

Proposed Revisions to RICE MACT - 40 CFR 63 Subpart ZZZZ

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Top 10 Things I (*should have*) Learned in the Navy

- An interesting and very colorful vocabulary
- How to walk on walls (bulkheads)
- Sleep is completely optional
- How to say “beer” and “where is the bathroom” in 15 different languages
- How to drink flaming shots of liquor without catching myself on fire (after only 3 attempts!)
- A man might get in trouble (and be unhappy with the results) if he carelessly leaves his camera lying around a bunch of bored sailors
- You will get in far more trouble if that camera belonged to your chief, and pictures of your butt appear on film that he submitted to Navy Intelligence
- The Navy has effective ways of identifying your butt, and will not hesitate to compromise your dignity to do so
- Most of the time, it’s better “cover your butt” than to show it
- **NAVY = Never Again Volunteer Yourself**



Background

- Proposed rule signed 2/25/09, published 3/5/09, and is intended to “complete” the RICE NESHAP (40 CFR 63 Subpart ZZZZ)
 - Promulgation schedule under consent order, final rule required by February 10, 2010
- Previous rulemaking:
 - 6/15/2004 – Standards for new and existing stationary RICE, >500 hp, and located at major source of HAP (except for non-emergency CI engines)
 - 1/18/08 - Standards for new (constructed after 6/12/06) RICE at area sources, and new (constructed after 12/19/02) RICE at major sources < 500 hp
- Proposed revisions address previously unregulated units:
 - Existing RICE at area sources (all sizes)
 - Existing RICE < 500 hp at major sources (constructed before 6/12/06)
 - Existing non-emergency CI RICE > 500 hp at major sources (constructed before 12/19/02)
 - Establishes standards during periods of SSM for “added” source categories, and to those categories already affected by previously promulgated RICE rules

Navigating the Rule

- **Complicated**, because published rule contains only the changes to the existing 40 CFR 63 Subpart ZZZZ (no complete rule text).
- Following factors have to be considered when trying to figure out what is applicable
 - Engine Types (SI, including 2SLB, 4SLB, 4SRB, and landfill/digester; CI)
 - New or existing (revisions address existing for the most part)
 - Engine hp rating (many different thresholds - 50, 100, 250, 300, 500 and corresponding requirements)
 - Status of source – major or area for HAP
 - Emergency vs. non-emergency



“Exemptions”

- The following RICE, at major sources of HAP, are subject to the rule but have no requirements (from previous rulemaking)
 - Existing 2SLB >500 hp at major source
 - Existing 4SLB > 500 hp at major source
 - Existing emergency > 500 hp at major source
 - Existing limited use RICE >500 hp at major source
 - Existing landfill/digester gas > 500 hp at major source
 - Note – no exemption for non-emergency CI engines > 500 hp
- There are requirements for all RICE at area sources, and for any RICE < 500 hp at major sources in the proposed rule
 - There is no “limited use” category for RICE at area sources, or for engines < 500 hp at major sources
 - EPA’s logic is that the exemptions extended during previous rulemaking remain valid, but based on recent court decision on MACT standards, exemptions cannot be applied to previously unregulated categories
 - Many comments from ENGOs and regulatory agencies have challenged this

Standards during SSM

- For “no-control” categories, EPA set SSM emission limits identical to the standards applicable during normal operation
- For categories that standards are based on add-on controls, emission limits during SSM are based on assuming loss of a control device providing 90% removal.
 - EPA: *“our Emissions Database has no specific data showing that emissions during startup and malfunction are different than during normal operation”*
 - **No data for periods of SSM contained in database**
 - *EPA...notes that an approach that sets a single MACT standard that applies at all times, including SSM periods, may result in a higher overall MACT standard, based on the need to account for variation of operations in setting MACT standards.*
- Extensive comments on SSM standards – issues with lack of data to support, problems with compliance certification, etc.
 - Many comments suggested work practice standards under Section 112(h) instead of numeric emission limits

