

White Paper Summary
40 CFR Part 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and
40 CFR Part 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

This document is intended to provide the regulated community with an overview of the new federal emission standards for stationary spark ignition internal combustion engines and air toxics standards for reciprocating internal combustion engines. This document is not intended to address every requirement of these new and revised rules, so both rules should be read in their entirety. A copy of the preamble and final rules may be found at the following EPA webpage: www.epa.gov/ttn/oarpg/t3pfpr.html [Docket ID No.s EPA-HQ-OAR-2005-0030 and EPA-HQ-OAR-2005-0029]. The final rules are also located in the Code of Federal Regulations at: [Electronic Code of Federal Regulations \(http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl\)](http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl).

Administrative Delegation to AQB Effective August 17, 2009:

The New Mexico Environment Department's Air Quality Bureau (AQB) was delegated Administrative authority for the new NSPS JJJJ and the NESHAP ZZZZ revisions promulgated March 18, 2008. AQB is now the Administrator of these federal regulations. See the FAQ section of this document for AQB startup notifications, test notifications, and test report submittal requirements.

ZZZZ Update 2-25-09:

On February 25, 2009, the EPA proposed revisions to National Emissions Standards for Hazardous Air Pollutants (NESHAP), Subpart ZZZZ to set standards for reciprocating internal combustion engines (RICE) that were not included in the rule effective March 18, 2008. Click here <http://www.epa.gov/ttn/oarpg/new.html> to view the proposed rules and the fact sheet filed 2-25-09. This fact sheet has not yet been updated to incorporate the EPA's 2-25-09 proposed rules.

New Source Performance Standard (NSPS) Subpart JJJJ Summary

This rule became effective on March 18, 2008, and applies to new, modified and reconstructed stationary spark ignition (SI) internal combustion engines (ICE), regardless of size and combusting any fuel. This rule does not apply to combustion turbines. Emissions are controlled to levels achievable by Best Demonstrated Technology (BDT). The regulated pollutants are NO_x, CO and VOC, plus a sulfur limit on gasoline.

Note: The final NSPS for stationary compression ignition (CI) engines (Subpart IIII) was published on July 1, 2006.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ Summary

This revised rule also became effective on March 18, 2008, and includes requirement to regulate emissions from new and reconstructed stationary reciprocating internal

combustion engines (RICE) ≤ 500 hp at major sources of hazardous air pollutants (HAP) and all new and reconstructed stationary RICE at area sources.

A HAP major source is a facility with a potential to emit 10 (tons per year) tpy of a single HAP or 25 tpy of a combination of HAPs. An area source is a source that is not a HAP major source.

The new NESHAP regulations are a revision to existing Subpart ZZZZ that is applicable to stationary RICE > 500 hp at major sources, promulgated in 2004. The regulated pollutants are the seven urban HAPS (7 polycyclic aromatic hydrocarbons (PAHs), acetaldehyde, arsenic, benzene, beryllium compounds, cadmium compounds and formaldehyde) using CO or VOC as surrogates.

Owners and operators of an area source subject to the final rule are exempt from the obligation to obtain a Title V permit provided they are not required to obtain a permit under 40 CFR 70.3(a) for a reason other than their status as an area source (40 CFR 70.3(a) covers applicability to the Title V permitting program and requires any source, including an area source, subject to standards under Section 111 or 112 of the Clean Air Act to obtain a Title V permit.).

Note: Neither the NSPS Subpart JJJJ nor the NESHAP Subpart ZZZZ addresses emissions from existing stationary reciprocating internal combustion engines. A separate, future rulemaking process will address existing sources.

NSPS Subpart JJJJ Standards

The standards in Tables 1 and 2 apply to manufacturers.

Table 1: NO_x , HC, NMHC and CO Emission Standards for Stationary SI Engines ≤ 19 kW (25 hp) Manufactured after July 1, 2008. [The engine manufacturer is required to certify that the engines meet these standards.]

Engine Class	Emission Standards in g/kW-hr (g/hp-hr)		
	HC+NO _x	NMHC+NO _x	CO
I 100 cc \leq Displacement < 225 cc	16.1 (12.0)	14.8 (11.0)	610 (455)
I-A Displacement < 66 cc	50 (37)	--	
I-B 66 cc \leq Displacement < 100 cc	40 (30)	37 (27.6)	
II Displacement ≥ 225 cc	12.1 (9.0)	11.3 (8.4)	

Table 2: NO_x , HC, NMHC and CO Emission Standards for Stationary Non-Emergency SI Gasoline Engines > 19 kW (25 hp) and Rich Burn LPG Engines > 19 kW (25 hp) [The engine manufacturer is required to certify that the engines meet these standards.]

