

# Final Amendments to Emission Standards for RICE

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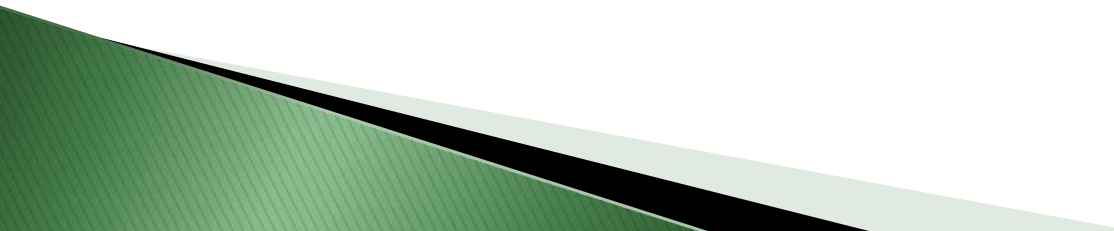
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Slides 11, 13, 15-25, 28-34 are directly or modified from presentations by Melanie King, U.S. EPA Office of Air Quality Planning & Standards. Posted at <http://www.epa.gov/ttn/atw/rice/20130306webinar.pdf>.

# Webinar Logistics

- ▶ Everyone should be on mute; to speak, “raise your hand” or send message
- ▶ Listen through computer or telephone; if not using a phone, will need a microphone to speak
- ▶ Type questions anytime
- ▶ Can type questions in “comment or question box” in the navigation pane
- ▶ Webinar will be archived; slides will be posted ([www.sbeap.org](http://www.sbeap.org))

# Overview

- ▶ SBEAP
  - ▶ RICE NESHAP background
  - ▶ Final amendments to the NESHAP
  - ▶ Definition of an emergency engine
  - ▶ Revisions made to new source performance standards (NSPS) for consistency with RICE NESHAP
  - ▶ Notification, reporting
  - ▶ Resources
- 

# Who's Kansas SBEAP?

- ▶ **Kansas State University**
  - **College of Engineering**
    - **Engineering Extension**
      - **Pollution Prevention Institute (PPI)**
        - **Small Business Environmental Assistance Program (SBEAP)**

# Small Business Environmental Assistance Program



K A N S A S

**SBEAP**

Small Business Environmental Assistance Program

SBEAP's mission is to help Kansas businesses comply with environmental regulations and identify pollution prevention opportunities.

- Nancy Larson, Wichita
- David Carter, Manhattan
- Ryan Hamel, Olathe
- Barb Goode, Salina

# Small Business Environmental Assistance Program

- ▶ Environmental compliance assistance
- ▶ Multimedia [air (mostly), waste, water, energy, GHG inventory and reporting, and EMS]
- ▶ Small- and medium-sized businesses (KDHE funded)
- ▶ Free and confidential
- ▶ Staff located throughout the state
- ▶ Contact information
  - Web site: [www.sbeap.org](http://www.sbeap.org)
  - Hotline: 800-578-8898
  - E-mail: [sbeap@ksu.edu](mailto:sbeap@ksu.edu)



# Why are engine emissions a concern?

- ▶ Suspected of causing cancer and other serious health effects:
  - Aggravation of respiratory and cardiovascular disease
  - Changes in lung function and increased respiratory symptoms
  - Premature deaths in people with heart or lung disease
  - Benzene and 1,3-butadiene are known human carcinogens
  - Neurological, cardiovascular, liver, kidney effects, also effects on immune and reproductive systems
- ▶  $\text{NO}_x$  and VOC can react in the presence of sunlight to form ozone

# Bad news, good news

- ▶ **Bad news – pollutants emitted**
  - Main HAPs – formaldehyde, acetaldehyde, acrolein, methanol, and PAH
  - Main criteria pollutants – NO<sub>x</sub>, CO, VOC, PM
- ▶ **Good news – estimated reductions, start 2013**
  - 2,800 tons per year (tpy) HAPs
  - 9,600 tpy nitrogen oxides (NO<sub>x</sub>)
  - 36,000 tpy of carbon monoxide (CO)
  - 36,000 tpy volatile organic compounds (VOC)
  - 2,800 tpy particulate matter (PM)



