

AN OVERVIEW OF RISK MANAGEMENT PLANS (RMP)

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RMP/PSM Overview



BACKGROUND

Federal Regulations

- Clean Air Act (CAA) 112(r), 11/15/90.
- OSHA PSM regulations first published in 1990 and became effective in 1992.
- EPA regulations first published in 1992 and became effective in 1996.
- Amendments.

RISK MANAGEMENT PLAN (RMP)

- Chemical Accident Prevention Provisions 40 CFR 68.
- Regulated by EPA.
- Protect the public and environment from the effects of a chemical release offsite.

ELEMENTS OF RMP

- Management System
- Hazard Assessment
- Emergency Response Plan
- Prevention Program (Program 3 facilities)
 1. Process Safety Information
 2. Process Hazard Analysis (PHA)
 3. Operating Procedures
 4. Training
 5. Mechanical Integrity
 6. Compliance Audits
 7. Incident Investigation
 8. Management of Change (MOC)
 9. Pre-startup Safety Review (PSSR)
 10. Employee Participation
 11. Hot Work Permit
 12. Contractors

PROCESS SAFETY MANAGEMENT (PSM)

- 29 Code of Federal Regulations (CFR) 1910.119.
- Regulated by OSHA.
- Protects employees in the workplace from releases of highly hazardous chemicals.
- 14 Elements.
- Applies to those companies that deal with any of the toxic and reactive chemicals or the flammable liquids and gases in listed quantities.

ELEMENTS OF PSM

1. **Process Safety Information**
2. **PHA**
3. **Operating Procedures**
4. **Training**
5. **Mechanical Integrity**
6. **MOC**
7. **PSSR**
8. **Employee Participation**
9. **Hot Work Permit**
10. **Contractor Evaluation/Selection**
11. **Incident Investigation**
12. **Compliance Audits**
13. **Emergency Response**
14. **Trade Secrets**

EPA RMP vs OSHA PSM

EPA RMP

- RMP required to be submitted
- Offsite Consequences Analysis
- Written Management System to oversee RMP implementation
- Program Levels
- PHAs must consider offsite impacts
- Emergency Response Plan (ERP) has specific requirements as previously mentioned
- PHAs every 5 years (offsite consequences)
- Audits every 3 years

OSHA PSM




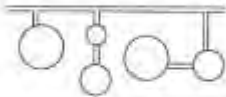



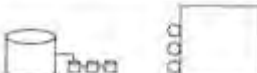
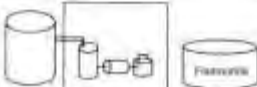
- No reporting of the PSM program
- No Offsite Consequences Analysis
- Written management system not required
- No Program Levels
- PHAs do not have to analyze offsite impacts
- Emergency Action Plan (CFR 1910.38)
- ERP required if the facility has an emergency response team
- PHAs every 5 years (no offsite consequences)
- Audits every 3 years

WHAT IS A PROCESS?

- Process is defined as any activity involving a regulated substance including any use, storage, manufacturing, handling or onsite movement of such substance, or a 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, shall be considered a single process.

PROCESS

EXHIBIT 1-2: PROCESS

Schematic Representation	Description	Interpretation
	1 vessel 1 regulated substance above TQ	1 process
	2 or more connected vessels same regulated substance above TQ	1 process
	2 or more connected vessels different regulated substances each above TQ	1 process
	pipeline feeding multiple vessels total above TQ	1 process
	2 or more vessels co-located same substance total above TQ	1 process
	2 or more vessels co-located different substances each above TQ	1 process
	2 vessels - located so they aren't involved in a single release same or different substances each above TQ	2 processes
	2 locations with regulated substances each above TQ	1 or 2 processes depending on distance
	1 series of interconnected vessels same or different substances above TQs plus a co-located storage vessel containing fermentables	1 process

RMP PREVENTION PROGRAMS

- **Program 1** – Processes with no public receptors within the distance to an endpoint from a worst-case release and with no incidents with specific offsite consequences within the past five years. Program 1 is subject to limited hazard assessment requirements and minimal prevention and emergency response requirements.
- **Program 2** – Processes not eligible for Program 1 or subject to Program 3. Program 2 is subject to streamlined prevention program requirements, hazard assessment, management, and emergency response requirements.
- **Program 3** – Process not eligible for Program 1 and are subject to OSHA PSM standards or classified in one of ten specified North American Industrial Classification System (NAICS) codes. Program 3 is subject to OSHA's PSM standard as the prevention program as well as additional hazard assessment, management, and emergency response requirements.

