MACT/RESIDUAL RISK PROGRAM – ACHIEVEMENTS, FUTURE ACTIVITIES and KEY ISSUES

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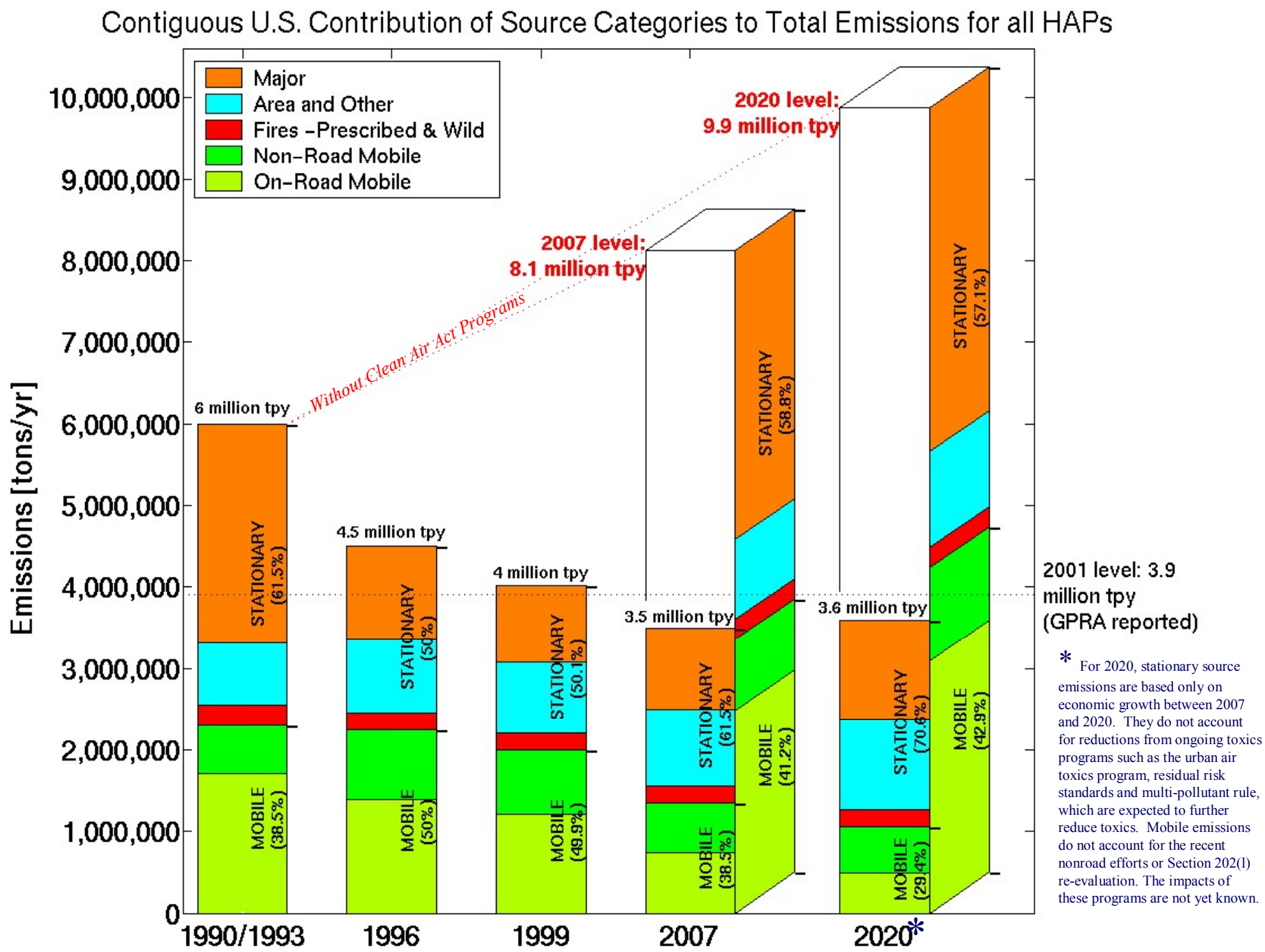
MACT Program Achievements

- EPA has promulgated 96 MACT standards which address 174 source categories.
- Large numbers of sources have been required to comply. (Under about 70% of the MACTs the compliance deadlines for existing sources have passed.)
- Air toxic emissions substantially reduced.
- For information on MACTS see: http://www.epa.gov/ttn/atw/mactfnlalph.html



* For 2020, stationary source emissions are based only on economic growth between 2007 and 2020. They do not account for reductions from ongoing toxics programs such as the urban air toxics program, residual risk standards and multi-pollutant rule, which are expected to further reduce toxics. Mobile emissions do not account for the recent nonroad efforts or Section 202(l) re-evaluation. The impacts of these programs are not yet known.

Future MACT/Residual Risk Activities

- Promulgate Utility Cap and Trade and/or MACT rule
- Promulgate 55 area source standards
- Promulgate "residual risk" requirements
- Prepare for requests from sources for risk based exemptions from the plywood and boiler MACTs
- Implement recently issued MACTs

Utility Cap and Trade & MACT Proposal

Goals of Utility Cap and Trade And/or MACT Rule

- Bring about significant reductions in mercury emissions from coal fired power plants through either a MACT standard or a cap and trade program
- Bring about significant reductions in nickel emissions from oil fired power plants through MACT standard

Utility Sources to Be Regulated

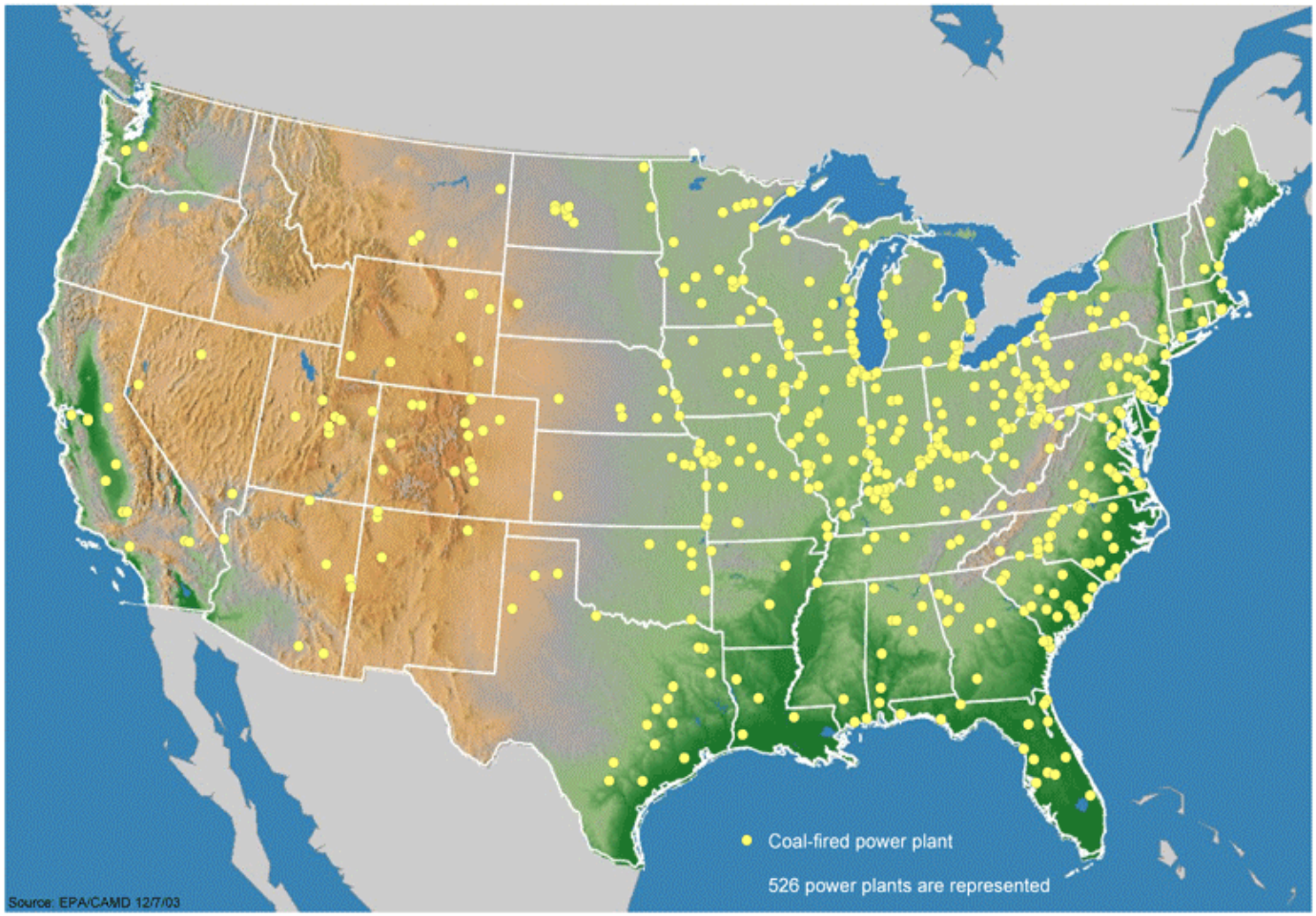
Affected sources - electric utility steam generating units:

