

National Air Compliance Training Program

NACT 290
Maximum Achievable
Control Technology
(MACT)

COURSE OVERVIEW

- HISTORY
- CAA section 112
- MACT TIMELINE
- GENERAL / SPECIFIC
- INFORMATION RESOURCES

Big MACT



NUMBERS GAME

- 188 Hazardous Air Pollutants (HAPs)
- 174 Source Categories
- 68 Area Sources Regulated
- 125 Total promulgated MACTs
- All requiring periodic updates
- Each MACT = 75 - 587 pages

WOW !

A LITTLE HISTORY

Four Sources Hazardous Air Pollutants (HAPs)

- **Natural Sources**
 - Forest fires, Volcanoes
- **Mobile Sources**
 - Planes, Trains, Automobiles
- **Accidental Releases**
 - Factory or Tanker mishaps
- **Stationary Sources**
 - Factories, Businesses







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A plant in Donora, Pa., belches clouds of smoke in 1948. The photo is part of the exhibition at the town's smog museum.

A LITTLE HISTORY

Regulating Four Sources Hazardous Air Pollutants (HAPs)

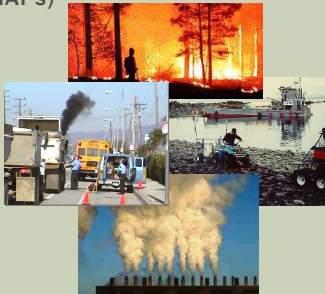
- **Natural Sources**
- **Mobile Sources**
 - Regulated Tailpipe Admissions
 - Reformulated Gasoline
 - Vapor Recovery
- **Accidental Releases**
 - Risk Management Programs
- **Stationary Sources**
 - 1970 Clean Air Act



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 - Risk Management Programs
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 - 1970 Clean Air Act



REMEMBER 1970 



1970 CLEAN AIR ACT

US EPA


- Identify HAPs
- Reduce emissions
- Set emission standards (NESHAPs)



1970 CLEAN AIR ACT

US EPA

- Establish NESHAPs
- Through NESHAPs reduce routine HAP emissions
- NESHAP = National Emission Standards for Hazardous Air Pollutants



DID IT WORK?

Eight in 20

Eight HAPs promulgated in 20 years !!

REMEMBER 1990 ?



1990 CLEAN AIR ACT AMENDMENTS

Seven Major Titles

Title I - Non attainment

Title II - Mobile Sources

Title III - General

Title IV - Acid Rain

1990 CLEAN AIR ACT AMENDMENTS

Seven Major Titles (cont.)

- Title V – Permits
- Title VI – Ozone Depleting Substances
- Title VII – Enforcement

1990 CAAA

40 CFR Part 63

- *Technology and performance based*
- *Reduce HAP emissions*
 - Major Sources
 - Area sources

TITLE I 1990 CAAA

40 CFR Part 63

- *Identified 181 HAPs*
 - IARC – International Association for Research on Cancer
- *Rule development Timeline*

THE REGULATIONS

1990 CAAA

- Modified 1970 CAA Title I
- §112

THE REGULATIONS


1970 CAA

- Title I
 - Modified by 1990 CAAA
- Section 112 (a thru r)
 - Created by 1990 CAAA

THE REGULATIONS

40 CFR Part 63

- Section 112 Codified
- Citation Numbers



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SEC 112

- a Definitions
- b List of HAPs and their control
- c List of Source Categories
- d Emission Standards
- e Schedule for Standards and Review
- f Standard to protect Public Health
- g Modifications
- h Work practices
- I Schedule of compliance

SEC 112 (CONT.)

- j Equivalent Limitation of permit
- k Area source program
- l State programs
- m Deposition
- n Other provisions
- o National Academy of Sciences Study and guidance
- p Air Toxic Research Center
- q Savings provision
- r Accidental Releases

CLEAN AIR ACT SECTION 112

Section 112 Hazardous Air Pollutants

- 112 a) Definitions
- 112 b) Pollutants
- 112 c) Source Categories



CLEAN AIR ACT SECTION 112

Section 112 Hazardous Air Pollutants

- ❖ 112 d) Standards (MACT)
- ❖ MACT Floor
- ❖ 112 e) Schedule
- ❖ 112 f) Standard to protect Public Health
- ❖ 112 h) Work Practice Standards and other requirements

CLEAN AIR ACT SECTION 112

Section 112 Hazardous Air Pollutants

- 112 j) Equivalent Limitation by Permit (MACT Hammer)
- 112 k) Area Source Program
- 112 r) Prevention of accidental releases

