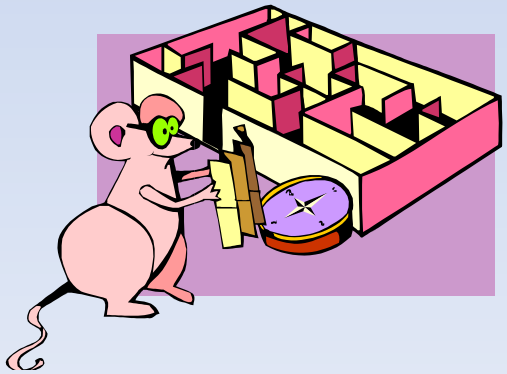
RICE NESHAP

CAPCOA Engineering Symposium

June 22, 2011

Overview

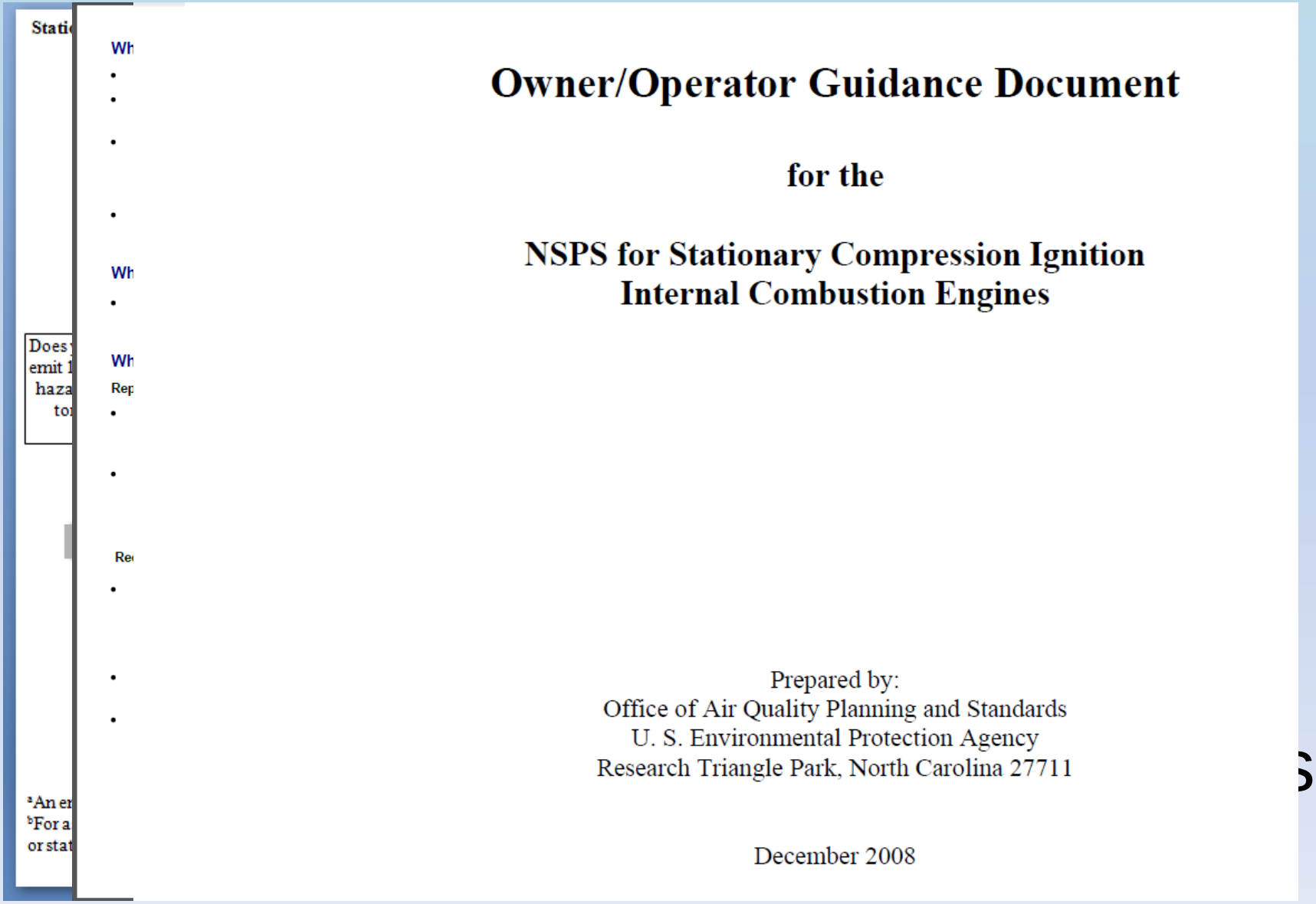
- Will discuss the maze of regulations
- Will provide specific requirements for common sources most Districts have at area sources
  - Emergency diesel engines
  - Prime diesel engines (agricultural)
  - Prime natural gas engines (cogen, gas field compressors)



Basics

- Definitions
  - "New" – date engine is manufactured
  - "Reconstructed" (rebuilt with cost exceeding 50% of a new engine) engines treated like "new" engines
- Acronyms
  - SI - spark ignition
  - CI - compression ignition
  - RB - rich burn LB - lean burn
  - 2S - 2 stroke 4S - 4 stroke

Background



Owner/Operator Guidance Document

for the

NSPS for Stationary Compression Ignition Internal Combustion Engines

Prepared by:
Office of Air Quality Planning and Standards
U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

