Process Safety Management

Key Takeaways:
– Learning about the dangers associated with a catastrophic release of highly hazardous chemicals
– Understanding the purpose of Process Safety Management
– Recognizing the possible causes of hazardous chemical releases
– Learning good Process Safety Management Program components
– Realizing how a culture of safety contributes to the effectiveness of Process Safety Management
– Comprehending elements of Process Safety Information (PSI) and Process Hazard Analysis (PHA) that keep employees safe
– Identifying basic criteria for Emergency Planning and Response, Training, Pre-startup Safety Review, Management of Change, and Operating Procedures

Course Description
The U.S, Chemical Safety Board states that over 10,000 American workers are harmed by incidents involving chemicals annually.

A comprehensive approach to prevent chemical releases is process safety management. Effective process safety management programs will include an evaluation of the whole process including design and technology, and other elements that might impact the process. Proper chemical safety always starts with a thorough examination of work operations to identify and control risk and potential hazards related to handling of chemicals.

Workforce safety can be increased through process safety management. Presently, small businesses with limited resources might use other ways to decrease the risks associated with hazardous chemicals in the workplace, but development of a process safety management program is the operating standard. Employers must compile a written process information resource to create an effective process safety management program. Supplied information allows workers to identify and understand the hazards posed by processes that involve highly hazardous chemicals.

Included in the process safety information package, you’ll

discover technology and equipment information. Technology information should contain higher level information like block or process flow diagrams. Diagrams like such are used as visual tools to help users understand the process. Equipment information should contain more detailed information such as materials of construction, and piping and instrument diagrams.

Safety professionals are required by the Clean Air Act to talk with workers about efforts to develop and implement process safety management program elements and hazard assessments. As well, a written plan must be developed on how to engage workers for participation, how to train and inform them of any findings from an incident investigation if they were directly affected.

The process hazard analysis (PHA) (or, the process hazard evaluation) is critical for determining potential failure points in a process. Every process covered by the Process Safety Management of Highly Hazardous Chemicals standard must be analyzed.

The PHA discusses:
– Process hazards
– Every previous incident that had the potential for catastrophic consequences in the workplace
– Engineering and administrative controls and how to apply detection methodologies to provide early warning of releases
– Consequences of engineering or administrative control failure
– Facility siting
– Human factors
– Potential safety and health effects of control failure on employees

After completion of the PHA, your employer must establish a system to:
– Promptly address and resolve the team’s findings and recommendations
– Record future actions and resolutions
– Complete actions swiftly
– Create a schedule to complete actions
– Communicate actions to employees whose work may be affected

Operating protocols describe tasks, data, and safety and health precautions, and need to be accessible to employees whose work is part of a process. At the very least, the protocols should include the steps for each operating phase, emergency shutdown operations, safety and health considerations, properties and hazards of chemicals used in the process, and controls in case exposure does occur.

Methods to preventing exposure include engineering controls, administrative controls, and personal protective equipment.

Engineering controls typically involve:
– Enclosures
– Physical containment of the hazards
– Mechanical methods to separate personnel from contact (for example: exhaust ventilation)

Administrative controls are meant to protect personnel against exposure and duration of exposure to hazards.

Personal protective equipment (PPE) needed for chemical exposures include:
– Multiple types of respirators to eliminate or reduce the inhalation exposure
– Protective clothing for the hands, face, and body

A great method for increasing chemical safety is to reduce the inventory of chemicals on site to below threshold quantities, which decreases the chances of a catastrophic incident. In the case that reducing inventory isn’t possible, then spreading the inventory to several locations on site is a good option. This way, if a chemical release happens, the smaller amount that’s released won’t constitute a catastrophic condition. Simply put, you want to lower the concentration of hazardous chemicals stored together to minimize the risk of a major accident.