

NAAQS, MACT, and GACT Oh My!?

9th Annual Winter Technical
Meeting
December 9, 2010

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Topics

- New NO₂ NAAQS
- New SO₂ NAAQS
- Boiler MACT/GACT
- RICE NESHAP
- Area Source NESHAPs Abound
- SSM Reminder

New 1-hr NO₂ & SO₂ NAAQS



Revised NO₂ NAAQS

- Existing standard (established in 1971)
 - ◆ 53 ppb annual average (100 µg/m³)
 - ◆ Reviewed and retained in 1985 and 1996
- February 23, 2010 – EPA promulgated new 1-hr NO₂ NAAQS
 - ◆ 100 ppb (about 188.3 µg/m³)
 - ◆ 3-year average of 98th percentile of annual distribution of daily maximum 1-hour concentrations
 - ◆ Secondary NO₂ standard is being reviewed separately
 - ◆ **Effective April 12, 2010**

Revised NO₂ NAAQS Timeline

Milestone	Date
State Designation Recommendations to EPA	January 2011: One year following promulgation (Based on existing network data)
Designations	January 2012: EPA designates all/most areas as "unclassifiable" (because near road monitors not in place)
New NO ₂ Monitoring Network	January 1, 2013: All monitors operating
Next NO ₂ NAAQS Review Completed	January 2015: Anticipated time frame
Nonattainment Re- Designations (discretionary)	January 2016/2017 (depending on date that sites become operational)
Attainment Date	January 2021/2022 (5 years after date of nonattainment designations)

Revised NO₂ NAAQS - Implications for Indiana

- No new nonattainment areas initially based on existing monitoring data
- New NO₂ monitors, likely near major roadways in urban areas
 - ◆ To be operational by January 2013
 - ◆ Mobile sources may be targets for reductions, but how??
- Worrisome with any new NAAQS – PSD modeling requirements

1-hr NO₂ NAAQS Modeling

- Step 1 – Try modeling total conversion (all NO_x as NO₂)
- Step 2 – Try modeling NO_x using default conversion rate of 0.75 NO_x to NO₂ (or nearby monitored background ratio)
- Step 3 – Proceed to more rigorous modeling using Plume Volume Molar Ratio Method (PVMRM) – protocol required

1-hr NO₂ NAAQS Modeling

■ Step 3 - PVMRM

- ◆ Input NO₂ in-stack concentration from source (justify)
- ◆ Input inventory NO₂ emissions (but inventory will show NO_x emissions)
- ◆ Input ambient air NO_x/NO₂ ratio (typically 0.75)
- ◆ Input 1-hr monitored ozone data (from nearby monitor)
- ◆ Get modeled 1-hr NO₂ concentrations

Revised SO₂ NAAQS

- Published in Federal Register on June 22, 2010
 - ◆ New 1-hour standard = 75 ppb
 - ◆ 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations
 - ◆ Existing 24-hour standard (140 ppb) and annual standard (30 ppb) revoked (established in 1971) – one year after effective date of new 1-hr designations
 - ◆ New standard to reduce exposure to high, short-term concentrations of SO₂ deemed to be greatest health risk in recent health studies
 - ◆ No change to 3-hour secondary standard (under separate review)
 - ◆ New near source monitoring required by 2013
- Rule effective as of August 23, 2010
 - ◆ Petition for reconsideration sent August 23, 2010 by states

