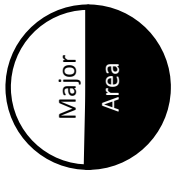
RICE MACT
40 CFR 63, Subpart ZZZZ

SI Source Requirements

7/18/2013

Key Definitions



- Stationary RICE – Reciprocating internal combustion engine that uses motion to convert heat energy into mechanical work and is not mobile. Engines that are mobile that do not propel engines and are used exclusively at a facility may be considered a Stationary RICE.

- Major Source – Facility with potential to emit 10 tpy of any HAP or 25 tpy of combination of HAPs
- Area Source – Facility that does not meet definition of a major source

- Rich burn – 4 stroke engine where the manufacturer's recommended operating stoichiometric air/fuel ratio is less than or equal to 1.1 or if the manufacturer's recommendation is not available the excess oxygen content of the exhaust at full load conditions is less than or equal to 2 percent. Engines modified from rich to lean burn after December 19, 2002 with passive technologies are considered rich burn
- Lean burn – Engine that is not rich burn

- Site Rated HP – Manufacturer's design capacity at engine site locations (mostly dependent on altitude and ambient temperature)

Key Definitions

- Spark Ignition – gasoline-fueled engine; or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Dual-fuel engines in which a liquid fuel is used for CI and gaseous fuel is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis.
- Compression Ignition – Engine that does not meet the definition of a spark ignition engine

- Reconstruction – The replacement of components of an affected or a previously nonaffected source to such an extent that:
  - (1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source; and
  - (2) It is technologically and economically feasible for the reconstructed source to meet the relevant standard(s) established by the Administrator (or a State) pursuant to section 112 of the Act. Upon reconstruction, an affected source, or a stationary source that becomes an affected source, is subject to relevant standards for new sources, including compliance dates, irrespective of any change in emissions of hazardous air pollutants from that source.

Key Definitions

- Deviation – Failure to meet the requirements in ZZZZ to include operating and emission limits
- Malfunction – Sudden, infrequent, not reasonably preventable failure which causes or has the potential to cause emission limitations to be exceeded from failure of the following:
  - Air pollution control equipment
  - Process equipment
  - Process to operate in a normal/usual manner
- Monitoring Malfunction – Sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data (§63.6635(b))

