

EPA RICE MACT (Reciprocating Engines) Rule Updates

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Al Cole
Senior Consultant
540-342-5945

acole@trinityconsultants.com

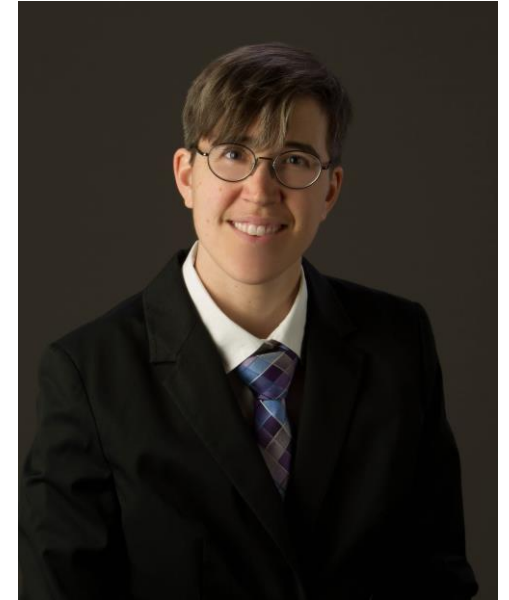


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Introductions – Your Presenter

▶ Al Cole

- Lifelong interest in engineering and science
- Native of Lincoln, NE
- BS ChE, Iowa State University
- MS CE, University of Nebraska
 - ◆ Thesis on mulch biofilms for groundwater remediation
- Started at Trinity in 2012 in Roanoke
- Office ‘multimedia’ (air/water/waste) and reporting expert
- Enjoys playing board games and writing poetry





Evolution of Trinity Consultants

Started in 1974 by **one consultant** in Dallas, Texas serving clients' **air quality** regulatory compliance needs.

Today, we are more than **1,600 employees** in more than **80 locations** on **four continents**.

We help organizations overcome complex, mission-critical **EHS, engineering, and science** challenges through **consulting, technology, training, and staffing** support.

Trinity Consultants International Presence

North America



Europe

England, UK / Dublin, IE



Asia

China / Singapore / India



Australia

Queensland / New South Wales



- EHS Consulting
- SafeBridge Regulatory & Life Sciences Group
- Minnow Aquatic Environmental Services
- Ecological Assessment Services
- Advent Engineering Life Science Solutions
- Provenance Consulting
- Vision Environment
- WorkingBuildings
- AWN Consulting
- Cerami & Associates
- Aztec Technologies
- Ecofish Research

Our Commitment to Quality

- ▶ ISO 9001:2015 certification in our Dallas headquarters signifies our commitment to:
 - Maintaining consistent quality of deliverables across the organization
 - Ensuring client's objectives are achieved
 - Emphasizing continuous improvement
 - Formalizing training procedures
 - Reducing corporate liability
 - Focusing on our strategic principle

Environmental Health & Safety Consulting Services

AIR QUALITY



Air quality permitting and compliance support with federal and state/local regulatory requirements.

ESG, EJ AND SUSTAINABILITY



Comprehensive ESG and sustainability program support for companies across many industries.

EHS MANAGEMENT



Trinity's EHS Performance & Risk Management team assists in addressing EHS challenges from various perspectives - strategic planning, program evaluation, and systems development.

WASTE MANAGEMENT



Provides regulatory waste management support for industrial facilities.

CHEMICAL COMPLIANCE



Compliance support for chemical-related compliance and reporting requirements.

EHS LITIGATION SUPPORT



Provides technical support and expert testimony for legal issues regarding air quality, noise impact, industrial air quality and weather-related litigation.

HEALTH AND SAFETY



Support with OSHA, EPA, and local/state agencies regulations that protect the health and safety of workers and surrounding communities.

WATER QUALITY



Water quality permitting, compliance, and sampling.