112 (a) DEFINITIONS

Major Source

- Potential To Emit (PTE)
 - 10 tons per year any HAP
 - 25 tons per year any combination of HAPs



112 (a) DEFINITIONS

Area Source

- Potential To Emit (PTE)
 - Less than 10 TPY. Single HAP
 - Less than 25 TPY Mixture HAPs
 - Collective emissions



POTENTIAL TO EMIT (PTE)

Potential to Emit – The maximum capacity of a stationary source to emit pollutant(s) under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit pollutant(s) including air pollution control equipment and hours of operation or on the type, or amount of material combusted, or stored, or processed shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

Section 112 Glossary of terms – Aug 1998

POTENTIAL TO EMIT (PTE)

- 1994 – Maximum capacity to emit federally enforceable
- 1996 Enforceable by state and local agencies


POTENTIAL TO EMIT (PTE)

- Emitting 24 hrs, 365 days
- Permitting Agency may consider limitations
- Policy documents

112 (b) HAPS

188 Hazardous Air Pollutants


- Examples:
 - Benzene (gasoline)
 - Perc (Dry Cleaning)
 - Dioxin



112 (b) HAPS

188 Hazardous Air Pollutants

- Examples:
 - Benzene (gasoline)
 - Perc (Dry Cleaning)
 - Dioxin
 - Toluene



112(c) SOURCE CATEGORIES

174 Categories

- Major
 - Petroleum and Natural Gas Prod & Refining
 - Waste Treatment Disposal
- Area
 - Electroplating
 - Glassware Manufacturing

112 (d) MACT STANDARD

- Based on emission levels of better controlled, lower-emitting sources
- Standards to control routine HAP emissions from major facilities in a “source category” (industry group)



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HOW MACT STANDARDS ARE DEVELOPED

- Based on emission levels achieved by best facilities through Control Techniques
 - (A) process changes
 - substitution of materials
 - (B) enclosure
 - (C) collect, capture, treat
 - (D) design
 - equipment
 - work practice
 - operational standards
 - (E) combination of above



CONTROL TECHNIQUES:

Control Devices

- Enclosed Systems
- Collection, Capture and Treatment of Emissions
- Equipment Design



CONTROL TECHNIQUES:

Work Practices

- Material Substitutions
- Materials Handling
- Operational Standards



HOW MACT STANDARDS ARE DEVELOPED

- Set a baseline called "MACT Floor"
- States and Districts can set standard more stringent than the MACT Floor



MACT FLOOR

Existing Sources

- 30 or more - average of best 12%
- Less than 30 - average of 5 best



MACT FLOOR

New Sources

- Standard is percent reduction of emissions or concentration limit

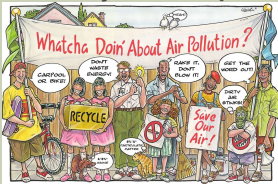


CAA §112(d)

- Area sources—in lieu
 - Generally Available Control Technologies

CAA 112 (H) WORK PRACTICE STANDARDS

- If no other HAP control standard is feasible?
- Design, equipment, work practice or Operational standard may be adopted
 - A NUMERICAL STANDARD IS REQUIRED! (when feasible)



CAA 112 (J) MACT HAMMER

Equivalent Emission Limitation by Permit

- Case-by-case MACT determination if EPA misses rule promulgation schedule
- Incorporate MACT standard into Title V permit
- Title V permit due 18 months from scheduled promulgation date



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CAA 112 (J) MACT HAMMER

- November 15, 2000 Promulgation Deadline
 - Over 60 MACTs not promulgated
 - Hammer date: May 15, 2002
- EPA Changes final Rule
 - 2 part process
 - Part 1: Notification
 - Part 2: Permit
 - 2 yrs between parts 1 & 2

CAA 112 (J) MACT HAMMER

- Sierra Club Sues US EPA
 - Want 12 months between Parts 1 & 2
- Settled out of Court
- 12 months between Parts 1 & 2
- Extended Promulgation Dates for MACTs
- EPA met all Promulgation Dates



CAA 112 (K) AREA SOURCE PROGRAM

- Affects all non-Major Sources
- 75% Reduction in cancer risk
- Substantially reduce non-cancer health effects like birth defects
- Address hotspots



112 (K) AREA SOURCE PROGRAM

- Identify 30 Haps which present largest threat to public health in largest number of urban areas
- Benzene (gas stations)
- PERC (dry cleaning)
- Cr⁶ (Chrome plating)



