BAY AREA AIR QUALITY MANAGEMENT DISTRICT

NESHAP for Stationary RICE

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RICE NESHAP Background

- NESHAP = National Emission Standards for Hazardous Air Pollutants
- RICE = Reciprocating Internal Combustion Engines
- NESHAP for Stationary RICE = 40 CFR Part 63 subpart ZZZZ
  - formaldehyde, acetaldehyde, acrolein, methanol, and PAHs (polycyclic aromatic hydrocarbons)
- Rule covers all sizes of engines, except existing emergency engines located at residential, institutional, or commercial area sources used or obligated to be available ≤15 hr/yr for emergency demand response, and not used for local reliability.

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RICE NESHAP Background (cont'd)

Major Source vs. Area Source:

- Major source of HAP emit ≥ 10 TPY of any single HAP or 25 TPY of any combination of HAPs.
- Area source of HAP is a source that is not a major source.

Existing vs. New:

- > 500 HP at major sources:

  Existing ← Dec 19, 2002 → New
- ≤ 500 HP at major sources and all HP at area sources:

  Existing ← Jun 12, 2006 → New

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January 30, 2013 Amendments

- Amendments effective April 1, 2013.
- Minor amendments made to NSPS.
- Issues addressed in RICE NESHAP amendments:
  - Emergency engine operation for demand response & peak shaving
  - Requirements for existing 4-stroke SI RICE at area sources
  - Total hydrocarbon (THC) compliance option for 4-stroke rich burn SI RICE
  - Tier 1/Tier 2 certified CI RICE scheduled for replacement
  - Tier 3 certified CI RICE
  - CI RICE at area sources of HAP in remote areas of Alaska
  - CI RICE on offshore vessels

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Emergency Engine Operation

- Emergency engine operation limited to:
  - Unlimited use for emergencies.
  - 100 hr/yr for maintenance/testing & 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 (existing RICE at area sources only).
    - Peak shaving until May 3, 2014 (existing RICE at area sources only).

Notes: This slide also shows minor amendments made to NSPS, but the amended NSPS does not include peak shaving allowance.

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Emergency Engine Operation (cont'd)

- Fuel requirements to use ULSD fuel beginning January 1, 2015 apply 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).

- ULSD = Ultra Low Sulfur Diesel:
  - Max sulfur content of 15 ppm; and
  - Either min cetane index of 40 or max aromatic content of 35%v/v.

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Emergency Engine Operation (cont'd)

- Requirements apply 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:
  - 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

- Submit report electronically through the Compliance and Emissions Data Reporting Interface
  - Accessed through EPA's Central Data Exchange at http://www.epa.gov/cdx.

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4-Stroke SI RICE at Area Sources

- 2010 RICE NESHAP: existing 4-stroke SI RICE > 500 HP at area sources of HAP required to meet emission limits for CO or formaldehyde.
- 2013 amendments: emission limits removed, and below requirements established:
  - Engines in remote areas must meet management practices.
  - Engines not in remote areas must meet equipment standard and other requirements.

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THC Compliance Option

- 2004 RICE NESHAP: formaldehyde limit for nonemergency 4SRB SI RICE > 500 HP at major sources established:
  - Either reduce formaldehyde by 76%, or limit it to 350 ppbvd.
- 2013 amendments: engines meeting the 76% formaldehyde reduction standard can show compliance by demonstrating through testing that THC is reduced by at least 30%.

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Tier 1/Tier 2 Certified Engines Scheduled for Replacement

- 2010 RICE NESHAP: existing non-emergency CI RICE > 300 HP required to comply with CO limit.
  - Engines would likely not comply without catalyst retrofit.
- California state/local rules require CI engines certified to Tier 1 or Tier 2 standards to be replaced in next few years.
- 2013 amendments: existing non-emergency Tier 1 or 2 CI RICE > 300 HP at area sources subject to state/local rule requiring replacement can comply with management practices until Jan 1, 2015, or 12 yrs after the engine's installation date, but not later than Jun 1, 2018.
  - Must submit notification by Mar 3, 2013, identifying state/local regulation.

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Tier 3 Certified Engines

- Tier 3 (model year 2006) CI RICE constructed (installed) between Jan 1-Jun 12, 2006 are:
  - Under NESHAP, existing engines; and
  - Under 2010 RICE NESHAP, subject to CO emission limit that would likely require catalyst retrofit.

- Identical Tier 3 engine installed after Jun 12, 2006, does not require retrofit to comply with applicable EPA rule for that engine (NSPS).

- 2013 amendments: existing non-emergency CI RICE > 300 HP at area sources certified to Tier 3 standards can comply with RICE NESHAP by complying with the CI ICE NSPS (subpart IIII).

