5 from the combustion of fuel oil have been linked to respiratory diseases and cancer.
  - EPA has already targeted the larger HAP and PM-2.5 sources (i.e. power plants, industrial boilers, incinerators, other major sources) and has now begun moving into area sources.
  - Reduce Smog caused by ground level ozone (e.g. NOx, non- methane hydrocarbon emissions…BTEX)
- Engines from 1960s and older still being utilized, without advanced emissions technologies (i.e. air to fuel ratio correction, catalytic converters, etc.)
- EPA estimates 600,000 engines subject to RICE

MAJOR EPA REGULATIONS IMPACT RICE UNITS

NESHAP

- June 2004 - Subpart zzzz ; NESHAP for existing, new and reconstructed RICE Units >500 HP at major sources
- January 2008 - Subpart zzzz; NESHAP for new and reconstructed RICE units at area sources and new and reconstructed RICE units >500 HP at major sources
- August 2010 - Subpart zzzz; NESHAP for existing SI RICE units <500 HP at major and existing SI RICE units at area sources

NSPS

- July 2006 - Subpart iiii; NSPS for CI RICE units constructed or reconstructed after July 2005
- January 2008 - Subpart jjjj; NSPS for SI RICE units constructed after 2007
- July 2011 - Subpart iiii & jjjj; NSPS for SI & CI revised

Non-Road Engines (additional strings may apply)

- General Compliance provisions for Highway, Stationary, and Non-Road Programs - 40 CFR 1068
- Control of Emissions from CI, SI, and marine engines- 40 CFR 1039, 1042, 1045, 1048, & 1054.

RICE SUMMARY

- Are your RICE units subject to RULE?
- What are your requirements?
  - Notification
  - Emission Limits
  - Maintenance
  - Operating
  - Reporting
  - Recordkeeping

RULE SUMMARY

NESHAP FOR RICE AREA SOURCES [1]			RICE NSPS
Emergency Engines	**Engines w/ Fuel Input <300 HP (CI) <500 HP (SI)**	**Engines w/ Fuel Input > 300 HP (CI)[2] ≥500 HP (SI)**	**CI Installed after July 2006 of SI installed after July 2007**
• Install Hour Meter • Operate less than: ▪ 100 hours for T/M ▪ 50 hours for Non-emergency • Complete required maintenance	• Maintenance ▪ Change Oil ▪ Inspect air filter, hoses, belts ▪ Operate/Maintain in accordance with manufacturer's recommendations	• Notify • Emission Limits ▪ Initial stack test ▪ 70% reduction if does not meet limits • Maintenance Required • Semi-Annual Deviation Reports	• Notify • Emission Limits ▪ Manufacturer Emissions Certificate • Stack Test (if not certified) to demonstrate compliance and/or required controls

1. CI – Engines manufactured or installed before July 2006. SI Engines manufactured and installed before July 2007.
2. If Engines exceed 500 HP of heat input, they must conduct stack testing every 3 years or 8760 hours of operation

REQUIREMENTS – NOTIFICATION

- **Applicability**
  - Non-emergency CI engines > 300 HP Installed before July 2006 (NESHAP)
  - Non-emergency SI engines > 500 HP Installed before July 2007 (NESHAP);
  - Non-emergency CI engines manufactured after July 2006 (NSPS)
  - Non-emergency SI manufactured after July 2007 (NSPS)
- **Submit Letter to EPA Region with:**
  - Facility Name
  - Engine Make/Model/Serial# & Engine Family
  - Testing Requirements
  - Max Engine Power/Displacement/Fuel
  - Controls, if in place
  - Fuel Used
  - Emission Limits
- **Submission Date**
  - NSPS – due with 30 days after construction
  - NESHAP – February 11, 2012 unless Tier I or II engines using BMP due March 2013