December 2008

Background

- Total of 6 federal rules adopted

Date Finalized	Title	Applicability
2/2004	NESHAP ZZZZ (RICE MACT)	All (new & existing, CI & SI) engines > 500 hp at major HAP sources
7/2006	NSPS IIII	All new CI engines
1/2008	Consolidated Rule (NSPS JJJJ & NESHAP ZZZZ)	All new SI engines
3/2010	NESHAP ZZZZ	Existing CI < 500 hp at major sources Existing CI at area sources
8/2010	NESHAP ZZZZ	Existing SI < 500 hp at major sources Existing SI at area sources
6/8/2011*	NSPS IIII & NSPS JJJJ	Revision for very large engines

NESHAP ZZZZ (RICE MACT)

- Finalized Feb 26, 2004
  - Applicable to new and existing stationary engines > 500 hp at major HAP sources
  - Controls HAPs (formaldehyde)
  - Requires catalytic control for all new engines and existing RB engines
  - Detailed requirements notification, reporting, recordkeeping, monitoring, & performance tests
  - Few engines controlled by this rule

NSPS Subpart IIII

- Finalized July 11, 2006
  - Applicable to all new (>7/11/2005) CI engines
  - Controls criteria pollutants (NOx, CO, PM, HC)
  - In general, required owners to purchase certified engines, use low sulfur fuel, and maintain the engine per mfg recommendations
  - Separate requirements for emergency engines
  - Extra requirements for very large engines (>10 liters per cylinder, >30 liters per cylinder, >3000 hp)

Consolidated JJJJ/ZZZZ

- Finalized Jan 18, 2008
- “consolidated engine rule” - 3 rules in 1
  - NSPS (JJJJ)
  - NESHAP (ZZZZ) at major source
  - NESHAP (ZZZZ) at area source
- Applicable to new (>6/12/2006) SI engines
- Engines which already had to comply with original RICE MACT have to comply with both rules

Consolidated JJJJ/ZZZZ

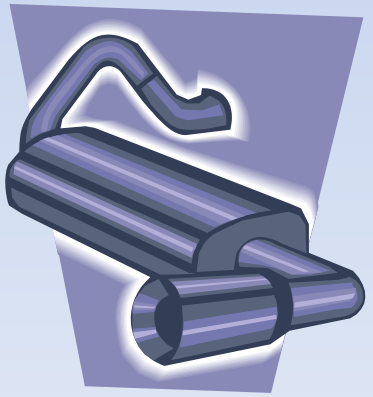
- Summary of JJJJ requirements
  - Controls criteria pollutants (NOx, CO, PM, HC)
  - New SI engines < 25 hp must be certified
  - All other engines can be mfg certified (very few are) or operator must comply w/ emission limits
  - All engines have maintenance requirements
  - Most engines require performance testing (initial for engines < 500 hp, initial & every 8760 hours for > 500 hp)

Consolidated JJJJ/ZZZZ

- Summary of ZZZZ (major source) requirements
  - Controls toxics, but uses CO and VOC as surrogate for HAP (primarily formaldehyde)
  - SI engines < 500 hp (except 4SLB 250 – 500 hp) must meet JJJJ
  - CI engines < 500 hp must meet IIII
  - 4SLB engines 250 - 500 hp reduce CO by 93% or meet 14 ppmv formaldehyde

Consolidated JJJJ/ZZZZ

- Summary of ZZZZ (area source) requirements
  - Controls toxics, but uses CO and VOC as surrogate for HAP (primarily formaldehyde)
  - Requires compliance with IIII or JJJJ

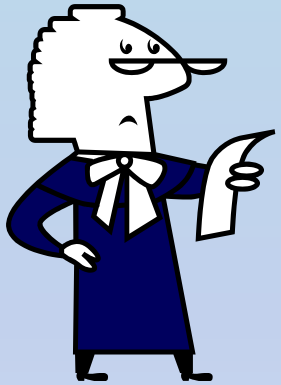


ZZZZ, CI Amendments

- Finalized Mar 3, 2010
- Summary of requirements
  - Catalyst for existing (pre 6/12/2006) CI engines > 300 hp
  - Emission limits for CI engines >100 hp & < 300 hp at major sources
  - Maintenance management practices (MMPs) required for CI engines < 100 hp at majors and < 300 hp at area sources
  - Continuous Parameter Monitoring System (CPMS) required for some engines
- Existing engines must comply by 5/3/2013

ZZZZ, CI Amendments

- Added exemptions for following existing engines
  - >500 hp at majors
    - Spark ignited 2 SLB
    - Spark ignited 4 SLB
    - Emergency use
    - Limited use (<100 hrs/year)
    - Landfill gas or digester gas > 10% heat input
  - ‘Residential’, ‘Commercial’, & ‘Institutional’ emergency use at area sources



ZZZZ, CI Amendments

- Examples of ‘commercial’
  - office buildings, hotels, stores, telecommunication facilities, restaurants, financial institutions such as banks, doctor’s offices, and sports and performing arts facilities
- Examples of ‘institutional’
  - medical centers, nursing homes, research centers, institutions of higher education, correctional facilities, elementary and secondary schools, libraries, religious establishments, police and fire stations

ZZZZ, SI Amendment

- Finalized Mar 3, 2010
- “New” engine date set at 6/12/2006
- Summary of requirements
  - Catalysts required for some engines (in order to meet emission limits)
  - MMPs required for all engines not requiring catalysts (including emergency) – same as CI
  - Continuous Parameter Monitoring System (CPMS) required for some engines
- Existing engines must comply by 10/19/2013

