

Training Program Water and Wastewater Treatment Plants

Risk Management Plan (RMP) Program

Jeff Beattie



History of RMP Program



- Union Carbide
 - Bhopal, India
 - Dec. 3, 1984 release of methyl isocyanate (MIC)
 - 42 tons of toxic gas released
 - » 3,800 deaths
 - » 3,900 permanently disabled
 - » 558,000 injured

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 stores certain chemicals must develop and report to EPA an **accident prevention plan** that includes, but 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 do occur.**

Risk Management Plan (RMP)

- Clean Air Act of 1990 (Section 112(r))
- 40 CFR Part 68
- **ORC Chapter 3753**
- **OAC 3745-104**

- June 21, 1999 initial RMP due to the U.S. EPA
 - 404 +/- RMP facilities in Ohio
 - **5-year reporting cycle/updates**

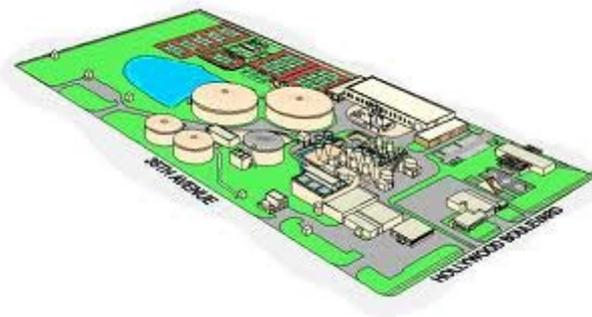
- Ohio EPA received delegation (13 total) of the RMP program in January 2000
 - Ohio EPA began auditing subject facilities
 - Kimberly Joseph and Sherri Swihart are the Ohio EPA RMP auditors

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 outlines 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
 - 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
 - Amount of chemical
 - Toxics: 500 lbs. to 20,000 lbs.
 - Flammables: 10,000 lbs.
 - Identify process
 - Includes storage, handling, processing, etc.



RMP Chemicals

- 40 CFR Part 68, Section 68.130 contains the List of Toxic Chemicals (77) and Flammables (63).
- USEPA's "List of Lists"
 - Consolidated listing of chemicals subject to EPCRA and RMP is a reference tool.
 - <http://www.epa.gov/epcra/epcracerclacaa-ss112r-consolidated-list-lists-march-2015-version>

RMP Toxic Chemicals Examples

- 500 pounds (Hydrogen Selenide & Phosgene)
- 1,000 pounds (Nickel Carbonyl & Fluorine)
- 2,500 pounds (**Chlorine** & Hydrocyanic Acid)
- 5,000 pounds (Sulfur Dioxide & Hydrogen Chloride- both in anhydrous form)
- 10,000 pounds (**Anhydrous Ammonia** & Ethylene Oxide)
- 15,000 pounds (Formaldehyde & Hydrochloric Acid)
- 20,000 pounds (Methyl Thiocyanate)

RMP Flammables

- 10,000 pounds thresholds

- Examples include:

Propane

Vinyl Chloride

Acetaldehyde

Isobutene

Ethyl Chloride

Methane

Methyl Ether

Ethylene

Isoprene

Process

- A process is any activity involving a regulated substance, including any use, storage, manufacturing, handling, or on-site movement, or any 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, is considered a process.

Program 1: Processes which would not affect the public in case of a worst- case release and no accidents with specific offsite consequences within last 5 years.

Program 3: Processes not eligible for Program 1 and either subject to OSHA's PSM standard or classified in one of 10 specific NAICS codes.