Maximum Engine Power	Manufacture Date	Emission Requirement in g/kW-hr (g/hp-hr)	
		HC+NO _x	CO
25 $<$ hp < 500	July 1, 2008	2.7 (2.0)	4.4 (3.3)

	July 1, 2008 (severe duty)	2.7 (2.0)	130.0 (97.0)
hp \geq 500	July 1, 2007	2.7 (2.0)	4.4 (2.2)
	July 1, 2007 (severe duty)	2.7 (2.0)	130.0 (97.0)

Note: Gasoline-fired SI engines must use gasoline meeting the requirements of 40 CFR 80.195 (regulation of fuels and fuel additives), including a maximum sulfur content of 80 ppm.

Manufacturers of gasoline or LPG rich burn emergency engines must certify such units to the standards in 40 CFR Part 90 (<130 hp) or Part 1048 (\geq 130 hp).

The standards in Tables 3 and 4 apply to owners and operators of the specified engine types that commence construction after June 12, 2006 and that are manufactured after the applicable dates. For the purposes of this NSPS, the date that construction commences is that date the engine is ordered by the owner or operator.

Table 3: NO_x, HC, NMHC and CO Emission Standards for Owners/Operators of Stationary Non-Emergency SI Natural Gas Engines 19<kW<75 (25<hp<100) and Lean Burn LPG Engines 19<kW<75 (25<hp<100) [Optional manufacturer certification]

Maximum Engine Power	Manufacture Date	Emission Requirement in g/kW-hr (g/hp-hr)	
		HC+NO _x	CO
25<hp<100	July 1, 2008	3.8 (2.8)	6.5 (4.8)
	July 1, 2008 (severe duty)	3.8 (2.8)	200.0 (149.2)

Table 4: NO_x, CO and VOC Emission Standards for Owners/Operators of Stationary Non-Emergency SI Engines \geq 100 hp (except gasoline and rich burn LPG), Stationary SI Landfill/Digester Gas Engines, Stationary Emergency $>$ 25hp [Optional manufacturer certification]

Engine Type and Fuel	Maximum Engine Power	Manufacture Date	Emission Standards					
			g/hp-hr			ppmvd @ 15% O ₂		
			NO _x	CO	VOC	NO _x	CO	VOC
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG	100 \leq hp<500	07/01/2008	2.0	4.0	1.0	160	540	86
		01/01/2011	1.0	2.0	0.7	82	270	60
Non-Emergency SI Lean Burn Natural Gas and LPG	500 \leq hp<1,350	01/01/2008	2.0	4.0	1.0	160	540	86
		07/01/2010	1.0	2.0	0.7	82	270	60
Non-Emergency	hp \geq 500	07/01/2007	2.0	4.0	1.0	160	540	86

Engine Type and Fuel	Maximum Engine Power	Manufacture Date	Emission Standards					
			g/hp-hr			ppmvd @ 15% O ₂		
			NO _x	CO	VOC	NO _x	CO	VOC
SI Natural Gas and Non-Emergency SI Lean Burn LPG (except lean burn 500≤hp<1,350)	hp≥500	07/01/2010	1.0	2.0	0.7	82	270	60
		07/01/2008	3.0	5.0	1.0	220	610	80
Landfill Digester Gas (except lean burn 500≤hp<1,350)	HP<500	01/01/2011	2.0	5.0	1.0	150	610	80
		07/01/2007	3.0	5.0	1.0	220	610	80
	hp≥500	07/01/2010	2.0	5.0	1.0	150	610	80
		01/01/2008	3.0	5.0	1.0	220	610	80
Landfill/ Digester Gas lean burn	500≤hp<1,350	07/01/2010	2.0	5.0	1.0	150	610	80
		01/01/2009	10	387	N/A	N/A	N/A	N/A
Emergency	25<hp<130	01/01/2009	2.0	4.0	1.0	160	540	86
	hp≥130							

NSPS Subpart JJJJ Compliance

Manufacturers

Manufacturers that are required to certify their engines must follow the certification and testing procedures in 40 CFR Part 90 or 1048, as applicable.

Manufacturers that voluntarily certify their SI engines to the applicable standards must do so using pipeline-quality natural gas, or if the engines are certified using another fuel, specify the fuel properties and required adjustments the owner/operator must make during installation to meet the standards while combusting the alternative fuel.

Owners and operators of natural gas engines are allowed to use propane as a backup fuel up to 100 hours per year. If an engine is operated on propane >100 hours per year without certification when using propane, the owner/operator is required to conduct performance tests while combusting propane to demonstrate compliance with the standards.

