

# Risk Management Program



Risk Management Program

## Applicability of CAA Section 112(r) & General Duty Clause



April- May 2010

## Focus & Agenda

- Focus
  - Applicability of Clean Air Act (CAA) Section 112(r) & 40 CFR Part 68
- Agenda
  - U.S. chemical accident prevention & preparedness laws
  - CAA Section 112(r)
    - Basic requirements
    - General duty clause
    - Regulated substances
    - Threshold criteria
  - 40 CFR Part 68 Risk Management Program rule
    - Applicability criteria
    - Definitions
    - Exemptions
    - Requirements
    - Overview of regulated facility locations, industry sectors & chemicals
  - Applicability of Program Levels

# Risk Management Program

## Relevant U.S. Laws

- Emergency Planning and Community Right-to-Know Act — EPCRA (1986)
- Clean Air Act Amendments — CAA (1990)
  - Process Safety Management Standard — PSM (1992)
  - Risk Management Program Regulation (1994-1996)
  - U.S. Chemical Safety and Hazard Investigation Board — CSB (1998)
- Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act — CSISFRRA (1999)



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## Clean Air Act Section 112(r)

- Established a General Duty Clause
- Required EPA to list at least 100 regulated substances known to cause death or serious adverse effects to human health or the environment
- Required EPA to promulgate regulations and guidance to prevent, detect, and respond to accidental releases of regulated substances
- Regulations to include a risk management plan (RMP) available to government officials and the public



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## General Duty Clause



- Owners and operators have a general duty to:
  - Identify hazards associated with a potential accidental release of an “extremely hazardous substance” using appropriate hazard assessment techniques
  - Design and maintain a safe facility, taking steps to prevent releases
  - Minimize the consequences of accidental releases which do occur
- Not limited to a specific list of chemicals or threshold quantities

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## CAA Section 112(r)(3) – Listing Criteria

- List at least 100 substances known to cause death, injury, or serious adverse effects to human health or the environment if accidentally released
- Required EPA to use, but not be limited by, EPCRA EHS list, with appropriate modifications
- 16 specific substances mandated by statute
- Listing criteria
  - Severity of acute adverse health effects
  - Likelihood of accidental releases
  - Potential magnitude of human exposure

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# Risk Management Program

## Substances Mandated for Listing by CAA

- Chlorine
- Anhydrous ammonia
- Methyl chloride
- Ethylene oxide
- Vinyl chloride
- Methyl isocyanate
- Hydrogen cyanide
- Ammonia
- Hydrogen sulfide
- Toluene diisocyanate
- Phosgene
- Bromine
- Anhydrous hydrogen chloride
- Hydrogen fluoride
- Anhydrous sulfur dioxide
- Sulfur trioxide

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## Final List of Regulated Substances

- 77 toxic & 63 flammable substances listed based on:
  - Toxicity:
    - Inhalation  $LC_{50} \leq 50$  mg/L air
    - Dermal  $LD_{50} \leq 50$  mg/kg body weight
    - Oral  $LD_{50} \leq 25$  mg/kg body weight
  - Ambient physical state
    - Gas
    - Liquid with vapor pressure  $> 10$  mm Hg
  - Flammability: NFPA 4 flammability (Flash point  $< 73^{\circ}F$ , Boiling point  $< 100^{\circ}F$ )
  - Production volume & accident history



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## Mixtures & Solutions

- Listed toxic mixtures containing > 1% listed toxic substance w/partial pressure > 10 mm Hg
- Listed flammable mixtures containing > 1% listed flammable substance w/mixture exceeding NFPA 4 flammability criteria
- Substances with specified concentrations:
  - Nitric Acid ( $\geq 80\%$ )
  - Hydrofluoric Acid ( $\geq 50\%$ )
  - Hydrochloric Acid ( $\geq 37\%$ )
  - Aqueous Ammonia ( $\geq 20\%$ )

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## CAA Section 112(r)(3) – Threshold Quantity Criteria

- Threshold quantities established by regulation
- Thresholds must account for:
  - Toxicity, reactivity, volatility, dispersibility, combustibility, or flammability of the substance
  - Amount of the substance which, as a result of an accidental release, is known to cause or may reasonably be anticipated to cause death, injury or serious adverse effects to human health for which the substance was listed