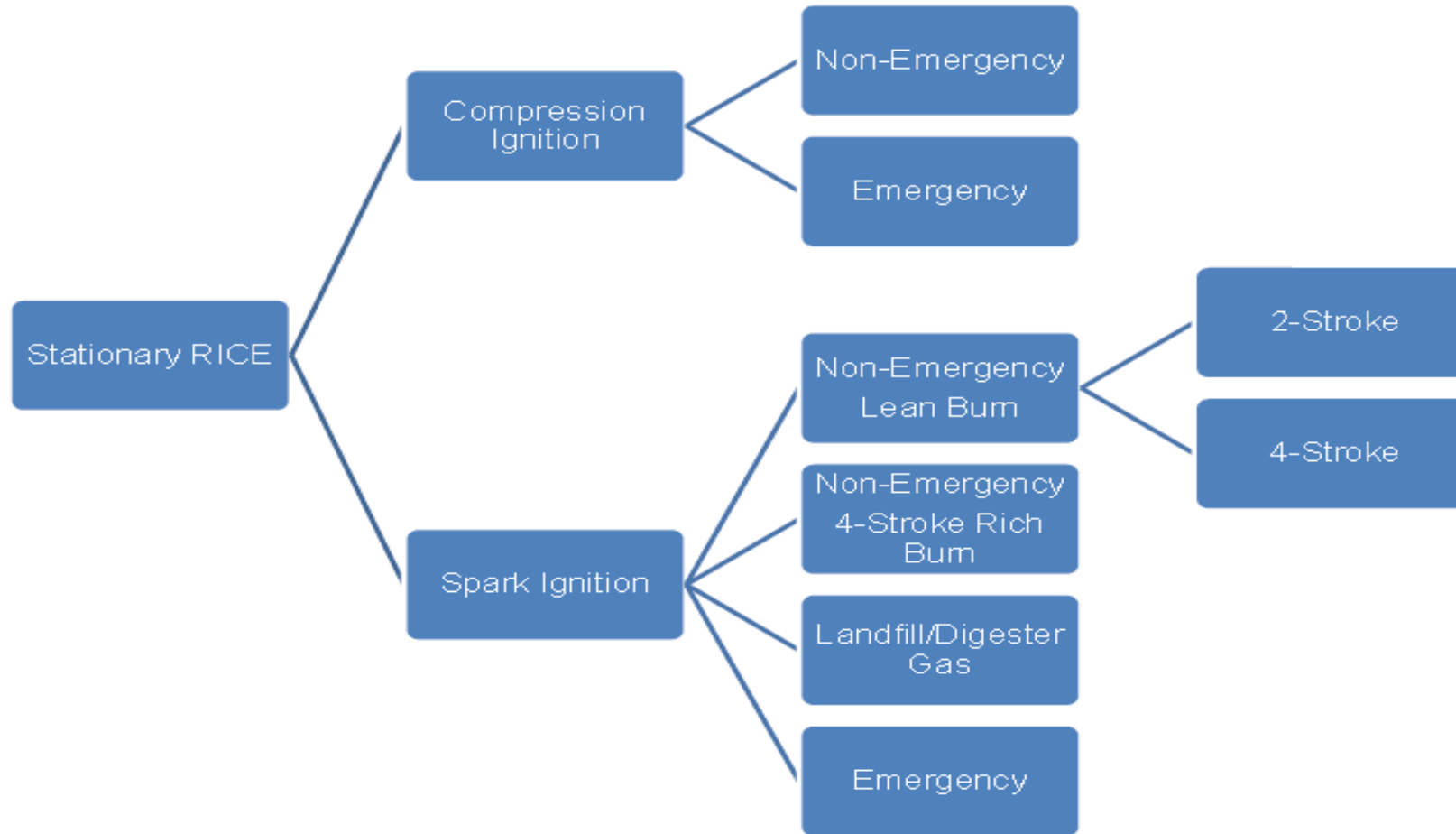


Outline

- ▶ Engine Terminology
- ▶ Proposed Rule Changes
 - Electronic Reporting
 - Proposed Clarifications and Corrections
 - Request for Comments

Engine Terminology

EPA Reciprocating Engine Categories



Engine Acronyms

▶ **Internal Combustion Engine (ICE)**

- Engine where the combustion of fuel occurs with an oxidizer (usually air) in a combustion chamber
- The gases produced by combustion exert a force to a component of the engine.
 - ◆ Pistons, turbine blades, rotor, or nozzle

▶ **Reciprocating ICE (RICE)**

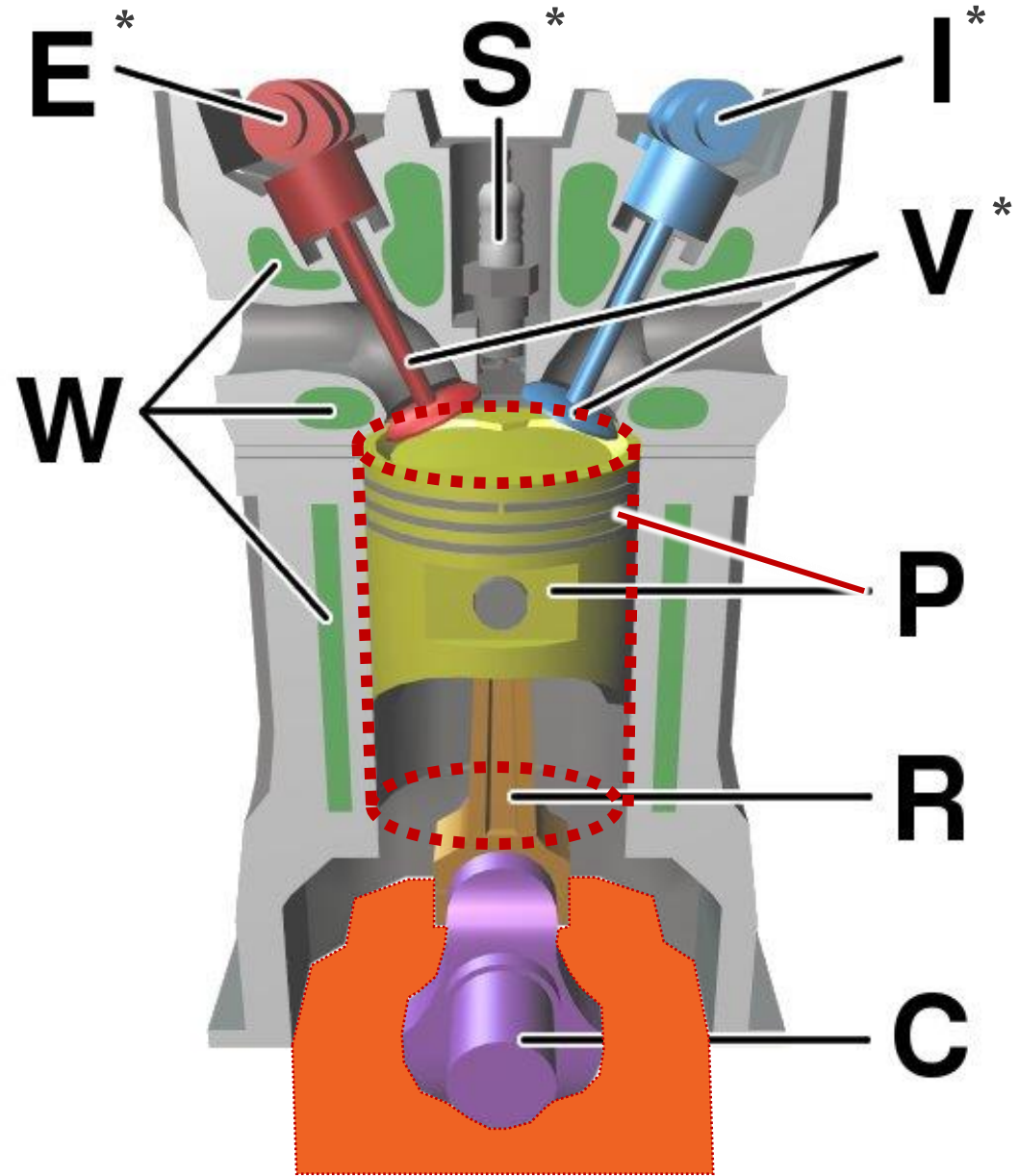
- Pistons moving backwards and forwards in a straight line