# EPA's Stationary Engine Regulations

- ▶ National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE)
  - 40 CFR part 63 subpart ZZZZ
- ▶ New Source Performance Standards (NSPS) for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)
  - 40 CFR part 60 subpart IIII
- ▶ NSPS for Stationary Spark Ignition (SI) ICE
  - 40 CFR part 60 subpart JJJJ

# Affected sources

- ▶ Stationary engine
- ▶ Major and area sources of HAPs
- ▶ New or existing source
- ▶ Engine subcategories
- ▶ All sizes (HP)
  
- ▶ **ONLY ENGINES NOT SUBJECT**
  - existing emergency engines located at residential, institutional, or commercial area sources used or obligated to be available  $\leq 15$  hr/yr for emergency demand response, and not used for local reliability

# Stationary vs. Nonroad

- ▶ Stationary means not used in a motor vehicle and not a nonroad engine
  - Nonroad engines are:
    - Self-propelled (tractors, bulldozers)
    - Propelled while performing their function (lawnmowers)
    - Portable or transportable (has wheels, skids, carrying handles, dolly, trailer, or platform)
      - Portable nonroad becomes stationary if it stays in one location for more than 12 months



VS.



# Area vs Major Sources

- ▶ National Emission Standards for Hazardous Air Pollutants (NESHAP) – Subpart ZZZZ applies to
  - **major** source – facility emits or has PTE at least 10 tons/yr single HAP or 25 tons/yr combinations of HAPs
  - **area** source – not a **major** source
  - [www.epa.gov/ttn/atw/area/arearules.html](http://www.epa.gov/ttn/atw/area/arearules.html)
- ▶ CAA requires EPA to ID 30 most toxic HAPs in urban areas
- ▶ CAA requires EPA to ID **area** source categories representing 90% of emitters of these  
“Urban Dirty Thirty”