Program 2: Processes not eligible for Program 1 or subject to Program 3

Program Levels RMP Content

PROGRAM 1	PROGRAM 2	PROGRAM 3
Management	Management	Management
Hazard Assessment	Hazard Assessment	Hazard Assessment
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		Management of Change
		Pre-startup Review
	Compliance Audit	Compliance Audit
	Incident Investigation	Incident Investigation
		Employee Participation
		Hot Work Permit
		Contractors
Emergency Response Plan	Emergency Response Plan	Emergency Response Plan

RMP*Comp

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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 (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

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RMP*Comp

Release Kind

Single Chemical

Mixture of Flammable Substances

Click the link to select a chemical:

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

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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:

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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)

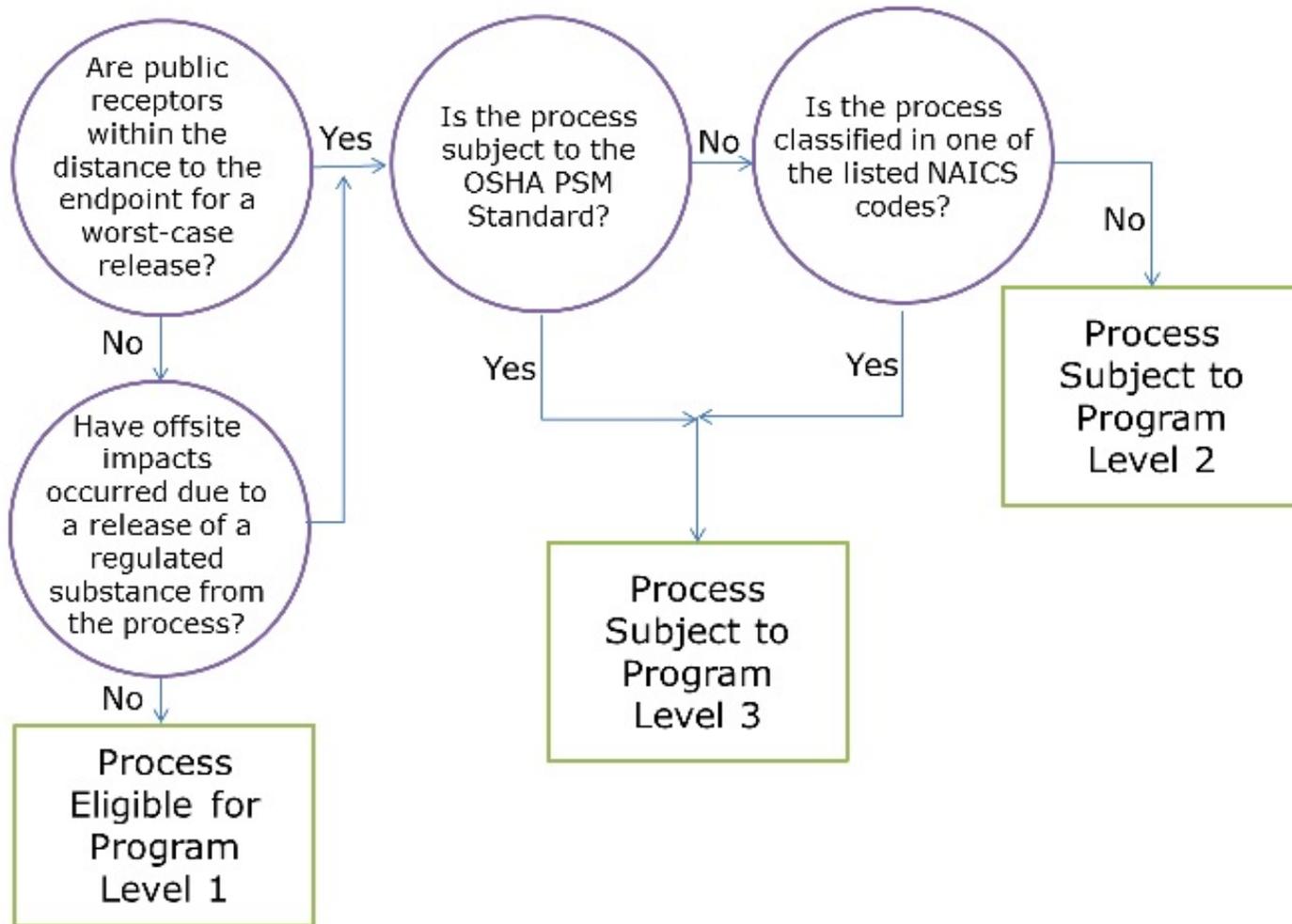
Toxic endpoint: 0.0087 mg/L; basis: ERPG-2

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)



RMP Subject?