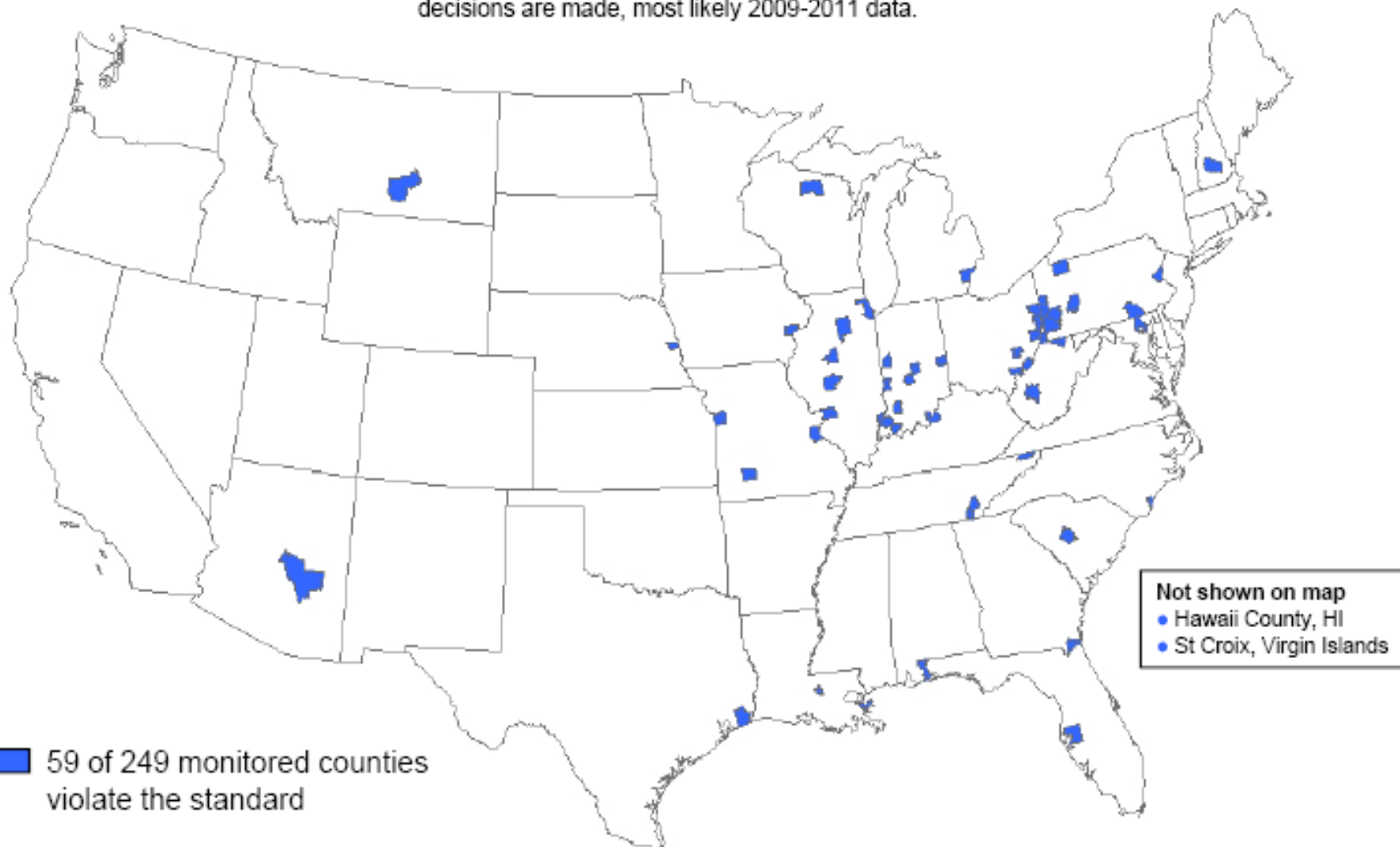
Revised SO₂ NAAQS Timeline

Deadline	Milestone
June 2010	EPA sets new primary SO ₂ standard
June 2011	States submit designation recommendations, based on available monitoring data and any modeling they choose to perform in advance of submitting their state implementation plans
June 2012	EPA issues initial designations: <ul style="list-style-type: none"> ➤ “nonattainment” = monitored <u>or</u> modeled violations ➤ “attainment” = monitored <u>and</u> modeled evidence of no violations ➤ “unclassifiable” = all other areas
January 2013	New monitoring network operational
June 2013	State plans for basic requirements to implement the revised standards (including appropriate state regulations to carry out monitoring etc.) due to EPA Attainment and unclassifiable area state implementation plans, modeling attainment of the new standard by August 2017, due to EPA.
February 2014	Nonattainment area plans due to EPA
August 2017	All areas attain the standard

Counties With Monitors Currently Violating the Revised Primary 1-Hour Sulfur Dioxide (SO₂) Standard of 75 ppb

(Based on 2007 – 2009 Air Quality Data)

EPA will not designate areas based on these data but will use the currently available air quality data at the time designations decisions are made, most likely 2009-2011 data.



