

NSPS Subpart JJJJ

- New Source Performance Standards for Stationary Spark Ignited Internal Combustion Engines
 - §60.4230
- NSPS is a federal rule
 - Applies to all states
 - Is NOT regional
 - State rules cannot be less stringent than federal rules
- Effective date – January 18, 2008
 - rule is currently in effect

What equipment does this rule affect?

- Spark ignited engines
- June 12, 2006 is the magic date
 - Anything before this is exempt
- Rule affects all new, reconstructed or modified engines
 - If the engine is not new, reconstructed or modified – the rule does not apply
- What is a new engine?
 - Any engine ordered after June 12, 2006 AND manufactured after the following dates:

Engine type and fuel	Maximum engine power	After Manufacture date
Non-Emergency Natural Gas	100 HP<500	7/1/2008
Non-Emergency Lean Burn Natural Gas	500 _≤ HP<1,350	1/1/2008
Non-Emergency Natural Gas (except lean burn 500= HP<1,350)	HP 500	7/1/2007
Emergency	HP 130	1/1/2009

Emission Limits – New Engines

Engine type and fuel	Maximum engine power	After Manufacture date	Emission standards ^a					
			g/HP-hr			ppmvd at 15% O ₂		
			NO _x	CO	VOC ^d	NO _x	CO	VOC ^d
Emergency	25>HP<130	1/1/2009	≤10	387	N/A	N/A	N/A	N/A
Non-Emergency Natural Gas	100 HP<500	7/1/2008	2	4	1	160	540	86
Non-Emergency Lean Burn Natural Gas	500≤HP<1,350	1/1/2008						
Non-Emergency Natural Gas and (except lean burn 500= HP<1,350)	HP 500	7/1/2007						
Emergency	HP 130	1/1/2009	1	2	0.7	82	270	60
Non-Emergency Natural Gas	100 HP<500	1/1/2011						
Non-Emergency Lean Burn Natural Gas	500≤HP<1,350	7/1/2010						
Non-Emergency Natural Gas (except lean burn 500= HP<1,350)	HP 500	7/1/2010						

Modification

- NSPS affects all new, reconstructed, and modified engines
- 40 C.F.R. 60.14 (Subpart A) defines a modification as...
 - Any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies
- Horsepower increases
- Engine conversions
- Only applies to modifications AFTER June 12, 2006
- Once we lose our exemption, we never get it back

How do we apply reconstruction?

- This is not an engine to engine cost analysis
 - We must consider the cost of an entirely new like kind facility
 - This means including associated percentages of components that directly service the engine (skid, cooler, control system, fuel gas system, oil system, labor to package)
- Example
 - An engine is overhauled at a cost of \$17,000. After including adders, and additional costs, the total overhaul cost is \$21,000. A new ENGINE is \$40,000.
 - Was reconstruction triggered?

Like Kind Facility

- Example 2
 - An engine is overhauled at a cost of \$17,000. After including adders, and additional costs, the total overhaul cost is \$21,000. A new ENGINE is \$40,000, but an entirely new, like kind facility is \$60,000.
 - Was reconstruction triggered?
 - Why or why not?
- How do I calculate the like kind facility cost?
 - GCA Document
 - Utilizes generic \$/hp numbers based upon engine HP ranges
 - Includes ancillary items (i.e. coolers and skid) as well as installation costs (i.e. trucking and cranes)

Emission Limits – Reconstructed/Modified

Engine type and fuel	Maximum engine power	Prior to Manufacture date	Emission standards					
			g/HP-hr			ppmvd at 15% O ₂		
			NO _x	CO	VOC	NO _x	CO	VOC
Reconstructed/Modified Natural Gas	HP<500	7/1/2008	3	4	1	250	540	86
	HP 500	7/1/2007						
Reconstructed/Modified Emergency	HP>130	1/1/2009						
Otherwise			Refer to New Engine Standards					

Spark Ignition RICE NESHAP

Brief Rulemaking History

Note: This presentation does not directly address requirements for CI/diesel engines, SI engines > 5000HP, emergency use engines, or limited use engines.

1. July 2004: Engines > 500 HP at HAP Major Sources, except existing LB. “Existing” if constructed before 12/19/2002.
2. January 2008: New, Modified, & Reconstructed engines at HAP Major and Area Sources. “Existing” if constructed before 6/12/2006. Included NESHAP & NSPS rulemaking.
3. August 2010: Existing engines at Area Sources and existing engines < 500 HP at HAP Major Sources. “Existing” if constructed before 6/12/2006.
4. January 2013: Identified existing “Remote Stationary RICE” > 500 HP at Area Sources that do not require controls.