- Any fossil fuel-fired combustion unit of more than 25 MWe that serves a generator that produces electricity for sale
- Any cogeneration utility unit – unit that generates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 MWe output to any utility power distribution system for sale

Power Generation Sources Not Covered

- Units not subject :
  - Any unit that meets the above definition, but which combusts natural gas >98% of the time
  - Simple- and combined-cycle turbine units
  - Industrial boilers used for on-site power generation

Coal-fired Power Plants

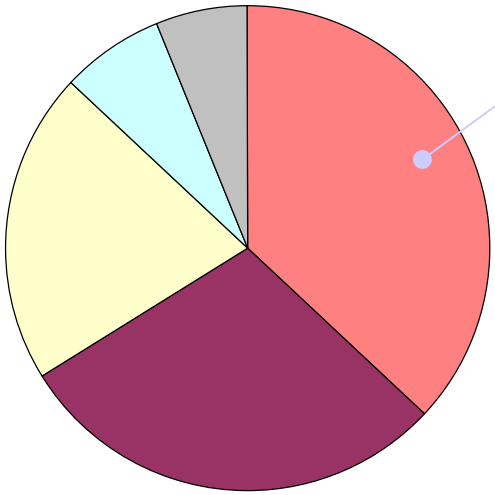


U.S. Coal-Fired Power Plants

- There are about 530 power plants with 305 GW of capacity that consist of about 1,300 units, of which 1,150 would be covered.

Power Generation Is a Major Source of Mercury Emissions

1999 Mercury Emissions



Utilities - 48 TPY (40%)

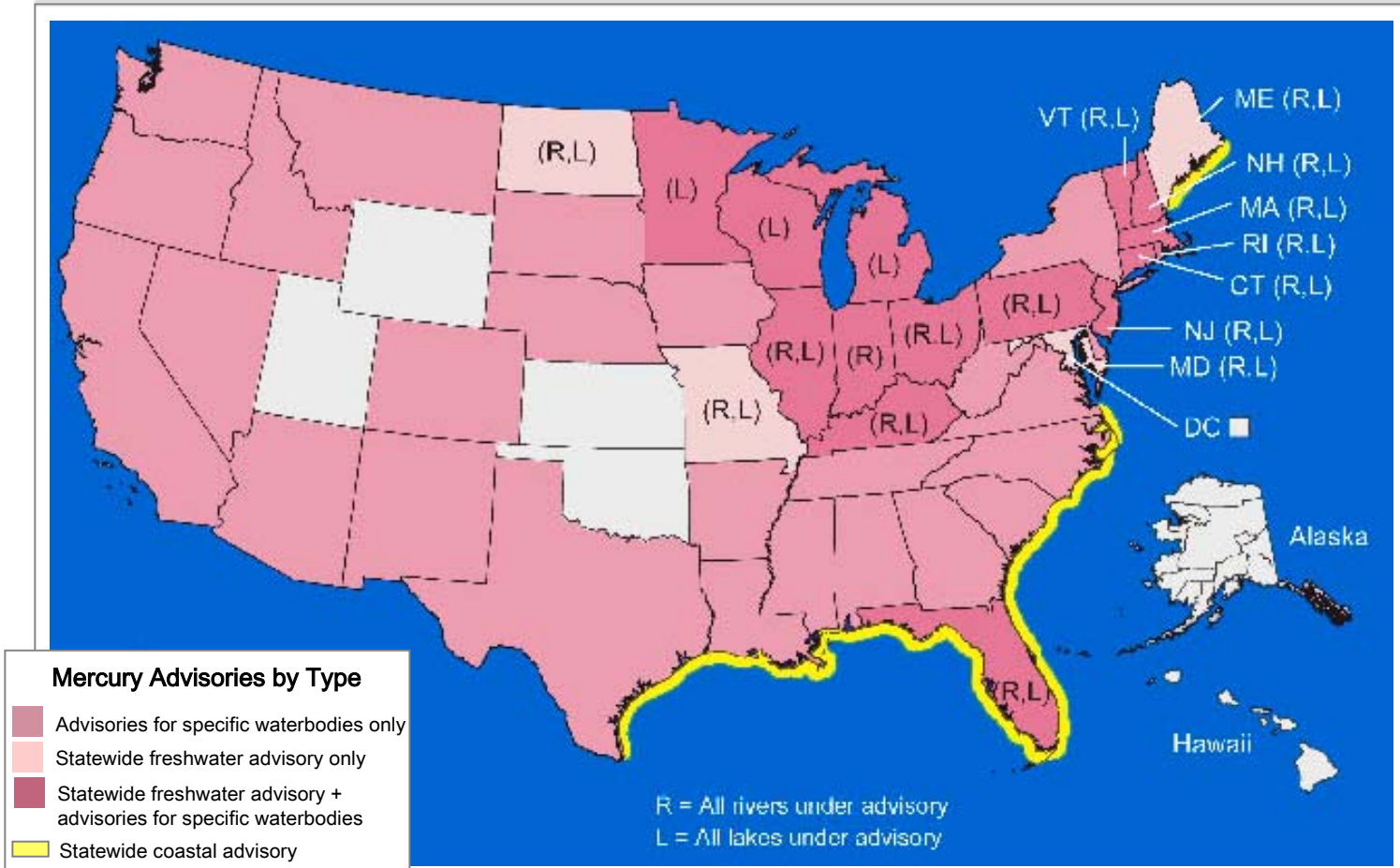
- Fuel Combustion-electric utilities
- Other stationary combustion *
- Industrial Processing
- Transportation
- Miscellaneous

* Other stationary combustion includes residential and commercial sources.