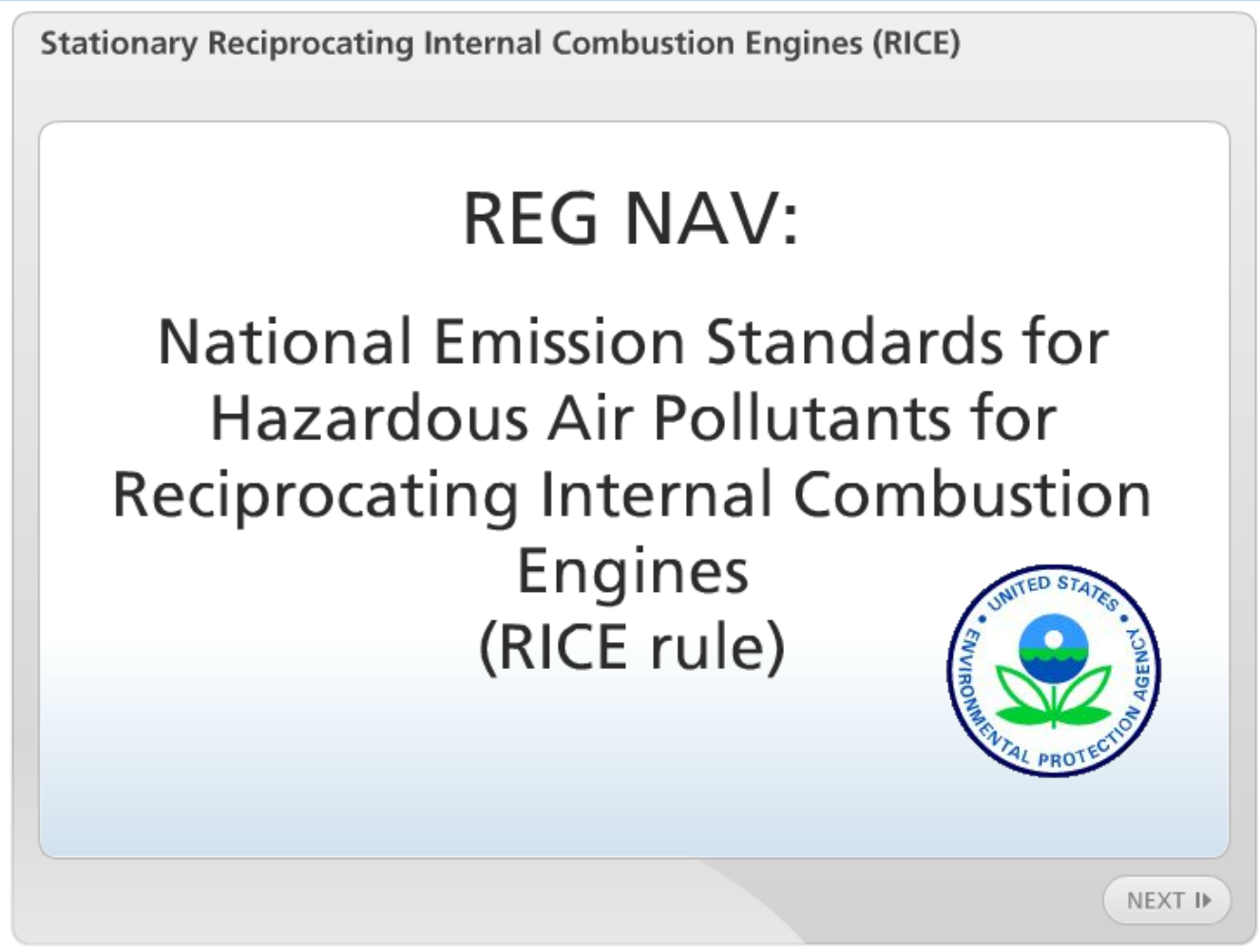
IIII & JJJJ Amendments

- Signed by Lisa Jackson 6/8/2011 – hasn't been published in FR yet
- Summary of IIII changes
  - For engines >10 & < 30 liters/cylinder, incorporating new marine engine standards
    - 1st tier - model years 2013 & 2014
    - 2nd tier - model years 2016 & 2017
  - For engines > 30 liters/cylinder, delaying standards until 2016
  - Exempting emergency engines > 30 liters/cyl
- Only minor error fixes for JJJJ