PREVENTION PROGRAM AND EMERGENCY RESPONSE

Program 1

- Worst-Case (WC) analysis
- Certify no Alternate Case (AC) analysis
- 5 year accident history
- Coordinate with Local Responders
- Certify no additional steps required

Program 2

- WC analysis
- AC analysis
- 5 year accident history
- Management System
- Emergency Response Plan
- Process Safety Information
- Hazard Review
- Operating Procedures
- Training
- Maintenance
- Incident Investigation

Program 3

- WC analysis
- AC analysis
- 5 year accident history
- Management System
- Emergency Response
- Process Safety Information
- Process Hazard Analysis
- Operating Procedures
- Training
- Mechanical Integrity
- Incident Investigation
- Compliance Audit
- MOCs
- PSSR
- Contractors
- Employee Participation
- Hot Work Permits

MANAGEMENT

- Designates overall responsibility for Risk Management Plan.
- Documents the positions of individuals who are responsible for each specific element of the program.

HAZARD ASSESSMENT

- Worst-Case Scenario
- Alternate Case Scenario
- 5 Year Accident History
- Documentation
 - Description & Rationale of Each Scenario
 - Weather Conditions
 - Dispersion Model
 - Offsite Receptors (Public & Environmental)
 - Height & Rate of Release
 - Temperature of Chemical
 - Endpoints
 - Mitigation

WORST-CASE RELEASE SCENARIO

- The greatest distance in any direction to an endpoint.
- Can incorporate administrative controls.
- Quantity determination
 - The greatest amount held in a single vessel, or
 - The greatest amount in a pipe
- One worst-case release scenario to represent all regulated toxic substances in Program 2 and Program 3 processes.
- One worst-case release scenario to represent all regulated flammable substances in Program 2 and Program 3 processes.
- Analyze additional worst-case scenarios if release scenarios from other covered processes at your facility would affect different public receptors.

ALTERNATIVE RELEASE SCENARIOS

- More likely to occur than worst-case scenario.
- One alternative release scenario for each regulated toxic substance in Program 2 and Program 3 processes.
- One alternative release scenario to represent all regulated flammable substances in Program 2 and Program 3 processes.
- Must reach offsite endpoint unless there are none.
- Can consider active mitigation systems, such as interlocks, shutdown systems, pressure relieving devices, flares, emergency isolation systems, and fire water and deluge systems, as well as passive mitigation systems.

SOFTWARE

- **RMP*Comp**
 - Free program used to complete the offsite consequence analyses.
 - Steps users through a short list of questions about the CAA regulated chemical (such as the amount released).
 - Estimates the distance to endpoint according to EPA's recommended procedures.
- **LandView 6 and MARPLOT®**
 - Estimate Population
 - Create Maps
- **Missouri Census Data Center Circular Area Profiles (CAPS) Version 10C**
 - Estimate Population

PROCESS SAFETY INFORMATION

- Written process safety information (prior to PHA).
- Purpose is to identify and understand the hazards posed by those processes involving regulated substances.
- Should include information pertaining to the hazards of the regulated substances used or produced by the process, the technology of the process, and the equipment in the process.

PROCESS SAFETY INFORMATION

■ Information includes:

- Toxicity Information
- Permissible exposure limits
- Physical data
- Reactivity data
- Corrosivity data
- Thermal and Chemical Stability
- Ventilation system design
- Relief System and design
- Hazardous effects of inadvertent mixing
- P&IDs
- Process Chemistry
- Safe Upper and Lower Limits
- Consequences of deviations
- Materials of construction
- Electrical classifications
- Safety systems
- Block Flow Diagrams

PROCESS SAFETY INFORMATION

- Information includes:
 - Documenting that equipment complies with recognized and generally accepted good engineering practices.
 - Documentation for existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in use, that the equipment is designed, maintained, inspected, tested and operating in a safe manner.

PROCESS HAZARD ANALYSIS

- Every five years
- Retain for life of the process
- Methodologies:
 - (1) What-If
 - (2) Checklist
 - (3) What-If/Checklist
 - (4) Hazard and Operability Study (HAZOP)
 - (5) Failure Mode and Effects Analysis (FMEA)
 - (6) Fault Tree Analysis
 - (7) An appropriate equivalent methodology
- Address hazards, identify previous incidents, admin controls, consequences of failure, *etc.* as listed in 68.67(c)

OPERATING PROCEDURES

- Develop written procedures for safely conducting activities.
- Information should include initial startup, normal operations, temporary operations, emergency shutdown, operating limits, safe work practices, *etc.* as listed in 68.69(a)(1) – 68.69(d).
- Develop safe work practices (*i.e.* lockout/tagout, confined space entry, *etc.*).
- Review as often as necessary; Certify annually 68.69(c).

TRAINING

- Initial training should include an overview of process and operating procedures.
- Refresher training should be provided at least every three years; consultation with employees.
- Documentation
 - Prepare a record with employee name, date of training, and the means used to verify training was understood.

