



Federal Clean Air Act Requirements for Stationary Reciprocating Internal Combustion Engines



SYNOPSIS

- Reciprocating Internal Combustion Engines (RICE) are typically operated at Department of Energy (DOE) sites for a wide variety of uses, including: powering remote welding equipment, compressors, or water pumps; generating electrical power; testing new fuels; or producing inert gasses.
- Many RICE at DOE sites are already regulated. However, the U.S. Environmental Protection Agency (EPA) recently issued new changes in the regulations which establish new record keeping, reporting, and testing requirements and emissions limits for new, existing, modified, and reconstructed RICE.
- The *Technical Assistance Tool for Addressing Clean Air Act Requirements for Reciprocating Internal Combustion Engines at DOE Sites (RICE Tool)* includes detailed descriptions of the RICE air regulations.

BACKGROUND

The EPA issued new RICE regulations using two authorities: the New Source Performance Standards (NSPS) and the National Emissions Standard for Hazardous Air Pollutants (NESHAP).

1. Separate NSPSs contain requirements for Spark Ignition (SI) RICE and Compression Ignition (CI) RICE;
2. The RICE NESHAP contains requirements for **all** RICE; and
3. Another NESHAP is applicable to RICE used only in Engine Test Cells/Stands.

Both NSPS regulations are applicable to RICE that are purchased, modified, or reconstructed after the applicability date of the NSPS (July 11, 2005, for CI RICE and June 12, 2006, for SI RICE).

The RICE NESHAP is applicable to all RICE, regardless of installation or construction date. The Engine Test Cell/Stand NESHAP is applicable only to RICE used for testing located at a major source of hazardous air pollutants (HAPs).

NSPS Overview

There are two NSPSs: Title 40 of the Code of Federal Regulations, Part 60, (40 CFR 60), Subpart III regulates CI RICE (fuel combustion via compression instead of using a spark plug). Forty CFR 60, Subpart JJJJ regulates SI RICE (a spark plug is used to combust fuel).

New RICE purchased for DOE sites will be certified by the RICE manufacturer for compliance with the NSPS.

Modified RICE are existing RICE physically changed in a manner that increases their air emissions, (e.g., replacing fuel injectors to combust more fuel and generate more power). Reconstructed RICE are existing RICE for which enough replacement parts have been installed and exceed the applicable EPA threshold.

Both RICE NSPSs include special requirements for emergency RICE and temporary replacement RICE used at a site for less than one year. The requirements for emergency RICE are summarized in the Information Brief: *National Emissions Standards for Hazardous Air Pollutants: Emergency Reciprocating Internal Combustion Engines* [HS-21-18-2011-25 (August, 2011)] (*Emergency RICE Brief*). http://www.hss.energy.gov/sesa/environment/guidance/caa/neshaps_rice.pdf

Generally, both RICE NSPSs require prior notification for the construction of certain types of RICE and stipulate requirements for record keeping and types of fuel used. RICE not certified by the manufacturer or rebuilder as meeting the applicable

RICE NSPS must comply with the emissions limits and testing protocols included in the RICE NSPS. RICE must be operated per the manufacturer's operating manual. If a manual is unavailable, operating instructions must be developed and followed and emissions tests conducted.

RICE NESHAP Overview

The RICE NESHAP applies to all existing, new, reconstructed, and modified RICE. The RICE NESHAP was originally published in 2004 and has been amended several times to include additional types of RICE. The matrix in Subsection 6.1.1 of the *RICE Tool* summarizes the requirements and applicability dates of the RICE NESHAP.

The NESHAP categorizes RICE by engine type (e.g., CI), use (e.g., emergency), fuel type (e.g., landfill gas), and engine brake horsepower. SI RICE are further categorized by number of strokes (e.g., two) and air-fuel-ratio (e.g., rich burn).

RICE located at major and area sources of HAPs have different requirements. A major source is a facility where the total potential and/or actual emissions of HAPs exceed 25 tons per year (tpy) for all HAPs and/or 10 tpy for any individual HAP. A facility includes all sources of HAPs within a contiguous area and under common control, including HAP emissions from all RICE. An area source is defined by EPA as a source that emits less than 10 tons of a single HAP or less than 25 tons of a combination of HAPs annually.