RICE REQUIREMENTS – EMISSION LIMITS

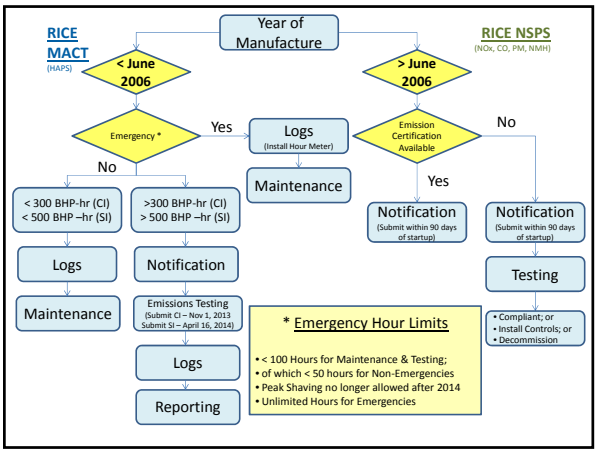
- **RICE NESHAP *(CI/SI Installed before July 2006/2007)***
  - **< 300 HP –none**
  - **> 300 HP – Must meet CO Emission limit**
    - Must Submit Initial Compliance Notice by May 3, 2013 (CI), October 19, 2013 (SI)
      - If compliant, maintain records and retest if engine reconstructed
      - If Non-Compliant, install controls to achieve limits or reduce emissions by 70%
  - **> 500 HP – Must meet CO and/or formaldehyde (Major) emission limits**
    - Must conduct Initial stack test by May 3, 2013 (CI) and October 19, 2013 (SI)
      - If compliant, maintain records and retest every 3 yrs. or 8760 hours of operation
      - If Non-Compliant, install controls to reduce emissions by 70% and retest every 3 yrs. or 8760 hours of operation
- **RICE NSPS *(CI/SI manufactured after July 2006/2007)***
  - **Obtain Engine Manufacturer Emissions Certificate and demonstrate compliance with NOx, CO, PM, VOC, NMHC**
    - If demonstrates compliance, maintain certificate
    - If certificate is not available or certificate indicates exceedances:
      - Conduct Stack Test within 60 days of installation to determine emissions, install controls if required and re-test to demonstrate compliance (must meet emission limit)

RICE REQUIREMENTS – RECORDKEEPING

RICE NESHAP *(CI/SI Installed before July 2006/2007)*	**RICE NSPS** *(CI/SI manufactured after July 2006/2007)*
– Initial notification to the EPA – Logbook of generator runtimes – Maintenance logs, with the hour of operation noted when maintenance was performed – Compliance tests	– Initial notification to the EPA – Records of certifications & compliance tests

RICE REQUIREMENTS – REPORTING

RICE NESHAP *(Installed before July 2006)*	RICE NSPS *(Manufactured after July 2006 – all engines)*
– Initial CI engine notification of compliance were due by May 3, 2013 – Initial CI engine compliance stack tests are due by November 1, 2013 – Initial SI engine notification of compliance due by October 19, 2013 – Initial SI engine compliance tests are due by April 16, 2014 – Annual compliance report demonstrating engine was operated in compliance with all operating requirements	– Submit the one time certification to local permitting body



Deadlines

- May 3, 2013 – Compression Ignition Compliance
  - Submit an Initial Compliance Notification
  - Perform Initial Emissions Compliance Test
  - Implement O & M Plan and Logs
- October 19, 2013 – Spark Ignition
  - Submit an Initial Compliance Notification
  - Perform Initial Emissions Compliance Test
  - Implement O & M Plan and Logs

Potential Deadline Issues

- Don't have Emissions Test performed prior to Compliance Dates
- Emissions Test note emissions greater than the limit
- Didn't file the Initial Notification for the Engine

Additional Issues

- Size or Rating of Engine in Question Unknown
- Approved Testing Protocol
- Demand Response Program Participation
- Emergency Issues

Question 1

Q: What do I do if I don't pass my stack test on a pre-2006 engine?

A: You must do one of the following:

- Replace the engine with a NSPS compliant Engine;
- Install controls for Carbon Monoxide (typically a catalyst System), and retest; or,
- Shut down the Engine
- Use as emergency (if engine is not in the program)

Question 2

Q: If I have a pre-2006 Emergency Engine what hour limits must I meet?

A: You have two pools of hours to work from:

- Pool 1: Unlimited time for emergency operation as long as it meets the emergency definition.
- Pool 2: A pool of 100 hours for the following:
  - Up to the full 100 hours for Maintenance and Testing
  - Up to 50 hours of the 100 for non-emergency use

Question 3

Q: What do I do if I have a post-2006 engine that has no emissions certificate?

A: Depending on the Engine's output you may have to perform emissions testing for PM, NOx, CO, and NMHC.