ZZZZ Implementation

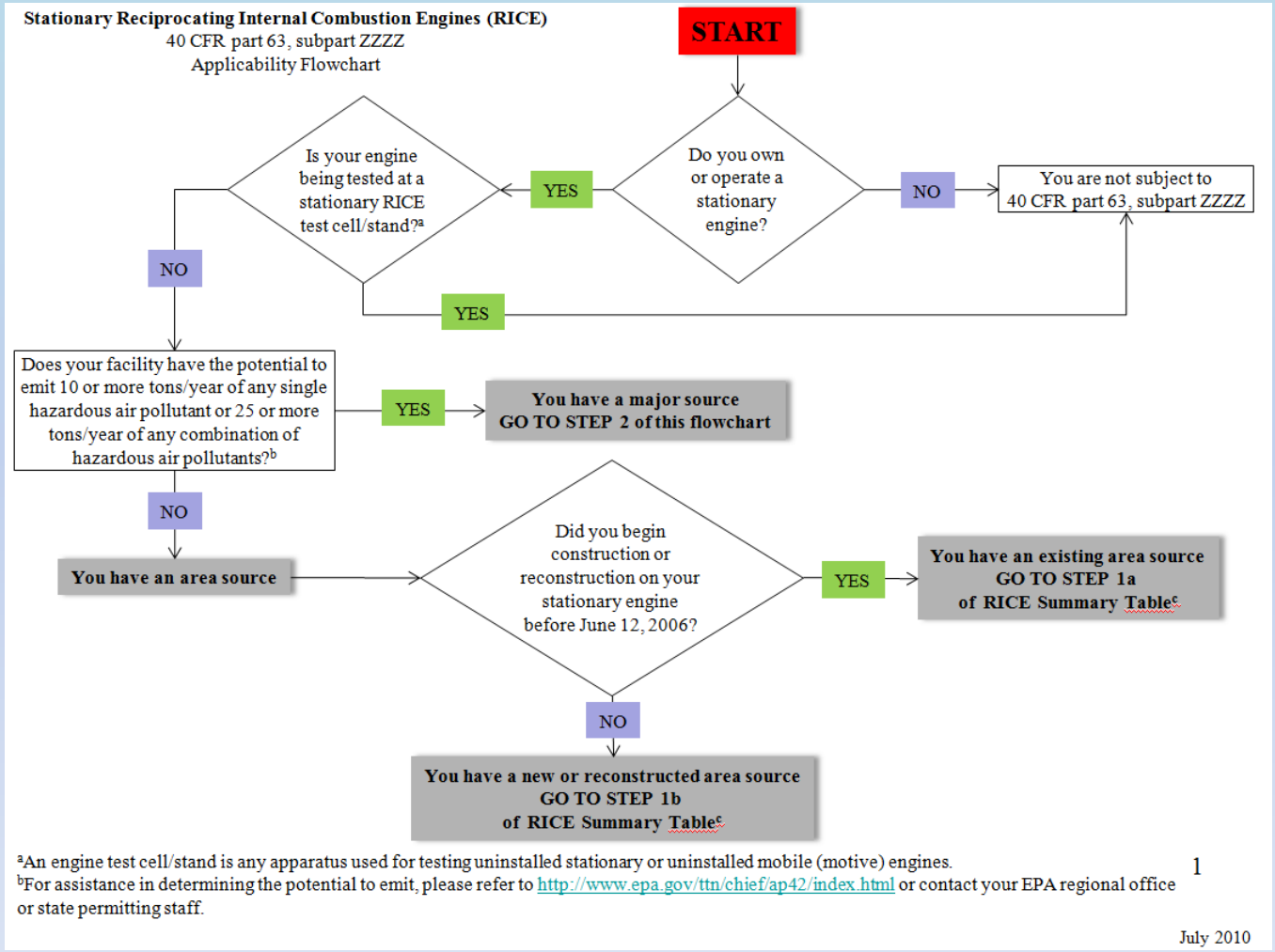
- All engines now covered
  - New CI engines – IIII
  - New SI engines – JJJJ
  - New > 500 hp at major sources – ZZZZ
  - Existing engines – ZZZZ
- Difficult part is figuring out specific requirements

Resources



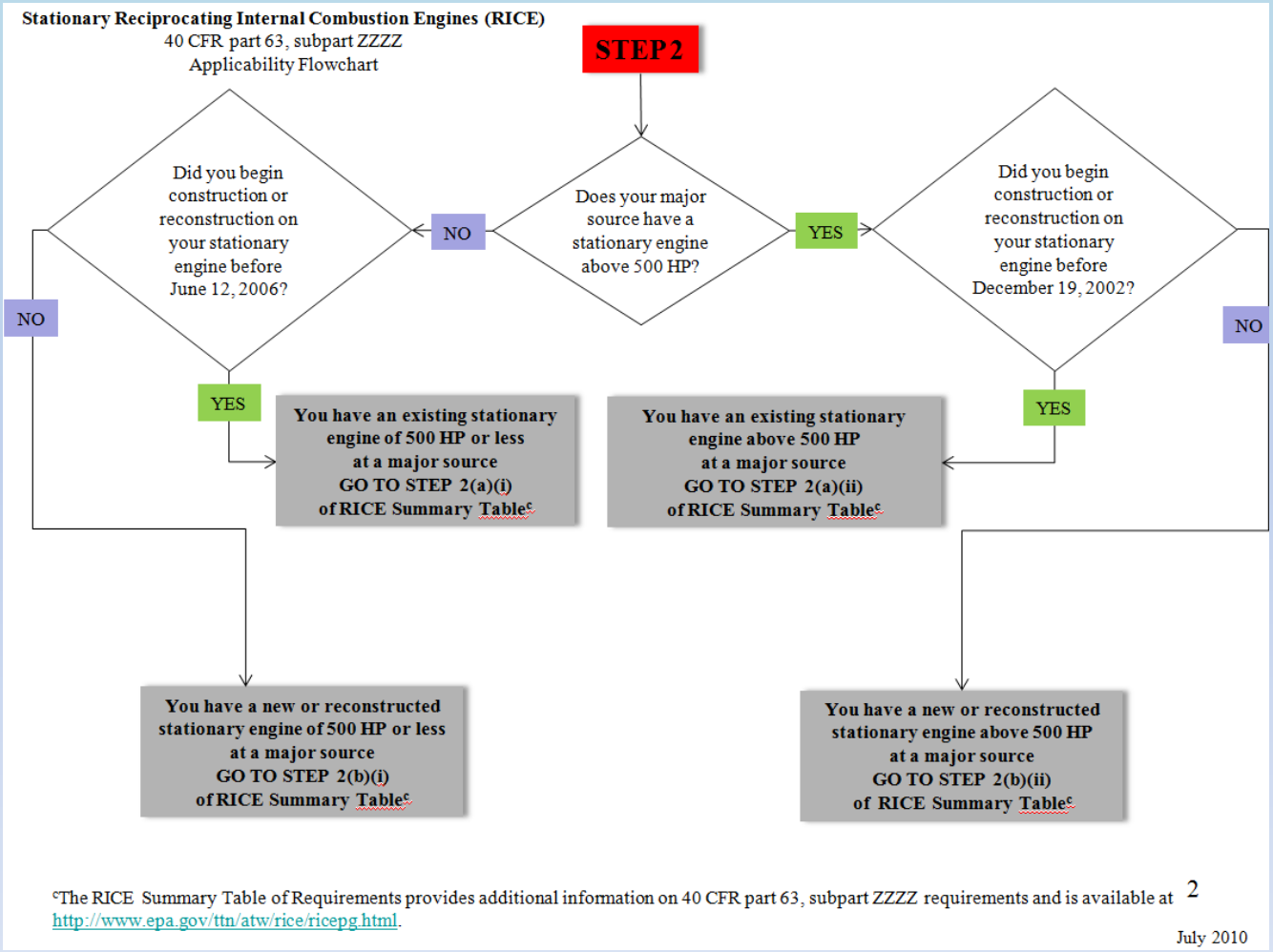
http://www.epa.gov/ttn/atw/rice/output/quiz.html

