PSM/ RMP Overview

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Understanding PSM and RMP—limit your risks early for the best results.
Agenda

• Define and Illustrate key parts of
  • OSHA 29 CFR 1910.119 Process Safety Management (PSM) and,
  • EPA Risk Management Plan (RMP) regulations - Section 112(r) of Clean Air Act
• Relativity of these regulations to you.
• Conservation of your resources while meeting standards.

These slides represent federal rules and do not take into account any state or local rules.

This information is being presented in a condensed format and may not include all elements of any particular regulation.
PSM VS RMP—what’s the difference

PSM-inside the property and is meant to protect human lives.

It includes everything that hazards can reach in the process.

RMP - outside the property and is meant to protect our environment and the community.

It includes homes, schools, rivers, trees, pretty much everything outside of your fence line.
PSM- Process Safety Management

• History
  • 1984 Bhopal India
    • Union Carbide- pesticide plant (methyl isocyanate gas)
    • Over 3700 deaths; over 500,000 injured
  • 1992 OHSA issues PSM Rules
    • Oversight for highly hazardous chemical
      Mfg, users, transport or storage.
  • 2005 Texas City Texas
    • 15 deaths; 180 injured
  • 2007 added a National Emphasis Program

Control Systems-
  instruments, mitigation

Alarms- people response
Highly Hazardous Chemicals

- OSHA 1910.119 and Subpart H- Ammonia, Hydrochloric Acid, H2S, and flammable gas such as methane.
- Cat 1 flammable gas or liquid over 10,000 lbs, within the covered process system.

Some States do not follow OSHA exemptions, such as for municipalities.
Covered Process System?

- Where does it begin and end?
- Any activity involving a highly hazardous chemical—any use, storage, manufacturing, handling, or the on-site movement of it.

This includes:
- Interconnected vessels
- Separate vessels that “could be” affected.
What IS PSM?

Employee Participation/ Involvement:
- Actual employees from all relative groups
- Be involved in all parts of PSM
- Accessible information to all.

Process Safety Information (PSI):
- List regulated substances and characteristics
- Show technology of process
- List all equipment and operation parameters

Process Hazard Analysis:
- Method
- Identify and analyze hazards of the process
- Define methods to control hazards

Operating Procedures:
- Create and oversee standard operating procedures.
- Ensure accuracy, periodic review and training
What IS PSM?

Training
• Upon hire or prior to new job assignments
• Refresher, at least every 3 years.

Contractors:
• Screening process- safety related
• Work authorization system

Pre-Startup Safety Review
• Means to confirm system meets the MOC
• Verification that safety, operational, maintenance and emergency procedures are in place.

Mechanical Integrity:
• Maintaining integrity and condition of equip.
• Inspection and testing of equipment
• Procedures and Training are in place
Hot Work Permits:
• Permit system
• Elimination of spark producing tools to ignite any flammables or combustible materials.
• Includes gas detection

Management Of Change (MOC):
• Defines what CHANGE is
• Must be reviewed PRIOR to change
• Includes provision for Temporary and Permanent changes.

Incident Investigation:
• Learn from past mistakes
• Review with employees (Emp. Participation)
• System for Resolution
Emergency Planning and Response:
• aka Emergency Action Plan/ Contingency
• Heavy on prevention
• Ability to respond (inside or outside ER)

Compliance Audits:
• Ensure that PSM elements meet the intended purpose by doing drills and documenting their presence.

Trade Secrets
• Limits disclosures for proprietary secrets.
• Does not reduce the protective mechanisms of PSM.
Why a PHA? What's wrong with brainstorming?

• PHA methods provide rules for how you review hazards.
• PHA will document your brainstorming.
• PHA allows you to justify why you took OR did not take a specific action.
• You can review your previous PHAs whenever a change occurs in the future.
• It is a requirement of OSHA.
Ultimately a PHA will

- Document potential Risks and how you have chosen to reduce them.
- Help you to understand how risk ranking can reduce your cost for compliance.