Proposed Standards for Existing RICE at Major Sources

Subcategory	Emission standards at 15 percent O ₂ (parts per million by volume on a dry basis)	
	Except during periods of startup, or malfunction	During periods of startup, or malfunction
Non-Emergency 2SLB 50≥HP≤249	85 ppmvd CO	85 ppmvd CO.
Non-Emergency 2SLB 250≥HP≤500	8 ppmvd CO or 90% CO reduction	85 ppmvd CO. ←
Non-Emergency 4SLB 50≥HP≤249	95 ppmvd CO	95 ppmvd CO.
Non-Emergency 4SLB 250 ≥HP≤500	9 ppmvd CO or 90% CO reduction	95 ppmvd CO. ←
Non-Emergency 4SRB 50≥HP≤500	200 ppbvd formaldehyde or 90% formaldehyde reduction.	2 ppmvd formaldehyde. ←
All CI 50≥HP≤300	40 ppmvd CO	40 ppmvd CO.
Emergency CI 300>HP≤500	40 ppmvd CO	40 ppmvd CO.
Non-Emergency CI >300 HP <50 HP	4 ppmvd CO or 90% CO reduction	40 ppmvd CO. ←
Landfill/Digester 50≥HP≤500	2 ppmvd formaldehyde	2 ppmvd formaldehyde.
Emergency SI 50≥HP≤500	177 ppmvd CO	177 ppmvd CO.
	2 ppmvd formaldehyde	2 ppmvd formaldehyde.

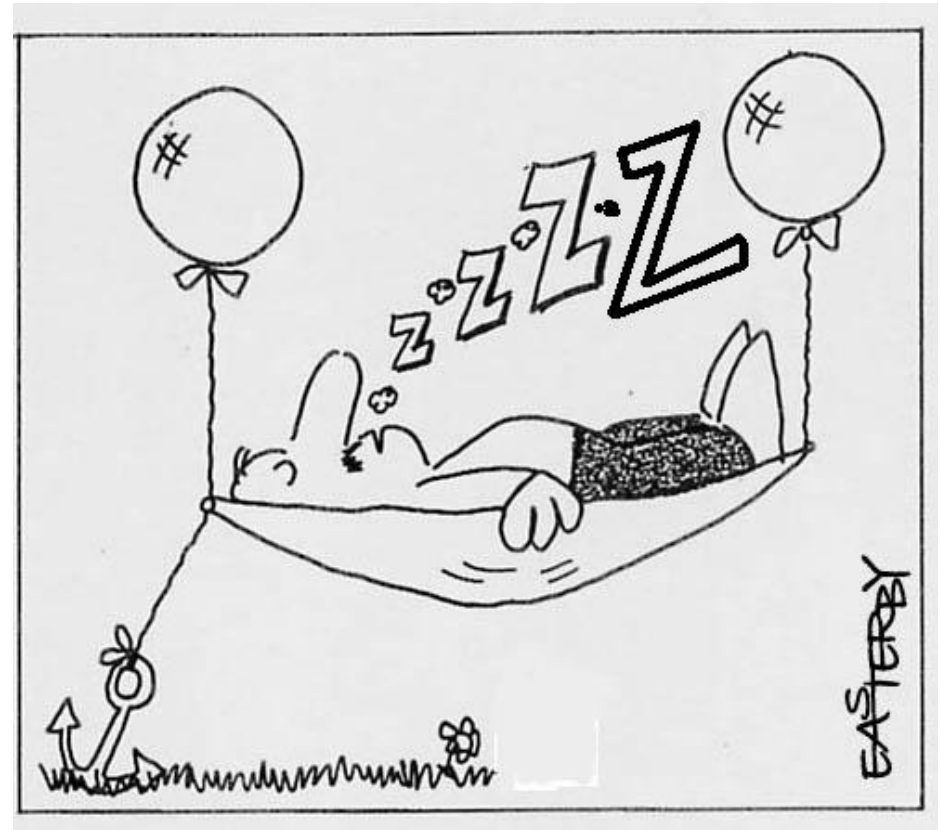
For each * * *	You must meet the following emission or operating limitation at all times, except during periods of startup, or malfunction * * *	You must meet the following emission or operating limitation during periods of startup, or malfunction * * *
1. Non-Emergency 2SLB 50≥HP≤249	a. change oil and filter every 500 hours; b. replace spark plugs every 1000 hours; and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 500 hours; ii. replace spark plugs every 1000 hours; and iii. inspect all hoses and belts every 500 hours and replace as necessary.
2. Non-Emergency 2SLB ≥250 HP	a. limit concentration of CO in the stationary RICE exhaust to 8 ppmvd or less at 15 percent O ₂ ; or b. reduce CO emissions by 90 percent or more.	limit concentration of CO in the stationary RICE exhaust to 85 ppmvd or less at 15 percent O ₂ .
3. Non-Emergency 4SLB 50≥HP≤249	a. change oil and filter every 500 hours; b. replace spark plugs every 1000 hours; and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 500 hours; ii. replace spark plugs every 1000 hours; and iii. inspect all hoses and belts every 500 hours and replace as necessary.
4. Non-Emergency 4SLB ≥250 HP	a. limit concentration of CO in the stationary RICE exhaust to 9 ppmvd or less at 15 percent O ₂ ; or b. reduce CO emissions by 90 percent or more.	limit concentration of CO in the stationary RICE exhaust to 95 ppmvd or less at 15 percent O ₂ .
5. Non-Emergency 4SRB ≥50 HP	a. limit concentration of formaldehyde in the stationary RICE exhaust to 200 ppbvd or less at 15 percent O ₂ ; or b. reduce formaldehyde emissions by 90 percent or more.	limit concentration of formaldehyde in the stationary RICE exhaust to 2 ppmvd or less at 15 percent O ₂ .