We are Exposed to Mercury Through Fish Consumption

- Currently 44 states have issued fish consumption advisories for some or all of their waters due to contamination from mercury.*

States with Fish Advisories Due to Mercury



***Note:** For more information about the relationship between fish advisories and human exposure to mercury, see the EPA Report "America's Children and the Environment: Measures of Contaminants, Body Burdens, and Illnesses" available at *http://yosemite.epa.gov/ochp/ochpweb.nsf/content/publications.htm*

Progress to Date

- Published proposed Mercury Reductions Rule on January 30, 2004 (69 FR 4651)
- Published supplemental proposal on March 16, 2004 (69 FR 12398)
- Public hearings held 2/25-26 and 3/31/04
- Comment period extended to June 29, 2004
- Target Date for Promulgation – March 2005

EPA Proposed Three Alternatives For Reducing Mercury Emissions From the Power Sector

- NSPS/Cap-and trade approach under CAA sections 111(b) and (d)
- Cap-and-trade approach under CAA section 112(n)(1)(a)
- Traditional MACT requirements under CAA section 112(d)

Key Elements of Mercury Control Proposals Under CAA Section 111

- New coal-fired plants covered by an NSPS
- Existing sources required to meet their allocation of national cap
- Interim cap in 2010 which reflects mercury reductions expected from emission controls expected to be installed under the IAQR
- Final cap of 15 TPY in 2018 which reflects expected improvements in mercury controls

New Sources Would Be Covered by an NSPS

- EPA would establish new source performance standards (NSPS) under CAA section 111(b)

Subcategory	Emission Limit
Bituminous-fired	6.0[1]
Subbituminous-fired	20[1]
Lignite-fired	62[1]
IGCC	20[1]
Coal refuse-fired	1.1[1]
Oil-fired	0.0008[2]

[1] – Hg emissions; 10^{-6} lb/MWh
[2] – Ni emissions; lb/MWh

Implementing the Mercury Cap and Trade Program Under CAA Section 111(d)

- States may join the trading program by adopting or referencing the model trading rule in state regulations

- States may adopt regulations that mirror the necessary components of the model trading rule

State Options

- States can choose not to join the federal trading program and meet their budget through intra-state trading or no trading
- States can also choose to implement more stringent mercury emissions requirements

Monitoring Hg Emissions

- Monitoring provisions are proposed in the supplemental rulemaking notice. A comprehensive QA/QC program required
- Alternative monitoring approaches acceptable if they meet the performance requirements in the rule

Federal Cap and Trade Alternative

- EPA has also taken comment on a proposal to promulgate a federal cap-and-trade program for Hg from coal-fired utility units under section 112(n)(1)(a). EPA, instead of the states, would serve as the permitting authority

MACT Limits – New Sources

Subcategory	Hg (10^{-6} lb/MWh)[1]
Bituminous-fired	6.0
Subbituminous-fired	20
Lignite-fired	62
IGCC	20[3]
Coal refuse-fired	1.1

[1] – Based on a 12-month rolling average
[3] – Based on a 90% reduction for beyond-the-floor control

Subcategory	Ni (lb/MWh)[2]
Oil-Fired	0.0008

[2] – Based on a not-to-exceed annual limit

NOTE: Output-based standards are referenced to a baseline efficiency (35% for new units).

MACT Limits - Existing Sources

Subcategory	Hg (lb/TBtu)[1]	Hg (10^{-6} lb/MWh)[1]
Bituminous-fired	2.0	21
Subbituminous-fired	5.8	61
Lignite-fired	9.2	98
IGCC	19.0	200
Coal refuse-fired	0.38	4.1

[1] – Based on a 12-month rolling average

Subcategory	Ni (lb/TBtu)[2]	Ni (lb/MWh)[2]
Oil-fired	210	0.002

[2] – Based on a not-to-exceed annual limit

NOTE: Output-based standards are referenced to a baseline efficiency (32% for existing units).

Fuel Blending

- **Coal blending options**
  - Unit classified by the predominate coal burned during the compliance period, or
  - Unit classified by a "weighted emission limit" based on the proportion of energy output (in Btu) contributed by each coal rank burned during the compliance period
- **If non-regulated fuels such as petroleum coke, tire-derived fuel [TDF], etc., Are used, the compliance calculation would include:**
  - Energy output (in Btu) of all fuels
  - Hg emissions considered would be all measured by the stack monitor
  - However, the blended emission limitation is based only on the regulated fuels

Monitoring and Compliance

- Hg testing and monitoring requirements
  - 12-month rolling average Hg emission level
- Emissions averaging provision for Hg
  - Demonstrate compliance through averaging Hg emissions from multiple (two or more) affected units located at a common, contiguous facility site
  - Leads to a single applicable facility-wide emission limit
- Ni testing and monitoring requirements
  - Maximum allowable emission limit; Not to be exceeded

Expected Mercury Reductions From Utility Plants in Region III's States

State	1999 Mercury Emissions (tons)	Percent of National Mercury Emissions	National Rank for Mercury Emissions	2010 Mercury Allocation (tons)	2018 Mercury Allocation (tons)	Percent Mercury Reduction '99-2018
PA	4.979	10.4%	2	Proposing	0.710	85.7%
VA	0.633	1.3%	23	to set at	0.234	63.0%
WVA	2.466	5.1%	5	level	0.554	77.5%
MD	0.910	1.9%	20	achieved	0.186	79.6%
DEL	0.104	0.2%	38	by IAQR.	0.029	72.1%
SUM	9.092	18.9%			1.713	81.2%

Area Source Program

Clean Air Act Requirements

- Sections 112(c)(3) and 112(k)(3)(b)(ii)
  - List area source categories representing at least 90 percent of the emissions of the 30 listed HAP
  - Promulgate regulations by November 15, 2000
- Section 112(k)(1)
  - Achieve a substantial reduction in emissions of HAPS
  - Achieve at least a 75 percent reduction in cancer incidence

Regulatory Status

- **70 source categories have been listed**
- **15 standards have been promulgated**
- **55 source categories remain to be addressed**
  - 5 standards have consent decree dates agreed upon with Earth Justice
  - All standards will be initiated by Oct, 2006
- **Area source categories are listed at: http://www.epa.gov/ttn/atw/urban/arearules.html**

Promulgated Area Source Standards

STANDARDS COMPLETED [15]	Propose	Promulgate
Chromic Acid Anodizing		01/95
Decorative Chromium Electroplating		01/95
Hard Chromium Electroplating		01/95
Commercial Sterilization Facilities		12/98
Dry Cleaning Facilities		09/93
Halogenated Solvent Cleaners		12/94
Hazardous Waste Incineration		09/99
Medical Waste Incinerators		09/97
Municipal Waste Combustors (small)		12/00
Municipal Landfills		01/03
Portland Cement		06/99
Publicly Owned Treatment Works		10/99
Secondary Aluminum Production		03/00
Secondary Lead Smelting		06/97
Mercury Cell Chlor-Alkali Plants		12/03

Area Source Standards For Which Consent Decree Requires Promulgation From 2005 to 2007

STANDARDS WITH CONSENT DECREE COMPLETION DATES [5]	Propose	Promulgate
Oil and Natural Gas Production (4)*	06/05	12/06
Stationary Internal Combustion Engines (13)	10/06	12/07
Hospital Sterilizers (15)	10/06	12/07
Other Solid Waste Incineration	11/04	11/05
Gasoline Distribution Stage I	10/06	12/07

