PROCESS SAFETY MANAGEMENT (PSM) IN WOOD PRODUCTS MANUFACTURING

PSM OVERVIEW

INTRODUCTION TO PSM

PSM is the use of management principles and systems to identify, understand, avoid, and control process hazards to prevent, mitigate, prepare for, respond to, and recover from process-related incidents.

PSM provides wood products manufacturing facilities a framework to address risk associated with combustible dust to prevent loss-producing incidents, including fires and explosions.

PSM ELEMENTS

The CSA Z767 Process Safety Management Standard is a 16-element system.

Process Safety Management Elements			
Process safety leadership	Understanding hazards and risks	Risk management	Review and improvement
Accountability	Process knowledge and documentation	Training and competency	Investigation
Regulations, codes, and standards	Project review and design procedures	Management of change	Audits process
Process safety culture	Process risk assessment and risk reduction	Process and equipment integrity	Enhancement of process safety knowledge
Conduct of operations — senior management responsibility	Human factors	Emergency management planning	Key performance indicators

PSM ELEMENTS GLOSSARY

Accountability: Senior management accountability for the PSM system including establishing process safety goals and considering process safety risks throughout the facility lifecycle.

Regulations, standards, and codes: Management system for the control of pertinent regulations, standards, and codes to ensure relevant documentation is up to date, communicated with relevant stakeholders, and consistently used throughout the organization.

Process safety culture: Collective mindset of the organization with respect to safety and risk, including attitudes and behaviours.

Conduct of operations - senior management responsibility: Carrying out operational and management tasks in a methodical way to achieve excellence in operations.

Process knowledge and documentation: Process safety information, which consists of data relating to the characteristics of a process involving hazards, including hazardous materials properties, technologies and methods, equipment, and operation. This includes technical documentation, including piping and instrumentation diagrams (P&IDs), process flow diagrams, and process risk assessments.

Project review and design procedures: Consideration of risk assessments throughout project status, including request for approval, siting decisions, and the design process.

Process risk assessment and risk reduction: Identification and analysis of process-related hazards, documentation of hazard analyses, and implementation of risk reduction measures.

Human factors: Consideration of the role of human factors in process safety, including aspects like human error, written procedures, fatigue management and the use of engineering controls.

Training and competence: System in place to ensure that personnel have the required qualifications and competencies to fulfill their roles and responsibilities and conduct their tasks safely and effectively; includes experience, education, and training.

Management of change: Management of risks associated with changes to design, equipment, procedures, personnel, and the organization; and includes temporary and permanent changes.

Process and equipment integrity: Systems to ensure the integrity of the process and process equipment, including inspection, testing, and maintenance (ITM) of equipment, establishing safe work practices, and conducting a pre-startup safety review (PSSR) before running a new or modified process or equipment.

Emergency management planning: Program used to manage the consequences of hazardous scenarios that could arise from a loss of containment incident considering regulatory requirements, standards, and industry best practices, in the preparation for and response to an emergency.

Investigation: Program established to identify, report, investigate, and record process safety incidents. Process safety incidents include near misses as well as significant events.

Audit process: System for assessing the organization's current PSM program with respect to the standard (CSA Z767) to determine if the program conforms to the standard and if the PSM program is implemented and maintained.

Enhancement of process safety knowledge:
Continuous improvement of process safety knowledge through industry learnings and participation in various associations (e.g., professional, trade, labour, technical), and incorporation of advances and improvements where feasible.

Key performance indicators for process safety:
Use of leading and lagging indicators that are selected and monitored to target for improvement. Leading indicators are process-focussed metrics that signify the function of operating discipline, processes, or safety barriers/controls. Leading indicators are selected to provide an early signal of potential issues or degradation of safety controls so proactive corrective actions can be conducted. Lagging indicators are outcome-focussed metrics that can signify recurring issues and include events that have taken place.

BUSINESS BENEFITS OF PROCESS SAFETY MANAGEMENT

Corporate Social Responsibility – enhances image, reputation, and brand, which makes company more attractive

Business Flexibility – preserves resources that could be used to focus on growth because companies are welcomed by communities

Loss Prevention – prevents injuries and avoids major losses and environmental damage

Sustainable Growth – boosts productivity, delivers high-quality products on-time at lower cost, and contributes to shareholder value

Leadership Excellence – ensures consistency and reliability, which carries over to other business areas through involved leadership and management

MEASURABLE BENEFITS OF PSM

Increases in productivity

Reduction in production costs

Reduction in maintenance costs

Reduction in capital budget

Reduction in insurance costs

NEXT STEPS FOR WPAC MEMBERS

Building on the research results of an Innovation at Work project (funded by WorkSafeBC), the BC Forest Council and WPAC will support operations for the implementation of PSM, which will involve activities focussed on outcomes including:

- A PSM implementation guide, workplan and timelines,
- Self-assessment worksheets and action plans, and
- PSM procedures and policies.

RESOURCES

Process Safety Initiative (WorkSafeBC)

CSA Z767-17 Process Safety Management Standard (CSA Group)

References:

CCPS (Center for Chemical Process Safety). (2016). Guidelines for Implementing Process Safety Management. American Institute of Chemical Engineers (AIChE), New York, New York.

CCPS (Center for Chemical Process Safety). (2018). The Business Case for Process Safety. American Institute of Chemical Engineers (AIChE), New York, New York. Last retrieved April 14, 2023 from https://www.aiche.org/ccps/about/business-case-process-safety

CSA (Canadian Standards Association). (2017). Process safety management. CSA-Z767-17, National Standard of Canada. Toronto, ON: CSA Group.