6. Emergency CI 50≥HP≤500	a. change oil and filter every 500 hours; b. inspect air cleaner every 1000 hours and replace as necessary; and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 500 hours; ii. inspect air cleaner every 1000 hours and replace as necessary; and iii. inspect all hoses and belts every 500 hours and replace as necessary.
7. Emergency CI >500 HP	a. limit concentration of CO in the stationary RICE exhaust to 40 ppmvd or less at 15 percent O ₂ .	limit concentration of CO in the stationary RICE exhaust to 40 ppmvd or less at 15 percent O ₂ .
8. Non-Emergency CI 50≥HP≤300	a. change oil and filter every 500 hours; b. inspect air cleaner every 1000 hours and replace as necessary; and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 500 hours; ii. inspect air cleaner every 1000 hours and replace as necessary; and iii. inspect all hoses and belts every 500 hours and replace as necessary.
9. Non-Emergency CI >300 HP	a. limit concentration of CO in the stationary RICE exhaust to 4 ppmvd or less at 15 percent O ₂ ; or b. reduce CO emissions by 90 percent or more.	limit concentration of CO in the stationary RICE exhaust to 40 ppmvd or less at 15 percent O ₂ .
10. <50 HP	a. change oil and filter every 200 hours; b. replace spark plugs every 500 hours (SI engines only); and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 200 hours; ii. replace spark plugs every 500 hours (SI engines only); and iii. inspect all hoses and belts every 500 hours and replace as necessary.
11. Landfill/Digester Gas 50≥HP≤500	a. change oil and filter every 500 hours; b. replace spark plugs every 1000 hours; and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 500 hours; ii. replace spark plugs every 1000 hours; and iii. inspect all hoses and belts every 500 hours and replace as necessary.
12. Landfill/Digester Gas >500 HP	a. limit concentration of CO in the stationary RICE exhaust to 177 ppmvd or less at 15 percent O ₂ .	limit concentration of CO in the stationary RICE exhaust to 177 ppmvd or less at 15 percent O ₂ .
13. Emergency SI 50≥HP≤500	a. change oil and filter every 500 hours; b. replace spark plugs every 1000 hours; and c. inspect all hoses and belts every 500 hours and replace as necessary.	i. change oil and filter every 500 hours; ii. replace spark plugs every 1000 hours; and iii. inspect all hoses and belts every 500 hours and replace as necessary.
14. Emergency SI >500 HP	a. limit concentration of formaldehyde in the stationary RICE exhaust to 2 ppmvd or less at 15 percent O ₂ .	limit concentration of formaldehyde in the stationary RICE exhaust to 2 ppmvd or less at 15 percent O ₂ .