Area Source Standards To Be Promulgated From 2007 to 2011

STANDARDS TO BE STARTED BY OCTOBER 2003 [20]	
Steel Foundries (1)*	Plating and Polishing (12)
Stainless and Nonstainless Steel Manufacturing EAF (2)	Agricultural Chemicals & Pesticides Manufacturing (14)
Flexible Polyurethane Foam Production (3)	Industrial Inorganic Chemicals Manufacturing (16)
Industrial Boilers (5)	Fabricated Plate Work (17)
Secondary Nonferrous Metals (6)	Clay Ceramics Manufacturing (18)
Iron Foundries (7)	Cyclic Crude and Intermediate Production (19)
Primary Nonferrous Metals - Zn, Cd, Be (8)	Chemical Preparations (20)
Paint and Allied Products (9)	Paint Stripping Operations
Plastic Parts and Products (Surface Coating) (10)	Auto Body Refinishing
Pressed & Blown Glass & Glassware Manufacturing (11)	Institutional/Commercial Heaters

Area Source Standards To Be Promulgated From 2007 to 2011

STANDARDS TO BE STARTED BY OCTOBER 2004 [9]	STANDARDS TO BE STARTED BY OCTOBER 2005 [5]
Lead Acid Battery Manufacturing	Pharmaceutical Production
Secondary Copper Smelting	Copper Foundries
Ferroalloys Production:Ferromanganese & Silicomanganese	Iron and Steel Forging
Primary Copper (not subject to Primary Copper Smelting MACT)	Valves and Pipe Fittings
Acrylic Fibers / Modacrylic Fibers Production	Flexible Polyurethane Foam Fabrication
Miscellaneous Organic Chemical Manufacturing (MON)	
Industrial Organic Chemicals Manufacturing	
Plastic Materials and Resins Manufacturing	
Synthetic Rubber Manufacturing	

Area Source Standards To Be Promulgated From 2007 to 2011

STANDARDS TO BE STARTED BY OCTOBER 2006 [16]	
Sewage Sludge Incineration	Heating Equipment, Except Electric
Wood Preserving	Inorganic Pigments Manufacturing
Asphalt Processing and Asphalt Roofing Manufacturing	Nonferrous Foundries
Carbon Black Production	Prepared Feeds Manufacturing
Industrial Machinery and Equipment: Finishing Operations	Primary Metals Products Manufacturing
Electrical and Electronic Equipment: Finishing Operations	Brick and Structural Clay Products Manufacturing
Fabricated Metal Products, nec	Chemical Manufacturing: Chromium Compounds
Fabricated Structural Metal Manufacturing	Polyvinyl Chloride and Copolymers Production

Rulemaking

- **Standards may be MACT or GACT**
- **MACT is average of the best performing 12% (30 or more sources) or average of best performing five (< 30 sources)**
- **There are advantages of GACT**
  - Allows more flexibility
  - There is no floor to calculate
  - Cost effectiveness is considered
- **Standard development usually requires 4 to 5 years**

Regulatory Development – Factors to Consider

- Many rules cover numerous small facilities
- Many individual facilities will have very low emissions
- Many rules will affect businesses not previously regulated

Possible Approaches

- Explore pollution prevention options and incentives
- Develop user friendly and cost effective control options
- Develop innovative compliance measures (e.g., Simplified monitoring plans, reduced recordkeeping)

Delegation

- EPA likely to request that State/local agencies take delegation of authority to implement and enforce future area source standards

Area Source Standards and Title V Permit Requirements

Currently Deferred from Title V:

- **Dry cleaners (30,000+ sources)**
- **Degreasers (3,800 sources)**
- **Chrome platers (5,000 sources)**
- **EO sterilizers (40 sources)**
- **Secondary lead smelters (3 sources)**
- **Secondary aluminum production facilities (2,700 sources)**

Deferrals End This Year

- Deferrals end December 9, 2004.
- Unless exempted, Title V applications are due December 9, 2005.

<u>References</u>:

- **Five categories were deferred in one notice (see 64 FR 69637, 12/14/99).**
- **Secondary aluminum production facilities were deferred separately (see 65 FR 15690, 3/23/00).**

EPA's Expected Proposed Rulemaking

- EPA is considering proposing to exempt five of these area source categories from title V permitting.
- EPA is not considering proposing to exempt secondary lead smelters; Applications due Dec. 2005 for secondary lead.

Timing

- Fall 2004: proposal for comment in Fed. Reg.
- Spring 2005: final FR action.

Justification for Exemption

- To exempt, EPA must show that permitting would be "infeasible, impracticable or unnecessarily burdensome" on the source categories.

Some Possible Justifications: "Unnecessarily Burdensome"

- Title V permit may result in minimal environmental benefits
- Major burden on small sources to apply for Title V permits and to meet any additional Title V only requirements
- States can assure compliance without Title V permit

Larger Picture

- Challenge by environmentalists likely
- States need to increase oversight of area sources
- Will likely set precedent for later standards – up to 55 area source MACT standards expected

Voluntary Area Source Emissions Reduction Program

- What is this Program? – An EPA initiative to obtain air toxic emission reductions from area sources in urban communities
- The initiatives will be developed with the assistance of industry trade associations
- The programs will be self-certifying

Primary Selection Criteria

- On the air toxics area source list
- Strong trade association (or similar organization)
- Currently unregulated by any NESHAP
- No court-ordered promulgation date

Other Selection Criteria

- Significant urban presence (density and emissions)
- Voluntary emissions reduction program already developed (such as a design for the environment program)
- Opportunity for meaningful emissions reductions

Candidate Area Source Categories

- Autobody refinishing
- Welding (part of several metal finishing/fabricating source categories)
- Nickel plating (part of several metal finishing/fabricating source categories)
- Paint and coating manufacturing
- Industrial boilers

Questions and Concerns

- How do you measure and document results for these initiatives?
- How will this initiative interface with the area source rulemakings?
- How do you enforce a voluntary program?
- Who will enforce the voluntary program?