# New or Existing Source?

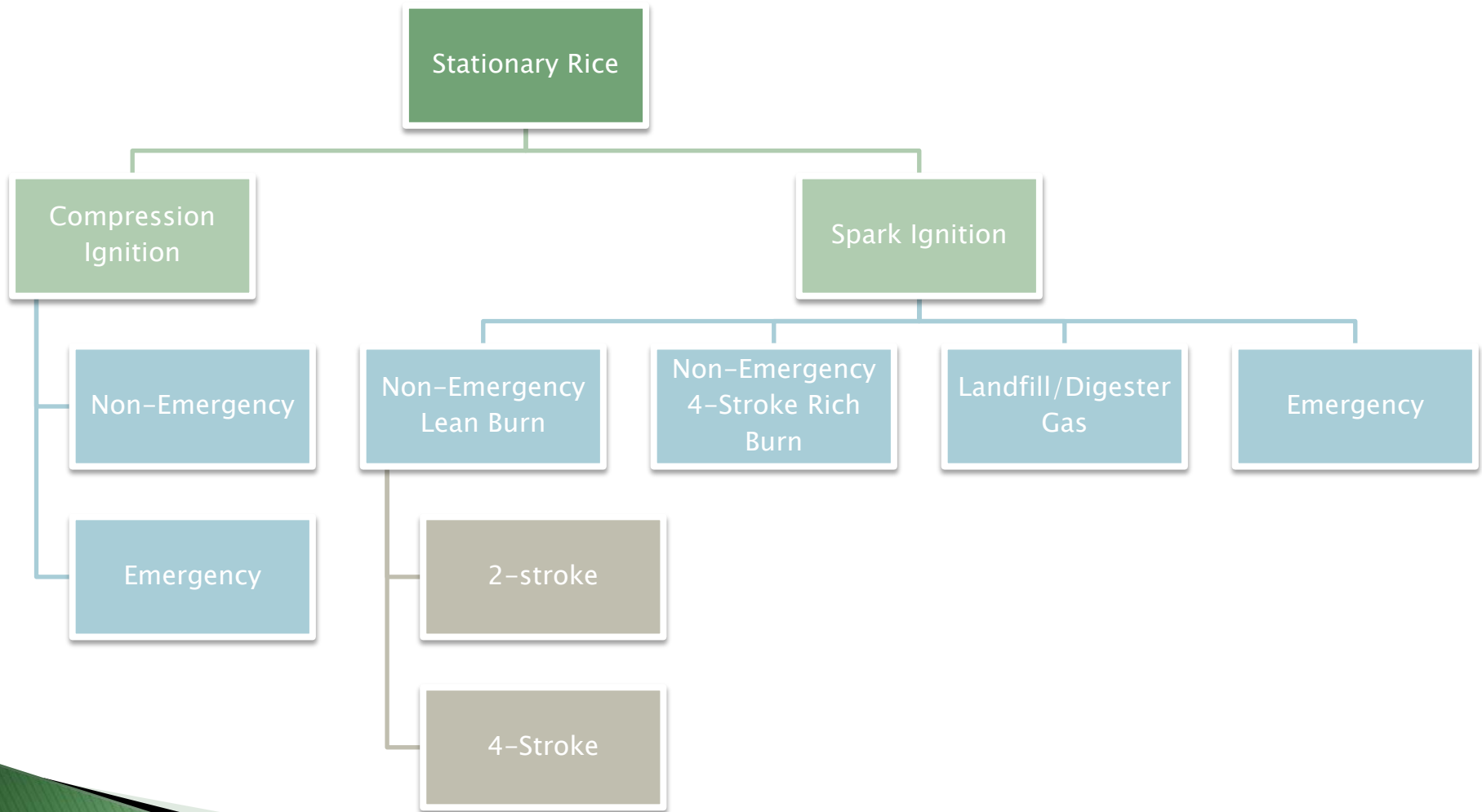
## MAJOR SOURCES

## AREA SOURCES

<b>≤ 500 HP</b>	<b>EXISTING</b> < June 12, 2006	<b>NEW</b> ≥ June 12, 2006	<b>EXISTING</b> < June 12, 2006	<b>NEW</b> ≥ June 12, 2006
	<b>EXISTING</b> < Dec 19, 2002	<b>NEW</b> ≥ Dec 19, 2002	<b>EXISTING</b> < June 12, 2006	<b>NEW</b> ≥ June 12, 2006
<b>&gt; 500 HP</b>				

**Construction date:** owner/operator has entered into a contractual obligation to undertake and complete, within a reasonable amount of time, a continuous program for the on-site installation of the engine.

# Engine Subcategories



# Timeline of Final Regulations

Date	Rule	Type of engines covered
June 2004	NESHAP	•Existing/new engines >500 HP at major sources
June 2006	NSPS	•New CI engines
January 2008	NSPS	•New SI engines
	NESHAP	•New engines •≤500 HP at major sources •all HP at area sources
March 2010	NESHAP	•Existing CI engines •≤500 HP at major sources •all HP at area sources •non-emergency CI >500 HP at major sources
August 2010	NESHAP	•Existing SI engines •≤500 HP at major sources •all HP at area sources
June 2011	NSPS	•Amendments for CI and SI engines
January 2013	NESHAP and NSPS	•Reconsideration of 2010 NESHAP •Minor amendments to NSPS for CI and SI engines

# Applicability

RICE  
NESHAP

- Applies to stationary CI and SI engines, both existing and new

CI ICE  
NSPS

- Applies to stationary CI engines:
  - Ordered after July 11, 2005 and manufactured after April 1, 2006
  - Modified or reconstructed after July 11, 2005

SI ICE  
NSPS

- Applies to stationary SI engines:
  - Ordered after June 12, 2006 and manufactured on/after
    - July 1, 2007 if  $\geq 500$  HP (except lean burn  $500 \leq \text{HP} < 1,350$ )
    - January 1, 2008 if lean burn  $500 \leq \text{HP} < 1,350$
    - July 1, 2008 if  $< 500$  HP
    - January 1, 2009 if emergency  $> 25$  HP
  - Modified or reconstructed after June 12, 2006



# Modification and Reconstruction

- ▶ Modification (NSPS only)
  - Physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of a regulated pollutant
  - See 40 CFR 60.14
- ▶ Reconstruction
  - Replacement of components of an existing source to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost of a comparable entirely new source, and it is technologically and economically feasible to meet the applicable standards
  - See 40 CFR 60.15 and 63.2