Resources



http://www.epa.gov/ttn/atw/rice/flowchart_applicability.ppt

Resources



http://www.epa.gov/ttn/atw/rice/flowchart_applicability.ppt

Resources

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Engine Category	Date Constructed	Compliance Date	Emission Limitations	Operating Limitations	Fuel Requirements	Performance Tests	Monitoring, Installation, Collection, Operation and Maintenance Requirements	Initial Compliance	Continuous Compliance	Notification Requirements	Recordkeeping Requirements	Reporting Requirements	General Provisions (40 CFR part 63)
2	**Stationary RICE at Area Sources**													
3	**STEP 1a - Existing Area Sources**													
4	**Existing Stationary Engine ≤500 HP Located at Area Sources of HAP**													
5	Emergency CI	Before 6/12/2006	5/3/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (f), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c))	Footnote 2 of Table 2d	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
6	Non-Emergency CI 300<HP≤500	Before 6/12/2006	5/3/2013	63.6603 Table 2d	No Requirements	>300 HP with displacement <30l/cyl: 63.6604	63.6612 63.6620 Table 4 Table 5	63.6625(h) ≥300 HP: 63.6625(a)	63.6630 Table 5	63.6605 63.6640	63.6645	63.6655 (except 63.6655(c) and (f))	63.6650 (except 63.6650(q))	Yes
7	Non-Emergency CI ≤300 HP	Before 6/12/2006	5/3/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
8	Emergency SI	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (f), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c))	Footnote 2 of Table 2d	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
9	Non-Emergency SI 4SLB	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
10	Non-Emergency SI 2SLB	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
11	Non-Emergency SI 4SRB	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
12	Non-Emergency Landfill/Digester Gas	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
13	Residential/Commercial/Institutional Emergency CI	Before 6/12/2006	5/3/2013	There are no engines are subject to the requirements in 40 CFR 63.6640(f). No other requirements apply.										
14	Residential/Commercial/Institutional Emergency SI	Before 6/12/2006	10/19/2013	There are no engines are subject to the requirements in 40 CFR 63.6640(f). No other requirements apply.										
15	**Existing Stationary Engine >500 HP Located at Area Sources of HAP**													
16	Emergency CI	Before 6/12/2006	5/3/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (f), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c))	Footnote 2 of Table 2d	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
17	Non-Emergency CI	Before 6/12/2006	5/3/2013	63.6603 Table 2d	63.6603 Table 2b	>300 HP with displacement <30l/cyl: 63.6604	63.6612 63.6615 63.6620 Table 3 Table 4 Table 5	63.6625(a), (b), (c), (h), (k)	63.6630 Table 5	63.6605 63.6635 63.6640	63.6645	63.6655 (except 63.6655(c), (e) and (f))	63.6650 (except 63.6650(q))	Yes
18	Emergency SI	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (f), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c))	Footnote 2 of Table 2d	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
19	Non-Emergency SI 4SLB (that operate more than 24 hours per year)	Before 6/12/2006	10/19/2013	63.6603 Table 2d	63.6603 Table 2b	No Requirements	63.6612 63.6615 63.6620 Table 3 Table 4 Table 5	63.6625(a), (b), (h), (k)	63.6630 Table 5	63.6605 63.6635 63.6640	63.6645	63.6655 (except 63.6655(c), (e) and (f))	63.6650 (except 63.6650(q))	Yes
20	Non-Emergency SI 4SLB (that operate 24 hours or less per year)	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
21	Non-Emergency SI 2SLB	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
22	Non-Emergency SI 4SRB (that operate more than 24 hours per year)	Before 6/12/2006	10/19/2013	63.6603 Table 2d	63.6603 Table 1b	No Requirements	63.6612 63.6615 63.6620 Table 3 Table 4 Table 5	63.6625(a), (b), (h), (k)	63.6630 Table 5	63.6605 63.6635 63.6640	63.6645	63.6655 (except 63.6655(c), (e) and (f))	63.6650 (except 63.6650(q))	Yes
23	Non-Emergency SI 4SRB (that operate 24 hours or less per year)	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
24	Non-Emergency Landfill/Digester Gas	Before 6/12/2006	10/19/2013	63.6603 Table 2d	No Requirements	No Requirements	No Requirements	63.6625(e), (h), (i)	No Requirements	63.6605 63.6640	No Requirements	63.6655 (except 63.6655(c) and (f))	No Requirements	Yes, except per 63.6645(a)(5), the following do not apply: 63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), and 63.9(b)-(e), (g) and (h).
25	Residential/Commercial/Institutional Emergency CI	Before 6/12/2006	5/3/2013	There are no engines are subject to the requirements in 40 CFR 63.6640(f). No other requirements apply.										
26	Residential/Commercial/Institutional Emergency SI	Before 6/12/2006	10/19/2013	There are no engines are subject to the requirements in 40 CFR 63.6640(f). No other requirements apply.										
27	*Note that certain engines covered under 40 CFR part 63, subpart ZZZZ, may be subject to additional requirements under 40 CFR part 60, subparts IIII and JJJJ.													

