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Acoustic & Emission Technologies

QuietShield™ with
GreenShield® technology

Compliance Guide to EPA's 40CFR Part 63

**SI (Natural Gas) RICE NESHAP
Compliance Guide**

Exhaust System Considerations
Lean Burn Catalyst Systems
Rich Burn Catalyst Systems
Compliance Catalyst Monitor

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RICE NESHAP CATALOG
FOR SI ENGINES

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Note

- ∴ All dimensions in inches and weights in pounds, unless otherwise indicated.

Exhaust System Considerations

Natural Gas Exhaust System Considerations

If your operation requires the use of stationary natural gas reciprocating engines as a prime source of power, you need to recognize that RICE NESHAP may require some modifications of your work practices and engine(s). The ruling, issued in August 2010, covers existing non-emergency stationary natural gas engines. Compliance to the ruling is required by October 19, 2013. EPA states there are over 360,000 stationary engines in the United States that are affected by this ruling.

Though compliance is a few months away, it doesn't hurt to start planning early, especially if your operation consists of many engines. The first step is to determine your requirements to meet the ruling. The second step is to bring your engine(s) into compliance.

Exhaust System Evaluation

To begin the analysis you need to gather the following data:

1. Horsepower of the engine
2. Annual hours of operation
3. Annual hours of operation for non-emergency purposes
4. Annual hours of operation for maintenance checks and readiness purposes

This information is required to determine if your application is emergency or non-emergency, and whether you fall into a Major Source or Area Source of Hazardous Air Pollutants. A Major Source is an area that produces over 10 tons of Hazardous Air Pollutants (HAPs) annually. An Area Source is considered to be any area that is not a Major Source. Next, take this data to page 1.4 or page 1.6 or to an online RICE NESHAP calculator. There is one located on Universal's website at www.UniversalAET.com. The calculator will use the data to determine the steps needed to bring your engine into compliance.

There are several categories that may require attention to bring your engine into compliance. They are:

- Allowable emission levels
- Standard work practices
- Engine operating limitations
- Start-up requirements
- Compliance demonstration
- EPA reporting requirements

Study the requirements generated by the calculator with your maintenance staff. Some requirements do not require a lot of resources. Keeping maintenance and operating records may already be a part of your daily routine. However, there are other requirements that may require additional resources. Some engines may require testing, monitoring equipment and a catalyst system. Contact your engine supplier or an emission control specialist to help facilitate these needs, as their sizing and installation can be quite complex.

If you think you have the resources to handle the more complex requirements, there are some items you need to consider:

- Type of control technology
- Backpressure requirements
- Catalyst placement
- Supportive structure
- Catalyst sizing
- Service requirements
- Enclosed engines
- Compliance testing
- Compliance monitoring
- Labor time
- Air fuel ratio control

Type of Control Technology

Emission control technology that will be used is Oxidation Catalysts. See sections 2, 3, and 4. RICE NESHAP requires CO or formaldehyde reduction.

Backpressure

Engine backpressure also needs to be considered when adding a catalyst to an existing engine. Adding a catalyst will add backpressure that may exceed the engine exhaust backpressure threshold. A catalyst can add an additional 3–4" of water to engine backpressure. Replacing the silencer



Figure 1: Universal provides a combination catalyst/silencer system that causes less engine backpressure.

with a combination silencer/catalyst unit is a solution to minimize the additional backpressure. They are designed for lower backpressure by reducing the number of expansion and contractions of the exhaust gases. Another option is the catalyst itself can be designed for lower backpressure.

Catalyst Placement

Placement of the catalyst in the exhaust system is critical as the exhaust gas temperature needs to be managed so the catalyst works properly. Most catalysts need to operate above 550° F. The further the gas path is from the source, the lower the temperature. In some applications, this may require additional insulation around the exhaust system in order to maintain the proper exhaust temperature. The system should be optimized for the lowest temperature seen throughout the year. For example, colder climates may need additional insulation because of winter temperatures. Also, proper attention needs to be paid to the components upstream from the catalyst system. If you are using a packed silencer in sequence with the catalyst system, fibers may come loose that may coat or plug the catalysts element and reduce its effectiveness. In these instances, the catalyst system should be located upstream from the packed silencer.