Proposed Standards for Existing RICE at Area Sources



Existing Emergency RICE

- Subject to standards, but no requirement to perform compliance test
 - “*Emergency stationary RICE* means any stationary RICE...
 - Whose operation is limited to emergency situations and required testing and maintenance....
 - Examples include stationary RICE used to produce power for critical networks or equipment when electric power from the local utility, or stationary RICE used to pump water in the case of fire or flood, etc....
 - Stationary RICE used for peak shaving are not considered emergency stationary RICE.”



Emergency RICE Limitations

- Operational checks, maintenance, and readiness testing is allowed, but limited to < 100 hours per year
- A non-resettable hour meter must be installed, and records documenting all operation (i.e., emergency, testing, non-emergency)
- Emergency RICE may be used up to 50 hours per year for non-emergency use (with some restrictions), but these hours count toward the 100 hr/yr total allowed use.
- There are no restrictions on the amount of time emergency RICE can be used during actual emergency conditions.



Existing Emergency – Standards

- Existing emergency engines (between 50 and 500 hp) at major sources are subject to requirements to “limit” emissions (40 ppm CO for CI, 2 ppm formaldehyde for SI), per Table 2c.
 - Table 2c does not contain emission limits for existing emergency CI > 500 hp at major sources
 - No requirement to test/demonstrate compliance with emission limits
- At area sources, existing CI and SI emergency between 50 and 500 hp are subject to work practice standards (no numeric limit).
 - Change oil, filters, spark plugs, etc., change belts and hoses on a specified schedule
- Emergency CI/SI > 500 hp at area sources are subject to numeric emission limits (40 ppm CO for CI, 2 ppm formaldehyde for SI)
 - Existing area source emergency RICE > 500 hp are subject to standards, while major source emergency RICE > 500 hp are not
 - Existing major source emergency RICE < 500 hp subject to standards, while those > 500 hp at major sources are not

Compliance Requirements

Major Sources

- Existing, non-emergency RICE < 100 hp, and existing emergency RICE do not require performance tests; maintain equipment according to manufacturer instructions or develop acceptable plan
- Existing, non-emergency RICE 100 < HP < 500 - conduct initial performance test
- Existing, non-emergency CI > 500 hp - conduct initial performance test, then subsequent tests every 8,760 hours/3 years, whichever comes first
- Continuously monitor catalyst temperatures, measure pressure drop across catalysts monthly, for CI non-emergency engines > 500 hp (existing and new)



Compliance Requirements

Area Sources

- For existing units not subject to emission limits, comply with maintenance requirements listed in rule
- For existing units subject to numeric emission limits, conduct initial performance test
 - Rule does not list requirement for initial testing for emergency equipment (preamble states that they are exempt), but the exemption is not explicitly provided in the rule
- For existing units >500 hp, and subject to numeric emission limits, subsequent performance tests every 8,760 hrs/3 years, whichever comes first
 - Emergency equipment < 500 hp not subject to emission limits, and therefore exempt from testing. Exemption for emergency RICE > 500 hp not clear, though implied in preamble
- Existing 2SLB, 4SLB, 4SRB, and CI that are >500 hp must continuously monitor and record catalyst inlet temp, and measure pressure drop across catalyst monthly

Low Sulfur Diesel Requirement

- Proposed rule will require use of Ultra Low Sulfur Diesel (ULSD, 15 ppm) fuel for existing, non-emergency CI RICE > 300 hp, and with displacement of < 30 liters per cylinder
- Requirement deemed necessary due to concerns that SO₂ will be catalyzed to form sulfate particulate
 - Example of EPA's increased interest in "sector-based" regulations



MACT Floor Summary

- MACT floor for all source categories was determined to be based on “no add on controls”
- Above-the-floor MACT was applied to:
 - Non-emergency CI, between 300 and 500 hp (oxidation catalyst)
 - Non-emergency 2SLB, between 250 and 500 hp (oxidation catalyst)
 - Non-emergency 4SLB, between 250 and 500 hp (oxidation catalyst)
 - Non-emergency 4SRB, between 50 and 500 hp (NSCR)
 - GACT requirements for area sources >500 hp based on control
- 90% reduction is assumed for oxidation catalyst, NSCR, and CDPF technologies

MACT Floor for CI engines

- EPA established MACT floor for CO emissions from CI engines (emergency and non-emergency) as follows
 - *“CO test results of the best performing 12 percent was not available. Therefore, EPA reviewed emissions from all CO tests (10 tests) and selected the best performing 12 percent (or 1 test)”.*
- Review of the emissions database, and other EPA info, indicates that the 10 tests were all conducted on the same (1000 hp) engine at varying load conditions.
- Therefore, EPA’s floor is based on the single best result from 10 tests conducted on a single engine
 - This implies that, EPA’s data contains “credible evidence” that, when the engine operates at any condition other than the best case, it would not meet the standard!
- Similar problems seen with other source categories

Issues EPA is Soliciting Comments On

- Regulation of metallic HAP
- Requiring CDPF rather than oxidation catalysts for diesel engines
- Appropriateness of uniform standard for area sources in rural and urban areas
- Extending beyond-the-floor control requirements for CI engines < 300 hp
- Requiring all existing CI RICE to burn ULSD



Latest “Rumors”

- There are no discussions about extending the date for proposed rule, except a possibility that standards for natural and landfill gas-fired units may be delayed
 - In response to comments, EPA is obtaining additional testing information on these units
 - Not a Section 114 request, but data is being gathered by trade groups such as API and INGAA
 - EPA does not plan to gather additional data on other categories, including diesel units
- There is a possibility that, for periods of SSM, EPA may replace numeric emission limits with work practice standards
- Also, it is possible that for area sources, the numeric emission standards (normal and SSM), will be replaced by work practice standards
- Current “no-requirement” units probably OK for now, but EPA will likely revisit this issue in the next scheduled 8-year review (2012).