Special Engine Definitions

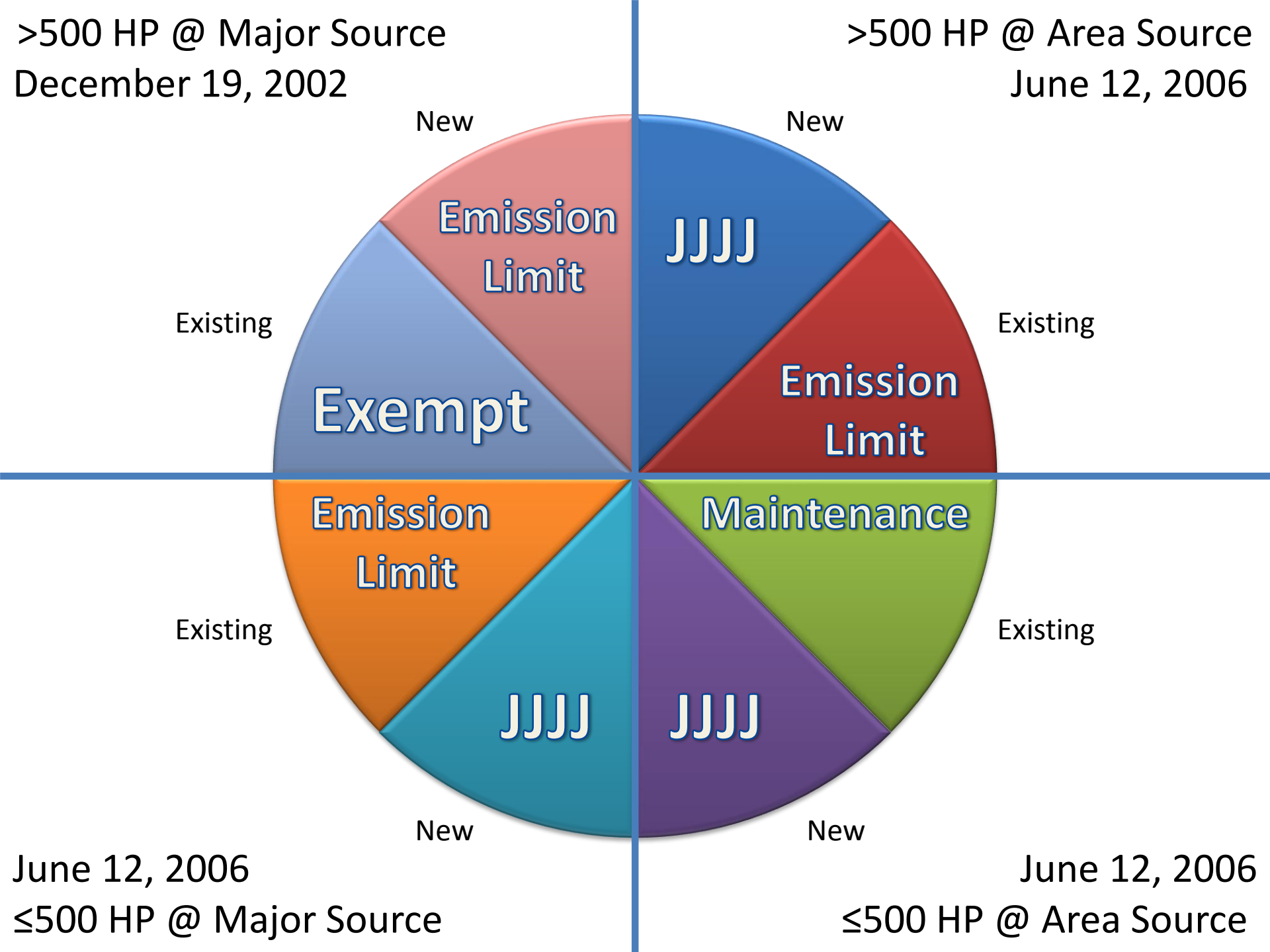
- Residential/Institutional Emergency – Engines located at apartment buildings, schools, homes, religious establishments, medical facilities, police stations, fire stations, and more that provide power during emergency situations
- Commercial Emergency – Engines located at commercial establishments to include telecom centers, regional offices, and corporate offices that provide power in emergency situations
- Emergency – An engine whose operation is limited to emergency situations. Emergency situations include loss of power, flooding, and fire. Peak shaving is not an emergency. These engines are at risk of being reclassified if proper documentation is not available
- Black Start – An engine whose sole purpose is to start up a combustion turbine
- Limited Use – A stationary RICE that operates less than 100 hours per year
- Landfill/Digester Gas – An engine that burns the gaseous by-product of waste decomposition through land or wastewater applications.
- Dual Fuel – A stationary RICE that typically uses liquids fuel for compression ignition and natural gas as a primary fuel. If the annual average of this engine's fuel usage is 2 parts diesel to 100 parts total fuel it will be considered a Spark Ignition Engine

Remote Engines Definition

- Remote stationary RICE (pipelines DOT and Non-DOT)- Stationary RICE located on a pipeline segment where each 1-mile continuous segment has:
  - Within 220 yards of the centerline 10 or fewer buildings intended for human occupancy
  - Within 220 yards of the centerline no buildings with four or more stories
  - Within 100 yards of the centerline no building or a small, well-defined outside area that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period.
- Remote stationary RICE (no pipelines) - Stationary RICE that have 5 or fewer buildings intended for human occupancy and no buildings with four or more stories within a 0.25 mile radius around the engine