http://www.epa.gov/ttn/atw/rice/requirements.xls

Common Source Examples

- **EMERGENCY DIESEL ENGINES**
  - Existing, located at an area source
    - Standby generators installed at an industrial facility
- **PRIME DIESEL ENGINES**
  - Existing, located at an area source, examples include
    - Stationary agricultural engine driven irrigation pumps
    - Non-emergency power generation
- **PRIME SPARK IGNITED ENGINES**
  - Existing, located at an area source, examples include
    - Gas field compressor engines
    - Cogeneration units

Emergency Diesel Engines

- **APPLICABILITY**
  - Considered New
    - If constructed after June 12, 2006
    - Not subject to NESHAP ZZZZ but subject to NSPS Subpart IIII
  - Considered Existing
    - If constructed before June 12, 2006
    - Exempted from ZZZZ if engine is a Residential, Commercial, or Institutional installation
    - Subject if engine is located other than above (i.e. industrial installation)
    - Compliance Date – May 3, 2013

Emergency Diesel Engines

- **STANDARDS**
  - Change oil and filter every 500 hours of operation or annually, whichever comes first
  - Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first
  - Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Emergency Diesel Engines

- **DEMONSTRATING CONTINUOUS COMPLIANCE**
  - 100 hours/yr maintenance as recommended by a Federal, State, or Local government, the manufacturer, vendor, or insurance company associated with the engine
  - Up to 50 hours for non-emergency operation
    - Can’t be used for peak shaving or other financial gain
    - Up to 15 hours per used can be used for a demand response program
    - All hours in this category shall be counted towards the maintenance hours listed above
  - No restriction on emergency operation
  - Shall be maintained according to the manufacturer's emission-related operation and maintenance instructions or develop and follow your own maintenance plan in accordance with good air pollution control practice

Emergency Diesel Engines

- **RECORDKEEPING REQUIREMENTS**
  - Occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or of the air pollution control and monitoring equipment
  - Actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation
  - Maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan for engines subject to management practices
  - Hours of operation

Emergency Diesel Engines

- **REPORTING REQUIREMENTS**
  - Report any failure to perform the management practice on the schedule required and the Federal, State or local law under which the risk was deemed unacceptable

Prime Diesel Engines

- **APPLICABILITY**
  - Considered New
    - If constructed after June 12, 2006
    - Not subject to NESHAP ZZZZ but subject to NSPS Subpart IIII
  - Considered Existing
    - if constructed before June 12, 2006
    - Compliance Date – May 3, 2013

Prime Diesel Engines

- **STANDARDS – ≤ 300 HP**
  - Change oil and filter every 1,000 hours of operation or annually, whichever comes first
  - Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first
  - Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Diesel Engines

- **STANDARDS – 300 < HP ≤ 500**
  - Limit concentration of CO in the stationary RICE exhaust to 49 ppmvd at 15 percent O_2 (approximately 0.37 g/hp-hr); or
  - Reduce CO emissions by 70 percent or more
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Diesel Engines

- **STANDARDS – > 500 HP**
  - Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd at 15 percent O_2 (approximately 0.17 g/hp-hr); or
  - Reduce CO emissions by 70 percent or more
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Diesel Engines

- **FUEL REQUIREMENTS – > 300 HP**
  - Sulfur content of 15 ppm
  - Minimum Cetane Index of 40, or
  - Maximum Aromatic Content of 35 v/v%
  - CARB Diesel meets these requirements

Prime Diesel Engines

- **PERFORMANCE TESTS**
  - Required for the engines that must meet an emission standard (>300 HP)
  - Initial Test must be performed within 180 days of initial compliance date (5-3-2013)
  - Ongoing frequency
    - Limited use (<100 hr per year) - Every 8760 hours of operation or 5 years whichever comes first
    - Not Limited use - Every 8760 hours of operation or 3 years whichever comes first

Prime Diesel Engines

- **PERFORMANCE TESTS (continued)**
  - Use of portable analyzer, if complying with the percent reduction emission standard
    - Measure CO and O2 at the inlet and outlet of the control device
  - Method 1,3,4, 10, or ASTM Method D6522–00 to measure CO, if complying with the CO concentration emission standard
    - Measure CO and O2 at the outlet

Prime Diesel Engines

- **INITIAL COMPLIANCE – 300 < HP ≤ 500 HP**
  - Results of initial performance test
  - The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load
  - Install a closed crankcase ventilation system or an open crankcase filtration emission control system

Prime Diesel Engines

- **INITIAL COMPLIANCE - >500 HP**
  - If using an oxidation catalyst to comply with emission limit
    - Results of initial performance test which includes
      - The engine percent load, with documentation of the calculations, assumptions, and measurement devices used to measure or estimate percent load
      - Record the catalyst pressure drop and catalyst inlet temperature
    - Install a Continuous Parameter Monitoring System (CPMS) to continuously monitor catalyst inlet temperature per the requirements in § 63.6625(b)
    - Install a closed crankcase ventilation system or an open crankcase filtration emission control system