Exhaust System Considerations

Natural Gas Exhaust System Considerations



Figure 2: Proper positioning of catalyst access doors at the site is important for easy service.

Supportive Structure

Before installation of the catalyst system, the physical support structure needs to be considered. For larger catalyst systems, the connecting pipe will not be able to support the catalyst's weight. A steel ladder system may be required to support the catalyst from the package's base. The supportive structures should be fabricated before on-site installation to minimize service time.

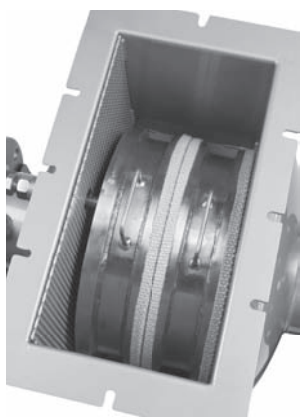


Figure 3: This catalyst housing, offered by Universal, provides a system that eliminates exhaust bypass by forcing the catalyst against the downstream side.

Catalyst Sizing

Proper attention needs to be given to catalyst sizing. The volume of the catalyst must be properly sized for the exhaust flow rate to meet the required emissions reduction target. If it is undersized, you won't meet the emissions target. And if it is oversized, the catalyst may be overpriced and uncompetitive when selling to an end user.

Service Requirements

Catalysts require periodic servicing, typically every 8,700 hours of operation. The catalyst system needs to be placed where it can be easily accessed, whether near a service panel or open area. This design should allow easy access and removal to the catalyst element without special tools or cumbersome capture mechanisms. The quicker to remove and replace the catalyst element, the more time your technicians have for other jobs. Exhaust bypass is a common problem in some catalyst housing designs. This is where the exhaust gas is not forced through the catalyst. This issue will impact the effectiveness of the catalyst system. Seek a housing and catalyst design that includes a positive seal against the side of the housing, forcing the exhaust gas to flow through the catalyst element.

Enclosed Engines

Many engines that will be affected by the RICE NESHAP ruling will come in enclosed skid-mounted packages. Space inside the enclosures is at a premium. Finding a location to fit a catalyst can be difficult. However, by utilizing an integrated silencer/catalyst system, you may be able to place it in the same footprint as the current silencer. Also, you will need catalyst housings that have different mounting configurations, such as end-in/end-out, side-in/end-out, and high-side in/end-out.

Compliance Testing

Existing stationary engines that require the addition of a catalyst system require before and after emissions testing to validate compliance. To make this requirement easier for your organization, work with an exhaust stack testing firm that can provide the testing.

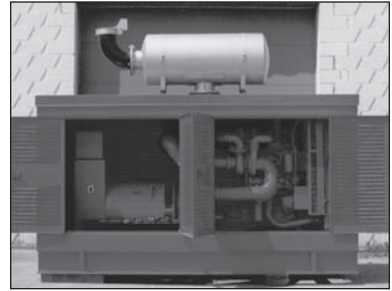


Figure 4: Enclosed packages could present space problems for a "bolt in" catalyst system.

