



The Proposed Utility MACT Rule

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Overview

- Utility MACT Overview
 - What is Utility MACT?
 - Limits
- Complicating Factors
 - Washington DC factors
 - Possible Changes to the Rule
- Compliance
 - Requirements
 - Strategies
 - CSAPR Coordination

Synonyms for *Utility MACT*

- Clean Air Act
 - 112
- HAPs
 - Hazardous Air Pollutants
- NESHAP
 - National Emission Standards for HAPs
- Air Toxics
- MACT
 - Maximum Achievable Control Technology
- MATS
 - Power Plant Mercury and Air Toxics Standards

What is Utility MACT?

- HAP reduction through direct measurement of
 - HAPs or surrogates

- Regulated Emissions
 - Non-Mercury Metals (via Particulate Matter)
 - Acid Gases (via HCl)
 - Mercury

- Reduced Emissions (Work Practice Standards)
 - Organic HAPs (via CO)
 - Dioxin and Furans

Important Utility MACT Dates

- Draft rule issued March 16, 2011
- Published in the Federal Register May 3, 2011
- Expected Promulgation December 2011
- Three-Year Compliance from Promulgation
 - Expected to be December 2014
 - One year extensions can be granted on a case-by-case basis
- EPA Updates at:
 - www.epa.gov/airquality/powerplanttoxics/

Proposed Coal Limits

- Proposed Limits:
 - PM 0.030 lb/MMBtu (total PM)
 - Includes both filterable and condensable PM
 - Will be difficult for ESPs
 - EPA expects a large number of fabric filters
 - HCl 0.002 lb/MMBtu (~1.4 ppm @ 6% O₂ wet)
 - DSI where there isn't already WFGD/DFGD
 - Hg 1 lb/TBtu >8300 Btu fuel
 - Hg 4 lb/TBtu <8300 Btu fuel (beyond-the-floor)
 - Fuel and backend dependent (equipment & temperature)
 - CO and D/F
 - Work Practice Standards (GCP - Good Combustion Practice)

Washington DC

- Ozone NAAQS reconsideration was withdrawn
- House passes the TRAIN Act (9/23/11)
 - Transparency in Regulatory Analysis of Impacts on the Nation
 - Strikes CSAPR and MACT - “shall be of no force and effect”
 - Seeks a three year delay
- Other actions
 - Greenhouse Gas Reporting
 - Coal Ash Regulations
 - CSAPR - Texas Lawsuit
- Election cycle
 - Movement on Jobs and Energy Reliability

A more lenient final rule may be expected

Complicating Factors (as Proposed)

- Pet coke
 - Oil Derived? Or combined with coal as a solid fuel? Blends?
- Health based methods rejected for HCl limits
 - Opens the door for changes later
- Technology based methods rely on having good data
 - Errors in the data are points of contention
- SSM
 - Start Up and Shut Down are included in emission limits
 - Malfunctions are not included (“Affirmative Defense”)
- Low Emitting EGU (LEE)
 - Monthly fuel testing required to show low Cl and Hg
- Emission averaging across site is allowed
- Output based emission limits (lb/MMBtu *versus* lb/MWh)

PM Compliance

- PM is a surrogate for non-mercury HAP metals
- PM CEMs for non-mercury HAP metals compliance
 - PM CEMs only measure filterable PM
 - Compliance requires total PM (filterable + condensable)
 - During testing, CEM PM is correlated to total PM
 - A new PM CEMs operational limit is then established
- A very difficult standard to meet
 - For existing coal, PM limit = 0.03 lb/MMBtu
 - 10 ppm of SO₃ = 0.03 lb/MMBtu condensable PM
 - Other condensable PM sources (e.g., ammonium chloride)
 - Could spell the end of sulfur burners for ESP improvement
 - Big (positive) impact on ACI for Hg - Other ESP additives might see use
- Fabric filters may be needed for high SO₃ emitting sites

Alternative PM Compliance

- Alternative to PM CEMs
 - Bi-monthly measurements (monthly if no PM device; e.g., oil)

- Option 1: Total non-Hg HAP testing
 - Total non-Hg metals < 40.0 lb/Tbtu

- Option 2: Individual non-Hg metals testing
 - Antimony, Sb < 0.6 lb/Tbtu
 - Arsenic, As < 2.0 lb/Tbtu
 - Beryllium, Be < 0.2 lb/Tbtu
 - Cadmium, Cd < 0.3 lb/Tbtu
 - Chromium, Cr < 3.0 lb/Tbtu
 - Cobalt, Co < 0.8 lb/Tbtu
 - Lead, Pb < 2.0 lb/Tbtu
 - Manganese, Mn < 5.0 lb/Tbtu
 - Nickel, Ni < 4.0 lb/Tbtu
 - Selenium, Se < 6.0 lb/Tbtu

PM Compliance Solutions

- Fabric Filters (Bag Houses) are the obvious 100% solution
- Wet ESPs work well
 - Expensive and have not seen broad installation
- Many existing cold side ESPs will meet proposed requirements
- Tuning marginal ESP units
 - Modification (new TR sets, larger plate separation, more fields)
 - Chemical additives to improve ash resistivity
 - Combustion modifications to reduce LOI and ash carry over
 - Fuel switch (e.g., lower ash fuel)
 - Derate (worse case)
- Beware that other “MACT Solutions” might help or hurt ESP
 - For example, trona injection for HCl capture
 - CSAPR consideration

HCl Compliance Solutions

- Desulphurization systems get HCl as co-benefit
 - Means that very low HCl is required
 - But maybe not due to health based standards
 - The answer to this will drive the solutions

- Ultimate solution: WFGD (then DFGD)

- Duct (or Dry) Sorbent Injection (DSI)
 - Trona
 - Sodium Bicarbonate
 - Hydrated Lime (or other calcium-based sorbents)

- Other chemical additives (duct or furnace)
 - Magnesium chemistries
 - Some fuel additives

- Fuel switching or blending

- Wet ESPs

Mercury Compliance

- Hg is a bioaccumulating HAP
- Three compliance options
 - Mercury CEMS
 - Continuous - 30 day average
 - Sorbent Traps
 - EPA 30B
 - Averaged over 28-30 days
 - One trap pair must be less than 14 days
 - Low mercury fuel (low emitting EGU)
 - Certification and routine fuel analyses required
- Extensive details in Appendix A of the proposed rule

Mercury Compliance Solutions

- Halogen Oxidizers
- Activated Carbon Injection
 - Can ruin ash sales and affect ESP
 - Beware high SO_3 , which interferes
- Alkali injection
 - Usually as a co-benefit from other technologies
- Proprietary non-carbon sorbents
 - Many in development
 - Goal is usually to preserve ash sales
- Co-benefit from acid gas reduction
 - Scrubbers (wet or dry) and DSI
 - Reemission control in scrubbers
 - Watch out for water regulations

CO and Dioxin/Furan Compliance

- Work Practice Standards
 - GCP = Good Combustion Practice; as follows:
- Inspect burner (Fix if needed)
- Inspect flame pattern (Fix if needed)
- Inspect fuel-to-air control (Fix if needed)
- Optimize for CO and NOx
- Measure CO and NOx
- Document
 - CO & NOx before and after
 - Description of corrective actions
 - Maintain a record of fired fuels

Summary

- Utility MACT rule should be final soon
 - Will probably be more lenient than proposed
- There are some complicating factors that the final rule will hopefully address
- There are compliance strategies that can be implemented to reach the proposed limits
- CSAPR compliance should be part of a MACT strategy

Thank You

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