Notes:

1. Data are shown for monitors that met the following criteria: 75% of the day has valid hourly values, 75% of the days in a quarter are valid, and all 4 quarters for each of the three years are valid as well as other applicable data handling conventions included in 40CFR50 Appendix T.

Revised SO₂ NAAQS - Implications for Indiana

- Indiana has 9 monitors violating 1-hr standard based on 2007-2009 data
 - ◆ Daviess (124 ppb), Floyd (152 ppb), Fountain (158 ppb), Gibson (97 ppb), Marion (92 ppb), Morgan (110 ppb), Vigo (137 ppb), Warrick (84 ppb), & Wayne (93 ppb)
- Nonattainment areas will be defined based on BOTH monitoring and modeling
 - ◆ IDEM in process of conducting internal modeling for large SO₂ sources – “not looking too positive”
- New 1-hour standard very problematic for sources required to model compliance with NAAQS
 - ◆ New standards are being challenged by both industry groups and states

Revised SO₂ NAAQS - IDEM Modeling

- Model sources with allowable emissions > 100 tpy SO₂
 - ◆ Potential for lower threshold? **(Illinois using 1.5 tpy threshold for modeling!)**
 - ◆ Are there inherent difficulties in modeling smaller sources?
- Data request for modeling parameters coming soon – building info, stack locations, stack orientations, exhaust parameters
- Issues with determining background concentrations
- IDEM hopes to engage sources directly in early 2011
 - ◆ Seeking emission reductions

NESHAP Updates

Boiler MACT/GACT

RICE NESHAP

Area Source Rules

SSM Update



NESHAP – Major Sources

- A source that has the potential to emit
 - ◆ 10 tons per year of any single HAP OR
 - ◆ 25 tons per year of any combination of HAPs
- Major Sources must meet Maximum Achievable Control Technology (MACT)
 - ◆ New Sources - MACT is set as the emission limitation achieved in practice by the best controlled similar source
 - ◆ Existing Sources – MACT Floor is determined as the average emissions of the top performing 12% of the sources

NESHAP – Area Sources

- Any source that is not a Major Source
- EPA can promulgate either MACT or generally available control technology (GACT)
- GACT has the same requirements for new and existing sources
 - “...methods, practices, and techniques which are commercially available and appropriate for application by the sources in the category considering economic impacts and technical capabilities of the firms...”

Coverage of Boiler Rules

- Major sources
 - ◆ ~13,555 existing boilers and process heaters
 - ◆ ~ 46 new boilers and process heaters to be installed in next 3 years
- Area sources
 - ◆ ~183,600 existing boilers (92,000 facilities)
 - ◆ ~ 6,800 new boilers to be installed in next 3 years

Key Requirements

- ◆ Emission limits for PM, HCl, Hg, CO, and Dioxin/Furans
 - Subcategories by boiler type and fuel combusted
 - Emission averaging for subcategories (plan required)
 - No limits for natural gas boilers
- ◆ Area source limits for PM, HCl, Hg
- ◆ Annual/Biennial tune-up requirements
- ◆ One-time Energy Assessments

Budgets and Costs

- EPA estimates that the boiler BACT will cost industry an estimated:
 - ◆ \$9.5B in initial capital
 - ◆ \$3.2B in annual operations
- The majority of the costs will be associated with the ~13,500 units located at major sources
- Average major source compliance cost per unit:
 - ◆ \$700k in initial capital
 - ◆ \$250k in annual operations

