



# Risk Management Plan Program

Accidental Release Prevention Program

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# History of RMP Program

- Union Carbide
  - Bhopal, India
    - Dec. 3, 1984 release of methyl isocyanate
      - 40 tons of toxic gas released
        - » 3,800 deaths
        - » 11,000 disabilities



# Bhopal, India Incident

- Root cause
  - Inferior safety controls due to design.
  - Shortage of experienced workers (layoffs).
  - Refrigeration to MIC tank was shut off (save money).
  - Corroded pipe on flare tower not replaced.
  - No caustic tower for neutralization.
  - Stored MIC in large tanks beyond recommended levels.
  - Failure of multiple safety systems (poor maintenance).
  - Lack of employee training.
  - No preventative maintenance program.
  - Modifications to equipment were unsafe.

# Risk Management Plan Intent

- Facilities that produce, process, distribute, or store certain chemicals must develop and report to U.S. EPA an **accident prevention plan** that includes, but is not limited to, hazard assessment, prevention history, and an emergency response plan.
- **Goal is to maintain a safe facility that takes steps to prevent/reduce releases and to minimize the consequences of an accidental release which does occur.**

# Risk Management Plan Intent

- One of the most important parts of the RMP regulation relates to recognized and generally accepted good engineering practices.
- American Society of Mechanical Engineers (ASME)
- American Society for Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- The Chlorine Institute
- National Fire Protection Association

# RMP Program Background

- Congress enacted the Emergency Planning and Community Right-to-Know Act of 1986.
- OSHA developed Process Safety Management Program (1992).
- Accidental Release Prevention (RMP Program):
  - Signed into law Nov 15, 1990 as part of the CAA Amendments of 1990.
  - Final regulations published by U.S. EPA (June 1996).
  - List rule published (January 1994).

# RMP Program

- Beginning June 21, 1999, subject facilities were required to prepare and execute an RMP program.
  - **Submit a Risk Management Plan.**
    - A report that details the facility's prevention program, emergency response program, and hazard assessment.
  - **Hazard assessment.**
    - Worst case and alternative release.
  - **Prevention program.**
    - Detect, prevent, and minimize accidental releases.
  - **Emergency response program** (new coordination requirements).
    - Protect human health and the environment in the event of an accidental release.

# RMP Program Applicability

- To determine a facility's applicability:
  - Review list rule:
    - 77 toxic substances
    - 63 flammable substances
    - [epa.ohio.gov/divisions-and-offices/air-pollution-control/dapc-programs/risk-management-planning](http://epa.ohio.gov/divisions-and-offices/air-pollution-control/dapc-programs/risk-management-planning)
    - [epa.ohio.gov/portals/27/atu/112%28r%29/list.pdf](http://epa.ohio.gov/portals/27/atu/112%28r%29/list.pdf)
  - Identify process:
    - Includes storage, handling, processing, etc.
  - Determine amount of chemical:
    - Toxics: 500 to 20,000 pounds
    - Flammables: 10,000 pounds

# RMP Program Applicability

- Water and wastewater treatment plants

- Potential RMP chemicals:

- Chlorine \* - 2500 pounds
    - Sulfur dioxide – 5000 pounds
    - Ammonia (20% or greater) -20,000 pounds
    - Anhydrous ammonia – 10,000 pounds

- 10% of RMP affected universe:

- Approximately 40 WTP/WWTPs



# RMP Program Applicability

- For treatment plants (chlorine)
  - more than one 1-ton chlorine cylinder on site:
    - Storage.
    - Processing.
  - May use written administrative controls:
    - Written procedures to maintain chlorine storage amount below 2,500 lbs. threshold.
    - Sodium Hypochlorite (WTP) and UV to disinfect.



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# General Duty Clause

- What is the GDC?
  - 112(r)(1) CAA Amendments of 1990.
  - Required to comply since 1990.
  - Makes the owners/operators of facilities that have regulated and other extremely hazardous substances responsible for ensuring that their chemicals are managed safely.
- Who is covered?
  - Applies to any stationary source producing, processing, handling or storing regulated substances or other extremely hazardous substances.



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# General Duty Clause

- How to meet GDC obligations:
  - Adopt or follow relevant industry codes, practices or consensus standards.
  - Be aware of unique circumstances of your facility.
  - Be aware of accidents and other incidents in your industry.
- Regulated at Federal level (OSHA & U.S. EPA):
  - CAA Section 113(b) allows penalties of up to \$37,500 per day for each violation.