112 (K) AREA SOURCE PROGRAM

- 68 Area Sources subject to standards
 - Municipal Landfills
 - Medical Waste Incinerators
 - Stationary internal Combustion Engines
 - Hospital Sterilizers

112 (K) AREA SOURCE PROGRAM

- Integrated Urban Air Toxics Strategy
- Generally available Control Technologies (GACT) or Management practices

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CAA 112 (R) PREVENTION OF ACCIDENTAL RELEASES

- At Least 100 substances known to cause death, injury, environmental damage
- Created Chemical Safety and Hazard Investigation Board



CAA 112 (R) PREVENTION OF ACCIDENTAL RELEASES

- California Program is equivalent with additional chemicals listed
- Requires a risk management plan for Title V permits



MACT TIMELINE



Compliance Date:

- Existing Sources - 36 months (48 in some cases)
- New Sources - Compliance date or upon Startup
- Demonstrate compliance within 6 months of startup

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MACT TIMELINE



Compliance Date:

- **Boilers**
 - Effective date: Nov. 12, 2004
 - Compliance date (New) Nov.12, 2004 or on Startup
 - Compliance date (existing) Nov.13, 2007

RESIDUAL RISK STANDARDS

- 8 Years after setting MACT
- Examples of completed reviews
 - Dry Cleaning
 - Gasoline Distribution
 - Commercial Ethylene Oxide Sterilizers
 - Halogenated Solvent Cleaning
 - Industrial Cooling Towers
 - Magnetic Tape Manufacturing



MACT LAYOUT

Summary

- **Effective Date**
- **Contact info**
- **Supplemental Info**
 - Federal Register
 - Web page

I - INTRODUCTION

- Authority
 - Statute
- Affected Processes
 - Who is effected

II - FINAL RULE

- Source Categories Affected
- Pollutants Regulated
- Requirements
- Compliance
 - Date of Compliance
 - Demonstration of compliance

III - IMPACT

- Environmental
 - Air, Water, Solid and Waste
- Energy
 - increase or decrease
- Economic

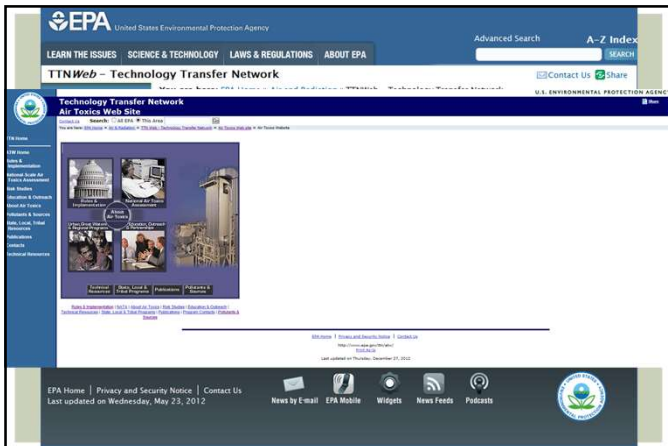
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MACT LAYOUT

- IV – Summary of Changes
- V – Response to Major comments
- The Regulation

INTERNET RESOURCES

- www.epa.gov/ttn/atw/eparules.html
- <https://www3.epa.gov/ttn/atw/area/arearules.html#imp>
- <http://www.combustionportal.org/>
- <https://www.tceq.texas.gov/permitting/air/rules/federal/fedhp>
- <https://www.govinfo.gov/help/cfr>
- <https://ecfr.io/Title-40/>



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Technology Transfer Network
Air Toxics Web Site

U.S. ENVIRONMENTAL PROTECTION AGENCY

Rules and Implementation

Notice

The Clean Air Act requires EPA to regulate emissions of toxic air pollutants from industrial sources referred to as "acute sources." As required under the Act, EPA has developed a list of acute sources that must meet certain technology requirements for these toxic air pollutants. The list is required to ensure "uniformity" (also known as rules or standards), for all industries that emit one or more of the pollutants in significant quantities.

Notice announcing that EPA has completed the emission standards required by sections 112(c)(1) and 112(c)(3) and 112(c)(5) of the Clean Air Act (CAA).

Selected New Source Performance Standards (NSPS) (these are criteria pollutant regulations)

note that the General Emission limits:

- Airfield Clean Air Standards Rule
- Glass Clean Air Standards Rule
- Lead Clean Air Standards Rule
- Nitrogen Oxides Clean Air Standards Rule
- Sulfur Dioxide Clean Air Standards Rule
- Sulfur Oxides Clean Air Standards Rule
- Volatile Organic Compounds Clean Air Standards Rule
- Zinc Oxide Clean Air Standards Rule