- Example: Backflow of process water could affect city water system
  - Without Safeguards:
    - Severity: HIGH; Likelihood: Likely to Occur
  - With Safeguards: 2 check valves, check valve maintenance and testing
    - Severity: HIGH; Likelihood: Improbable
## PHA Results

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Max Risk</th>
<th>Place(s) Used in HAZOP</th>
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</thead>
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<td>4. Recommendation 4</td>
<td>Very High</td>
<td>Consequences: 3.3.2.1</td>
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<td>8. Recommendation 8</td>
<td>Very High</td>
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<td>9. Recommendation 9</td>
<td>High</td>
<td>Consequences: 10.1.7.1, 10.2.5.1</td>
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<td>10. Recommendation 10</td>
<td>High</td>
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<td>11. Recommendation 11</td>
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<td>2. Recommendation 2</td>
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<td>5. Recommendation 5</td>
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<td>1. Recommendation 1</td>
<td>Medium</td>
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<td>3. Recommendation 3</td>
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<td>6. Recommendation 6</td>
<td>Medium</td>
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### 14 risks reduced by one safeguard

- Guard Rail System around pit
- Pedestrian Fall
- Driver Unloading
- Wet Process Slip
- Tight Work Area
- ETC
Conserve Your Resources

• Spend your money where it makes sense.
• Use your resources where it makes sense.
• Give yourself the best chance to:
  • Avoid Overplanning
  • Avoid Underplanning

Guard Rail: $1500

Fall Protection: $600
- anchor point
- means of retrieval $400+
- SOP for use and inspection
- Risk of those that fail to use it
- Worry

(engineer the problem out)
Summary

• OHSA’s PSM focus is to ________  ________.

• There are _______ elements of PSM.

• PHA main purpose is to identify and _________________ process hazards and find ways to _______________ them.
Risk Management Plan (RMP)

- Part of the Clean Air Act 1990 section 112(r);
  - Chemical facility accident prevention of “REGULATED SUBSTANCES”
  - Requirements:
    - Hazard Assessment - potential effects of an accidental release; **worst-case scenarios**
    - Prevention - precautions, maintenance, monitoring and training;
      - This will most likely be managed already through PSM
    - Emergency Response Program - training, **community response organization notifications**
    - Resubmission every 5 years.
Are you regulated by RMP?

• Owners/ Operators who manufacture, use, store or ‘otherwise handle’ regulated substances in a process.

• A ‘process’ is any activity involving a listed regulated substance, including any use, storage, manufacture, handling or onsite movement of such substance or any combination of these activities.

• General Duty Clause - see next slide.

• Regulated substances (toxic or flammable) examples
  • Ammonia (concentration of 20% or more) of a solution 20,000 lbs.; note PSM is 44% or more,
  • Methane and Propane 10,000 lbs.,
  • Hydrogen Sulfide 10,000 lbs.
Section 112(r)(1), also known as the General Duty Clause (GDC), which makes the owners and operators of facilities that have regulated and other extremely hazardous substances responsible for ensuring that their chemicals are managed safely.

• EPA further defines “other extremely hazardous substances” as:
  • any agent "which may or may not be listed or otherwise identified by any Government agency which may as the result of short-term exposures associated with releases to the air cause death, injury or property damage due to its toxicity, reactivity, flammability, volatility, or corrosivity".

General Duty Clause
Can I avoid RMP by reducing your inventory below the established thresholds?

“I don’t have to submit an RMP because I lowered my thresholds – and I believe that I lowered my risk. Am I still subject to the General Duty Clause?

Yes. If you use a regulated substance or any other extremely hazardous substance in any amount you are subject to the GDC.”.

- EPA General Duty Clause document EPA 550 - F-20-002
Summary

• EPA focus is to protect our ________________ and ________________.

• Each covered chemical must be reviewed and, if necessary, (re)submitted every _____________ years?

• If you do not meet the threshold limits of any listed, regulated substances then you will not be subject to EPA Clean Air Act 112(r)?
  • YES OR NO OR... ..MAYBE
Thank You!!

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