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## Threshold Methodology – Toxics

- Relative ranking factor method used IDLH/volatility ranking index
  - Mammalian toxicity data ( $LC_{50}$ , etc.) used if no IDLH
- Thresholds assigned by order of magnitude ranges in ranking factor
  - General TQ range informed by other methods & lists
  - Assigned higher TQ than EPCRA Threshold Planning Quantity for same substance
  - Minimum TQ (500 lbs) representative of drum-size containers
  - Maximum TQ (20,000 lbs) representative of typical large handling quantities
  - TQ categories: 500, 1000, 2500, 5000, 10000, 15000, 20000

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## Threshold Methodology – Flammables

- Reviewed accident history information
- Evaluated relative hazards of vapor cloud explosions, BLEVEs, vapor cloud fires & pool fires
  - Vapor cloud explosion was of greatest concern
- Threshold quantity basis
  - Quantity associated with vapor cloud explosion risk
  - Lethal blast effects at 100 meters from site of detonation
- Threshold for all flammables set at 10,000 lbs

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# Risk Management Program

## 40 CFR Part 68 Risk Management Program

- The Risk Management Program is designed to:
  - Prevent accidental chemical releases to the air
  - Minimize the consequences of releases that do occur
  - Provide information about chemical hazards to the public and government officials in order to promote a dialogue with industry to reduce risk



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## Applicability Criteria

- Facilities meeting all of the following criteria are subject to 40 CFR Part 68:
  - Stationary source
  - With one or more regulated substances
  - Contained in a process
  - Above a threshold quantity



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# Risk Management Program

## Definitions – Stationary Source

- “...any buildings, structures, equipment, installations or substance emitting stationary activities
  - (i) which belong to the same industrial group,
  - (ii) which are located on one or more contiguous properties,
  - (iii) which are under the control of the same person (or persons under common control), and
  - (iv) from which an accidental release may occur” (CAA Section 112(r)(2))

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## Definitions – Process

- Any activity involving a regulated substance, including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities
  - Any group of vessels that are interconnected, or separate vessels that are located such that a regulated substance could be involved in a potential release, are considered a single process

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# Risk Management Program

## RMP Regulation – Exemptions

- Mixtures < 1% concentration (flammable and toxic)
- Gasoline used as fuel for internal combustion engines
- Naturally occurring hydrocarbon mixtures prior to processing
- “Articles”
- Specified uses:
  - As a structural component of the stationary source
  - For routine janitorial maintenance
  - As foods, drugs, cosmetics, or other personal items
  - In process water, non-contact cooling water, compressed air or air used for combustion
- Activities in laboratories
- Anhydrous ammonia held by farmers for use as a nutrient
- Flammable substances used as fuel or held for retail sale
- Outer continental shelf sources
- Transportation

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## RMP Regulation – Requirements

- Owner/operator requirements:
  - Conduct a hazard assessment (offsite consequence analysis & five-year accident history)
  - Develop a management system and implement an accident prevention program (except Program 1 processes)
  - Implement an emergency response program or plan
  - Submit a Risk Management Plan (RMP) to EPA
- RMPs available to government, limited public access



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# Risk Management Program

## Applicability of Program Levels

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## Applicability of Program Levels

- **Program 1**
  - Eligibility Criteria
    - No public receptors in worst-case scenario zone and
    - No accidents with specified **OFF-SITE** consequence in the last five years (68.10)
  - Requirements
    - Limited hazard assessment requirements
    - Minimal prevention and emergency response requirements
  - Flammable storage most common

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# Risk Management Program

## Applicability of Program Levels

- **Program 3**

- Eligibility Criteria

- Ineligible for Program 1
- Either subject to OSHA PSM (Federal or state) or one of 10 NAICS codes specified in Part 68



- Requirements

- Imposes OSHA's PSM standard as the prevention program
- Plus additional hazard assessment, management, and emergency response requirements

- Usually complex chemical processes

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## Applicability of Program Levels