Parts of a Reciprocating ICE

- > **P = Piston**
 - ❖ Rings
- > **Cylinder**
- > **R = Connecting Rod**
- > **C = Crankshaft**

- > * **V = Valves**
- > * **E and I = Camshafts**
- > * **S = Spark plug**
- > * **Oil Pan**
- > **W = Water jackets (coolant flow)**

- * Not part of 2S and/or CI engines

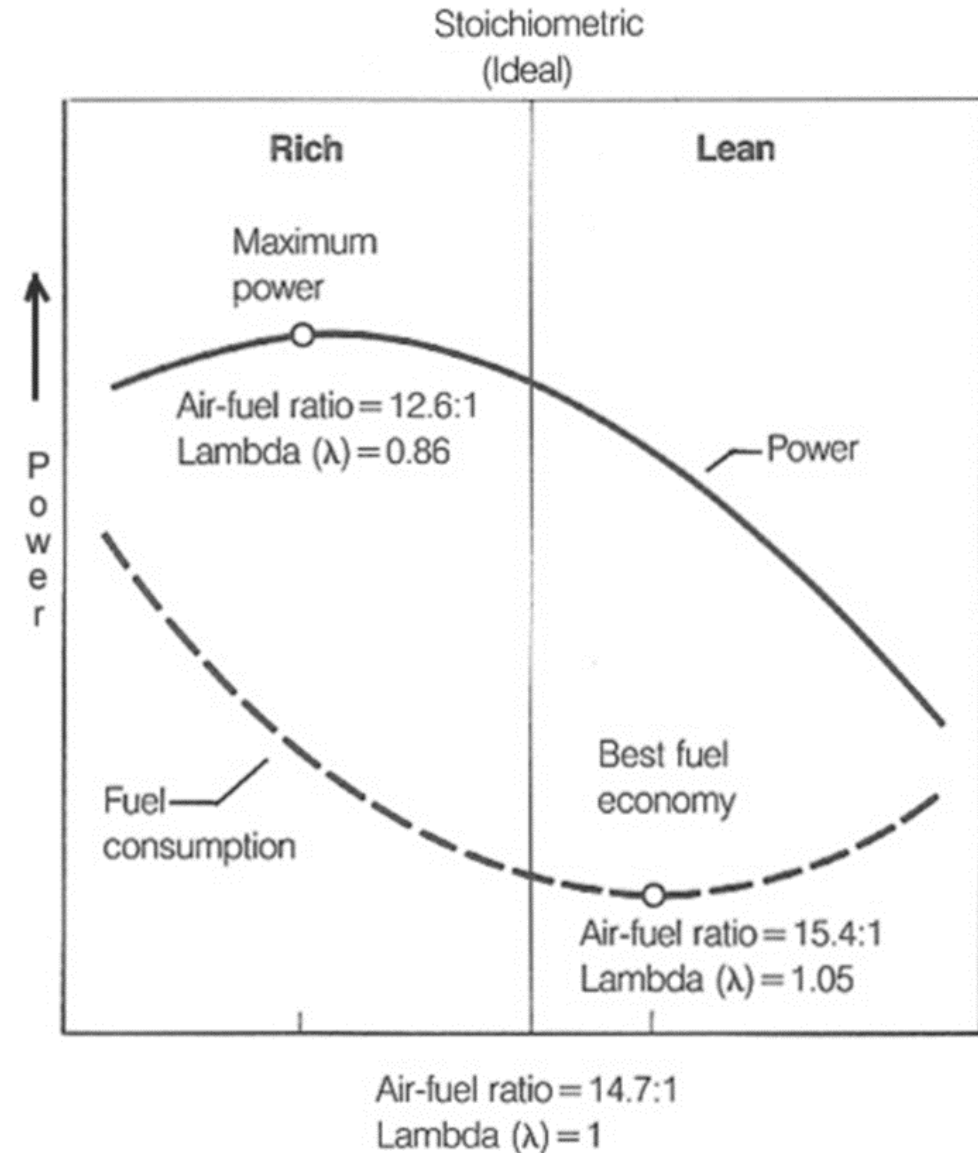


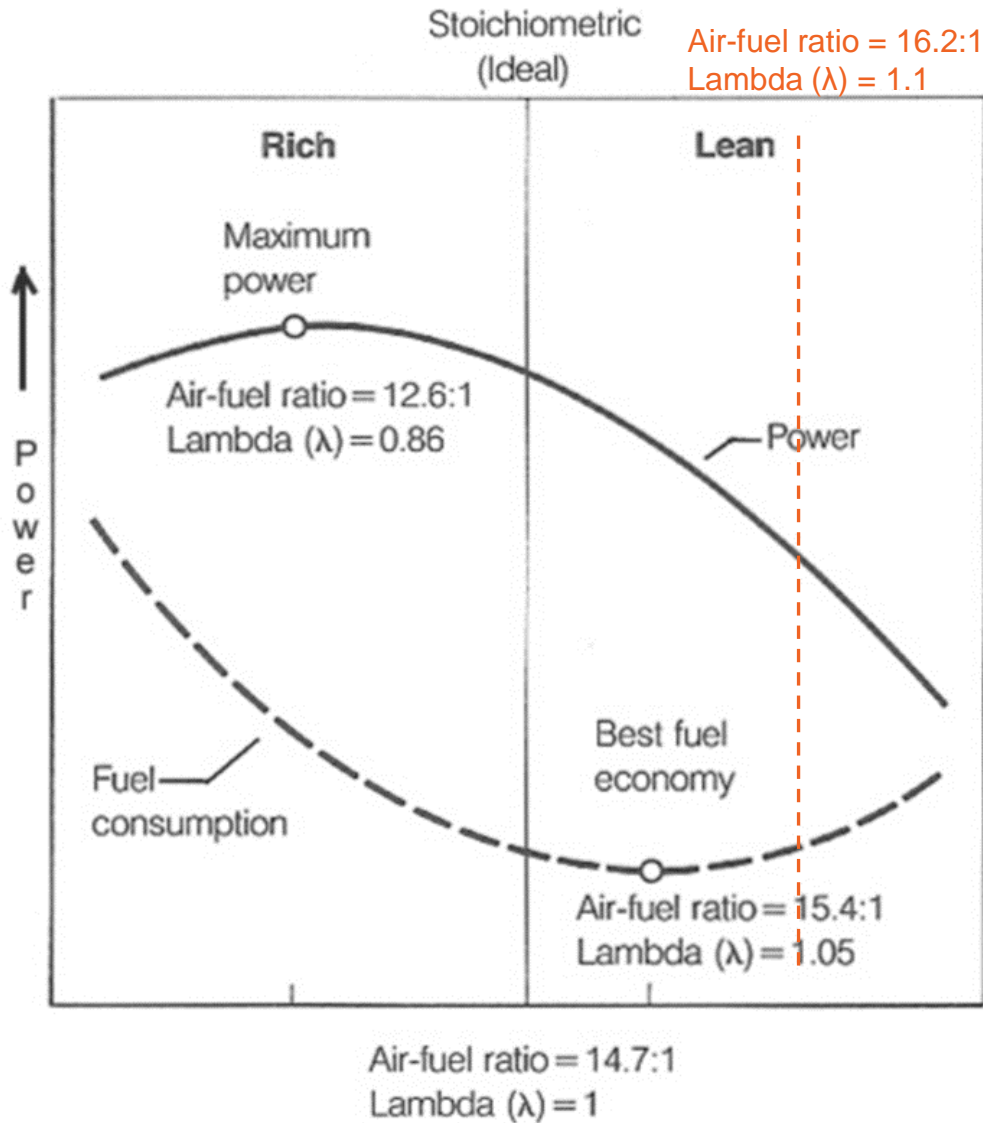
Engine Acronyms

- ▶ Compression Ignition (CI)
 - Heat of compression initiates ignition
- ▶ Spark Ignition (SI): engines with spark plugs
 - Normal definition: A spark plug ignites the mix of air/fuel (usually gasoline, natural gas, LPG, etc.)
 - Regulatory definition: ...less than 2 % diesel fuel to total fuel

Rich v. Lean Burn

- ▶ $\lambda < 1$ = Rich burn (RB)
more fuel, less air
- ▶ $\lambda > 1$ = Lean burn (LB)
less fuel, more air
 - Lower combustion temperature
 - Up to 50:1 A/F ratios for spark ignition engines and 500:1 for diesel engines
 - ◆ Flame stability issues as you approach the lower explosive limit (LEL)