Prime Diesel Engines

- **INITIAL COMPLIANCE - >500 HP (continued)**
  - If not using an oxidation catalyst to comply with emission limit
    - Results of initial performance test which includes
      - The engine percent load, with documentation of the calculations, assumptions, and measurement devices used to measure or estimate percent load
    - Install a CPMS to continuously monitor operating parameters approved by the Administrator **(if any)** per the requirements in § 63.6625(b)
    - Record the approved operating parameters **(if any)**
    - Install a closed crankcase ventilation system or an open crankcase filtration emission control system

Prime Diesel Engines

- **CONTINUOUS PARAMETER MONITORING SYSTEM**
  - Must prepare a site-specific monitoring plan which includes
    - Performance criteria and design specifications of the monitoring system equipment.
    - Representative sampling interface location
    - Equipment performance evaluations or other audit procedures
    - Ongoing operation and maintenance procedures
    - Ongoing reporting and recordkeeping procedures
  - Must install, operate, and maintain each CPMS in accordance with site-specific monitoring plan

Prime Diesel Engines

- **CONTINUOUS PARAMETER MONITORING SYSTEM (continued)**
  - The CPMS must collect data every 15 minutes
  - The temperature sensor must have a minimum tolerance of 2.8ºC or 1% of the measurement range
  - Must conduct CPMS equipment performance evaluations or audits in accordance with the site-specific monitoring plan

Prime Diesel Engines

- **DEMONSTRATING CONTINUOUS COMPLIANCE**
  - Conduct the subsequent source tests as specified previously
  - If a catalyst is used to comply with an emission limitation
    - Collect the catalyst inlet temperature data monitored by the CPMS and reduce the data to 4-hour block rolling averages
    - Maintain the 4-hour rolling block averages within the operating limitations for the catalyst inlet temperature
    - Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test

Prime Diesel Engines

- **DEMONSTRATING CONTINUOUS COMPLIANCE (continued)**
  - If a catalyst is not used to comply with an emission limitation
    - Collect the approved operating data (if any) monitored by the CPMS and reduce the data to 4-hour block rolling averages
    - Maintain the 4-hour rolling block averages within the operating limitations established during the performance test

Prime Diesel Engines

- **NOTIFICATIONS – Engines >300 HP**
  - Initial Notification, due 120 days after effective date
  - Intent to perform a source test, due 60 days prior to test
  - Compliance Status, due 60 days after completion of source test
- **REPORTS – Engines >300 HP**
  - Compliance Report
    - Semi-annual reporting period Jan 1 – Jun 30 & Jul 1 – Dec 31
    - Due 31 days from end of reporting period

Prime Diesel Engines

- **RECORDKEEPING**
  - Copy of each notification and report, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted
  - Records of the occurrence and duration of each malfunction of operation (*i.e.* process equipment) or of the air pollution control and monitoring equipment
  - Records of performance tests and performance evaluations
  - Records of all required maintenance performed on the air pollution control and monitoring equipment
  - Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal manner of operation

Prime Diesel Engines

- **RECORDKEEPING (continued)**
  - Records of hours, catalyst inlet temperatures, catalyst pressure drop or other CPMS parameters as applicable for engines subject to the CO or Formaldehyde limitations
  - Records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan for engines subject to management practices.
  - For each CPMS
    - Records of each period during which a CMS is malfunctioning or inoperative (including out-of-control periods)

Prime Diesel Engines

- **RECORDKEEPING (continued)**
  - Records of performance evaluations, calibration checks, and adjustments and maintenance performed on CPMS
  - Previous versions of the performance evaluation plan
  - Requests, if any, for alternatives to the relative accuracy test for the CPMS

Prime Spark Ignited Engines

- **APPLICABILITY**
  - Considered New
    - If constructed after June 12, 2006
    - Not subject to NESHAP ZZZZ but subject to NSPS Subpart JJJJ
  - Considered Existing
    - if constructed before June 12, 2006
    - Compliance Date – October 19, 2013

Prime Spark Ignited Engines

- **STANDARDS – 2 STROKE LEAN BURN**
  - Change oil and filter every 4,320 hours of operation or annually, whichever comes first
  - Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first
  - Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Spark Ignited Engines

- **STANDARDS – 4 STROKE LEAN BURN AND 4 STROKE RICH BURN ≤ 500 HP**
  - Change oil and filter every 1,440 hours of operation or annually, whichever comes first
  - Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first
  - Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Spark Ignited Engines

- **STANDARDS – 4 STROKE LEAN BURN > 500 HP**
  - Limit concentration of CO in the stationary RICE exhaust to 47 ppmvd at 15 percent O_2; or
  - Reduce CO emissions by 93 percent or more
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Spark Ignited Engines

- **STANDARDS – 4 STROKE RICH BURN > 500 HP**
  - Limit concentration of formaldehyde in the stationary RICE exhaust to 2.7 ppmvd at 15 percent O_2; or
  - Reduce formaldehyde emissions by 76 percent or more
  - Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

Prime Spark Ignited Engines

- **PERFORMANCE TESTS**
  - Required for the engines that must meet an emission standard (>500 HP)
  - Initial Test must be performed within 180 days of initial compliance date (10-19-2013)
  - Ongoing frequency
    - Limited use (<100 HP per year) - Every 8760 hours of operation or 5 years whichever comes first
    - Not Limited use - Every 8760 hours of operation or 3 years whichever comes first
  - 4SLB, Use of portable analyzer, if complying with the percent reduction emission standard
    - Measure CO and O2 at the inlet and outlet of the control device