Residual Risk Standards

Clean Air Act Requirements

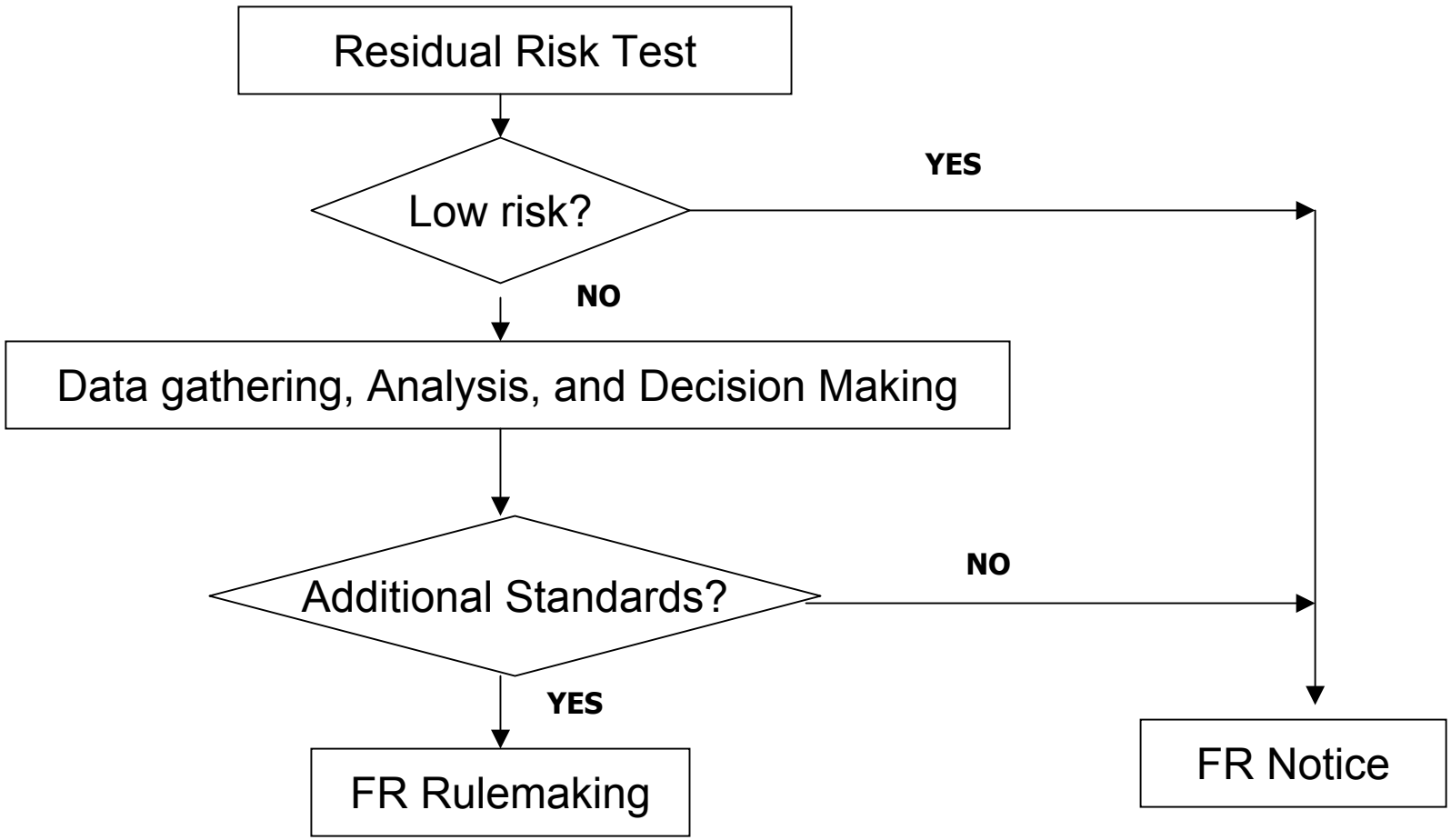
- Assess risks that remain after the technology-based (MACT) standards are in place
- Set additional standards if needed to protect public health with an "ample margin of safety" or to prevent adverse environmental effects

Current Residual Risk Activities

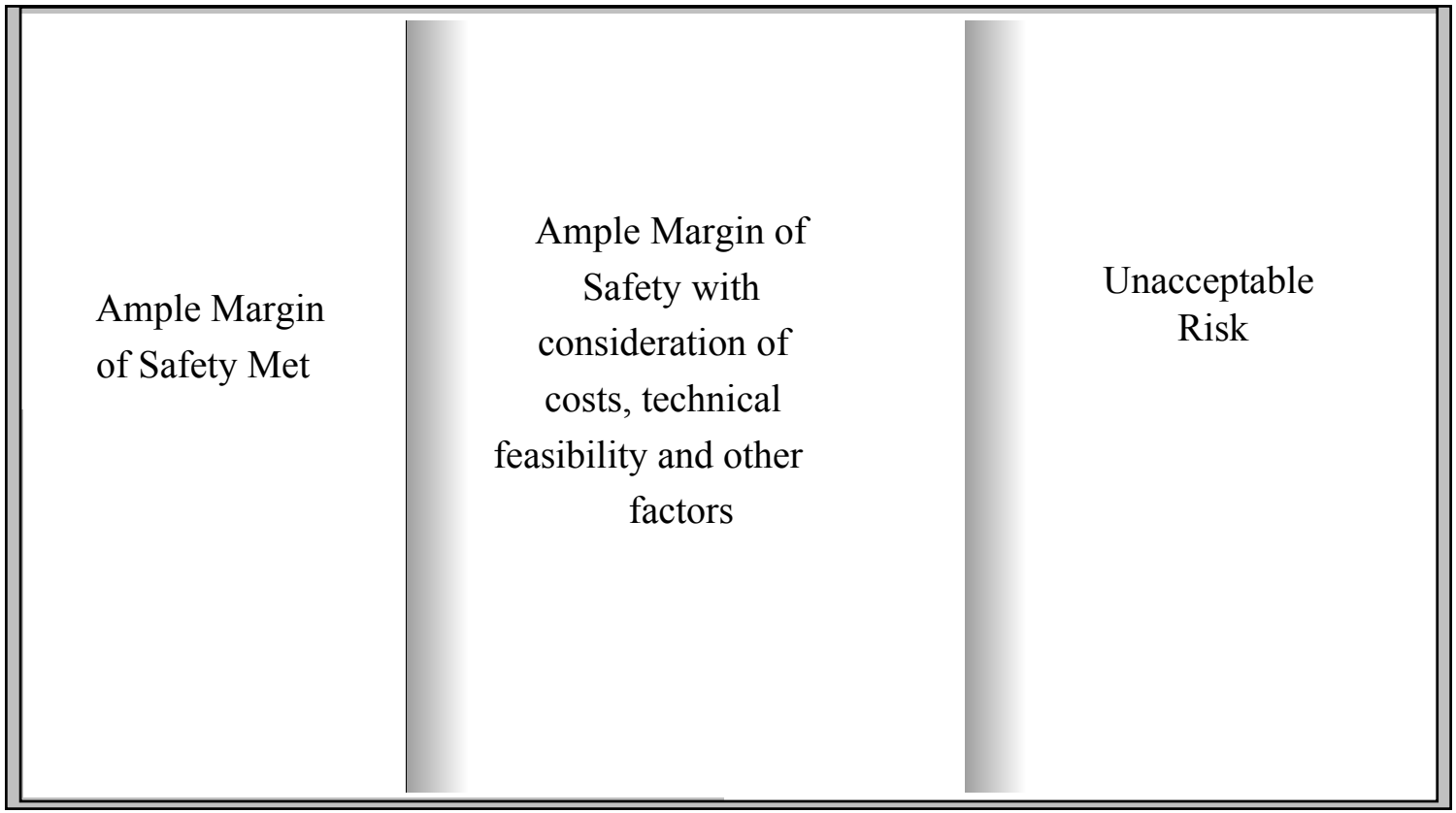
Residual risk standards started:

- Residual risk standards for all 20 of the two- and four-year MACTs have been started
- Residual risk standards for five of the 24 seven-year MACTs have been started