Rich v. Lean Burn USEPA Draws a Different Line

- ▶ Some Lean Burn RICE are regulated as Rich Burn
 - Any engine where the recommended A/F ratio divided by the ideal A/F ratio at full load is less than or equal to 1.1
 - This is the point at which NSCR can no longer be used. A λ of 1.1 represents 2 to 4 percent excess O_2

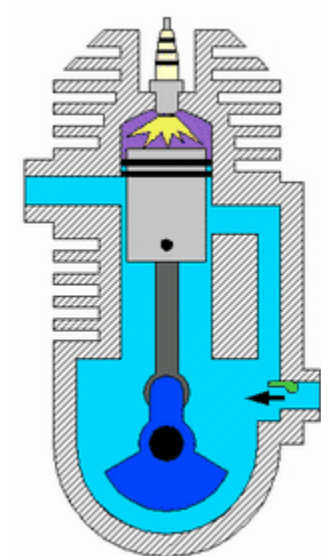
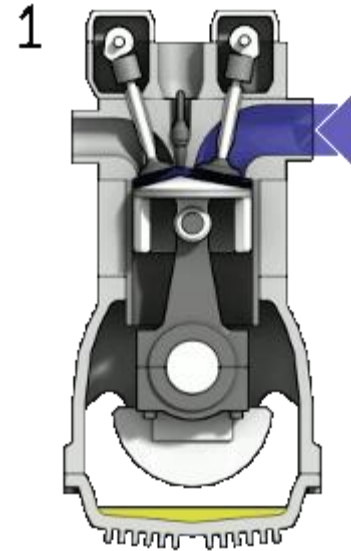
4 Stroke v. 2 Stroke

4 Stroke (4S) Rich or Lean

1. Intake - piston travels down
2. Compression - piston travels up
3. Power - piston travels down
4. Exhaust - piston travels up

2 Stroke (2S) ▪ Always Lean

1. Compression with intake (into crankcase) - piston travels up
2. Power with exhaust - piston travels down



Note: No valves and camshafts

Engine NSPS and NESHAP

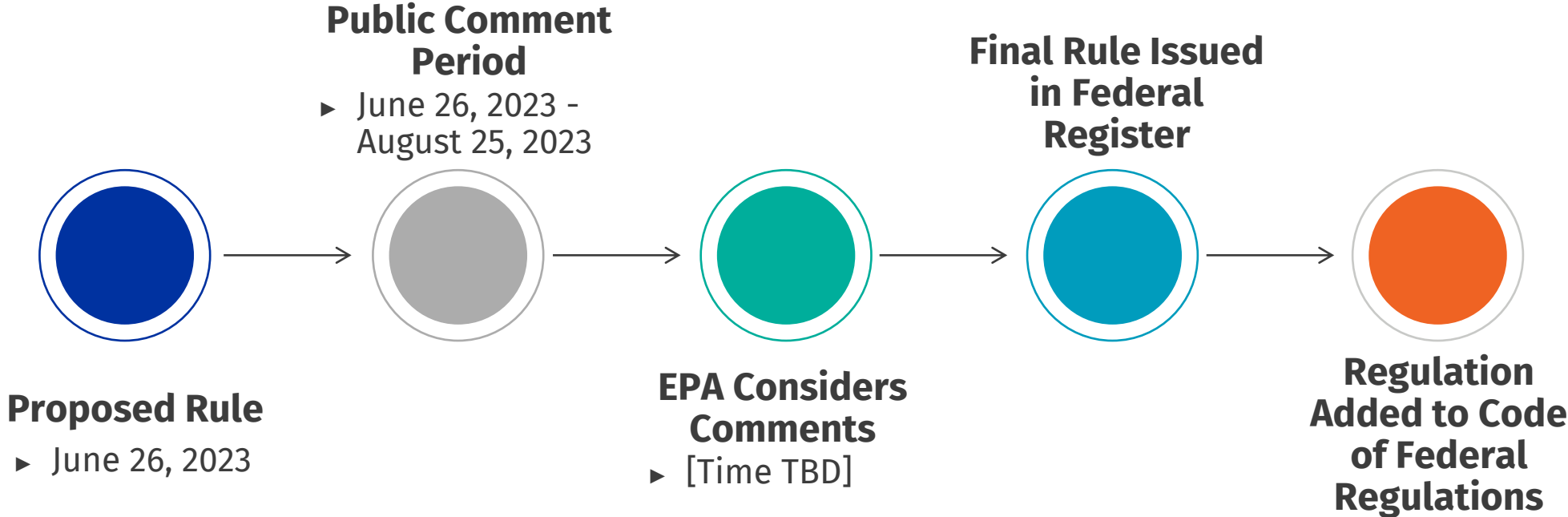
40 CFR 60 Subpart IIII; 40 CFR 60 Subpart JJJJ; 40 CFR 63 Subpart ZZZZ

- ▶ **NSPS Subpart IIII** – Compression-ignition engines constructed after 7/11/2005
- ▶ **NSPS Subpart JJJJ** – Spark-ignition engines which commenced construction after 6/12/2006
- ▶ **NESHAP Subpart ZZZZ** – Reciprocating internal combustion engines (multiple different dates)