Owners/Operators

Owners/operators using any engines ≤25 hp or gasoline or rich burn LPG engines >25 hp must certify compliance by using engines certified under 40 CFR Part 90 or 1048, as applicable.

Owners/operators using engines >25 hp using fuels other than gasoline and that are not rich burn LPG engines >25 hp must demonstrate compliance by either using an engine

certified to the applicable standards or by conducting an initial performance test (some engine sizes require periodic performance tests).

The owner/operator must keep maintenance records for all engines subject to the NSPS, and a Maintenance Plan is required for non-certified engines, including certified engines operating in a non-certified manner. Owners/operators of certified engines who do not follow the manufacturer's emission-related operation & maintenance procedures are considered to be operating non-certified engines, subject to performance testing.

Owners/operators of certified engines <100 hp that are operating in a non-certified manner are not required to conduct performance tests; however, owners/operators are required to maintain and operate the engines in a manner consistent with good practices to minimize emissions.

Owners/operators of certified engines ≥ 100 hp <500 that are operating in a non-certified manner must conduct performance tests within the first year of engine operation.

Owners/operators operating certified engines >500 hp in a non-certified manner must conduct performance tests within the first year of operation and every 8760 hours of operation or 3 years thereafter, whichever comes first.

Modified Sources

The final standards also apply to stationary engines manufactured before July 1, 2007 or July 1, 2008 that have been modified or reconstructed after June 12, 2006. For the purposes of this NSPS, a stationary engine that has been overhauled as part of a maintenance program is not considered to have been modified if there is no increase in the engine's emissions.

NSPS Subpart JJJJ Recordkeeping and Reporting

Owners/operators of all engines are required to maintain records of proper maintenance and non-certified engines must have a maintenance plan.

Initial notification is required for engines >500 hp that are non-certified.

Owners/operators of emergency engines are required to keep records of their hours of operation.

Owners/operators who are required to conduct performance testing on engines must report the results within 60 days of each performance test.

NESHAP Subpart ZZZZ Compliance at HAP Major Sources

Owners/operators of SI stationary RICE ≤ 500 hp at HAP major sources (except for 4-stroke lean burn (4SLB) RICE $250 \geq \text{hp} < 500$) that demonstrate compliance with the requirements of the final NSPS Subpart JJJJ will be in compliance with the NESHAP.

Owners/operators of 4SLB stationary RICE $250 \geq \text{hp} < 500$, manufactured on or after January 1, 2008, are required to reduce CO by 93% or limit formaldehyde in the engine exhaust gas to 14 ppmvd or less at 15% O₂, plus comply with the NSPS Subpart JJJJ requirements except for the CO emission standards (40 CFR 63.6601).

See 40 CFR 63.6600 for owner/operator requirements for other RICE located at major sources not included in 63.6601.

Owners/operators of compression ignition (CI) stationary engines ≤ 500 hp at HAP major sources that demonstrate compliance with the requirements of NSPS Subpart IIII will be in compliance with the NESHAP.

New and reconstructed stationary RICE ≤ 500 hp that start-up before January 18, 2008 must comply with the NESHAP no later than January 18, 2008. New and reconstructed stationary RICE ≤ 500 hp that start-up after January 18, 2008 must comply at start-up.

NESHAP Subpart ZZZZ Compliance at HAP Area Sources

Owners/operators that demonstrate compliance with either NSPS Subpart IIII or JJJJ, as appropriate, will be in compliance with the NESHAP.

New and reconstructed stationary RICE that start-up before January 18, 2008 must comply no later than January 18, 2008. New and reconstructed stationary RICE ≤ 500 hp that start-up after January 18, 2008 must comply at start-up.

NESHAP Reconstructed Sources

The final NESHAP standards apply to stationary engines on which reconstruction commenced on or after June 12, 2006.

NESHAP Subpart ZZZZ Recordkeeping and Reporting

Stationary RICE ≤ 500 hp at HAP major sources will be able to demonstrate compliance with the NESHAP by meeting the recordkeeping and reporting requirements of the appropriate NSPS (Subpart IIII or JJJJ).

New or reconstructed 4SLB stationary RICE ≥ 250 hp ≤ 500 at HAP major sources must meet the specific reporting and recordkeeping requirements of Subpart ZZZZ.

For questions about recordkeeping, reporting, notifications, and compliance testing related to NSPS JJJJ and NESHAP ZZZZ, please contact Scott Vail, Air Quality Bureau Compliance Inspection Manager, at 505-476-4300, extension 4357.