- **Program Level 3 NAICS Codes**

- 32211 Pulp mills
- 32411 Petroleum refineries
- 32511 Petrochemical manufacturing
- 325181 Alkali and chlorine manufacturing
- 325188 All other basic inorganic chemical manufacturing
- 325192 Cyclic crude and intermediate manufacturing
- 325199 All other basic organic chemical manufacturing
- 325211 Plastics material and resin manufacturing
- 325311 Nitrogenous fertilizer manufacturing
- 32532 Pesticide & other agricultural chemical manufacturing

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# Risk Management Program

## Applicability of Program Levels

- **Program 2**
  - Eligibility Criteria
    - Ineligible for Program 1 and not covered by Program 3
  - Requirements
    - Streamlined prevention program requirements
    - Additional hazard assessment, management, and emergency response requirements

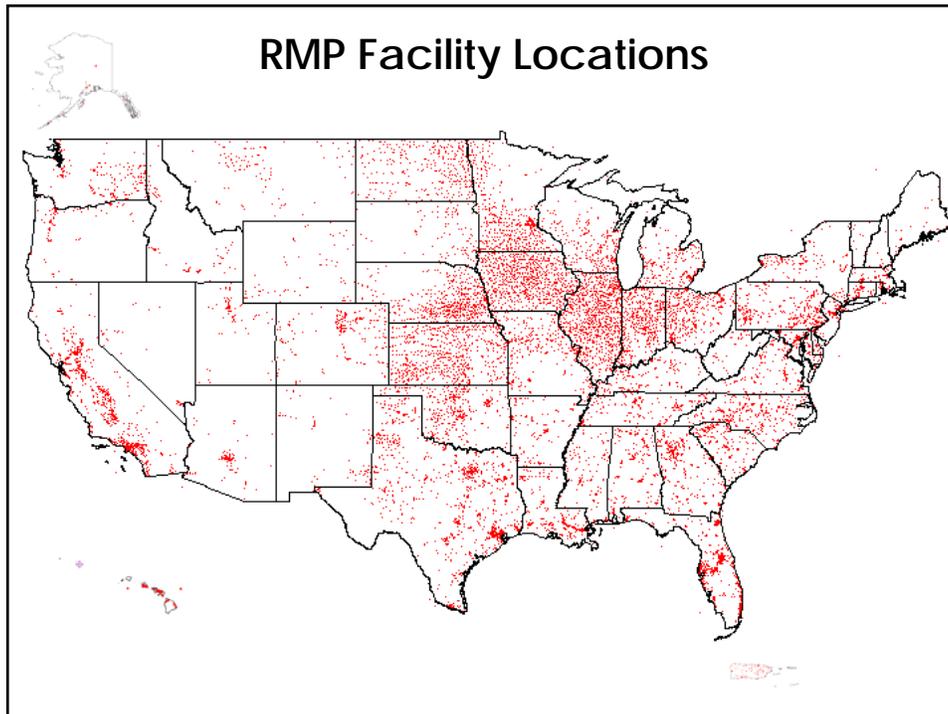
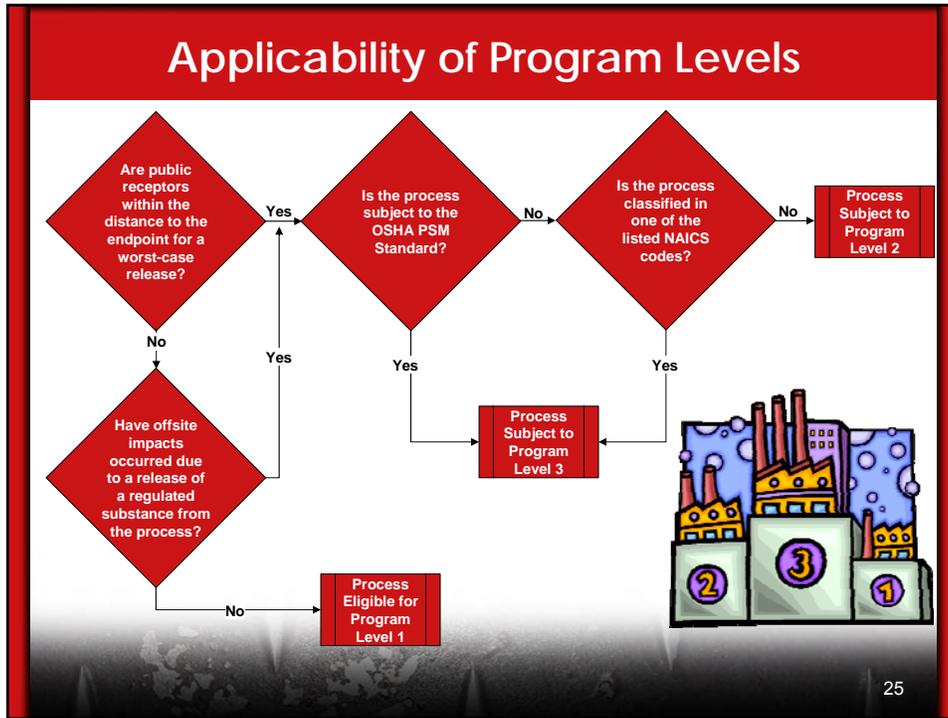
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## Applicability of Program Levels