Proposed Rule Changes

- ▶ June 26, 2023 Federal Register
 - Volume 88
 - Number 101
 - Page 41361

Timeline to Final Rule



Electronic Reporting Provisions

- ▶ Reports
 - Initial notification
 - Performance test results
 - ◆ If test method is supported by ERT
 - Notification Of Compliance Status (NOCS)
 - Annual and semiannual compliance reports
- ▶ Compliance Date (whichever is later)
 - 180 days from date of final rule OR
 - 1 year from the date the report template is available on CEDRI

Extending Electronic Reporting Period

- ▶ At the discretion of the Administrator -
 - Outages of CDX or CEDRI
 - Force majeure
 - ◆ Acts of nature
 - ◆ Acts of war
 - ◆ Acts of terrorism
 - ◆ Equipment failure/safety hazards beyond facility's control
 - ◆ Labor strike

Example Reports – Subpart III Annual Report

<https://www.regulations.gov/docket/EPA-HQ-OAR-2022-0879>

Part 60 - Standards of Performance for New Stationary Sources (NSPS) Subpart III - Stationary Compression Ignition Internal Combustion Engines - 60.4214(d)(3) Annual Report								REPORTING INFORMATION	
COMPANY INFORMATION									
Company Record No. (Field value will automatically generate once Company Name is added in Column C)	Company Name (\$60.4214(d)(1)(i))	Address where the Engine is located (\$60.4214(d)(1)(i))	Address 2 (\$60.4214(d)(1)(i))	City (\$60.4214(d)(1)(i))	County (\$60.4214(d)(1)(i))	State Abbreviation (\$60.4214(d)(1)(i)) (Select from dropdown)	Zip Code (\$60.4214(d)(1)(i))	Beginning Date of Reporting Period (\$60.4214(d)(1)(ii))	Ending Date of Reporting Period (\$60.4214(d)(1)(ii))
RecordId	CompanyName	AddressLine1	AddressLine2	CityName	CountyName	StateName	ZIPCode	PeriodStartDate	PeriodEndDate
e.g.: 1	e.g.: ABC Company	e.g.: 123 Main Street	e.g.: Suite 100	e.g.: Brooklyn	e.g.: Kings	e.g.: NY	e.g.: 11221	e.g.: 01/01/2020	e.g.: 6/30/2020

Part 60 - Standards of Performance for New Stationary Sources (NSPS) Subpart III - Stationary Compression Ignition Internal Combustion Engines - 60.4214(d)(3) Annual Report							
Engine Record No. (Autocompleted once Column C filled)	Company Record No. (Select from dropdown)	Engine Description (\$60.4214(d)(1)(iii))	Engine Site Rating (Brake Horsepower) (\$60.4214(d)(1)(iii))	Engine Model Year (\$60.4214(d)(1)(ii))	Latitude of the Engine (\$60.4214(d)(1)(iv))	Longitude of the Engine (\$60.4214(d)(1)(iv))	Did you use this engine for the purpose specified in §60.4211(f)(3)(i): 50 hours per year for non-emergency situations? (Select from dropdown)
EngineId	RecordId	EngineDescription	EngineRating	EngineYear	EngineLatitude	EngineLongitude	NonEmergencyFlag
e.g.: 1	e.g.: 1	e.g.: Engine 1	e.g.: 100	e.g.: 2020	e.g.: 12.12345	e.g.: -12.12345	e.g.: Yes

Part 60 - Standards of Performance for New Stationary Sources (NSPS) Subpart III - Stationary Compression Ignition Internal Combustion Engines - 60.4214(d)(3) Annual Report						
Engine Record No. (Select from dropdown)	Non-Emergency Use Event Begin Date (\$60.4214(b))	Non-Emergency Use Event Begin Time (\$60.4214(b))	Non-Emergency Use Event End Date (\$60.4214(b))	Non-Emergency Use Event End Time (\$60.4214(b))	Entity Who Dispatched the Engine (\$60.4214(b))	Situation That Necessitated the Dispatch of the Engine (\$60.4214(b))
EngineId	NonEmergencyStartDate	NonEmergencyStartTime	NonEmergencyEndDate	NonEmergencyEndTime	DispatchEntity	DispatchReason
e.g.: 1	e.g.: 02/01/2020	e.g.: 15:00	e.g.: 02/02/2020	e.g.: 15:00	e.g.: Dispatcher	e.g.: Engine Malfunction