What determines Applicability

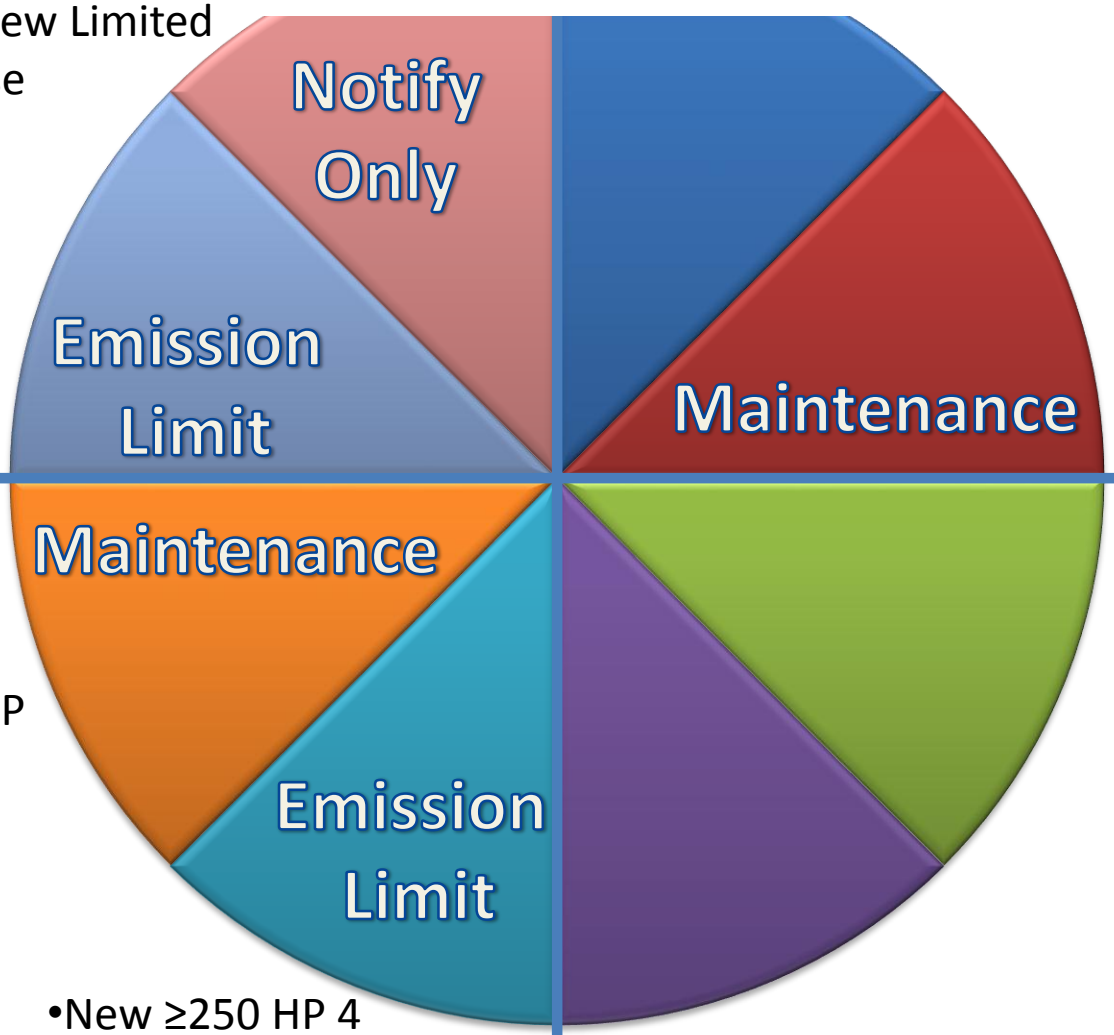
- Stationary or Mobile
  - RICE MACT only affect stationary engines
- Location
  - Whether it is located at a Major or Area Source of HAPs
- Site Rated HP
  - 500 HP is a major cutoff
  - 100, 250, 5000 HP are also cutoffs
- Date of Construction/First Use
  - 2 possible dates are used dependent on HP and Location
- Type/Configuration
  - Rich/Lean and 2/4 stroke have different requirements
- Use
  - Emergency Use/Auxiliary Power/Compression


>500 HP @ Major Source
December 19, 2002
New
Emission Limit
Existing
Exempt
>500 HP @ Area Source
June 12, 2006
New
JJJJ
Existing
Emission Limit
Emission Limit
Existing
JJJJ
New
Maintenance
Existing
JJJJ
New
June 12, 2006
≤500 HP @ Major Source
June 12, 2006
≤500 HP @ Area Source

