

# **NO<sub>x</sub> REQUIREMENTS**

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# **OVERVIEW**

- Developing State Regulation for NO<sub>x</sub>  
– Subpart Q
- Federal New Source Performance Standards
- Federal Rule for Hazardous Air Pollutants

# **Developing State Regulation for NO<sub>x</sub> Emissions from Stationary Internal Combustion Engines and Combustion Turbines**

35 Ill. Admin. Code 217, Subpart Q

# Subpart Q - Applicability

- Major Sources of NO<sub>x</sub> – Permitted for 100 Ton Per Year Source-wide
- Nonattainment Areas Only!
  - Chicago Area Counties:  
Cook, DuPage, Kane, Lake, McHenry, Will, part of Grundy and Kendall
  - Metro-East Area Counties:  
St. Clair, Monroe, Madison, Jersey and part of Randolph

## Subpart Q - Applicability (Cont.)

- Stationary reciprocating internal combustion engines at nameplate capacity rated at equal to or greater than 500 brake horsepower output
- Turbines rated at equal to or greater than 3.5MW (4,694 brake horsepower) output at 14.7 psia, 59°F and 60% relative humidity

# Subpart Q – Compliance Options

- 1) Individual units comply with the NOx emission limits
- 2) Average NOx emissions over a group of units
- 3) Low-usage designation

*Compliance Date is May 1, 2010*

## **Subpart Q – NOx Emission Limits**

- 1) 150 ppmv for spark-ignited rich-burn engines;
- 2) 210 ppmv for spark-ignited lean-burn engines;
- 3) 365 ppmv for existing spark-ignited Worthington engines that are not Phase II NOx SIP;
- 4) 660 ppmv for diesel engines;
- 5) 42 ppmv for gas-fired turbines; and
- 6) 96 ppmv for liquid-fired turbines.

All limits corrected to 15% O<sub>2</sub> on a dry basis.

# Subpart Q – Emissions Averaging

- May average NO<sub>x</sub> emissions from units at multiple facilities under same owner or operator
- Averaging plan must be filed with the IEPA with sample emission calculations for actual and allowable NO<sub>x</sub> emissions
- Averaging plan must show compliance during ozone season and calendar year
- Averaging plan may not include units beginning operation after January 1, 2002, unless it is a “replacement” unit
- Averaging plan may not include low usage units unless low usage level is exceeded

## **Subpart Q – Low Usage Designation - Emissions**

- Potential to emit NO<sub>x</sub> is  $\leq 100$  ton/year aggregated from all engines and turbines at a source that are not exempt and are not complying with the NO<sub>x</sub> emission limits.
- 100 ton/year limit must be in a federally enforceable permit.

## **Subpart Q – Low Usage Designation – Operating Hours**

- Aggregate brake horsepower-hours and MW-hours from all affected units located at the source that are not exempt and not complying with the NO<sub>x</sub> emission limits are less than or equal to
  - A) 8mm bhp-hrs or less on an annual basis for engines; and
  - B) 20,000 MW-hrs or less on an annual basis for turbines
- Hours limits must be included in a federally enforceable permit

# **Subpart Q – Other Requirements**

- Inspection and Maintenance
- Testing and Monitoring
- Recordkeeping
- Reporting

# Subpart Q

## New NOx Allowance Safe Harbor

NOx allowances may be purchased to cover exceedances of emission limits or low usage levels if:

- An anomalous or unforeseen operating scenario inconsistent with historical operations occurs for an ozone season or calendar year
- Used for compliance no more than twice in any rolling five-year period

**Final Federal New Source Performance  
Standards for Stationary Compression  
Ignition Internal Combustion Engines**

40 C.F.R. Part 60, Subpart IIII

Effective September 11, 2006

# NSPS Applicability

- Manufacturers of engines with displacement < 30 liters per cylinder where the model year is 2007 or later
- Owners and operators of engines ordered after July 11, 2005 and manufactured after April 1, 2006
- Owners and operators that modify or reconstruct their engines after July 11, 2005

# **NSPS Modification & Reconstruction**

- Modification: any physical or operational change which results in an increase in hourly emission rate; some exceptions may apply
- Reconstruction: replacement of components to the extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost for a comparable new unit

# NSPS Emission Standards

- Keyed to standards for nonroad diesel engines and marine engines
- Graduated limits depending on model year and engine power, as well as emergency vs. non-emergency designation
- Output-based limits for NO<sub>x</sub>, CO, PM, and NMHC, as well as % opacity

**Example: Max engine power  $\leq$   
2,237 KW/3,000 HP and  
displacement < 10 liters per  
cylinder (g/KW-hr)**

<b>Model Years</b>	<b>NO<sub>x</sub></b>	<b>NMHC + NO<sub>x</sub></b>
Pre 2007	9.2	
2007-2010		6.4
2011-2014	0.67	
2015 and later	0.67	

**Example: Max engine power  $\geq$   
2,237 KW/3,000 HP and  
displacement < 10 liters per  
cylinder (g/KW-hr)**

<b>Model Years</b>	<b>NO<sub>x</sub></b>	<b>NMHC + NO<sub>x</sub></b>
Pre 2007	9.2	
2007-2010	9.2	
2011-2014	0.67	
2015 and later	0.67	

# NSPS Manufacturer Obligations

- For model year 2007 and later engines
- Must certify compliance of engines with standards
- Engines must meet standards during engine's useful life

# NSPS Owner/Operator Obligations

- Must operate and maintain engines to meet emission standards over entire life of engine
- Must follow manufacturer's written instructions or procedures approved by manufacturer over entire life of engine
- Modified and reconstructed engines must meet standards for model year for which engine was originally new
- Compliance and Monitoring Requirements
- Notification and Recordkeeping Requirements
- Fuel Requirements for Sulfur Content
- Permitting

**Federal National Emission  
Standards for Hazardous Air Pollutants for  
Stationary Reciprocating Internal Combustion  
Engines**

40 C.F.R. Part 63, Subpart ZZZZ

# NESHAP Applicability

- **Existing engines** (commenced construction or reconstruction before June 12, 2006)
- **New engines** (commenced construction on or after June 12, 2006)
- **Reconstructed engines** (reconstruction commenced on or after June 12, 2006)

# NESHAP Requirements

- Existing engines are currently not subject to any emission reduction or any other requirement, but stay tuned – this is expected to change.
- New or reconstructed engines of any engine size must comply with the NSPS.

# Conclusion

- Subpart Q: consider compliance options and necessary preparations
- NSPS: be aware of triggers for new units, modifications or reconstruction, as well as compliance obligations
- NESHAP: watch for developments and impacts for existing units