Example Reports – Subpart ZZZZ Semiannual and Annual Report

<https://www.regulations.gov/docket/EPA-HQ-OAR-2022-0879>

40 CFR Part 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines: §63.6650(h)(3) and (i) Spreadsheet Template

COMPANY INFORMATION								REPORTING INFORMATION				
Company Record No. (Field value will automatically generate once Company Name is added in Column C)	Company Name (§63.6650(c)(1), (g)(4), and (h)(1)(i))	Address Where the Engine Is Located (§63.6650(c)(1), (g)(4), and (h)(1)(i))	Address 2 (§63.6650(c)(1), (g)(4), and (h)(1)(i))	City (§63.6650(c)(1), (g)(4), and (h)(1)(i))	County (§63.6650(c)(1), (g)(4), and (h)(1)(i))	State Abbreviation (§63.6650(c)(1), (g)(4), and (h)(1)(i)) (Select from dropdown)	Zip Code (§63.6650(c)(1), (g)(4), and (h)(1)(i))	Responsible Agency Facility ID (State Facility Identifier)	Beginning Date of Reporting Period (§63.6650(c)(3), (g)(6), and (h)(1)(ii))	Ending Date of Reporting Period (§63.6650(c)(3), (g)(6), and (h)(1)(ii))	Does the statement "There were no deviations from any emission or operating limitations during the reporting period" apply to this facility? (§63.6650(c)(5)) (Select from dropdown)	Does the statement "There were no periods during which the CMS was out-of-control during the reporting period" apply to this facility? (§63.6650(c)(6)) (Select from dropdown)
RecordId	CompanyName	AddressLine1	AddressLine2	CityName	CountyName	StateName	ZIPCode	StateFacID	PeriodStartDate	PeriodEndDate	DeviationFlag	CMSFlag
e.g.: 1	e.g.: ABC Company	e.g.: 123 Main Street	e.g.: Suite 100	e.g.: Brooklyn	e.g.: Kings	e.g.: NY	e.g.: 11221	e.g.:	e.g.: 01/01/2020	e.g.: 06/30/2020	e.g.: Yes	e.g.: Not Applicable
1	a											

40 CFR Part 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines: §63.6650(h)(3) and (i) Spreadsheet Template

Engine Record No. (Autocompleted once Column C filled)	Company Record No. (Select from dropdown)	Engine Type (§63.6650(c)(7), (g)(7), and (h)(1)(iii))	Engine Site Rating (Brake Horsepower) (§63.6650(c)(7), (g)(7), and (h)(1)(iii))	Date Construction Commenced (§63.6650(c)(7), (g)(7), and (h)(1)(iii))	Latitude of the Engine in Decimal Degrees (at least five decimal places) (§63.6650(c)(8), (g)(8), and (h)(1)(iv))	Longitude of the Engine (at least five decimal places) (§63.6650(c)(8), (g)(8), and (h)(1)(iv))	Total Operating Time of Engine During Reporting Period (Required when there is a deviation) (hours) (§63.6650(d)(1) and (e)(13))	Identification of Each Parameter and Pollutant Monitored (Required when there is a deviation) (§63.6650(e)(8))	This engine is reporting deviations under either §63.6650(d) or §63.6650(e) (Select from dropdown)	This engine fires 10% or more of the annual gross heat input from landfill gas or Digester Gas and is subject to the §63.6650(g) (Select from dropdown)	This engine is subject to the reporting provisions of §63.6650(h) (Select from dropdown)	Did you use this engine for the purpose specified in §63.6640(f)(4)(ii): 50 hours per year for non-emergency situations? (§63.6650(h)) (Select from dropdown)	Were there deviations from the fuel requirements in §63.6604? (§63.6650(h)(1)(viii)) (Select from dropdown)
EngineId	RecordId	EngineDescription	EngineRating	EngineYear	EngineLatitude	EngineLongitude	OperatingTime	ParametersMonitored	DeviationToggle	LandfillDigesterToggle	EmergencyToggle	NonEmergencyFlag	DeviationFlag
e.g.: 1	e.g.: 1	e.g.: SI 2SLB	e.g.: 100	e.g.: 2020	e.g.: 12.12345	e.g.: -12.12345	e.g.: 610	e.g.: Temperature, Carbon Monoxide	e.g.: §63.6650(d)	e.g.: Yes	e.g.: No	e.g.: Yes	e.g.: No

**Central Data
Exchange**

**Compliance and
Emissions Data
Reporting Interface
(CDX and CEDRI)**

E-Reporting Requirements

- ▶ EPA maintains a list of NSPS & NESHAP rules with e-reporting requirements on the [ERT website](#)
- ▶ This list is not always up to date
- ▶ Check specific rules for electronic reporting requirements!
- ▶ Each rule has specific items that must be reported (must review rule to determine requirements)

Common Rules with E-Reporting Requirements

- ▶ Boiler NSPS - Subparts Da, Db, and Dc
 - PM CEMS RATA Only!
 - Electronic emission reports (optional) – Da and Db
- ▶ RICE MACT – ZZZZ & RICE NSPS – IIII/JJJJ
 - Annual reports for certain engines that participate in emergency demand response, operate during voltage/frequency deviations, or non-emergency demand response or peak shaving
- ▶ Area Source Boiler MACT – JJJJJ
 - Notification of Compliance Status (NOCS)
 - Performance Tests/RATA (ERT)
- ▶ Major Source Boiler MACT – DDDDD
 - Performance Tests/RATA (ERT)
 - Compliance Reports (Air Emissions Reports)
 - Notification Reports/NOCS (Optional – But Recommended by EPA)

Registration

- ▶ Certifiers are prompted to follow the registration steps using the LexisNexis identity verification or the Electronic Signature Agreement (ESA) signing process
 - The LexisNexis identity verification requires Personally Identifiable Information (PII). If this verification is passed, the ESA can be signed instantly and electronically
 - Otherwise, the ESA process requires the Certifier to send a paper form to the EPA and can take **up to 2 weeks** to complete the registration process
 - The ESA must be processed before the Certifier role is activated within CDX
 - Be aware of timing – recommend setting up the Certifier in advance

RO No Longer in CDX, New RO Not Yet Started

- ▶ A Virginia site was preparing to submit their report and discovered
 - The old Responsible Official was no longer in CDX
 - The new Responsible Official had not started their new position and had not registered yet in CDX
- ▶ Solution – Quickly get new Responsible Official registered in CDX



Helpful Hints (1/2)

- ▶ Don't assume EPA has prepared appropriate reporting forms for each rule
- ▶ Existing forms/uploads may or may not request all information that a rule may require in a compliance report
- ▶ Consider supplementing with additional information in forms/PDF attachments
- ▶ Forms may not be setup to accept information for your monitored parameter, fuel, etc.
- ▶ Call CDX Help Desk with issues
- ▶ Hit Save!