# Amendments Background

- ▶ RICE NESHAP 2010 amendments for certain existing engines
- ▶ After promulgation EPA received
  - petitions for reconsideration,
  - petitions for judicial review, and
  - other communications regarding several issues with the final rules.
- ▶ January 30, 2013 amendments
  - Addressed petitions
  - Effective April 1, 2013
  - Minor amendments/clarification also to NSPS

# Major Issues Affecting Kansas

- ▶ Total hydrocarbon (THC) compliance demonstration option
- ▶ SI RICE > 500 HP at area sources
- ▶ Tier 3 certified CI RICE
- ▶ Emergency demand response and peak shaving

# THC Compliance Option

- ▶ Non-emergency, 4SRB SI RICE > 500 HP at major sources
- ▶ 2004 RICE NESHAP had formaldehyde limit
  - Reduce formaldehyde by 76%, or limit to 350 ppbvd
- ▶ 2013 amendments – can show compliance w/formaldehyde standard by demonstrating compliance w/30% reduction of THC

# Area Source SI RICE > 500 HP

- ▶ Non-emergency, existing, 4-stroke SI RICE > 500 HP at area sources
- ▶ Original 2010 RICE NESHAP required to meet limits for CO or formaldehyde
- ▶ 2013 amendments – removed emission limits; established following requirements:
  - Engines in remote areas must meet management practices
  - Engines not in remote areas must meet equipment standard and other requirements

# Definition of “Remote”

- ▶ Remote stationary RICE—
  - Located in offshore area; or
  - Located on a pipeline segment with 10 or fewer buildings intended for human occupancy and no buildings with 4 or more stories within 220 yards on either side of a continuous 1-mile length of pipeline (DOT Class 1 area), and the pipeline segment is not within 100 yards of a building or small well-defined outside area (playground, etc.) occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period; or
  - Not located on a pipeline and having 5 or fewer buildings intended for human occupancy and no buildings with 4 or more stories within a 0.25 mile radius around the engine

Must meet remote definition as of Oct 19, 2013

# Remote Area Source SI RICE

- ▶ Non-emergency, existing, 4-stroke lean & rich burn SI RICE > 500 HP at area sources
  - Management practices
    - Change oil and filter every 2,160 hours of operation or annually (or use oil analysis program)
    - Inspect spark plugs, hoses, and belts every 2,160 hours of operation or annually, and replace as needed
  - Keep records of maintenance
  - Evaluate remote status annually and keep records
  - If evaluation shows engine is no longer remote, comply with nonremote engine requirements within 1 year

# Non-Remote Area Source SI RICE

- ▶ Non-emergency, existing, 4-stroke SI RICE > 500 HP at area sources
  - Equipment standard requiring catalyst on engine
  - 4-stroke lean burn RICE: install oxidation catalyst; 93% CO reduction or 47 ppmvd CO
  - 4-stroke rich burn RICE: install non-selective catalytic reduction; 75% CO reduction, 30% THC reduction, or 270 ppmvd CO
  - Initial and annual catalyst activity checks
    - Initial: three 15-minute runs\*
    - Subsequent annual: one 15-minute run\*
  - High catalyst inlet temperature engine shutdown, or continuous catalyst inlet temperature monitoring
  - Notifications and compliance reporting

\*If using subpart ZZZZ appendix A, run must be at least one measurement cycle and include at least 2 min. of test data phase measurement



# Tier 3 Certified CI RICE

- ▶ Non-emergency, CI RICE  $> 300$  HP at area sources, installed before June 12, 2006
- ▶ Certified to Tier 3 (Tier 2 for engines above 500 kW)\*
- ▶ 2013 amendments – now complies w/RICE NESHAP by complying w/CI ICE NSPS (subpart III)

\*40 CFR Part 89

# Emergency Engine Operational Limitations

- ▶ To be considered an emergency stationary RICE, any operation other than
  - Emergency,
  - Maintenance and testing,
  - Emergency demand response, and
  - Operation in certain non-emergency situations for  $\leq 50$  hr/yr

is prohibited.