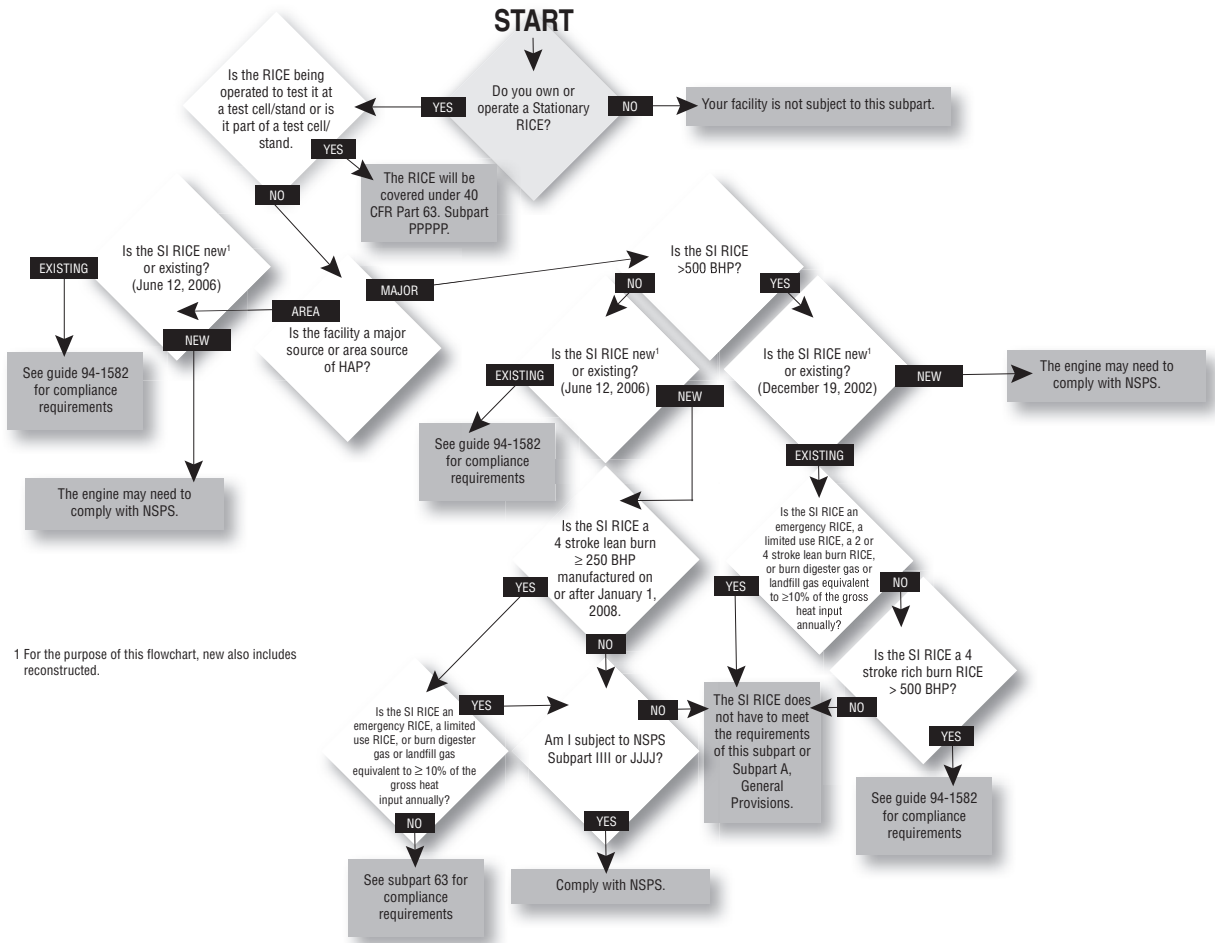
Compliance Monitoring

The RICE NESHAP ruling requires engines that are larger than 500 hp and are a major source of hazardous air pollutants to maintain a service log of catalyst differential pressure and temperature. See page 5.1. A continuous monitoring system can be installed to make this documentation requirement easier for your staff. Use a continuous monitoring device that allows the storage of multiple readings. Also, a monitoring device with CANBUS capabilities will allow integration into your facility's Building Automation System. Or, you may want to consider using a monitoring service that will handle the data tracking requirements for a monthly or yearly fee.

Labor Time

Labor time to retrofit an existing stationary engine is quite variable. One needs to consider the catalyst system's size, weight, site accessibility, lifting equipment, if the package is enclosed or open and installation complexity.

SI RICE NESHP Applicability Flowchart



RICE NESHAP Applicability Guide

Spark-Ignited Engines – Major Sources of HAP

A major source of HAP emissions is generally a stationary source that emits or has the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year.