Question 4

Q: What qualifies as an Emergency for RICE?

A: An emergency is defined as:

An incident where critical networks or equipment lose power (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.

...Interruption of normal power...

COMPLIANCE STRATEGY

1. Inventory your RICE Units.
2. Determine if any of the rules apply to your RICE units.
3. Develop a implementation plan and schedule.
4. Implement RICE compliance plan.

INVENTORY RICE UNITS

- Inventory any reciprocating motion engine regardless of size, fuel type, or use
- Collect the following information:
  - Date of Manufacture / Installation
  - Engine Make/Model/Serial#/Engine Size/Family
  - Ignition Type
  - Use (Emergency / Non-Emergency)
  - Run Times (Maintenance & Testing vs. Actual Use)

DETERMINE APPLICABILITY

- Based on engine parameters, and use, conduct detailed review to determine engine's unique requirements including:
  - Compliance Notification
  - Emission Limits/Stack testing
  - Maintenance
  - Recordkeeping
  - Reporting

DEVELOP AN IMPLEMENTATION PLAN

- Evaluate engines for the following:
  - Are they still utilized for non-emergency purposes?
  - Can the engine be replaced with utility power?
  - Will the engine meet emissions limits:
    - Check age of engine (Engines prior to 1998 likely will not meet requirements of RICE NESHAP subpart ZZZZ, prior to 2003 will not meet RICE NSPS subpart IIII or JJJJ)
    - Contact Manufacturer to obtain emission certificate
    - Evaluate condition of the engine
    - May wish to replace or rebuild engine

DEVELOP AN IMPLEMENTATION PLAN *(CONTINUED)*

- Perform testing dependent on your engine specifications
  - Costs are typically $7,000 – $10,000 per engine
- If the engine fails, evaluate replacement or installation of controls
  - Example New Engine replacement costs:
    - $400,000 – New Tier IV Interim 1,820 HP Engine
    - $300,000 – New Tier IV Interim 1,240 HP Engine
    - $65,000 – New Tier IV Interim 380 HP Engine
  - HAP control cost:
    - Oxidation Catalyst: CI = $27.4*HP - $939
      SI 4SLB = $12.8*HP + $3,069
    - Non-Selective Catalytic Reduction:
      SI 4SRB = $24.9*HP + $13,118

DEVELOP AN IMPLEMENTATION PLAN *(CONTINUED)*

- Develop a log book, which notes:
  - Emergency usage
  - Non-emergency usage
  - Maintenance / Testing
  - Peak shaving / Demand Response Program usage
- Implement a RICE unit maintenance program
  - Inspections
  - Replacement schedule
- Implement a compliance testing schedule

PITFALLS

- Inventory
  - Ensure you have identified all RICE engines. Rule of thumb, if it is an engine put it on the list until you prove it is not-applicable. **REMEMBER NOT JUST GENERATORS!!**
- Tracking
  - Emergency engines may not need to meet all requirements, but they need tracking and non-resettable hour meters.
- Non-Road engines
  - Portable equipment must be moved around the site or offsite. Such movement documented once a year or season. Beware of permanent installation.

PITFALLS *(CONTINUED)*

- Notifications
  - Ensure you send in your notifications ASAP, they are technically overdue
  - If an engine is no longer covered, you need to evaluate withdrawing the notification.
- Stack Testing
  - You must perform stack testing by the compliance dates May 3, 2013 and October 19, 2013 for CI and SI engines, respectively.
- Certifications
  - Ensure you get the exact certification and test data for NSPS engines

RESOURCES

- EPA's RICE MACT Website
  - http://www.epa.gov/ttn/atw/rice/ricepg.html
- Regulations
  - RICE MACT - http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&rgn=div6&view=text&node=40:14.0.1.1.1.1&idno=40
  - Subpart IIII - http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=e78e344a6fe87688d856a3202ccac7d9&n=40y7.0.1.1.1.97&r=SUBPART&ty=HTML
  - Subpart JJJJ - http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=373e43f265f4143bcb11ba8a0b07edb6&rgn=div6&view=text&node=40:7.0.1.1.1.98&idno=40
- Tools
  - EPA Applicability Tool -Http://www.epa.gov/ttn/atw/rice/output/quiz.html

QUESTIONS?

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