Budgets and Costs

- Average major source compliance cost per unit by fuel type

<u>Fuel Type</u>	<u>Total Initial Capital</u>	<u>Additional Annual Compliance</u>
Coal	\$7.7M	\$110k
Biomass	\$4.8M	\$85k
Liquid	\$1.7M	\$33k
Other Gas	\$7.8M	\$52k
Natural Gas	\$6k	\$6k

Budgets and Costs

- EPA estimates for annual energy audit
 - ◆ \$75,000 for an industrial scale units
 - ◆ \$2,000 to \$5,000 for commercial/institutional scale units
- EPA estimates for tune-ups
 - ◆ \$6,000 for natural gas fired units
 - ◆ \$18,000 for coal fired units

B-MACT “Top 10” Concerns List

10. Emissions averaging, limited to PM, HCl, & Hg, is only available for existing units within same subcategory, & has 10% penalty associated with its use.
9. Related to testing and monitoring, the rule is unclear on treatment of boilers that move from one fuel to another.
8. A one-time energy assessment is required by the proposed rule, with ill-defined boundaries.
7. Control device monitoring is more comprehensive than CAM; requirement for PM (and CO) CEMS for qualifying units.
6. Intentions are clear: natural gas boilers (both existing and new) were not included with emission limits. This will increase demand, and may increase fuel costs.

B-MACT “Top 10” Concerns List

5. Stack testing (with 4-hr runs) is required annually unless the boiler meets 75% of the standard on each pollutant, then tests are performed every 3 years.
4. Testing of (newly regulated) Dioxin and Furan must be completed annually (no opportunity for frequency reduction in rule).
3. Stark decrease in most emission limits vs 2004 Boiler MACT (e.g., 333x lower for new coal HCl, 25x for new coal PM)
2. CO limit reductions (newly regulated for existing units) may endanger sources' ability to meet NO_x limits, in era of 1-hr NO₂ NAAQS (and O₃ NAAs).
1. Emission limits were set on a pollutant-by-pollutant basis, therefore many boilers in the top 12% will still need to add controls.

B-MACT “Top 10” Concerns List

- Integrating compliance efforts with this standard in tandem with efforts associated with:
 - ◆ 1-hr NO₂ NAAQS
 - ◆ 1-hr SO₂ NAAQS
 - ◆ Quantifying condensable PM and PM_{2.5}
 - ◆ Possible changes to ozone attainment with upcoming 8-hr ozone changes (NO_x RACT)
 - ◆ Upcoming proposed CO NAAQS
 - ◆ And not triggering PSD (especially BACT for GHGs)

Implementation??

- ...
- Proposed rules - June 4, 2010 (signed April 29)
- New Boiler MACT originally scheduled for promulgation by December 16, 2010 (Court ordered deadline)
- Extended to January 16, 2010
- EPA requested extension to April 13, 2012
 - ◆ Updated proposed rule by June 15, 2011

Implementation??

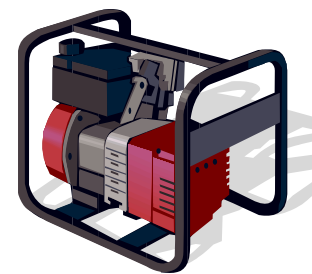
- EPA received over 4,800 comments, some of which exceeded 300 pages
- *“EPA’s preliminary assessment is that the comments may materially affect important decisions relating to source categorizations and coverage for the final emission standards.”*
- *“A re-proposal would result in standards that are more defensible and will yield environmental benefits earlier, because the final standards will more likely withstand substantive review.”*

RICE NESHAP Overview



NESHAP ZZZZ History

- June 15, 2004 – Part #1
 - ◆ Existing, new, & reconstructed RICE > 500 HP at major sources
 - ◆ Limited requirements for majority of existing RICE > 500 HP
- January 18, 2008 – Part #2
 - ◆ New & reconstructed RICE \leq 500 HP at major sources
 - ◆ New & reconstructed RICE at area sources
- March 3, 2010 – Part #3
 - ◆ Existing CI RICE \leq 500 HP at major sources
 - ◆ Existing CI RICE > 500 HP at major sources
 - ◆ Existing CI RICE at area sources
- August 20, 2010 – Part #4
 - ◆ Existing SI RICE \leq 500 HP at major sources
 - ◆ Existing SI RICE at area sources



What is a Stationary RICE?