>500 HP @ Major Source
December 19, 2002

>500 HP @ Area Source
June 12, 2006

EXCEPTIONS



•New Limited Use

•Existing 4 Stroke Rich Burn

•Existing 2 Stroke
•Existing Remote 4 Stroke Rich/Lean

•Existing <100HP

•New ≥250 HP 4 Stroke Rich Burn

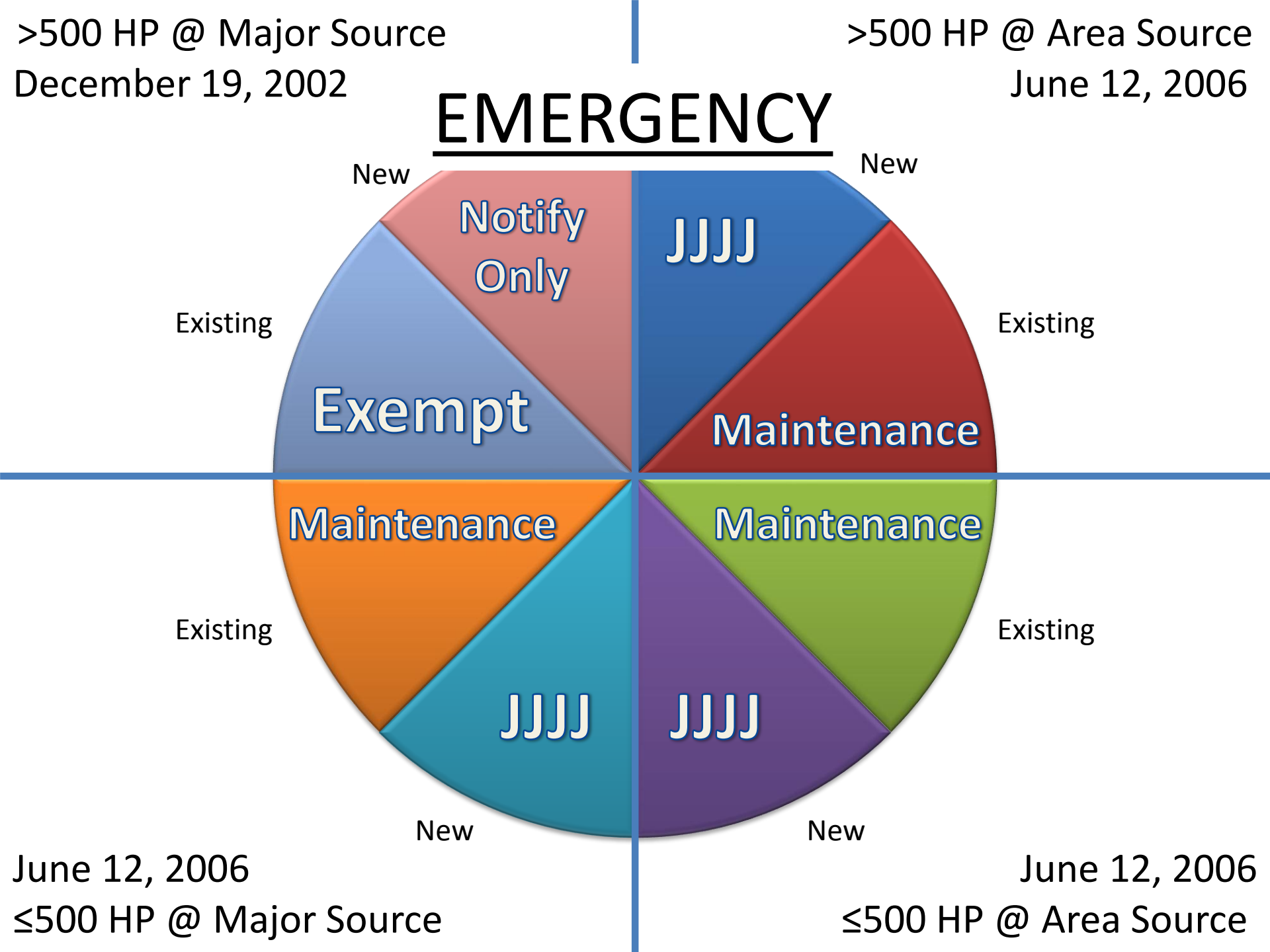
June 12, 2006
≤500 HP @ Major Source

June 12, 2006
≤500 HP @ Area Source

>500 HP @ Major Source
December 19, 2002

>500 HP @ Area Source
June 12, 2006

EMERGENCY



June 12, 2006
≤500 HP @ Major Source

June 12, 2006
≤500 HP @ Area Source

Units with Emission Limits

Emission Limitations
Major Sources

	4SRB	4SLB	2SLB
Existing >500HP	Formaldehyde 76% or 0.350 ppmvd	NONE-Not Applicable	NONE-Not Applicable
Existing 100-500 HP	Formaldehyde to 10.3 ppmvd	CO to 47 ppmvd	CO to 225 ppmvd
Existing 0-99 HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
New >500HP	Formaldehyde 76% or 0.350 ppmvd	CO by 93% or Formaldehyde to 14 ppmvd	CO by 58% or Formaldehyde to 12 ppmvd
New 250-500 HP	NONE-Refer to NSPS JJJJ	CO by 93% or Formaldehyde to 14 ppmvd	NONE-Refer to NSPS JJJJ
New 0-249 HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Emission Limitations
Area Sources

	4SRB	4SLB	2SLB
Existing Not Remote > 500HP	CO 75% or 270 ppmvd or THC 30%	CO 93% or 47 ppmvd	NONE-Not Applicable
Existing Remote > 500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
Existing ≤ 500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
New > 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ
New ≤ 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Testing
Major Sources