# Emergency Engine Operational Limitations (cont.)

- ▶ Unlimited use for emergencies (e.g., power outage, ice storm, tornado, fire, flood)
- ▶ Limited to 100 hrs/yr for any combination of
  - Maintenance checks/readiness testing
  - Emergency demand response
    - Energy Emergency Alert Level 2 has been declared by Reliability Coordinator
  - Voltage or frequency deviates by 5% or more below standard
  - 50 hr/yr of “other” non-emergency situations

# Emergency Engine Operational Limitations (cont.)

- ▶ 50 hr/yr of the 100 hr/yr allocation can be used for:
  - Non-emergency situations if no financial arrangement
  - Peak shaving until May 3, 2014 (emergency RICE at area sources of HAP only)
  - Local reliability as part of a financial arrangement with another entity if specific criteria met (emergency RICE at area sources of HAP only)

# Emergency Engine Operational Limitations (cont.)

- ▶ Operation for local reliability up to 50 hrs allowed if:
  - Engine is dispatched by local transmission/distribution system operator
  - Dispatch intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads
  - Dispatch follows reliability, emergency operation, or similar protocols that follow specific NERC, regional, state, public utility commission, or local standards or guidelines
  - Power provided only to facility or to support local distribution system
  - Owner/operator identifies and records dispatch and standard that is being followed

# Fuel Requirement for Emergency Engines

- ▶ Applies to emergency CI RICE  $> 100$  HP and displacement  $< 30$  liters/cylinder that are:
  - Operated or contractually obligated to be available  $> 15$  hr/yr (up to 100 hr/yr) for emergency demand response or voltage/frequency deviation, or
  - Operated for local reliability (up to 50 hr/yr)
- ▶ Beginning January 1, 2015, use ultra low sulfur diesel (ULSD) fuel
  - Existing inventory may be depleted first

# Reporting Requirements for Emergency Engines

- ▶ Applies to emergency RICE  $> 100$  HP that are:
  - Operated or contractually obligated to be available  $> 15$  hr/yr (up to 100 hr/yr) for emergency demand response or voltage/frequency deviation, or
  - Operated for local reliability (up to 50 hr/yr)
- ▶ Beginning with 2015 operation, report electronically by March 31 of following year
  - Compliance and Emissions Data Reporting Interface (CEDRI)
  - EPA Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx))

# Reporting Requirements for Emergency Engines

- ▶ What to report:
  - Facility name/address
  - Engine rating, model year, lat/long
  - Date, start time, end time for operation for purposes above
  - Number of hours engine is contractually obligated for emergency demand response or voltage/frequency deviation
  - Entity that dispatched engine for local reliability and situation that necessitated dispatch
  - Deviations from fuel requirement



# Stationary ICE NSPS Recent Amendments

- ▶ Emergency engine operation limited to:
  - Unlimited use for emergencies (e.g., power outage, fire, flood)
  - 100 hr/yr for maintenance/testing and emergency demand response
  - 50 hr/yr of the 100 hr/yr allocation can be used for
    - non-emergency situations (if no financial arrangement)
    - local reliability
- ▶ Operation for emergency demand response limited to:
  - Energy Emergency Alert Level 2 has been declared, or
  - Voltage or frequency deviates by 5% or more below standard

# Stationary ICE NSPS Recent Amendments

- ▶ Operation for local reliability limited to mitigating local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads; engine must be dispatched by local transmission/distribution system operator
- ▶ As with NESHAP, electronic reporting beginning with 2015 operation

# Key Dates

- ▶ Initial Notifications were due by:
  - August 31, 2010 for existing CI engines
  - February 16, 2011 for existing SI engines
- ▶ Compliance date:
  - May 3, 2013 for existing CI engines
  - October 19, 2013 for existing SI engines
- ▶ Request for extension
  - January 3, 2013 for existing CI engines
  - June 21, 2013 for existing SI engines

# Resources

- ▶ Regulations– 40 CFR Part 63, subpart ZZZZ or
  - [www.ecfr.gov](http://www.ecfr.gov), then search
  - Web search
- ▶ EPA stationary engine sites
  - <http://www.epa.gov/ttn/atw/rice/ricepg.html>
  - <http://www.epa.gov/region1/rice/>
  - <http://www.epa.gov/ttn/atw/nsps/cinsps/cinspspg.html>
  - <http://www.epa.gov/ttn/atw/nsps/sinsps/sinspspg.html>
- ▶ SBEAP air quality rules
  - <http://www.sbeap.org/aqrules>
  - <http://www.sbeap.org/aqrules/page/engines>

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