	Non-Emergency				Emergency CI		
	2SLB Non-Emergency 100≤HP≤500	4SLB Non-Emergency 100≤HP≤500	4SRB Non-Emergency 100≤HP≤500	Landfill/ Digester Gas Non-Emergency 100≤HP≤500	SI RICE Non-Emergency ≤100 HP (Not 2SLB)	SI RICE Non-Emergency ≤100 HP (2SLB)	SI RICE Emergency ≤500 HP
Emission Standards (except during periods of startup)	225 ppmvd CO at 15% O ₂	47 ppmvd at 15% O ₂	10.3 ppmvd formaldehyde at 15% O ₂	177 ppmvd CO at 15% O ₂	N/A	N/A	N/A
Work Practice Standards	N/A	N/A	N/A	N/A	Change oil and filter every 1,440 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary. Inspect all hoses and belts every 1,440 hours of operation, or annually, whichever comes first, and replace as necessary.	Change oil and filter every 4,320 hours of operation or annually, whichever comes first. Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first, and replace as necessary. Inspect all hoses and belts every 4,320 hours of operation, or annually, whichever comes first, and replace as necessary.	Change oil and filter every 500 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary. Inspect all hoses and belts every 500 hours of operation, or annually, whichever comes first, and replace as necessary.
Startup Requirements	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.
Demonstrating Compliance	Must conduct initial performance test to demonstrate achievement of required emission standards.	Must conduct initial performance test to demonstrate achievement of required emission standards.	Must conduct initial performance test to demonstrate achievement of required emission standards.	Must conduct initial performance test to demonstrate achievement of required emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.

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RICE NESHAP Applicability Guide

Spark-Ignited Engines – Major Sources of HAP

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	Non-Emergency				Emergency CI		
	2SLB Non Emergency 100≤HP≤500	4SLB Non-Emergency 100≤HP≤500	4SRB Non-Emergency 100≤HP≤500	Landfill/ Digester Gas Non-Emergency 100≤HP≤500	SI RICE Non-Emergency ≤100 HP (Not 2SLB)	SI RICE Non-Emergency ≤100 HP (2SLB)	SI RICE Emergency ≤500 HP
Reporting and Recordkeeping Requirements	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p> <p>Must submit notifications required in Table 8 of 40 CFR Part 63, Subpart ZZZZ, which lists the NESHAP General Provisions applicable to this rule. These include initial notification, notification of performance test, and a notification of compliance for each stationary RICE which must comply with the specified emission limitations.</p> <p>Must submit semi-annual compliance report.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p> <p>Must submit notifications required in Table 8 of 40 CFR Part 63, Subpart ZZZZ, which lists the NESHAP General Provisions applicable to this rule. These include initial notification, notification of performance test, and a notification of compliance for each stationary RICE which must comply with the specified emission limitations.</p> <p>Must submit semi-annual compliance report.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p> <p>Must submit notifications required in Table 8 of 40 CFR Part 63, Subpart ZZZZ, which lists the NESHAP General Provisions applicable to this rule. These include initial notification, notification of performance test, and a notification of compliance for each stationary RICE which must comply with the specified emission limitations.</p> <p>Must submit semi-annual compliance report.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p> <p>Must submit notifications required in Table 8 of 40 CFR Part 63, Subpart ZZZZ, which lists the NESHAP General Provisions applicable to this rule. These include initial notification, notification of performance test, and a notification of compliance for each stationary RICE which must comply with the specified emission limitations.</p> <p>Must submit semi-annual compliance report.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Required to keep records of hours of operation. Must install nonresettable hour meter on engines.</p>

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RICE NESHAP Applicability Guide

Spark-Ignited Engines – Area Sources of HAP

Area sources of HAP emissions are sources that are not major sources.

	Non-Emergency CI						Emergency CI		
	4SLB Non-Emergency >500 HP that operates more than 24 hours per year	4SRB Non-Emergency >500 HP that operates more than 24 hours per year	4SLB Non-Emergency >500 HP that operates 24 hours or less per year	4SRB Non-Emergency >500 HP that operates 24 hours or less per year	Landfill or Digester Gas Non-Emergency	2SLB Non-Emergency	4SLB Non-Emergency ≤500 HP	4SRB Non-Emergency ≤500 HP	Emergency SI RICE
Emission standards (except during periods of startup)	47 ppmvd CO at 15% O2 or 93% CO reduction	2.7 ppmvd formaldehyde at 15% O2 or 76% formaldehyde reduction	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Work Practice Standards	Change oil and filter every 500 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first.	Change oil and filter every 500 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first.	Change oil and filter every 500 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first.	Change oil and filter every 500 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first.	Change oil and filter every 1,440 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first.	Change oil and filter every 4,320 hours of operation or annually, whichever comes first. Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first.	Change oil and filter every 1,440 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first.	Change oil and filter every 1,440 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first.	Change oil and filter every 500 hours of operation or annually, whichever comes first. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first.
Startup Requirements	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.	Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the engine must meet the otherwise applicable emission standards.