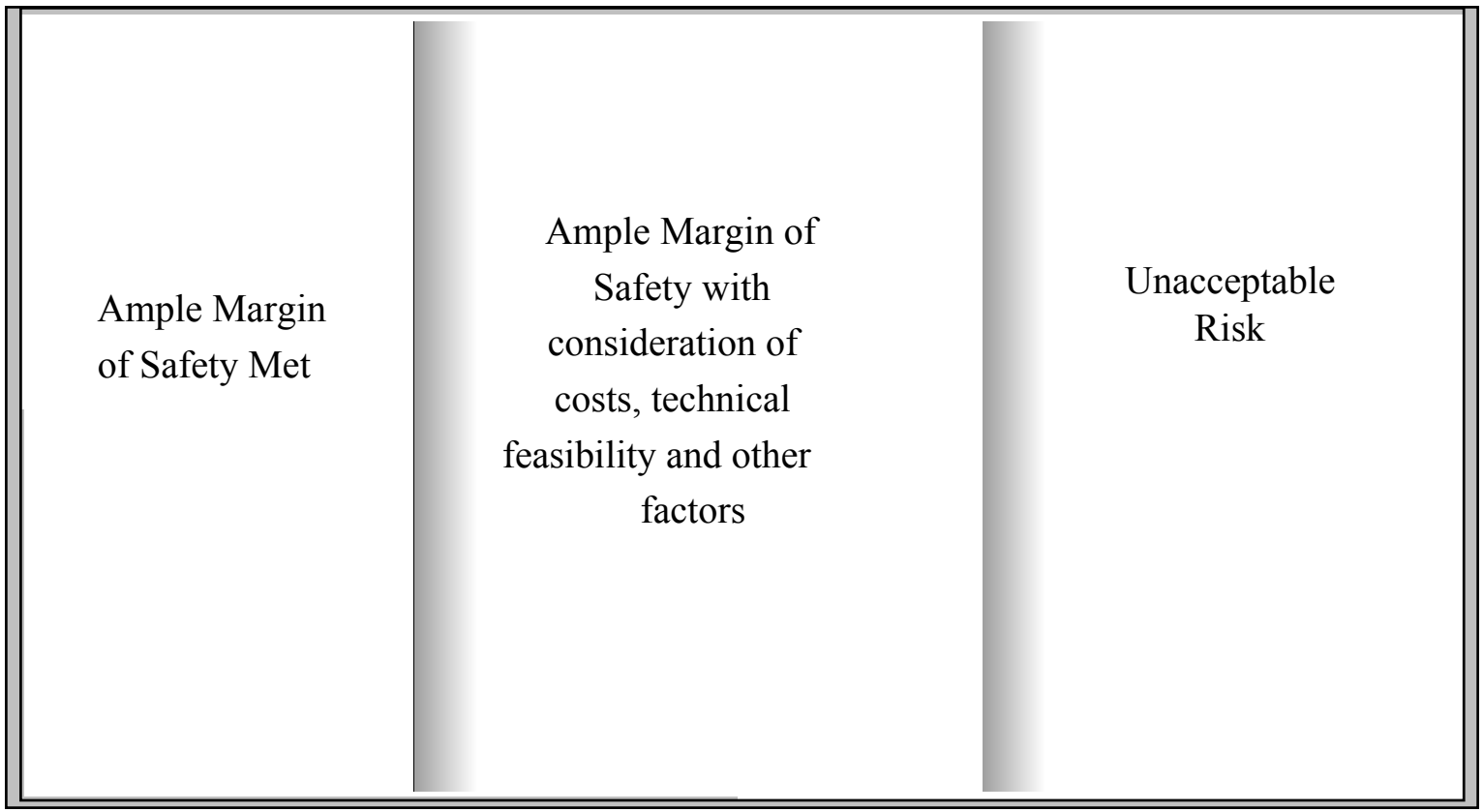
Residual Risk Standards Development Process