For all other questions about NSPS JJJJ and NESHAP ZZZZ, please contact Cember Hardison, Air Quality Bureau Permit Specialist at 505-476-4300, extension 4346.

FAQs

Question: How does the AQB define ‘modification’ and ‘reconstruction’?

Answer: The NSPS definitions of ‘modification’ and ‘reconstruction’ are included in 40 CFR 60.14 & 60.15, respectively. The NESHAP ‘reconstruction’ criteria are found in 40 CFR 63.2. As stated above, for the purposes of NSPS JJJJ, a stationary engine that has been overhauled as part of a maintenance program is not considered to have been modified if there is no increase in the engine’s emissions.

Question: If an engine previously covered under a Notice of intent (NOI) is required to have controls to meet the applicable NSPS JJJJ or NESHAP ZZZZ standard, is a construction permit required under 20.2.72.200.A.3 NMAC?

Answer: 20.2.72.202.C NMAC exempts sources and units that would otherwise be subject to a Part 72 permit if the only reason a permit is required is the applicability of certain NSPS and NESHAP. However, these units must obtain an NOI or meet the notification requirements of the applicable NSPS or NESHAP to qualify for this exemption. Please note that this exemption does not apply to sources subject to 40 CFR Part 60 Subpart I (Asphalt Plants) and Subpart OOO (Rock Crushers), and to 40 CFR Part 61 Subpart C (Beryllium) and Subpart D (Beryllium Rocket Motor Firing).

Question: Can NSPS JJJJ and NESHAP ZZZZ limits be used to determine applicability under 20.2.72.200. A (& B) NMAC?

Answer: Yes. Since the NSPS JJJJ and NESHAP ZZZZ limits are federally enforceable these limits can be used in determining the applicability under 20.2.72.200.A (& B) NMAC.

Question: What happens if a facility needs to swap out an engine? Can these still be handled as administrative revisions?

Answer: Maybe. PSD minor sources may continue to replace like-kind units as administrative revisions in accordance with current Bureau policy. PSD major sources are required to submit a netting analysis if the potential emission rate exceeds a PSD significance threshold. Note that 20.2.74.7.U(2) NMAC defines a ‘replacement unit’ as an existing unit (20.2.74.7.AS NMAC defines a ‘replacement unit’). The federally enforceable NSPS emission standards should be taken into account when determining the potential emission rate (PER).

Question: If a portable compressor unit has an engine that was manufactured before the dates in the rule, will it be required to meet the new standards after relocation?

Answer: No, unless the unit has been modified or reconstructed.

Question: What are the expectations when permittees submit manufacturer’s data?

Answer: The submittal of this data is not required by the NSPS; however, the owner/operator is required to maintain documentation that the engine is certified to meet the standards of 40 CFR Parts 90 or 1048.

Question: What does the Bureau expect from regulated sources on compliance testing and what protocols should be used?

Answer: The Bureau expects regulated sources to follow the testing requirements of the NSPS and NESHAP. The specific requirements, including test methods, are detailed in Table 2 to Subpart JJJJ of Part 60 and Table 4 to Subpart ZZZZ of Part 63.

Question: When will subsequent performance testing be required?

Answer: See § 60.4243 of the NSPS. Subsequent performance testing is required for SI ICE >500 hp every 8760 hours or 3 years, whichever comes first. Also, if you modify or reconstruct an engine subject to the rule, you will need to conduct a performance test to demonstrate continued compliance with the rule. This applies to non-certified engines or certified engines operating in a non-certified manner.

Question: How will the AQB enforce these regulations until they are incorporated into the SIP?

Answer: The AQB will not enforce NSPS JJJJ or the revised portions of NESHAP ZZZZ until they have been adopted by reference in 20.2.77 NMAC and 20.2.78 NMAC. However, you still have a duty to comply with all applicable federal regulations. These regulations are enforceable by U.S. EPA.

Question: How does the new rule define a “facility”? Does it consist of the engine, everything on the skid, or everything on-site? Provide case study examples of what the facility boundaries may be.

Answer: There is no definition for “facility” found in 40 CFR 60 (NSPS) or 40 CFR 63 (NESHAP), however, the following definitions are found for these rules:

Affected Facility, Existing Facility, and Stationary Source – Definitions at 40 CFR 60.2

Affected Source – Definitions at 40 CFR 63.2

Oil and Gas Production Facility – Definitions at 40 CFR 63.6675

Question: Is there any OEM (original equipment manufacturer) that is certifying engines at 25 HP or less, and if not, how can owners and operators satisfy the requirements that these engines be certified?