The RICE NESHAP includes special requirements for emergency and limited use RICE and exemptions for certain types of RICE, (e.g., new RICE, which would be subject to the RICE NSPS). The requirements for emergency RICE are summarized in the *Emergency RICE Brief*.

The RICE NESHAP requires pre-construction authorization from EPA before constructing new or reconstructing existing RICE that is a major source of HAP emissions. Table 6 of the RICE TOOL identifies the various notifications that must be submitted to the EPA for certain RICE, and the TOOL also includes examples of notification forms.

For certain RICE, emissions testing must be conducted and compliance reports must be submitted to the EPA Regional Office. The RICE NESHAP specifies operating and monitoring parameters and reporting requirements for control equipment used to reduce HAP emissions.

RICE must be operated per the operating manual. If an operating manual is unavailable, operating instructions must be developed and followed.

Test Cell/ST and NESHAP Overview

The Engine Test Cell/Stand NESHAP is applicable to all major sources of HAPs where uninstalled stationary or mobile engines are tested.

Additional Information

The *RICE Tool* includes compliance requirements from each of the four RICE air regulations and matrices that summarize the requirements for each individual category of RICE. A flowchart for determining regulatory applicability is also provided in the *RICE Tool*.

The Office of Sustainability Support establishes environmental protection policy for DOE and provides assistance to DOE elements on implementation of policy and resolution of compliance matters. Please refer any questions and requests for assistance concerning the subject material covered in this Information Brief to:

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ADDITIONAL RESOURCES

REGULATIONS:

- 40 CFR 60, Subpart A, “NSPS: General Provisions”
<http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr&rgn=div6&view=text&node=40:7.0.1.1.1.1&idno=40>
- 40 CFR 60, Subpart III, “NSPS: CI RICE”
<http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr&SID=c9e5a93c19347810b84be01d21f9dec6&rgn=div6&view=text&node=40:7.0.1.1.1.97&idno=40>
- 40 CFR 60, Subpart JJJJ, “NSPS: SI RICE”
<http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr&SID=c9e5a93c19347810b84be01d21f9dec6&rgn=div6&view=text&node=40:7.0.1.1.1.98&idno=40>
- 40 CFR, Part 63, Subpart A, “NESHAP: General Provisions”
<http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr&rgn=div6&view=text&node=40:10.0.1.1.1.1&idno=40>
- 40 CFR, Part 63, Subpart ZZZZ, “NESHAP: RICE”
<http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr&rgn=div6&view=text&node=40:14.0.1.1.1.1&idno=40>
- 40 CFR, Part 63, Subpart P P P P P, “NESHAP: Engine Test Cells/Stands”
<http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr&SID=c9e5a93c19347810b84be01d21f9dec6&rgn=div6&view=text&node=40:15.0.1.1.1.3&idno=40>

EPA RESOURCES:

- EPA Web site for CI RICE NSPS
<http://www.epa.gov/ttn/atw/nsps/cinsps/cinspspg.html>
- EPA Web site for SI RICE NSPS
<http://www.epa.gov/ttn/atw/nsps/sinsps/sinspspg.html>
- EPA Web site for RICE NESHAP
<http://www.epa.gov/ttn/atw/rice/ricepg.html>
- EPA Web site for RICE NESHAP regulatory navigation tool
<http://www.epa.gov/ttn/atw/rice/output/quiz.html>
- EPA Region 1 Web site for RICE
<http://www.epa.gov/region1/rice/>
- Combustion Portal (Cooperative Agreement between EPA, Compliance Assistance Center, and National Center for Manufacturing Sciences)
<http://www.combustionportal.org/rice.cfm>

DOE RESOURCES:

- *Technical Assistance Tool for Addressing Clean Air Act Requirements for Reciprocating Internal Combustion Engines at DOE Sites (RICE Tool)*
http://www.hss.energy.gov/sesa/environment/guidance/caa/rice_tech_assist_tool.pdf
- *National Emissions Standards for Hazardous Air Pollutants: Emergency Reciprocating Internal Combustion Engines [HS-21-18-2011-25 (August, 2011)] (Emergency RICE Brief)*
http://www.hss.doe.gov/sesa/environment/guidance/caa/neshaps_rice.pdf
- DOE Clean Air Work Group
<http://www.hss.doe.gov/sesa/environment/air/cawg/>