# RMP Submission

- Required to resubmit or correct:
  - Within five consecutive years of its initial submission and every five years thereafter.
  - No later than the date on which a regulated substance is first present above the threshold quantity.
  - One month of a change in emergency contact.
  - Six months after an RMP reportable accident.
  - De-register within six months.

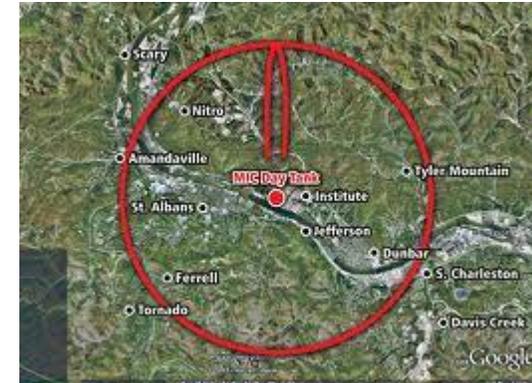
# RMP Submission

- U.S. EPA
  - CDX (RMP\* eSubmit)
  - <https://cdx.epa.gov/CDX>
    - <http://www.epa.gov/rmp/rmpesubmit>
  - RMP Reporting Center 703-227-7650
- Ohio EPA
  - Hard copy or email changes
  - Major changes
  - Initial RMPs
  - De-registrations

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# Hazard Assessment

- Worst case release scenario:
  - Greatest distance to the endpoint.
- Alternative release scenario:
  - More likely to occur.
    - Generally, less than distance to the endpoint for worst case.
- RMP\*Comp
  - [epa.gov/rmp/rmpcomp](http://epa.gov/rmp/rmpcomp)



# Hazard Assessment

- Worst case and alternative release scenario:
  - Residential population within the radius (distance to the endpoint).
    - Most recent Census.
      - Marplot.
      - CAPS .
        - » <http://mcdc.missouri.edu/applications/caps2010.html>
  - Public and environmental receptors:
    - Marplot maps.

## RMP\*Comp

[RMP\\*Comp](#)

[Download](#)

You are here: [RMP\\*Comp](#)

### RMP\*Comp Information

Welcome to RMP\*Comp! Use RMP\*Comp to perform offsite consequence analysis required under the EPA's Risk Management Program (RMP) rule, which implements Section 112(r) of the 1990 Clean Air Act Amendments. To begin analysis, click on the **"Begin"** link.

#### Some Background Information

If you own or operate a facility, you are subject to the RMP rule if you have more than a threshold quantity of a "regulated substance" in any process at your facility. These regulated substances include 77 acutely toxic substances and 63 flammable gases and volatile liquids.

If you are subject to the rule, you will need to perform an offsite consequence analysis to check whether your process puts nearby populations at risk (if you find that it does, you will need to take some steps to manage that risk; these steps are described in the rule). You can use RMP\*Comp to make this analysis. It implements the RMP offsite consequence analysis procedures recommended by the EPA.

#### Who to Call for Help:

RMP Reporting Center can answer technical (software/hardware) questions about RMP\*Comp and RMP\*eSubmit:  
(703) 227-7650 (phone)  
[RMPRC@epacdx.net](mailto:RMPRC@epacdx.net) (e-mail)

The Superfund, TRI, EPCRA, RMP & Oil Information Center can help you get answers to policy questions (applicability, exemptions, coverage) about the Risk Management Program and a variety of federal EPA regulations:  
(800) 424-9346, TDD (800) 553-7672

[Begin](#) 

RMP\*Comp

[Contact Us](#)

RMP\*Comp

Download

You are here: [RMP\\*Comp](#) » [Start](#)

## RMP\*Comp

 Release Kind

- Single Chemical
  Mixture of Flammable Substances

Click the link to select a chemical:

Chemical Name ▲	CAS Number ◆	Threat Type
<a href="#">1,1-Dimethylhydrazine</a>	57-14-7	Toxic Liquid
<a href="#">1,3-Butadiene</a>	106-99-0	Flammable Gas
<a href="#">1,3-Pentadiene</a>	504-60-9	Flammable Liquid
<a href="#">1-Butene</a>	106-98-9	Flammable Gas
<a href="#">1-Chloropropylene [1-Propene, 1-chloro-]</a>	590-21-6	Flammable Liquid
<a href="#">1-Pentene</a>	109-67-1	Flammable Liquid
<a href="#">2,2-Dimethylpropane [Propane, 2,2-dimethyl-]</a>	463-82-1	Flammable Gas
<a href="#">2-Butene</a>	107-01-7	Flammable Gas
<a href="#">2-Butene-cis</a>	590-18-1	Flammable Gas
<a href="#">2-Butene-trans [2-Butene, (E)]</a>	624-64-6	Flammable Gas
<a href="#">2-Chloropropylene [1-Propene, 2-chloro-]</a>	557-98-2	Flammable Gas
<a href="#">2-Methyl-1-butene</a>	563-46-2	Flammable Liquid
<a href="#">2-Methylpropene [1-Propene, 2-methyl-]</a>	115-11-7	Flammable Gas

You are here: [RMP\\*Comp](#) » [Start](#) » [Toxic Gas Processing](#)

## RMP\*Comp

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### Errors Found

No errors found

### Chemical Information

Chemical Name: Chlorine

CAS Number: 7782-50-5

Chemical Type: Toxic Gas

### Worst-case Analysis

**Scenario type:**  Worst-case  Alternative

**Physical state:**  Unliquefied  
 Liquefied by refrigeration  
 Liquefied under pressure

**Quantity released:**

**Surrounding terrain type:**  Urban (many obstacles in the immediate area)  
 Rural (terrain generally flat and unobstructed)

### Mitigation measures

Check the checkbox below if the following mitigation measure is in place in your process.

**Release in enclosed space, in direct contact with outside air:**

[Submit](#)

You are here: RMP\*Comp » Start » Summary

## RMP\*Comp

[← Back](#)

### Estimated Distance Calculation

**Estimated distance to toxic endpoint:** 1.3 miles (2.1 kilometers)

This is the downwind distance to the toxic endpoint specified for this regulated substance under the RMP Rule. Report all distances shorter than 0.1 mile as 0.1 mile, and all distances longer than 25 miles as 25 miles.

### Scenario Summary

**Chemical:** Chlorine

**CAS number:** 7782-50-5

**Threat type:** Toxic Gas

**Scenario type:** Worst-case

**Physical state:** Liquefied under pressure

**Quantity released:** 2000 pounds

**Release duration:** 10 min

**Release rate:** 200 pounds per minute

**Mitigation measures:** NONE

**Surrounding terrain type:** Urban surroundings (many obstacles in the immediate area)

**Toxic endpoint:** 0.0087 mg/L; basis: ERPG-2

### Assumptions about this scenario

**Wind speed:** 1.5 meters/second (3.4 miles/hour)

**Stability class:** F

**Air temperature:** 77 degrees F (25 degrees C)

# Hazard Assessment



- Required to maintain documentation on site.
  - RMP\*Comp (or other model) print outs.
  - Calculations for alternative scenario.
  - Population data.
  - Environmental data.
  - Public receptors data.

# Hazard Assessment

- Acceptable methods for determining the distance to the endpoint:
  - RMP\*Comp.
  - ALOHA.
  - American Water Works Association Tables.
  - U.S. EPA tables for water and wastewater treatment plants.

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# Prevention Program



- Process safety information:
  - Hazards of the substance.
    - MSDS.
  - Technology of the process.
    - Block flow diagram, process chemistry, operating parameters, inventory, etc.
  - Equipment in the process.
    - Piping and Instrument Diagrams (P&IDs), relief system design, ventilation system design, safety systems (interlocks, detection, suppression), etc.
    - Safe Upper and Lower Limits of equipment in process.
    - Design Codes and Standards

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# Prevention Program

- **Process hazard analysis.**
- Organized effort to identify and analyze the significance of potential hazards associated with the process.
  - Required every five years.
  - More often if a major change to process.
  - The analysis should include recommendations to improve safety.
    - Schedule completion dates for recommendations.
  - Include operators.
  - Checklist(s), What-if analysis, Hazard and Operability Study, Fault Tree Analysis to name a few.

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# Prevention Program

- **Operating procedures:**
  - Written steps for each operating phase.
    - Offloading containers, switching containers, process startup, shutdown, emergency shutdown, scrubber startup (any procedure affiliated with covered process).
    - Include operating parameters and consequences of deviations.
  - Annually certify.
  - Ensure procedures readily available to operators.
  - Utilize Chlorine Institute and materials they can offer.



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# Prevention Program

- **Training:**
  - Initial training for new operators.
  - Refresher training every three years.
    - Operating procedures.
  - Whenever there is a change in the operating procedures.
  - Process change (i.e., switching from liquid to gas feed).
  - Maintain documentation.