Answer: Per 40 CFR 60.4231 (as revised at 73 FR 59175, Oct. 8, 2008) manufacturers must certify stationary SI ICE with a horsepower of 25 or less and manufactured on or after July 1, 2008 according to the requirements of 40 CFR parts 90 or 1054.

Question: Is Method 25A - Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer a satisfactory testing method when measuring VOC emissions, and can CO be used as a surrogate for formaldehyde?

Answer: VOC testing requirements for NSPS JJJJ are found in 40 CFR 60.4244 and Table 2 to Subpart JJJJ. VOC testing options listed in Table 2 include 25A and 18 from appendix A of 40 CFR 60; Method 320 from Appendix A of 40 CFR 63; or ASTM D6348–03. There are no limits for VOCs in NESHAP ZZZZ.

CO and formaldehyde testing requirements are found in 40 CFR 63.6620 and Table 4 of Subpart ZZZZ. Testing options listed in Table 4 include measuring CO using a portable analyzer and measuring formaldehyde with Methods 320 or 323 of 40 CFR 63, appendix A; or ASTM D6348–03^b.

A discussion concerning the NMHC/VOC standards and test methods are found in pages 55 through 58 of the preamble to the final NSPS JJJJ and NESHAP ZZZZ rules (EPA-HQ-OAR-2005-030, FRL-RIN 2060-AM81).

Question: Can a Streamlined permit go to an NOI (or even an NPR) if emissions controls were put on to meet NSPS.

Answer: NSPS and NESHAP requirements are federally enforceable. NSR permit applicability (20.2.72 NMAC) is based upon the Potential Emission Rate (PER) of a pollutant which allows for emissions limits due to federally enforceable requirements (see PER definition at 20.2.72.7.Y). If a source is subject to an NSPS or NESHAP that requires methods for limiting emissions, that source can use the after control emissions to determine NSR construction permit applicability. If a source is not subject to an NSPS or NESHAP, the source can not take credit for after control emissions.

If a permittee re-evaluates emissions for a facility and finds that the facility-wide PER is less than 10 lb/hr and 25 tpy as a result of NSPS and/or NESHAP requirements, the permittee may request that the permit be canceled. A Universal Application form must be submitted that demonstrates the facility may operate with a Notice of Intent (20.2.73 NMAC) or a No Permit Required (NPR) and should include a letter requesting that the permit be cancelled and replaced with an NOI or NPR. A \$500 filing fee is required for NOI applications. The Department will evaluate the request and notify the permittee in writing of the determination.

Question: What is the rationalization for having some of the compliance deadlines take effect before the final rule was completed?

Answer: The answer to this question can be found in the preamble to the final rule. In response to comments that additional time was needed for owners, operators and manufacturers to comply with the final rule, EPA stated that Sections 111 and 112 of the Clean Air Act define new engines to be “all engines for which construction is commenced following the date of the proposal and it is routine for sources that commenced construction before the final rule to be subject to standards under these provisions.” EPA did extend the compliance date for all stationary ICE that, in the proposed rule, had a compliance date of January 1, 2008 by 6 months to July 1, 2008. Also, stationary SI lean burn engines between 500 and 1,350 hp that had a compliance date of July 1, 2007 in the proposed rule were given an additional 6 months to demonstrate compliance.

Question: What is the correlation of the date that construction commences and manufacture date with respect to NSPS and NESHAP applicability?

Answer: There is no direct correlation. NSPS JJJJ defines the date that construction commences as the date the engine is ordered by the owner or operator. According to EPA, some of the manufacture dates were chosen to match the dates in the non-road engine regulations, others were selected based on discussions with engine manufacturers on the lead-time needed to produce cleaner burning engines.

Question: How do we submit startup and performance test notifications required by NSPS JJJJ (40 CFR 60.4244 and 60.42445) and NESHAP ZZZZ (40 CFR 63.6645)?

Answer: Submit startup and testing notifications to the Air Quality Bureau. These notifications must meet the requirements of NSPS A (General Requirements 40 CFR 60.7 and 60.8) and NESHAP A (General Requirements 63.7 and 63.9)

Startup notifications should be submitted on company letterhead by paper copy and accompanied by a completed Reporting Submittal Form. Submit to Reports Manager, Compliance and Enforcement Section, NMED Air Quality Bureau.

Test notifications and test reports should be reported on the NMED standard electronic protocol and report form, accompanied by a Report Submittal form and addressed to stacktest.aqb@state.nm.us.

Forms are available on the New Mexico Environment Department Web Site under PROGRAMS/AIR QUALITY/COMPLIANCE AND ENFORCEMENT/FORMS and TESTING.