Prime Spark Ignited Engines

- **PERFORMANCE TESTS (continued)**
  - 4SLB, Method 1,3,4, 10, or ASTM Method D6522–00 to measure CO, if complying with the CO concentration emission standard
    - Measure CO and O2 at the outlet
  - 4SRB, Method 1, 3, 4, 320, 323 or ASTM D6348–03
    - Measure Formaldehyde at the inlet and outlet if complying with the percent reduction standard
    - Measure Formaldehyde at the outlet if complying with the Formaldehyde concentration emission standard

Prime Spark Ignited Engines

- **INITIAL COMPLIANCE - >500 HP, 4SLB**
  - If using an oxidation catalyst to comply with emission limit
    - Results of initial performance test
      - The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate percent load
      - You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test
    - Have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in § 63.6625(b)

Prime Spark Ignited Engines

- **INITIAL COMPLIANCE - >500 HP, 4SLB (continued)**
  - If not using an oxidation catalyst to comply with emission limit
    - Results of initial performance test
      - The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate percent load
    - You have installed a CPMS to continuously monitor operating parameters approved by the Administrator **(if any)** according to the requirements in § 63.6625(b)
    - You have recorded the approved operating parameters **(if any)** during the initial performance test

Prime Spark Ignited Engines

- **INITIAL COMPLIANCE - >500 HP, 4SRB**
  - If using NSCR to comply with emission limit
    - Results of initial performance test
      - The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load
      - You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test
    - Have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in § 63.6625(b)

Prime Spark Ignited Engines

- **INITIAL COMPLIANCE - >500 HP (continued)**
  - If not using non selective catalytic reduction to comply with emission limit
    - Results of initial performance test
      - The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate percent load
    - You have installed a CPMS to continuously monitor operating parameters approved by the Administrator **(if any)** according to the requirements in § 63.6625(b)
    - You have recorded the approved operating parameters **(if any)** during the initial performance test

Prime Spark Ignited Engines

- **DEMONSTRATING CONTINUOUS COMPLIANCE**
  - Conduct the subsequent source tests as specified previously
  - If a catalyst is used to comply with an emission limitation
    - Collect the catalyst inlet temperature data monitored by the CPMS and reduce the data to 4-hour block rolling averages.
    - Maintain the 4-hour rolling block averages within the operating limitations for the catalyst inlet temperature
    - Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test
  - If a catalyst is not used to comply with an emission limitation
    - Collect the approved operating data (if any) monitored by the CPMS and reduce the data to 4-hour block rolling averages.
    - Maintain the 4-hour rolling block averages within the operating limitations established during the performance test

Prime Spark Ignited Engines

- **NOTIFICATIONS – Engines >500 HP**
  - Initial Notification, due 120 days after effective date
  - Intent to perform a source test, due 60 days prior to test
  - Compliance Status, due 60 days after completion of source test

- **REPORTS – Engines >500 HP**
  - Compliance Report
    - Semi-annual reporting period, Jan 1 – Jun 30 & Jul 1 – Dec 31
    - Due 31 days from end of reporting period

Prime Spark Ignited Engines

- **RECORDKEEPING**
  - Copy of each notification and report, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted
  - Records of the occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or of the air pollution control and monitoring equipment
  - Records of performance tests and performance evaluations
  - Records of all required maintenance performed on the air pollution control and monitoring equipment
  - Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal manner of operation

Prime Spark Ignited Engines

- **RECORDKEEPING (continued)**
  - Records of hours, catalyst inlet temperatures, catalyst pressure drop or other CPMS parameters as applicable for engines subject to the CO limitations
  - Records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan for engines subject to management practices
  - For each CPMS
    - Records of each period during which a CMS is malfunctioning or inoperative (including out-of-control periods)

Prime Spark Ignited Engines

- **RECORDKEEPING (continued)**
  - Records of performance evaluations, calibration checks, and adjustments and maintenance performed on CPMS
  - Previous versions of the performance evaluation plan
  - Requests, if any, for alternatives to the relative accuracy test for the CPMS

Summary

- **EXISTING EMERGENCY DIESEL ENGINES**
  - For Engines located at
    - Area source
    - Non-commercial and Non-institutional facilities
  - Shall perform maintenance management practices (MMP's)
  - Constrained to specific hourly requirements for maintenance and other non maintenance operation
  - No constraints on emergency operation
  - Maintain records of maintenance
  - Report if unable to perform MMP's

Summary

- **EXISTING PRIME CI ENGINES – AREA SOURCE**
  - ≤ 300 HP perform MMP's
  - 300 < HP ≤ 500 subject to CO emission limitations
    - Initial and subsequent performance tests
    - Install crankcase ventilation/filtration system
  - >500 HP subject to more stringent CO emission limitations
    - Initial and subsequent performance tests
    - Install crankcase ventilation/filtration system
    - Install Continuous Parameter Monitoring System
  - Notification and Reports >300 HP
    - Initial notification, source test notification, compliance status with source test results
    - Semi-annual compliance reports

Summary

- **EXISTING PRIME CI ENGINES – AREA SOURCE (continued)**
  - Recordkeeping
    - Records of maintenance, malfunctions, catalyst temps and pressure drops, and CPMS calibration and auditing practices (if applicable)

Summary

- **EXISTING PRIME SI ENGINES – AREA SOURCE**
  - All 2SLB and ≤ 500 HP four stroke engines perform MMP's
  - >500 HP subject to emission limitations
    - Initial and subsequent performance tests
    - Install Continuous Parameter Monitoring System
  - Notification and Reports > 500 HP
    - Initial notification, source test notification, compliance status with source test results
    - Semi-annual compliance reports
  - Recordkeeping
    - Records of maintenance, malfunctions, catalyst temps and pressure drops, and CPMS calibration and auditing practices (if applicable)

Questions