HAP <u>Major</u> Sources						
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP	2004	No Requirements		2004		
100-500 HP	2010			2008		
<100 HP						

HAP <u>Area</u> Sources						
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP <u>NOT</u> REMOTE	2013		2010	2008		
>500 HP REMOTE						
</= 500 HP						

Important Rule Concepts

1. **Compliance Date [40 CFR 63.6595(a)(1)]:** “ ... *you must comply with the applicable emission limitations, operating limitations, and other requirements no later than October 19, 2013.*”
2. **“Remote Stationary RICE” [40 CFR 63.6675]:** Aligns with DOT Class Location definitions for Class 1 Pipeline. For RICE not on pipelines, no more than 5 buildings and no buildings with four or more stories in 0.25 mile radius around engine.
3. **Once-In Always-In [40 CFR 63.6603(f)]:** Must meet definition of “Remote Stationary RICE” on 10/19/13 to be remote.
4. **Re-Evaluation [40 CFR 63.6603(f)]:** Evaluate status of RICE every 12 months & keep records of the initial and annual evaluation. If evaluation indicates an engine is no longer remote, must comply with requirements within 1 year of the evaluation.

“Remote Stationary RICE” [40 CFR 63.6675]

Remote stationary RICE means stationary RICE meeting any of the following criteria:

- (1) Stationary RICE located in an offshore area.
- (2) Stationary RICE located on a pipeline segment that meets both of the criteria (i) and (ii) below.
 - (i) A pipeline segment with 10 or fewer buildings intended for human occupancy and no buildings with four or more stories within 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.
 - (ii) The pipeline segment does not lie within 100 yards of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period. The days and weeks need not be consecutive. The building or area is considered occupied for a full day if it is occupied for any portion of the day.
 - (iii) For purposes of this paragraph, the term pipeline segment means all parts of those physical facilities through which gas moves in transportation, including but not limited to pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies. Stationary RICE located within 50 yards of the pipeline segment providing power for equipment on a pipeline segment are part of the pipeline segment. Transportation of gas means the gathering, transmission, or distribution of gas by pipeline, or the storage of gas. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans.
- (3) Stationary RICE that are not located on gas pipelines and 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. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans.

Basic Requirements

Non-Remote Existing Area Source, 4S, >500 HP

HAP Area Sources						
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP <u>NOT</u> REMOTE	2008			2008		
>500 HP REMOTE						
</= 500 HP						

- Equipment Standard [~~ZZZZ~~ Table 2d (9)&(12)]
 - RB: Install NSCR Control; LB: Install Oxidation Catalyst
 - No Specific Emission Standards

Reminder

“Non-Remote Existing Area Source 4-Stroke Engines > 500 HP” may already have catalyst installed to comply with State issued air permits. The catalyst on these engines may or may not meet the requirements of this rule and are required to pass the initial & annual portable analyzer tests.

Basic Requirements

Non-Remote Existing Area Source, 4S, >500 HP

2. Monitoring [~~ZZZZ~~ Table 5 (13)&(14); Table 6 (14)&(15)]

- High Temp S/D OR Continuous Temp monitoring
 - RB: 1250F; LB: 1350F
- Initial portable analyzer test [40 CFR 63.6630(e)]
 - RB: 3 runs x 15 min; CO reduction $\geq 75\%$, CO concentration ≤ 270 ppmv, or THC reduction $\geq 30\%$
 - LB: 3 runs x 15 min; CO reduction $\geq 93\%$ or CO concentration ≤ 47 ppmv
 - Due by 4/17/2014 [40 CFR 63.6612]
 - New test procedure in Appendix A of NESHAP ~~ZZZZ~~.
 - For reductions, simultaneous pre & post catalyst readings

Red text denotes key change from the proposed rule (July 7, 2012) to the final rule published January 30, 2013.

Basic Requirements

Non-Remote Existing Area Source, 4S, >500 HP

2. More Monitoring ... [ZZZZ Table 5 (13)&(14); Table 6 (14)&(15)]

- Annual catalyst activity check [40 CFR 63.6640(c)]
 - Same as initial test, but 1 run x 15 min
 - If Annual Catalyst Check Fails:
 - Not a violation [77 FR 33822]
 - S/D engine & take corrective action
 - Retest w/in 7d of restart
 - Fail Retest - S/D until compliant except to test.
 - Semi-Annual Report with results [ZZZZ Table 7 (3)]

Basic Requirements

Remote Existing Area Source, 4S, >500 HP

HAP Area Sources						
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP <u>NOT</u>				2008		
>500 HP REMOTE						
<= 500 HP						

1. No emission or equipment standards, no requirement for catalytic controls
2. Operate and maintain engine & control device (if any) consistent with good air pollution control practices
[40 CFR 63.6605 & ZZZZ Table 6 (9)]

Basic Requirements

Remote Existing Area Source, 4S, >500 HP

3. Maintenance Practices [~~ZZZZ~~ Table 2d (8)&(11)]: Change oil/filter; Inspect spark plugs, hoses & belts, replace as necessary.
- Every 2160 op hrs (90 days) or annually, whichever first
 - May use oil analysis programs [40 CFR 63.6625(j)], same frequency as oil change.
 - ** Error in 63.6625(j) – missing reference to Table 2d (8)
 - Must change oil w/in 2 business days after receiving results if:
 - TAN increase >3.0 mg KOH/g from new,
 - +/- 20% change in viscosity from new, or
 - > 0.5% water content by volume

Red text denotes key changes from the proposed rule (July 7, 2012) to the final rule published January 30, 2013.

