OSHA’s PSM Standard: Achieving Compliance and Avoiding Pitfalls

AIHA-RMS & ASSE
Fall Technical Conference
September 12, 2018

PRESENTED BY

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- **Purpose:** to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable, or explosive materials.
Achieving Compliance

- Process Hazard Analysis
- Process Safety Information
- Management of Change
  - Standard Operating Procedures
  - Piping & Instrument Diagrams
  - Training
- Mechanical Integrity and Preventative Maintenance
- Industry Standards
Process Hazard Analysis

- Centerpiece of the PSM standard.
- Identifies and analyzes the significance of potential hazards associated with highly hazardous chemicals.
- Must be conducted by a qualified team that has knowledge and experience specific to the process being evaluated and the methodology being used.
- Not subject to a 6-month statute of limitations for uncorrected deficiencies.
Process Safety Information

- Informational foundation and starting point for PHA team.

- The Process Safety Information database must include information about the chemicals, technology, and equipment used in a covered process.
Management of Change

- Operators must implement and maintain written procedures to manage changes to the process.
- MOC procedures must address:
  - The technical basis of the proposed change;
  - Any impact on safety and health;
  - Modifications to operating procedures;
  - The necessary time period for the change; and
  - Authorization requirements for the proposed change.
- Three areas stand out as being particularly important to consider:
  - Standard Operating Procedures
  - Piping and Instrument Diagrams
  - Training
Management of Change

- **Standard Operating Procedures**
  - Compliant MOC procedures must ensure SOPs are reviewed and updated as part of the MOC process itself.
  - Even minor changes can have implications for SOP developed and implemented for the process.

- **Piping and Instrument Diagrams**
  - Updating plant drawings, particularly P&IDs, should be addressed by MOC procedures.
Management of Change

- **Training**
  - PSM standard mandates employees be trained to safely work on the process on which they have been assigned.
  - Changes to a process can, and likely will, necessitate training on the new process.
  - MOC procedures should address training to ensure that the new hazards attendant to the new process are adequately communicated to employees.

- **Institutional and Organizational Change**
  - Although not required under the PSM standard, use of MOC procedures when undergoing institutional or organizational change can be very valuable for ensuring continued worker safety.
  - The 2005 BP Texas City refinery disaster that claimed 15 lives and injured 180 others. The Chemical Safety Board, in its investigation of the incident, identified that failure to follow MOC procedures upon transfer of the facility from Amoco to BP was a contributing factor in failure to ensure PSM compliance which they allege directly resulted in the disaster.
Mechanical Integrity and Preventative Maintenance

- The PSM standard requires the development and implementation of written procedures to address the ongoing mechanical integrity of process equipment.

- Mechanical integrity procedures are required for:
  - Pressure vessels and storage tanks;
  - Piping systems;
  - Relief and vent systems and devices;
  - Emergency shutdown systems;
  - Controls; and
  - Pumps.

- Test and inspection results must be documented and retained for the life of the process.

- A thorough and high quality preventative maintenance plan is a very effective way to comply with the mechanical integrity requirement.
Industry Standards

- Industry standards are referenced in the PSM standard and serve as guideposts for effective chemical and safety management.
- Several provisions of the PSM standard refer to recognized and generally accepted good engineering practices (RAGAGEP).
- RAGAGEP is not presently precisely defined in the PSM standard.

The Center for Chemical Process Safety defines RAGAGEP as: “RAGAGEP are the basis for engineering, operation, or maintenance activities and are themselves based on established codes, standards, published technical reports, or recommended practices or similar documents. RAGAGEPs detail generally approved ways to perform specific engineering, inspection, or mechanical integrity activities, such as fabricating a vessel, inspecting a storage tank, or servicing a relief valve.”
Generic Oil Company has decided to expand production at its mid-size refinery. This expansion will entail the installation of pressure vessels, a vent system, a fire control system, and piping connecting the proposed addition to the current facility. The piping system will be used to combine production from both the current and proposed facility.

What aspects of the PSM standard are implicated by this decision?
- P&Id
- PHA
- MOC
- New Operating Procedure
- New Training
- PSSR
- Contractor training
Avoiding Pitfalls

- From October 2016 to September 2017, the most cited provisions of the PSM standard were:
  - Mechanical Integrity
  - Process Safety Information
  - Process Hazard Analysis
  - Operating Procedures
  - Management of Change
Mechanical Integrity

- Mechanical integrity was the most cited provision of the PSM standard.
- A robust preventative maintenance plan is a very effective strategy to achieve compliance.
- Failure to maintain required documentation is a common factor in non-compliance.
- Records must be maintained for the life of the process.
- Operators should strive to avoid “breakdown maintenance.”
Process Safety Information

- The second most cited provision of the PSM standard is the PSI requirement.
- The PSI requirement generates a significant administrative burden at the outset of a process.
- The information that must be gathered for the PSI is comprehensive and complex, making management techniques that ensure responsibility to complete the PSI is properly apportioned essential.
Process Hazard Analysis

- Violations of the PHA requirement were commonly cited by OSHA.
- PHAs must be revalidated and updated on a five year schedule to ensure that the PHA is consistent with the current process.
- Operators must document resolution of recommendations made in the PHA.
- PHA documentation must be retained for the life of the process.
OSHA commonly cites operators for violation of the Operating procedures requirement for their failure to maintain updated written procedures.

Operating procedures must be regularly updated and certified on a yearly basis.

Common management techniques, including yearly compliance audits and the appointment of a document owner, can help ensure that operating procedures are adequately maintained.
Management of Change

- A common pitfall in compliance with the MOC requirement is over classification of changes as “replacements in kind.”
- Replacements in kind do not trigger the MOC requirement.
- Operators should avoid the temptation of attempting to fit as many changes as possible under the label of a replacement in kind.
Conclusion

- Achieving compliance with the Process Safety Management standard is difficult and requires the careful attention of all facility employees and management.

- Institutional focus on achieving compliance is essential to avoid the considerable penalties associated with violation of the standard.
Any Questions
For more information on these and other occupational safety and health topics, please visit:

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