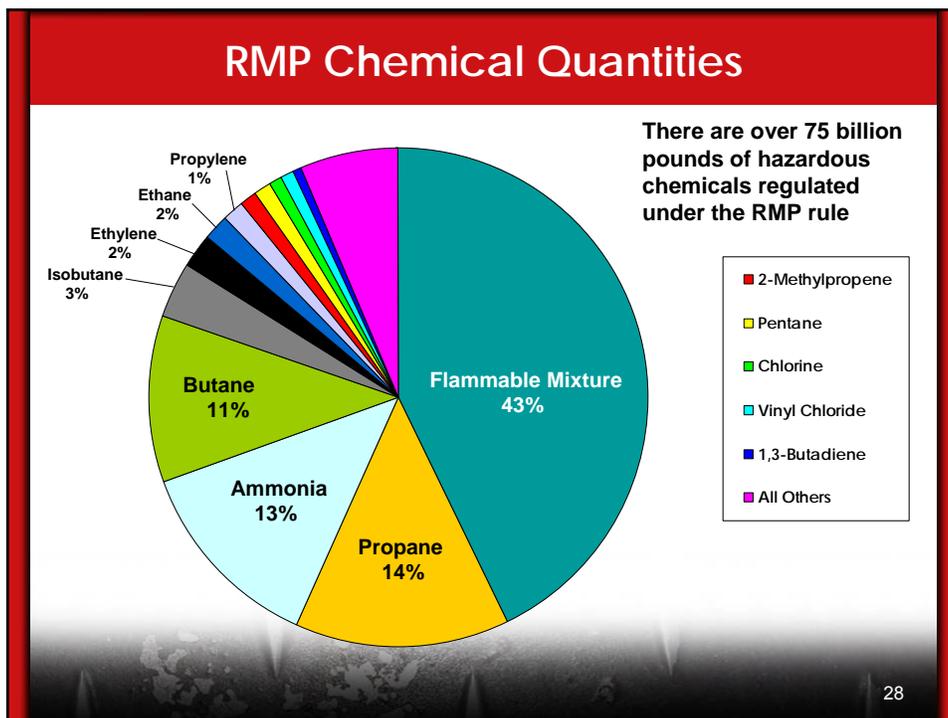
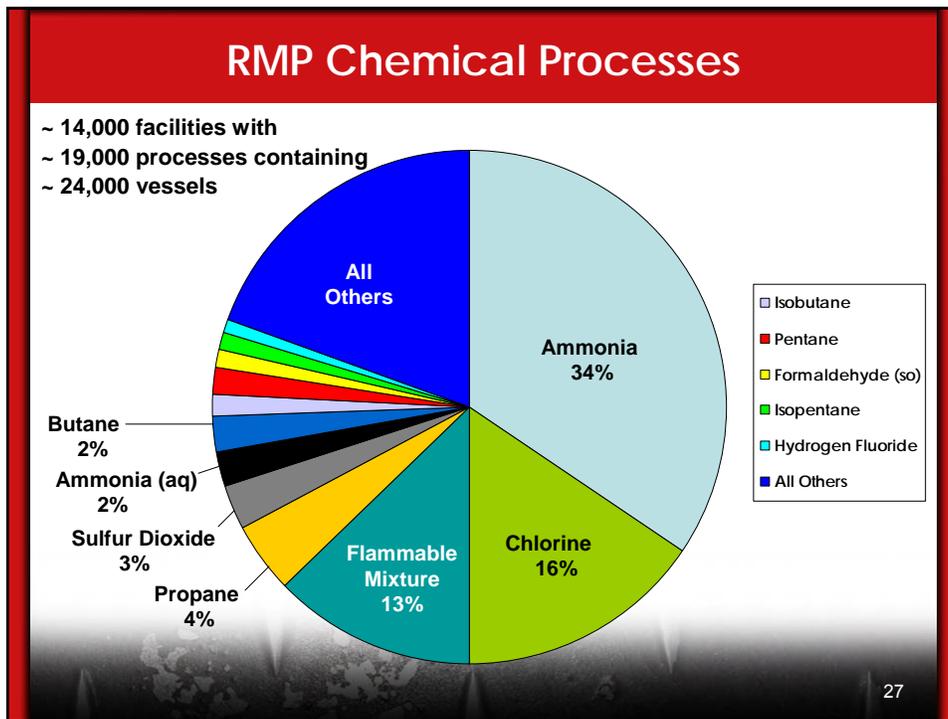
- Facilities likely to have one or more Program 2 Processes:
  - Agricultural fertilizer retailer
  - A publicly owned facility in a state that does not have a delegated OSHA program (e.g., municipal waste and wastewater treatment facilities)
  - Use of regulated acids in solution in activities that do not fall into one of the ten NAICS codes specified for Program 3
  - Petroleum Distillate/Natural Gasoline Stored at atmospheric pressure without cooling