Basic Requirements

Other Existing Area Source Engines

HAP Area Sources						
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP <u>NOT</u> REMOTE						
>500 HP REMOTE						
<= 500 HP						

1. Operate and maintain engine & control device consistent with good air pollution control practices [40 CFR 63.6605 & ZZZZ Table 6 (9)]
2. Maintenance Practices [ZZZZ Table 2d (6), (7), & (10)]
 - Change oil/filter; Inspect spark plugs, hoses & belts, replace as necessary
 - **2SLB, All HP:** Every 4320 op hrs (180 days) or annually, whichever first
 - **4S <= 500 HP:** Every 1440 op hrs (60 days) or annually, whichever first
 - May use oil analysis program, same as remote engines.

** Error in 63.6625(j) – missing reference to Table 2d (10)

Basic Requirements

Existing Major Source Engines, 100-500 HP

	HAP Major Sources					
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP	2004	No Requirements		2004		
100-500 HP				2008		
<100 HP						

- Emission Standards [ZZZZ Table 2c (9) (10) &(11)]
 - 2SLB - CO Limit 225 ppmv (Install Oxidation Catalyst)
 - 4SLB - CO Limit 47 ppmv (Install Oxidation Catalyst)
 - 4SRB - CO Limit 10.3 ppmv (Install NSCR Control)
- Monitoring [ZZZZ Table 5 (12)]
 - Initial Performance Test [40 CFR 63.6602]: 3 runs x 1 hr
 - Due by 4/17/2014 [40 CFR 63.6612]
- Semi-Annual Compliance Report [ZZZZ Table 7 (1)]

Basic Requirements

Existing Major Source Engines, <100 HP

	HAP Major Sources					
	Existing Engine			New/Modified/Reconstructed Engine		
	4SRB	4SLB	2SLB	4SRB	4SLB	2SLB
>500 HP	2004	No Requirements		2004		
100-500 HP				2008		
<100 HP				2008		

- Maintenance Practices [ZZZZ Table 2c (7) & (8)]
 - Change oil/filter; Inspect spark plugs, hoses& belts, replace as necessary
 - **2SLB**: Every 4320 op hrs (180 days) or annually, whichever first
 - **4S**: Every 1440 op hrs (60 days) or annually, whichever first
 - May use oil analysis program, same as remote engines.
- Operate and maintain engine & control device consistent with good air pollution control practices [40 CFR 63.6605 & ZZZZ Table 6 (9)]

Recordkeeping & Reporting

- As always ... Extensive Recordkeeping [40 CFR 63.6655]
 - No change to this part of the rule.
 - Record initial performance tests & catalyst activity checks
 - Record maintenance activities, including maintenance on pollution control equipment and monitoring equipment (e.g., High Temp SD)
 - Record oil analysis events, results of oil analysis, and required oil changes
 - Documentation of initial & annual review of sites with “remote” designation
 - Malfunction records – times, dates, causes, corrective actions
 - Records of temperature system evaluations & malfunctions

- Semi-annual report for Non-Remote engines > 500 HP [ZZZZ Table 7(3)]:
 - Report must include results of annual compliance demonstration (catalyst activity check) if conducted during reporting period.

Regulatory Status of Relocated Engines For Existing RICE > 500 HP

Move a ...	To a ...	RICE NESHAP Requirements At New Location
Remote Area Source RICE	Remote Area Source	Remote Area Source
	Non-Remote Area Source	Non-Remote Area Source
	HAP Major Source	HAP Major Source
Non-Remote Area Source RICE	Remote Area Source	Non-Remote Area Source
	Non-Remote Area Source	Non-Remote Area Source
	HAP Major Source	HAP Major Source
RICE at a Remote HAP Major location	Remote Area Source	Remote Area Source
	Non-Remote Area Source	Non-Remote Area Source
RICE at a Non-Remote HAP Major location	Remote or Non-Remote Area Source	Non-Remote Area Source

Regulatory Status of Relocated Engines For Existing RICE > 500 HP

Move a ...	To a ...	RICE NESHAP Requirements At New Location
Non-Remote Area Source RICE that was at a Remote location on 10/19/2013	Remote Area Source	Remote Area Source because it was "Remote" on 10/19/2013.
RICE located in an overhaul shop or in transit on 10/19/2013	Remote Area Source	Non-Remote Area Source
	Non-Remote Area Source	Non-Remote Area Source
	HAP Major Source	HAP Major Source

Questions & Discussion