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RICE NESHAP Applicability Guide

Spark-Ignited Engines – Area Sources of HAP

Area sources of HAP emissions are sources that are not major sources.

	Non-Emergency CI					Emergency CI			
	4SLB Non-Emergency >500 HP that operates more than 24 hours per year	4SRB Non-Emergency >500 HP that operates more than 24 hours per year	4SLB Non-Emergency >500 HP that operates 24 hours or less per year	4SRB Non-Emergency >500 HP that operates 24 hours or less per year	Landfill or Digester Gas Non-Emergency	2SLB Non-Emergency	4SLB Non-Emergency ≤500 HP	4SRB Non-Emergency ≤500 HP	Emergency SI RICE
Operating Limitations	If engine is equipped with oxidation catalyst or nonselective catalytic reduction, must ensure the pressure drop across the catalyst does not change by more than 2 inches of water from the pressure drop across the catalyst measured during initial performance test. If equipped with oxidation catalyst, must maintain exhaust temperature so catalyst inlet temperature is between 450° and 1350°F.	If engine is equipped with oxidation catalyst or nonselective catalytic reduction, must maintain the catalyst so the pressure drop across the catalyst does not change by more than 2 inches of water from the pressure drop across the catalyst measured during initial performance test. If equipped with NSCR, must maintain the temperature of exhaust so that catalyst inlet temperature is between 750° and 1,250°F.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Demonstrating Compliance	Must conduct initial performance test to demonstrate compliance. Must conduct subsequent performance testing every 8,760 hours of operation or 3 years, whichever comes first if not limited use. If limited use, tests must be every 8,760 hours or 5 years, whichever comes first. Must continuously monitor and record inlet temperature of oxidation catalyst or NSCR and take monthly measurements of pressure drop across oxidation catalyst or NSCR. If oxidation catalyst or NSCR is not being used, must continuously monitor and record the operating parameters (if any) approved by the Administrator.	Must conduct initial performance test to demonstrate compliance. Must conduct subsequent performance testing every 8,760 hours of operation or 3 years, whichever comes first if not limited use. If limited use, tests must be every 8,760 hours or 5 years, whichever comes first. Must continuously monitor and record inlet temperature of oxidation catalyst or NSCR and take monthly measurements of pressure drop across oxidation catalyst or NSCR. If oxidation catalyst or NSCR is not being used, must continuously monitor and record the operating parameters (if any) approved by the Administrator.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.	Must maintain stationary RICE and aftertreatment control device (if any) according to manufacturer's emission-related written instructions, or develop own maintenance plan. Do not have to conduct any performance testing because not subject to numerical emission standards.

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RICE NESHAP Applicability Guide

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Non-Emergency CI					Emergency CI				
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Reporting and Recordkeeping Requirements	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p> <p>Must submit notifications required in Table 8 of 40 CFR Part 63, Subpart ZZZZ, which lists the NESHAP General Provisions applicable to this rule. These include initial notification, notification of performance test and a notification of compliance for each stationary RICE which must comply with the specified emission limitations.</p> <p>Must submit semi-annual compliance report.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p> <p>Must submit notifications required in Table 8 of 40 CFR Part 63, Subpart ZZZZ, which lists the NESHAP General Provisions applicable to this rule. These include initial notification, notification of performance test and a notification of compliance for each stationary RICE which must comply with the specified emission limitations.</p> <p>Must submit semi-annual compliance report.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>	<p>Required to keep records of hours of operation. Must install nonresettable hour meter on engines. Must keep records that show the work or management practices are being met. Must include, at a minimum: oil and filter change dates and corresponding hours of operation (determined using hour meter, fuel consumption data, or other methods); inspection and replacement dates for spark plugs, hoses, and belts; and records of other emission-related repairs and maintenance performed.</p>

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