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# Prevention Program



- **Mechanical Integrity:**
  - Written program required.
  - Document inspections and tests.
  - Ensure documentation exists that deficiencies in equipment have been corrected.
  - Ensure program includes all critical equipment (including chlorinators, vaporizers, storage, etc., until chlorine is injected).
    - Frequency of inspections and tests correct.
  - Training for employees.

# Prevention Program

- Mechanical integrity.
- Written program must include frequencies of inspections:
  - Chlorine Institute.
  - Operations and Maintenance Manuals for equipment.
  - Prior operating experience.

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# Prevention Program

- **Management of change:**
  - Procedure to manage modifications not replacement-in-kind.
    - Switching gas to liquid feed.
    - Addition of scrubber.
    - Replace chlorinator (not identical).
- **Pre-startup review:**
  - Procedure to ensure modifications to process are safe.
  - Train appropriate employees.



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# Prevention Program



- **Compliance audits:**
  - Ensure RMP compliance every three years.
- **Incident investigation:**
  - Investigate incidents or near misses.
  - Ensure at least one person with knowledge in the process and/or could use an independent person(s).

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# Prevention Program

- **Employee participation:**
  - Written plan to involve employees with RMP program elements.
- **Hot work permit:**
  - Welding on process equipment.
- **Contractors:**
  - On or around process.
  - Review contractor's safety programs prior to hiring:
    - Provide copy of EAP and SDS.

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# Emergency Response

- U.S. EPA finalized RMP rule amendments (40 CFR part 68):
  - Federal Register November 20, 2019.
  - Modifying OAC 3745-104 to correlate with U.S. EPA amendments.
  - Addresses coordination with emergency responders.
  - Tabletop and field exercises.
  - Requires a public meeting in the event of an offsite release (RMP reportable).

# Emergency Response New Requirements

- Non-Responding agencies:
  - Annual notification drills:
    - Confirm emergency contact information is accurate and up to date.
    - November 20, 2024.
  - Annual coordination with LEPC and fire departments:
    - Effective as of 9/21/2018.
    - Must be documented.

# Emergency Response New Requirements

- Responding facilities:
  - Notification drills (annual):
    - Drill required by November 20, 2024.
  - Tabletop exercises (at least once every three years):
    - First exercise required by November 20, 2026.
  - Field exercises :
    - Work with local agencies to determine frequency:
      - Have plan within four years of FR publication.

# Facility Public Meeting New Requirement

- Public meeting is required to be held after an incident that has offsite impacts:
  - 60 days.
  - No onsite impacts.
  - Only RMP regulated substances.
  - Required for any releases after March 15, 2021

# Ohio EPA RMP Program

- Received delegation from U.S. EPA January 2000.
- Ohio EPA responsible for:
  - Rule development.
  - Audits.
  - Fees (\$250/year for most treatment plants).
  - Enforcement
  - Guidance.
  - Training.



# Ohio EPA RMP Program

- Audits:
  - Every five years.
  - One to two weeks notice.
  - Two to four hours.
  - Send checklist.
- After the audit:
  - Review violations.
  - Notice of Violation:
    - Resolution of Violation.
  - Letter of Compliance.
  - Enforcement.



# Common Violations

- Incomplete hazard assessment documentation.
- Incomplete process safety information.
- Lack of PHA revalidations.
- Recommendations not addressed in PHA.
- Incomplete operating procedures.
- No three-year refresher training.
- No preventative maintenance (repair as-needed).

# Common Violations

- No documentation for correcting deficiencies in equipment.
- MOC not conducted for changes in process.
- Not conducting compliance audits every three years.
- Lack of recommendations from incident investigations.
- Not implementing contractor program.

# Ohio EPA RMP Program

- Guidance
  - U.S. EPA website
    - [epa.gov/rmp/guidance-facilities-risk-management-programs-rmp](https://www.epa.gov/rmp/guidance-facilities-risk-management-programs-rmp)
  - Ohio EPA website
    - [epa.ohio.gov/divisions-and-offices/air-pollution-control/dapc-programs/risk-management-planning](https://epa.ohio.gov/divisions-and-offices/air-pollution-control/dapc-programs/risk-management-planning)
    - Tab “Compliance Information”; scroll down to “Water and Wastewater Treatment Plant (Industry Specific Guidance)”
  - The Chlorine Institute
  - American Water Works Association

# Questions?