- Includes both compression ignition (CI) AND spark ignition (SI) engines
- Not mobile and not a *non-road engine*
- *Non-road engines* (per 40 CFR 1068.30) are:
 - ◆ Self-propelled (e.g., bulldozer)
 - ◆ Intended to be propelled while operating (lawnmower)
 - ◆ Portable – designed to be carried or moved from location to location (e.g., wheels, trailers)
 - ◆ Does not remain at a fixed location for more than 12 consecutive months or for the full operating period at seasonal source
- Excludes stationary RICE being tested at test cell/stand (e.g., auto, tractor, diesel engine manufacturing facilities, military facilities)

Major/Area Source Standards

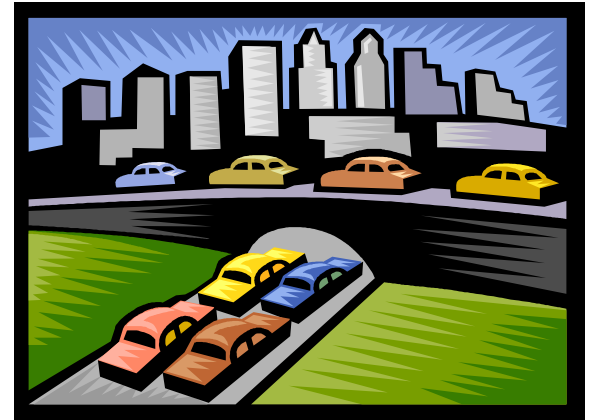
- New and reconstructed sources
 - ◆ Some numerical standards for engines at major sources (mainly limited to > 500 HP units)
 - ◆ Most only required to comply with NSPS IIII or JJJJ, as applicable
- Existing sources
 - ◆ Some numerical standards
 - ◆ Emergency and smaller sources have work practice standards instead of numerical standards

Emergency Engines

- Typical Emergency Engine Requirements
 - ◆ General O&M requirements
 - Minimize engine idle time
 - Periodic inspection requirements
 - ◆ Install non-resettable hour meter per
 - ◆ “Limited operation” requirements to be classified as an emergency generator
 - ◆ Applicable recordkeeping requirements

Area Source Rules

- EPA's Integrated Urban Air Toxics Strategy (1999)
 - ◆ Goals – reduce cancer and health risks
 - ◆ Identifies 33 HAPs that pose the greatest potential threat to public health in the largest number of urban areas, including 30 HAPs specifically identified as being emitted from *area sources*
 - ◆ Identifies list of area source categories
 - E.G., IC engines – PAHs, acetaldehyde, arsenic, benzene, beryllium, cadmium, formaldehyde



Area Source Rules

- List of 70 Area Source Categories to be Regulated
- A few common sources
 - ◆ Fabricated Metal Products
 - ◆ Miscellaneous Coatings
 - ◆ Paint Stripping
 - ◆ Plating and Polishing
 - ◆ Flexible Polyurethane foam fabrication
 - ◆ Hospital Sterilizers
 - ◆ Stationary Internal Combustion Engines

<http://www.epa.gov/ttn/atw/area/arearules.html#final>

<http://www.epa.gov/ttn/atw/area/compilation.html>



Common Applicability Criteria

- May apply only to very specific operations – check definitions in rule
- Target HAP – utilize one of the target HAPs listed in the rule
- Check for research and development exclusions
- NAICS code requirements??



GACT Applicability Review

- Let's review the applicability criteria for two specific GACT rules

SSM: Remember This Decision?

- December 19, 2008 - U.S. Court of Appeals for the D.C. Circuit - the Startup, Shutdown, Malfunction exemption is vacated
- Portland Cement MACT – final rule (9/8/10)

§ 63.1344 Affirmative defense for exceedance of emission limit during malfunction.

