

**Regulation Summary**  
**NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE)**  
**40 CFR Part 63, Subpart ZZZZ**

The Environmental Protection Agency published the final rule for emission standards for stationary, natural gas engines in 2010, with final rule amendments published on January 30, 2013. The rule is formally known as the National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines, or more commonly referred to as NESHAP RICE. In the revised rule, the EPA addressed emissions from existing natural gas engines not covered by earlier rules, known as Subpart ZZZZ, or Quad Z.

The rule targets emissions from existing natural gas engines and requires that owners bring existing engines into compliance with the emission regulation. Although the rule sets emission testing and compliance requirements for both compression ignited and spark ignited RICE, this summary concentrates on the impacts of the rule to existing spark ignited natural gas engines. See the full rule for information on compression ignited new, reconstructed, or existing engines.

In the rule, the EPA sets standards for emissions from the following Stationary Spark-ignited (SI) Engines: 4 Stroke Lean-Burn Natural Gas Engines, 4 Stroke Rich-Burn Natural Gas Engines, 2 Stroke Lean-Burn Natural Gas Engines, and Landfill Gas and Digester Gas Engines. The rule also addresses emissions from engines operating in emergency applications.

The EPA defined two categories of SI engines: those that operate at “Major Sources”, and those that operate at “Area Sources”. A Major Source is one that has the potential to emit 10 tons per year of any single Hazardous Air Pollutant (HAP), or 25 tons per year of any combination of HAP. An Area Source is essentially everything else. A HAP is any one of a number of compounds characterized by the EPA to cause both health and environmental damage, such as formaldehyde and acrolein. The complete list of HAPs regulated by the EPA can be found at [www.epa.gov/ttn/atw/orig189.html](http://www.epa.gov/ttn/atw/orig189.html).

Summaries of the rule for some non-emergency engines located at Major and Area Sources are in the tables below.

*Table I. Emission Standards from existing Stationary Engines located at Major Sources*

<b>Engine Type</b>	<b>Power Range</b>	<b>Emission Standard</b>
4 Stroke, Lean-Burn	100≤hp≤500	47 ppmvd carbon monoxide*
4 Stroke, Rich-Burn	100≤hp≤500	10.3 ppmvd formaldehyde*
Landfill or Digester Gas	100≤hp≤500	177 ppmvd carbon monoxide*

\*ppmvd = parts per million, dry volume basis

Owners and operators of existing stationary non-emergency SI 4 Stroke, Lean-Burn (4SLB) and SI 4 Stroke, Rich-Burn (4SRB) RICE > 500 hp at area sources that are located in sparsely populated areas (remote from human activity) are now subject to work practices rather than numerical emission limits

and associated testing and monitoring as originally promulgated. A Remote area is defined as either a Department of Transportation (DOT) Class 1 pipeline location or, if the engine is not on a pipeline, if within a 0.25 mile radius of the facility there are 5 or fewer buildings intended for human occupancy.

For 4 stroke engines > 500 hp at area sources located in populated (non-remote) areas, EPA has adopted an equipment standard requiring the installation of a catalyst to reduce HAP emissions. These sources are required to test their engines to demonstrate compliance initially, and thereafter only need to perform catalyst activity check-ups and either monitor the catalyst inlet temperature continuously or employ high temperature shutdown devices to protect the catalyst.

In order to be considered remote stationary RICE an existing non-emergency SI 4SLB stationary RICE with a site rating > 500 hp located at area sources of HAP must meet the definition of remote stationary RICE in §63.6675 on the initial compliance date for the engine, October 19, 2013, Owners and operators of engines that meet the definition of remote stationary RICE in §63.6675 as of October 19, 2013 must re-evaluate the status of their stationary RICE every twelve months. Owners and operators must keep records of the initial and annual evaluation of the status of the engine.

Engines <100 hp, as well as engines that operate only a few hours per year (<24), generally do not need after treatment or an emissions test. However the rule does require owners of these engines to follow a prescribed maintenance protocol. There are also requirements addressing engine startup, operation and documentation.

*Table II. Prescribed Maintenance Protocols*

<b>Engine Type</b>	<b>Requirement</b>
Non-emergency, non-black SI 2SLB stationary RICE	Change Oil and filter, Inspect Spark Plugs, and Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first. Maintain Records of maintenance and inspections.
Non-emergency, non-black, SI 4SLB or 4SRB stationary RICE ≤500 hp	Change Oil and filter, Inspect Spark Plugs, and Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first. Maintain Records of maintenance and inspections.
Non-emergency, non-black, SI 4SLB or 4SRB remote stationary RICE >500 hp	Change Oil and filter, Inspect Spark Plugs, and Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first. Maintain Records of maintenance and inspections.
Non-emergency, non-black SI 4SLB stationary RICE >500 hp that are not remote and operate more than 24 hours per calendar year.	Install an oxidation catalyst to reduce HAP emissions from the stationary RICE.
Non-emergency, non-black SI 4SRB stationary RICE >500 hp that are not remote and operate more than 24 hours per calendar year.	Install NSCR to reduce HAP emissions from the stationary RICE.

*This summary is not intended to evaluate all engines and requirements under the 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines; Final Rule. It addresses the most common spark ignited stationary engines found at natural gas production locations. The full text of the rule and all subsequent amendments should be referred to for any engines not covered in this summary. Sphere 3 Environmental, Inc. 2013.*