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Emission Standards: Existing RICE Located at Major Sources

HP	Non Emergency					Emergency
	CI	SI 2SLB	SI 4SLB	SI 4SRB	SI LFG/DG	
< 100	Change oil and filter and inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours (CI) or 4,320 (SI 2SLB) or 1,440 (all except for CI and SI 2SLB) of operation or annually; inspect hoses and belts every 500 hours (CI) or 4,320 (SI 2SLB) or 1,440 (all except for CI and SI 2SLB) of operation or annually					Change oil/filter & inspect hoses/belts every 500 hours or annually; inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually
100-300	230 ppm CO	225 ppm CO	47 ppm CO	10.3 ppm formaldehyde	177 ppm CO	
301-500	49 ppm CO or 70% CO reduction					
> 500	23 ppm CO or 70% CO reduction	No standards	No standards	10.3 ppm formaldehyde or 76% formaldehyde reduction	No standards	No standards

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Emission Standards: Existing RICE Located at Area Sources

HP	Non Emergency					Emergency
	CI	SI 2SLB	SI 4S, Remote	SI 4S, Non Remote	SI LFG/DG	
≤ 300	Change oil/filter & inspect air cleaner every 1,000 hours or annually; inspect hoses/belts every 500 hours or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 4,320 hours or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 1,440 hours or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 1,440 hours or annually	Change oil/filter, inspect spark plugs, & inspect hoses/belts every 1,440 hours or annually	Change oil/filter & inspect hoses/belts every 500 hours or annually; inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually
301-500	49 ppm CO or 70% CO reduction					
> 500	23 ppm CO or 70% CO reduction		Change oil/filter, inspect spark plugs, & inspect hoses/belts every 2,160 hours or annually	If engine used ≤ 24 hrs/yr: Same as "Emergency" in this table. If engine used > 24 hrs/yr: Install oxidation catalyst (4SLB) or install NSCR (4SBR)		

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Emission Standards: New RICE

New RICE Located at Major Sources:

HP	Non Emergency					Emergency
	CI	SI 2SLB	SI 4SLB	SI 4SRB	SI LFG/DG	
< 250	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with SI NSPS	Comply with CI or SI NSPS
250-500			14 ppm formaldehyde or 93% CO reduction			
> 500	580 ppb formaldehyde or 70% CO reduction	12 ppm formaldehyde or 58% CO reduction		350 ppb formaldehyde or 76% CO reduction	No standards	No standards

New RICE Located at Area Sources: meet Stationary Engine NSPS

CI: Part 60 Subpart IIII

SI: Part 60 Subpart JJJJ

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Compliance Requirements

Engine Subcategory	Compliance Requirements
Existing non-emergency: • CI ≥ 100 HP at major source • CI > 300 HP at area source • SI 100-500 HP at major source	• Initial emission performance test • Subsequent performance testing every 8,760 hours of operation or 3 years for engines > 500 HP (5 years if limited use) • Operating limitations - catalyst pressure drop and inlet temperature for engines > 500 HP • Notifications • Semiannual compliance reports (annual if limited use) Existing non-emergency CI > 300 HP: • Ultra low sulfur diesel (ULSD) • Crankcase emission control requirements
Existing non-emergency SI 4SLB/4SRB > 500 HP at area source used > 24 hr/yr and not in remote area	• Initial and annual catalyst activity checks • High temperature engine shutdown or continuously monitor catalyst inlet temperature • Notifications • Semiannual compliance reports

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Compliance Requirements (cont'd)

Engine Subcategory	Compliance Requirements
Existing emergency/black start: • ≤ 500 HP at major source • All at area source Existing non-emergency: • < 100 HP at major source • CI ≤ 300 HP at area source • SI ≤ 500 HP at area source • SI 2SLB > 500 HP at area source • SI LFG/DG > 500 HP at area source • SI 4SLB/4SRB > 500 HP at area source used ≤ 24 hours/year or in remote area	• Operate/maintain engine & control device per manufacturer's instructions or owner-developed maintenance plan • May use oil analysis program instead of prescribed oil change frequency • Emergency engines must have hour meter and record hours of operation • Keep records of maintenance • Notifications not required • Reporting and ULSD for emergency engines used for emergency demand response or local reliability

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Compliance Requirements (cont'd)

Engine Subcategory	Compliance Requirements
Existing non-emergency: • SI 4SRB > 500 HP at major source New non-emergency: • SI 2SLB > 500 HP at major source • SI 4SLB > 250 HP at major source • SI 4SRB > 500 HP at major source • CI> 500 HP at major source	• Initial emission performance test • Subsequent performance testing semiannually (can reduce frequency to annual)* • Operating limitations - catalyst pressure drop and inlet temperature • Notifications • Semiannual compliance reports
New emergency/limited use > 500 HP at major source	• Initial notification • Reporting and ULSD for emergency engines used for emergency demand response or local reliability
New non-emergency LFG/DG > 500 HP at major source	• Initial notification • Monitor/record fuel usage daily • Annual report of fuel usage

*Subsequent testing required for 4SRB engine complying with formaldehyde % reduction standard only if engine is ≥5,000 HP

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Implementation Assistance

- EPA's NESHAP for RICE Link:

http://www.epa.gov/ttn/atw/rice/ricepg.html

- Electronic CFR:

http://www.gpoaccess.gov/ecfr