MECHANICAL INTEGRITY

- Activities to ensure that equipment is designed, fabricated, procured, installed, and maintained appropriately.
- Inspections and testing should follow generally accepted good engineering practices and frequency should follow manufacturers' recommendations.
- Fixed equipment
- Rotating Equipment
- Electrical/Instrumentation
- New plant issues
 - Construction integrity
 - Installation integrity

MECHANICAL INTEGRITY

- Procedures
 - What code do they inspect to?
 - Identify inspection frequency.
- Established criticality
 - It's about risk and reliability
- Document trainings, inspections, tests, and deficiency corrections.
- Document date of inspection, who, and type of test.
- Fabrication of equipment is suitable.
- Performed appropriate checks for installation/ design specs.
- Maintenance materials are suitable.

MANAGEMENT OF CHANGE

- Develop written procedures to manage changes to process chemicals, technology, equipment, and procedures.
- Procedures should address: technical basis for change, impacts, modifications, time frame, *etc.* as listed in 68.75(b)(1)-68.75(b)(5).
- If a MOC is required, PSI and operating procedures will need to be updated.

PRE-STARTUP SAFETY REVIEW

- Perform for new and modified stationary sources.
- PSSR should confirm:
 - Construction and equipment is in accordance with design specifications.
 - Safety, operating, maintenance, and emergency procedures are in place.
 - A PHA has been performed and recommendations have been resolved or meet the requirements contained in MOC.
 - Training of each employee involved in operating a process has been completed.

COMPLIANCE AUDITS

- Conducted by at least one person knowledgeable in the process.
- Conducted every three years.
- Develop a report of the findings.
- Determine and document a response to each finding, and document deficiencies have been corrected.
- Retain two most recent compliance audit reports.

INCIDENT INVESTIGATION

- Promptly but not later than 48 hours, investigate each incident which resulted in or could have resulted in a catastrophic release.
- Include:
 - Date of incident
 - Date investigation began
 - A description of the incident
 - The factors that contributed to the incident
 - Any recommendations resulting from the investigation
- Document resolutions and corrective actions.
- Review with all affected personnel whose job tasks are relevant to the incident findings.
- Retain for five years.

EMPLOYEE PARTICIPATION

- Develop a written plan of action regarding the implementation.
- Consult with employees on the conduct and development of PHAs and on the development of the other elements of PSM.
- Access to PHAs and to all other information required.

HOT WORK PERMIT

- Issue a hot work permit for hot work operations conducted on or near a covered process.
- Document fire prevention and protection requirements.
- Keep on file until completion of the hot work operations.

CONTRACTORS

- Obtain and evaluate information regarding the contract owner or operator's safety performance and programs.
- Inform contract owner or operator of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.
- Explain Emergency Response Program.
- Develop and implement safe work practices consistent with § 68.69(d), to control the entrance, presence, and exit of the contract owner or operator and contract employees in covered process areas.
- Periodically evaluate performance.

EMERGENCY RESPONSE

- The Emergency Response Plan must include:
 - Procedures for informing the public and local emergency response agencies about accidental releases.
 - Documentation of proper first-aid and emergency medical treatment.
 - Procedures and measures for emergency response after an accidental release of a regulated substance.
 - Procedures for the use of emergency response equipment and for its inspection, testing, and maintenance.
 - Training for all employees in relevant procedures.
 - Procedures to review and update, as appropriate, the emergency response plan to reflect changes at the facility and ensure that employees are informed of changes.
 - Must be coordinated with the community emergency response plan.

Requirements for RMP Updates



RMP REQUIREMENTS

Facilities must submit a RMP

- By June 21, 1999;
- Three years after the date on which a regulated substance is first listed under 40 CFR 68.130; or
- The date on which a regulated substance is first present above a threshold quantity in a process.

RMP UPDATE REQUIREMENTS

RMPs must be resubmitted every five years or if any of the following changes occur:

- Within 6 months:
 - If a change alters the Program Level that applies to any covered process.
 - If a change requires a revised Offsite Consequence Analysis.
 - If a change requires a revised process hazard analysis or hazard review.

- If a new regulated substance is present above the threshold quantity in an already covered process, the RMP must be resubmitted on the date which the new substance is present.

- If a regulated substance is present above the threshold quantity in a new process, the RMP must be resubmitted on the date which the substance is present above the threshold quantity.

RMP UPDATE REQUIREMENTS

- If EPA begins regulating a new substance, the RMP must be resubmitted within three years of the date the substance is first regulated.
- A resubmission resets the five-year anniversary date by which the next RMP is due.

RMP CORRECTIONS

- Correcting a RMP refers to changing only a part of an existing RMP, such as changing a contact name or revising only a certain section. Corrections do not generate a new anniversary date.
 - Within one month of any change in the emergency contact information required under 68.160(b)(6), the owner or operator shall submit a correction of that information within 30 days.
 - New accident history information for any accidental release meeting the five year accident history reporting criteria of 68.42 shall be submitted within six months of the release or when the RMP is updated under 68.190, whichever is earlier.

Questions?