City of Xenia WWTP stores a maximum 1-one ton cylinder of chlorine and/or ten-150 pound cylinders in a building for chlorination.

The WWTP **is not subject** to the RMP Program; the threshold for chlorine is 2,500 pounds.

RMP Subject?

City of Xenia WWTP uses a minimum of 2-one ton cylinders of chlorine in a building for chlorination.

- a) one cylinder is used to determine the worst case scenario;
- b) the distance to the endpoint is 1.3 miles (urban)/3.0 miles (rural)
- c) Mobile Home Park located 0.8 miles from WWTP
- d) POTWs comply with OSHA standards under the state's Public Employee Risk Reduction Program (PERRP).

The WWTP is subject to the RMP Program; the threshold for chlorine is 2,500 pounds and endpoint for public receptors within the 1.3 miles. **Program 3.**

What Program?

I.B. Cold Company is a warehouse that stores grocery products for eventual distribution to local grocery stores, including cold storage. **Anhydrous ammonia** is used as the refrigerant for the coolers and freezers and stored in various pressure vessels and piping. The total amount in the process is 56,000 lbs. which exceeds the 10,000 lb. threshold and is therefore subject to the RMP regulations. 10,000 lbs. is also the threshold for OSHA PSM applicability.

1. Warehouse located 50 yards inside facility line
2. Nearest public receptor is 500 yards from fence line
3. Distance endpoint for worst case scenario release from the +15 accumulator equals 1.5 miles.
4. There are 2,800 residents, schools, and major commercial and industrial areas within the distance to the endpoint.

Answer: Program 3 (public receptors within endpoint distant of worst case scenario and they are subject to OSHA PSM)

What Program?

An agricultural retailer located in commercial area has a 200-ton tank of anhydrous ammonia and an 18,000-gallon propane tank. Retailer unloads both chemicals from bulk tanks into smaller tanks then transported to farms. The facility is within 0.25 mile of residential and downtown city square.

1. Facility has one covered process: the 200-ton tank of ammonia
2. Propane not subject; flammable fuel for sale by retailer.
3. Worst case analysis potentially impacts residences and downtown.
4. Facility documented as not being subject to OSHA PSM

Answer: Program 2.

RMP Logistics

1. Facility electronically submits its RMP Registration utilizing the RMP eSubmit software
2. USEPA mails out 5-year anniversary reminders and 30-day late notice to RMP facilities
3. Ohio EPA receives copy of reminder letters. Ohio EPA to implement notification as well.
4. Ohio EPA reviews the RMP submitted by facility prior to inspection/audit.
5. Goal is to inspect facility every 5 years.
6. Ohio EPA utilizes “on-site risk management audit checklist” based on the program level of the facilities process(es).

RMP Logistics cont.

7. Ohio EPA creates either notice of violation or letter of compliance within 2 weeks of the visit seeking further documentation and/or action based on findings.
8. Ohio EPA works with facility seeking compliance with OAC 3745-104.
9. Most facilities come into compliance based on site inspection/visit.
10. About 1 out of 20 inspections result in enforcement proceedings.

Ohio EPA RMP Audits

- Audit each facility at least every 5 years
 - Review supporting documentation for hazard assessment & prevention program
 - Issue letter of compliance or notice of violation letter to facility
 - Submit missing documentation to Ohio EPA
 - Follow-up inspection
 - Enforcement if needed

E-Submit Reporting

- RMP registrations to USEPA are submitted online using system called “RMP*eSubmit”
 - It is a secured on-line database tool for reporting.
 - You can access your RMP on-line anytime and it’s FREE!!!!!!