In response to an action to enforce the standards set forth in paragraph § 63.1343(b) you may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined at 40 CFR 63.2. Appropriate penalties may be assessed, however, if the respondent fails to meet its burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

TABLE 1 TO SUBPART LLL OF PART 63—APPLICABILITY OF GENERAL PROVISIONS—

Citation	Requirement	Applies to subpart LLL	Explanation
63.6(e)(1)–(2)	Operation & Maintenance	No	See § 63.1348(d) for general reference to § 63.6(e)(1)(i) in this subpart is to be treated as § 63.1348(d).
63.6(e)(3)	Startup, Shutdown Malfunction Plan.	No.	

Risk & Technology MACT Review

MACT	Bin	Proposal	Final	MACT	Bin	Proposal	Final
Marine Vessel Loading	1	9/14/2010	3/31/2011	Mineral Wool	5	10/31/2011	6/29/2012
Pharmaceuticals	1	9/14/2010	3/31/2011	Primary Aluminum	5	10/31/2011	6/29/2012
Printing and Publishing	1	9/14/2010	3/31/2011	Wool Fiberglass	5	10/31/2011	6/29/2012
Chromium Electroplating	2	9/14/2010	6/30/2011	Secondary Aluminum	5	11/30/2011	8/31/2012
Polymers and Resins 1	2	9/14/2010	6/30/2011	Pesticide Active Ingredient Production	6	11/30/2011	11/30/2012
Steel Pickling-HCL Process	2	9/14/2010	6/30/2011	Polyether Polyols Production	6	11/30/2011	11/30/2012
Primary Lead Smelting	2	1/31/2011	10/31/2011	Polymers and Resins IV	6	11/30/2011	11/30/2012
Shipbuilding and Ship Repair	3	12/03/2010	10/31/2011	Acrylic/Modacrylic Fibers	7	10/31/2012	10/31/2013
Wood Furniture	3	12/03/2010	10/31/2011	Flexible Polyurethan Foam Production	7	10/31/2012	10/31/2013
Pulp and Paper I and III	4	6/15/2011	1/31/2012	Off-Site Waste Recovery Operations	7	10/31/2012	10/31/2013
Secondary Lead Smelters	4	4/29/2011	12/16/2011	Phosphoric Acid/Phosphate Fertilizers	7	10/31/2012	10/31/2013
Aerospace	4	8/31/2011	6/29/2012	Polycarbonates Production	7	10/31/2012	10/31/2013
Ferroalloys Production	4	10/31/2011	6/29/2012	Polymers and Resins III	7	10/31/2012	10/31/2013
Portland Cement	7	6/15/2017	6/15/2018				

Example of Risk & Technology Review Data Gathering?

October 12, 2010

U.S. EPA intends to issue information collection requests to approximately 1,000 aerospace manufacturing and rework facilities concerning their business operations, use of hazardous air pollutant emissions control devices, and emissions during startup, shutdown, and malfunction. The aerospace manufacturing and rework source category includes any facility engaged in the manufacture or rework of commercial, civil, or military aerospace vehicles or components (with the exception of electronic components). This broadly includes any manufacturer who fabricates, processes, or assembles components of airplanes, helicopters, missiles, rockets, and space vehicles.

EPA will seek information concerning operations of spray booths, coatings, chemical milling and metal finishing, cleaning, composite processing, storage tanks, wastewater treatment, air pollution control devices at startup, shutdown, and malfunction, and the use and cost of control devices. EPA claims the information is necessary to adequately characterize residual risk at the facilities, to characterize emissions and control measures for operations not currently regulated, and to develop standards for new and existing aerospace facilities under section 112 of the Clean Air Act, as it deems appropriate for its review of national emissions standards for hazardous air pollutants (NESHAP).

Summary

- New NO₂ NAAQS difficult to model
- Look for IDEM data request for SO₂ Modeling
- Boiler MACT/GACT – may be delayed
- RICE NESHAP – all-inclusive
- Area Source NESHAPs – know how to determine applicability
- SSM changes moving along



Questions and Discussions

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