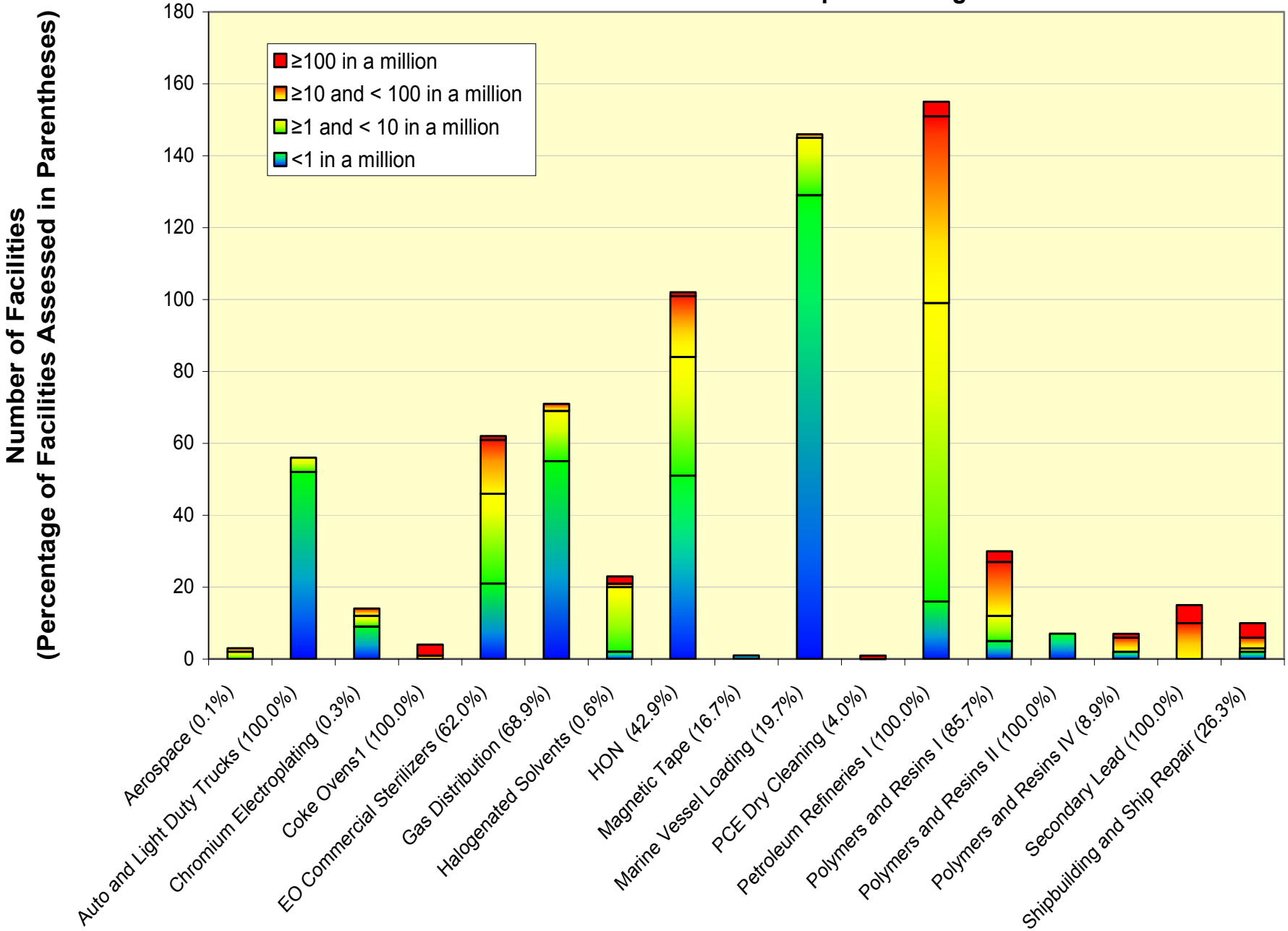


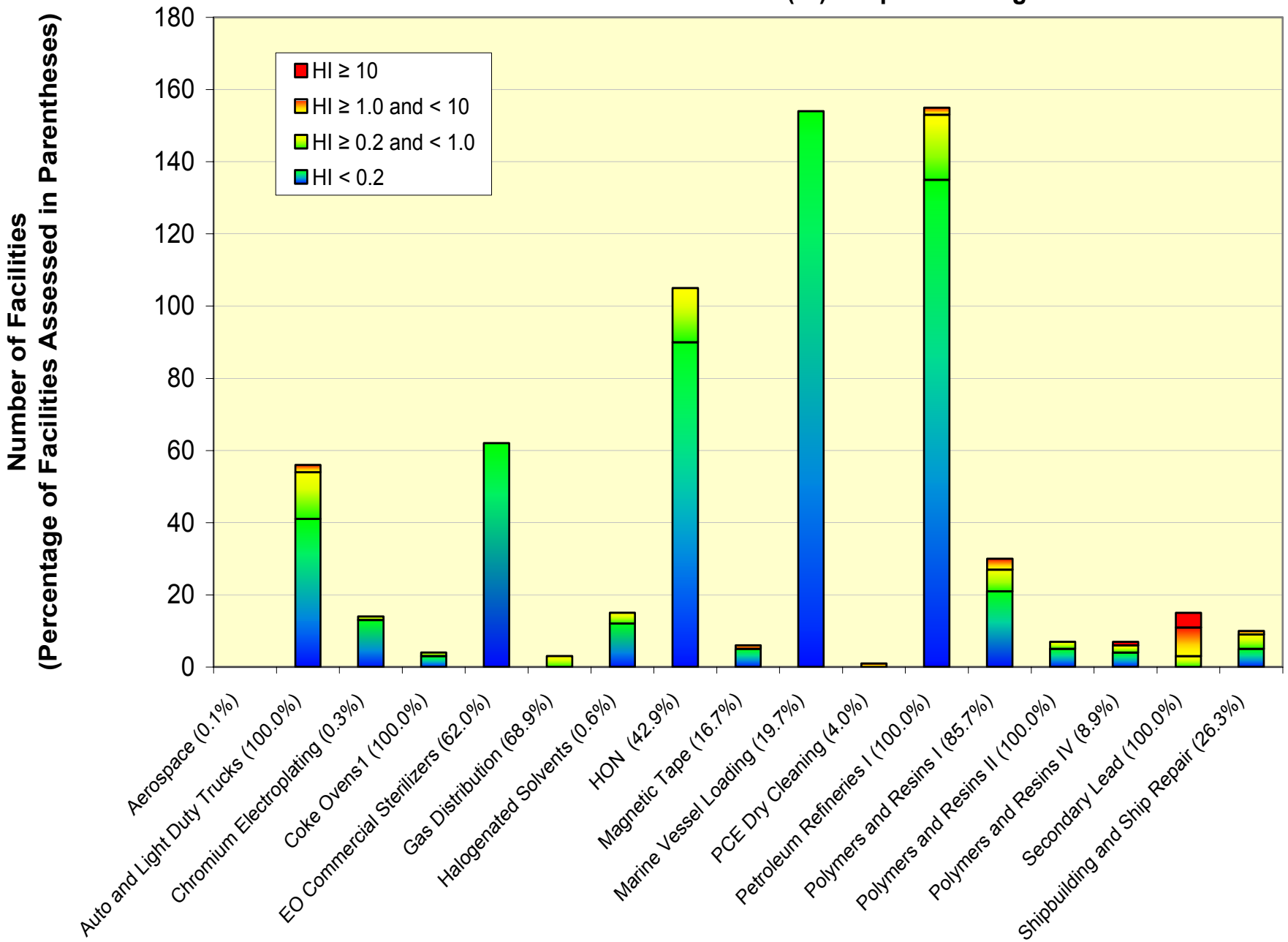
Assessing Margin of Safety -Cancer Risk



Noncancer Hazard Ranges




Residual Risk Test: Facilities Subject to MACT
With Maximum Individual Cancer Risk in Specific Ranges
Number of Facilities
(Percentage of Facilities Assessed in Parentheses)
≥100 in a million
≥10 and < 100 in a million
≥1 and < 10 in a million
<1 in a million
180
160
140
120
100
80
60
40
20
0
Aerospace (0.1%)
Auto and Light Duty Trucks (100.0%)
Chromium Electroplating (0.3%)
Coke Ovens1 (100.0%)
EO Commercial Sterilizers (62.0%)
Gas Distribution (68.9%)
Halogenated Solvents (0.6%)
HON (42.9%)
Magnetic Tape (16.7%)
Marine Vessel Loading (19.7%)
PCE Dry Cleaning (4.0%)
Petroleum Refineries I (100.0%)
Polymers and Resins I (85.7%)
Polymers and Resins II (100.0%)
Polymers and Resins IV (8.9%)
Secondary Lead (100.0%)
Shipbuilding and Ship Repair (26.3%)


Residual Risk Test: Facilities Subject to MACT With
Maximum Individual Noncancer Hazard Index (HI) in Specific Ranges
Number of Facilities
(Percentage of Facilities Assessed in Parentheses)
180
160
140
120
100
80
60
40
20
0
HI ≥ 10
HI ≥ 1.0 and < 10
HI ≥ 0.2 and < 1.0
HI < 0.2
Aerospace (0.1%)
Auto and Light Duty Trucks (100.0%)
Chromium Electroplating (0.3%)
Coke Ovens1 (100.0%)
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Expected Initial Actions

Standards:

- Coke ovens – final 2005
- Dry cleaning – final 2006
- HON – final 2006*
- Halogenated solvents – final 2006*

No further control determinations for:

- Industrial cooling towers – final 2006*
- Magnetic tape – final 2006*
- Ethylene oxide sterilizers – final 2006*
- Gasoline distribution – final 2006*

Organic Chemical Production

- **Modeled risk from 105 of 240 facilities in the source category**
  - Highest risk 50 in a million cancer risk
  - Half the facilities are less than 1 in a million cancer risk
  - All facilities have noncancer TOSHI less than 1
- **Assessment identifies equipment leaks as the major source of risk**
  - Increasing frequency of leak detection and repair is expensive, may not reduce emissions
  - Leakless equipment or enclosure is very expensive

Halogenated Solvent Degreasers

- Modeled risk from 126 of the 3800 facilities
  - Highest cancer risk was 230 in a million
  - Half had less than 1 in a million cancer risk
- Currently evaluating risk drivers at high risk facilities
- No obvious solutions so far

EPA's Plans for Residual Risk Rules

- Residual risk rules would amend MACT to include:
  - **Pollution prevention requirements**
  - **Performance standards (e.g., Percent reduction, emission rates, ambient concentrations)**
  - **Control equipment requirements**
  - **Work practices**
- Rule may also include provisions for a source category-level low risk demonstration

Challenges

- Develop rules which target high-risk facilities
- Developing innovative ways to reduce risks where further control options are limited

Further information is available at: http://www.epa.gov/ttn/atw/rrisk/residriskpg.html

Total Facility Low Risk Determination (TFLRD) Rule

Total Facility Low Risk Demonstration (TFLRD) Rule

- Voluntary option available to facilities with at least one MACT source
- Source conducts total facility risk assessment
- Sources submit risk assessment to permitting authority
  - Sources certify accuracy of assessment
  - 3rd party review? State review? EPA review? Audit?