RMP*eSubmit

- View the current version of RMP
- Create new RMP on-line
- Make corrections to, or create a new resubmission
- Help screens to assist in reporting properly
- **Must register as a preparer and/or certifier in the CDX-RMP Program to use.**
- www.cdx.epa.gov/epa_home.asp
- <http://www.epa.gov/rmp/rmpesubmit>
- <http://cdx.epa.gov/>
- 888-890-1995

RMP*eSubmit

- RMP Facility ID# from USEPA Reporting Center
- 12 digit number
- EPA Reporting Center 703-227-7650
- RMPPRC@epacdx.net

Common RMP Violations

- Not completing the recommendations from the process hazard analysis.
- Not annually reviewing the operating procedures
- Not conducting refresher training every three years.
- Not implementing a regular scheduled preventative maintenance program according to API standards.
- Not maintaining a contractor program

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Operating Procedures

OAC 3745-104-26

- Written procedures required for all activities associated with the **chlorine process**
- Required to annually review SOPs
- Must be accessible to operators

Operating Procedures

OAC 3745-104-26



- List the operating procedures that will be required
- How will you ensure that the procedures are annually reviewed and accessible to employees?

Operating Procedures

OAC 3745-104-26

- Procedures that could be associated with this chlorination process include:
 - Initial startup of chlorination process
 - Switching out chlorine cylinders
 - Normal operation of chlorination process
 - Temporary operations
 - Emergency shutdown
 - Startup after an emergency shutdown
 - Normal shutdown
 - Chlorine cylinder unloading and loading

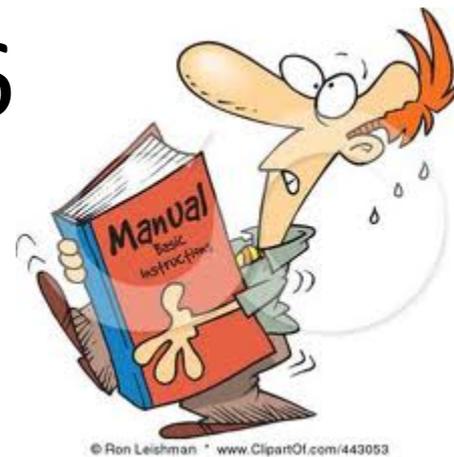
Operating Procedures

OAC 3745-104-26

- Required documentation
 - Complete set of operating procedures
 - Steps for each operating phase
 - Operating limits
 - Safety and health considerations
 - Safety systems and their functions
 - Documentation for annual certification
 - Describe how operators access SOPs

Operating Procedures

OAC 3745-104-26



- **Common deficiencies**

- Incomplete operating procedures
 - Not including a procedure for unloading cylinders from truck
- No annual certification

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Guidance Documents

- [General Risk Management Program Guidance](#)
- [Supplemental Risk Management Program Guidance for Ammonia Refrigeration Facilities](#)
- [Supplemental Risk Management Program Guidance for Wastewater Treatment Plants](#)
- [Risk Management Program Guidance for Propane Storage Facilities](#)
- [Risk Management Program Guidance for Warehouses](#)
- [Risk Management Program Guidance for Chemical Distributors](#)
- [Risk Management Program Guidance for Offsite Consequence Analysis](#)

- [Guidelines for Writing Effective Operating and Maintenance Procedures, Center for Chemical Process Safety of the **American Institute of Chemical Engineers 1996**](#)

Additional information

U.S. EPA website

<http://www.epa.gov/rmp>

<https://www.epa.gov/rmp/presentations-region-7-risk-management-plan-rmp-training-workshop>

<https://www.epa.gov/rmp/guidance-facilities-risk-management-programs-rmp>

Ohio EPA website

<http://www.epa.ohio.gov/dapc/atu/112r.aspx>

Sherri Swihart

Sherri.swihart@epa.ohio.gov

614-644-3594

Kim Joseph

Kim.joseph@epa.ohio.gov

614-644-2187