Helpful Hints (2/2)

- ▶ State/local agency requires separate copy
- ▶ This means facilities will likely be duplicating effort – Could be filling out state monitoring form and CEDRI monitoring form in some cases
- ▶ Have Certifier approved well in advance of submittal deadline
- ▶ Make sure reports are linked with facility – otherwise certifier cannot see them!
- ▶ The CEDRI forms change frequently – look out for changes!

ASK

THE

EXPERT

Resources

- ▶ CDX
<https://cdx.epa.gov/>
- ▶ CEDRI User Guide
[UserGuide.pdf \(epa.gov\)](#)
- ▶ CEDRI Overview and Templates
[CEDRI | US EPA](#)
- ▶ ERT and User's Guide –
[ERT User manual \(epa.gov\)](#)
- ▶ CDX Help Desk: (888) 890-1995

Proposed Clarifications and Corrections

Subpart ZZZZ Reporting Now Includes

- ▶ Engine site rating (hp)
- ▶ Date construction commenced
- ▶ Type of engine
- ▶ Latitude and longitude of engine location

Table 4 to Subpart III of Part 60

- ▶ For example only (incomplete table)
- ▶ Units - g/kW-hr (g/hp-hr)

Max Engine Power	Model Year	NMHC + NO _x	CO	PM
KW < 8 (HP < 11)	2010 and earlier	10.5 (7.8)	8.0 (6.0)	1.0 (0.75)
	2011+	7.5 (5.6)	8.0 (6.0)	0.40 (0.30)
8 ≤ KW < 19 (11 ≤ HP < 25)	2010 and earlier	9.5 (7.1)	6.6 (4.9)	0.80 (0.30)
	2011+	7.5 (5.6)	6.6 (4.9)	0.40 (0.30)

Subpart ZZZZ of Part 63

40 CFR 63.6625(j), Table 2c, Table 2d

- ▶ Option of utilizing an oil analysis program to extend the oil change requirement
 - Current rule references Table 2d items – 5, 6, 7, 9, 11
 - Proposed rule references Table 2d items – 5, 6, 7, 8, 10, 11, 13
 - ◆ 8. Non-emergency, non-black start 4SLB remote stationary RICE > 500 HP
 - ◆ 10. Non-emergency, non-black start 4SRB stationary RICE \leq 500 HP
 - ◆ 13. Non-emergency, non-black start stationary RICE which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis
- ▶ Confirming that oil and oil filter changes should occur “every 12 months” instead of “annually” in Table 2c and 2d

Request for Comments

Emergency RICE

40 CFR 63.6675

- ▶ The RICE is operated to provide electrical power or mechanical work during an emergency situation
- ▶ Examples:
 - Power generation during **normal supply interruptions**
 - Pumping water for fire suppression or flood control
- ▶ There are very important **operational limitations** to consider (more on that in a moment)

Emergency Use Requirements

40 CFR 63.6640(f); 40 CFR 60.4211(f); 40 CFR 60.4213(c)

- ▶ No time limit on emergency operation
 - Some states use 300/500 hrs total for permitting
- ▶ 100 hrs/yr of non-emergency operation for:
 - Maintenance checks and readiness testing
 - 50 hrs/yr of the 100 hrs/yr can be used for...
 - ◆ For all emergency RICE, any **situation except for peak shaving, non-emergency demand response, and generating income** by supplying power to the grid or another entity
 - ◆ For existing area source emergency RICE, local reliability under specific dispatch conditions, see 40 CFR 63.6640(f)(4)(ii)
 - **Operation for Emergency Demand Response and Freq. and Voltage Deviations is no longer allowed as of 5/1/2016**
 - Virginia does not allow for anything but maintenance checks and testing

Note that all this is on a calendar year basis

Request for Comments on 50-hour Provision

▶ Intent

- Assist local electric reliability and distribution in rural areas or was it for densely-populated urban areas?

▶ Request for comments

- How often is the 50-hour provision used?
- Under what circumstances is the 50-hour provision used?
- What language should be added to narrow the scope of where the 50 hour provision may be used?
- If the 50 hour provision is changed should it apply to all sources (including existing) or just new, modified, and reconstructed sources?

Additional Training Opportunities

- [Understanding Engines: Their Emissions and Your Compliance Requirements | Trinity Consultants](#)
- Webinar
- November 1 – November 3
- 9 am – 12 pm Central Time



Contact Us

Al Cole

acole@trinityconsultants.com

540.342.5945