Total Facility Low Risk Demonstration (TFLRD) Rule (cont)

- Parameters used in low risk demonstration are incorporated into title V permit and become enforceable limits

- Facilities that demonstrate their low risk status (e.g. Maximum cancer risk $\leq$ 1E-06 and noncancer HI $\leq$ 1.0) automatically satisfy the CAA section 112(f) requirements for all their MACT sources

Comprehensive Residual Risk Rule

Comprehensive Residual Risk Rule

- This would be a mandatory rule, or set of rules, to replace our current residual risk program
- Ultimate goal is to ensure that the total facility risk provides public health protection with an ample margin of safety
- Source would conduct a total facility risk assessment

Comprehensive Residual Risk Rule

- If not low-risk, requirements would depend upon level of risk and could be detailed in single rule or multiple rulemakings. Flexibility & enforceability desired.
- Review? Approval? Audit?
- All of this is a "work-in-progress"; very much in flux

Required Continuing MACT Reviews

MACT Review

- Section 112(d)(6) states:

  "The Administrator shall review and revise as necessary (taking into account developments in practices, processes, and control technologies), emission standards promulgated under this section no less often than every 8 years"

- Review to focus on the new source standards and not ratcheting down on existing sources
- We plan to conduct this review simultaneously with residual risk

Plywood and Boiler MACTs: Provisions Allowing Certain Sources to Obtain Risk Based Exemptions

Plywood Manufacturing

- MACT rule signed February 2004
- Rule created & delisted 8 clearly low "low-risk" subcategories
- EPA used delisting authority of CAA section 112(c)(9) to create and delist the low-risk subcategories of facilities

Plywood Manufacturing (Cont)

Rule provides process for individual facilities to demonstrate "low-risk" status:

- Look-up table provided to ease process
- Facilities who are not low-risk via look-up table may elect to perform site-specific risk assessment
- Assessment may use any scientifically-credible methods. Sources could choose to reference EPA's "Air toxics risk assessment library," volume 2.

Plywood Manufacturing (Cont)

- Facilities demonstrating low-risk must measure emissions for 13 HAP
- Risks must be less than 1 in a million for cancer, and less than or equal to 1.0 for noncancer HIs and acute HQs
- Site-specific risk assessments subject to review/approval by EPA

Plywood Manufacturing (cont)

- If approved, emission rates and stack parameters will be codified in permit; changes would require significant permit modification
- Rule also provides process for new sources and contingencies for changes (including changes to dose-response values)

Industrial Boilers

- MACT rule signed February 2004
- Rule provides 2 risk-based options under the "health threshold" provision of CAA section 112(d)(4). These allow compliance alternatives for the HCl standard and for Mn in total metals standard

Industrial Boilers (cont)

- HCl/Cl_2 compliance alternative - Individual facilities can develop site-specific HCl limits if they can demonstrate that those limits result in HI less than or equal to 1.0 for HCl and Cl_2

Industrial Boilers (cont)

- Mn compliance alternative - Individual facilities can eliminate Mn from the total metals limit if they can demonstrate that their current Mn emissions result in chronic noncancer impacts below the Rfc for Mn

Industrial Boilers (cont)

- Demonstrations are based on measured emissions of HCl/Cl2 or Mn, and can be performed either via look-up table or via site-specific risk assessment
- Demonstrations are filed with permitting authority and EPA along with certification of authenticity and accuracy

Industrial Boilers (cont)

- Emissions and stack parameters used as the basis for a demonstration must be codified in source's permit
- No review or approval is required

Turbines – Proposed Risk Based Exemptions of Certain Categories

Turbines

- MACT rule published March 5, 2004 (69 FR 10511)
- Proposal to delist 4 subcategories published April 7, 2004 (69 FR 18327) Delisting is based in part on industry petition and in part on EPA analysis
- Proposal to stay effectiveness of MACT for new sources in the lean pre-mix gas-fired turbines and diffusion gas-fired subcategories also published on April 7, 2004 (69 FR 18338)

Turbines (Continued)

- EPA analyzed potential inhalation risks and multipathway risks, cancer and noncancer, as well as environmental impacts and determined that, for all sources in the 4 subcategories:
  - Maximum individual lifetime cancer risks were below 1 in a million
  - Maximum noncancer HI values < 1.0
  - No adverse environmental effects anticipated

Turbines (Continued)

- EPA analysis based on a worst-case scenario which matched largest possible emission source with worst-case receptor configuration
- Result hinges upon using a dose-response approach for formaldehyde which represents improved science over EPA's 1994 IRIS value
- More recent info on formaldehyde may change things – EPA committed to summer review of science by SAB – any new developments will be considered when contemplating final action on proposal

For More Information

Website for risk assessment library:

www.epa.gov/ttn/fera/risk_atoxic.html

Recent MACTs

- Auto and light duty truck – 4/26/04
- Combustion turbines – 3/5/04
- Industrial, commercial, and institutional boilers and process heaters – signed
- Iron foundries – 4/22/04
- Lime manufacturing – 1/5/04
- Miscellaneous metal parts & products – 1/02/04

Recent MACTs

- Organic liquids distribution – 2/3/04
- Plastic parts – 4/19/04
- Plywood and composite wood products – signed
- Reciprocating internal combustion engines - signed

The Industrial Boiler & Process Heater MACT

What Units Does the MACT Cover?

- All industrial boilers, commercial and institutional boilers and process heaters located at major sources

What Units Are Not Covered?

- Fossil fuel-fired electric utility boilers
- Boilers burning municipal waste
- Boilers burning hazardous waste
- Boilers burning medical waste
- Black liquor recovery boilers
- Hot water heaters
- Waste heat boilers

Subcategories

- Three main subcategories based on fuel type:
  - Solid fuel units
  - Liquid fuel units
  - Gaseous fuel units
- Each fuel subcategory further subcategorized based on size and use
  - Large (Greater than 10 MM Btu/hr heat input)
  - Small (all firetubes and others less than 10 MM Btu/hr)
  - Limited-use (less than 10% capacity factor)
- Total of 9 subcategories

Emission Limits – Existing Units

- **Existing large solid fuel units**
  - **Pm -- 0.07 lb/million Btu, OR TSM – 0.001 lb/million Btu**
  - **HCl -- 0.09 lb/million Btu (~ 90 ppm)**
  - **Hg – 9 lb/trillion Btu**
- **Existing limited use solid fuel units**
  - **Pm -- 0.21 lb/million Btu, OR TSM – 0.004 lb/million Btu**
- **No emissions standards for existing small solid fuel units or any existing liquid and gaseous fuel units**

Emission Limits – New Units

- **New solid fuel units**

  PM -- 0.025 lb/million Btu, OR TSM 0.0003 lb/million Btu
  HCl -- 0.02 lb/million Btu (20 ppm)
  Hg --3 lb/trillion Btu
  CO -- 400 ppm @ 7% oxygen (not for small units)

- **New liquid fuel units**

  PM -- 0.03 lb/million Btu

  HCl -- 0.0005 lb/million Btu (large units)

  0.0009 lb/million Btu (small and limited use units)

  CO – 400 ppm @ 3% oxygen (not for small units)

- **New gaseous fuel-fired units**

  CO – 400 ppm @ 3% oxygen (not for small units)

Emission Averaging

- Only existing large solid fuel units
- Initial compliance based on maximum capacity
- Continuous compliance on a 12-month rolling average basis
- Must submit emission averaging plan

Several Subcategories NOT Subject to Initial Notification or Any Other Requirements in General Provisions

- Existing small solid fuel units
- Existing small liquid fuel units
- Existing small gaseous fuel units
- New small gaseous fuel units

Several Subcategories Subject Only to Initial Notification Requirements

- Existing large and limited use gaseous fuel units
- Existing large and limited use liquid fuel units
- New small liquid fuel units that do not burn residual oil

Testing and Monitoring Requirements

- **Testing:**
  - Initial compliance tests
    - Performance tests (stacks tests) OR fuel analyses
      - Annual performance tests
      - Fuel analysis every 5 years or each new fuel type
- **Monitoring**
  - Process parameters (opacity, pressure drop, CO, sorbent injection rate, fuel, etc.)
    - CO CEM only for new large units > 100 million Btu/hr
    - Annual CO tests for other new units
- **Continuous Compliance**
  - Demonstrated by maintaining operating limits

Alternative Health-based HCl Emission Limits

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