	4SRB	4SLB	2SLB
Existing >500HP	Semi-annually if over >5000HP @ ± 10% of 100% load	NONE-Not Applicable	NONE-Not Applicable
Existing 100-500 HP	Initial Only	Initial Only	Initial Only
Existing 0-99 HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
New >500HP	Semi-annually @ ± 10% of 100% load	Semi-annually @ ± 10% of 100% load	Semi-annually @ ± 10% of 100% load
New 250-500 HP	NONE-Refer to NSPS JJJJ	Semi-annually @ ± 10% of 100% load	NONE-Refer to NSPS JJJJ
New 0-249 HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Testing
Area Sources

	4SRB	4SLB	2SLB
Existing Not Remote > 500HP	Annual Demonstration (15 minute run)	Annual Demonstration (15 minute run)	NONE-Not Applicable
Existing Remote > 500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
Existing ≤ 500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
New > 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ
New ≤ 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

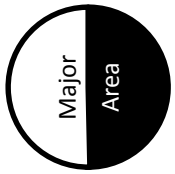
Equipment Requirements Major Sources

	4SRB	4SLB	2SLB
Existing >500HP	NSCR Catalyst / CPMS	NONE-Not Applicable	NONE-Not Applicable
Existing 100-500 HP	NSCR Catalyst	Oxidation Catalyst	Oxidation Catalyst
Existing 0-99 HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
New >500HP	NSCR Catalyst / CPMS	Oxidation Catalyst / CPMS	Oxidation Catalyst / CPMS
New 250-500 HP	NONE-Refer to NSPS JJJJ	Oxidation Catalyst / CPMS / non-reset hour meter	NONE-Refer to NSPS JJJJ
New 0-249 HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Equipment Requirements
Area Sources

	4SRB	4SLB	2SLB
Existing Not Remote > 500HP	NSCR Catalyst / CPMS or Hi-Temp Shutdown	Oxidation Catalyst / CPMS or Hi-Temp Shutdown	NONE-Not Applicable
Existing Remote > 500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
Existing ≤ 500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
New > 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ
New ≤ 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Emission Limit Units



- Updates to Testing
  - –4 stroke rich burn > 500HP can show compliance by reducing THC by 30%
  - –New 4 stroke lean burn ≥ 250HP and > 500HP @ Major source must test at ± 10% of 100% load
- Existing 100-500 HP @ Major Source
  - –No continuous compliance requirements
- Existing Not Remote 4 stroke @ Area Source
  - –CPMS will require CPMS plan if used

Units with Maintenance Requirements

Maintenance Intervals
Major Sources

	4SRB	4SLB	2SLB	Emergency
Existing >500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable
Existing 100-500 HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable	500/1000/500 hours
Existing 0-99 HP	1440 hours (60 days)	1440 hours (60 days)	4320 hours (180 days)	500/1000/500 hours
New >500HP	NONE-Not Applicable	NONE-Not Applicable	NONE-Not Applicable	NONE-Notify Only
New 250-500 HP	NONE-Refer to NSPS JJJJ	NONE-Not Applicable	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ
New 0-249 HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Maintenance Intervals
Area Sources

	4SRB	4SLB	2SLB	Emergency
Existing Not Remote > 500HP	NONE-Not Applicable	NONE-Not Applicable	4320 hours (180 days)	500/1000/500 hours
Existing Remote > 500HP	2160 hours (60 days)	2160 hours (60 days)	4320 hours (180 days)	500/1000/500 hours
Existing ≤ 500HP	1440 hours (60 days)	1440 hours (60 days)	4320 hours (180 days)	500/1000/500 hours
New > 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ
New ≤ 500HP	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ	NONE-Refer to NSPS JJJJ

Maintenance Units

- Required Maintenance Tasks
  - Change Oil & Filter or take Oil Analysis Sample
  - Inspect Spark Plug
  - Inspect Hoses & Belts
- Manufacturer's emission related instruction or your own maintenance plan
- Emergency units require a non-resettable hour meter

Oil Analysis

- Units requiring oil and filter change at specified intervals may opt for an oil analysis program
- Analyze for the following Condemning Limits
  - SI Engines
    - Total Acid Number increase by more than 3.0mg of potassium hydroxide
    - Viscosity has changed by more than 20% of when new
    - % H_20 content is greater than 0.5
- Condemning limit exceedance requires oil change within 2 days or results receipt or before engine is started up

Status Change

- If your facility becomes a major source
  - Comply within 3 years
- If your facility is no longer remote
  - Comply within 1 year
- Emergency unit loses emergency status
  - Comply upon loss of status