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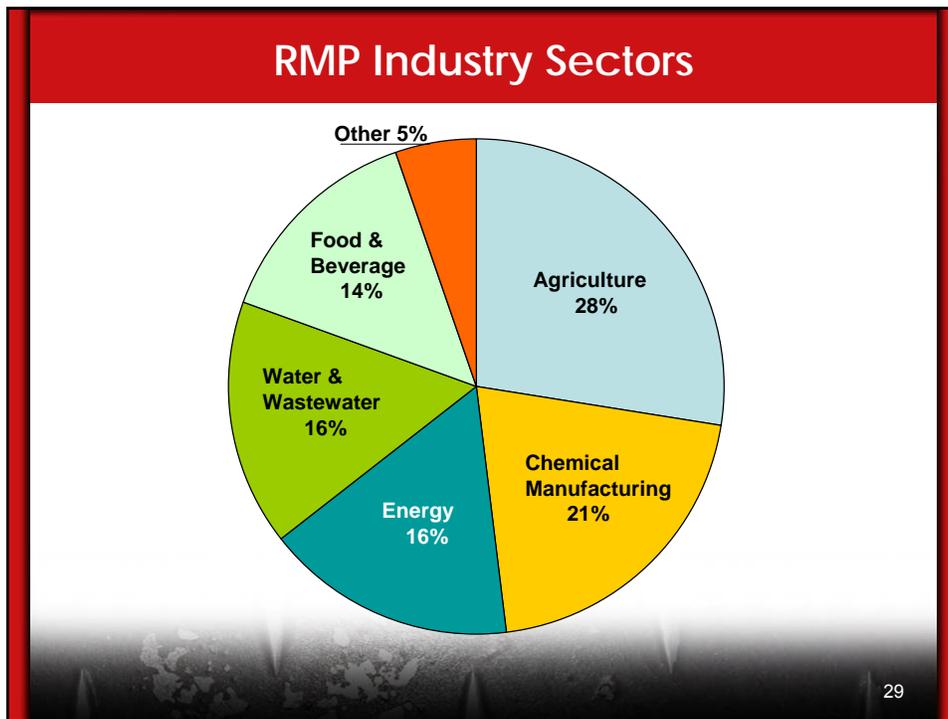
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