

Process Safety Management

Introduction to Process Safety Management:

OSHA standard 29 CFR 1910.119 (Process safety management of highly hazardous chemicals) contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. These releases may result in toxic, fire or explosion hazards.

The purpose of the standard is to aid employers in their efforts to prevent or mitigate episodic chemical releases that can lead to a catastrophe in the workplace and the surrounding community. To control these hazards, employers should develop the necessary expertise, experiences, judgment and proactive initiative within their workforce to properly implement and maintain an effective process safety management program.

Employee Involvement in Process Safety Management:

Section 304 of the Clean Air Act Amendments requires employers to consult with employees and their representatives regarding the employers' efforts in the development and implementation of a process safety management program, and to train and educate their employees and inform affected employees of findings from incident investigations required by the process safety management program. Many employers have already established health and safety programs which outline means and methods to keep employees and their representatives informed, and employers may be able to adapt these practices and procedures to meet their process safety obligations. Employers may wish to form a safety and health committee of employees and management representatives to help the employer meet these obligations. These committees can be a significant ally in helping the employer to implement and maintain an effective process safety management program for all employees.

Suggestions for Compliance:

Documentation: Maintain complete and accurate written information concerning process chemicals, process technology, and process equipment. Chemical information, including process intermediates, should be comprehensive enough for an accurate assessment of fire and explosion characteristics, reactivity hazards, workers' safety and health hazards, and corrosion and erosion effects on process equipment and monitoring tools. Current material safety data sheet (MSDS) information can be used to help meet this requirement, but must be supplemented with process chemistry information including runaway reaction and over pressure hazards if applicable. Equipment information may be obtained from the manufacturer and the codes and standards published by organizations like the American National Standards Institute, National Fire Protection Association, American Society for Testing and Materials, American Society of Mechanical Engineers, American Petroleum Institute, National Board of Boiler and Pressure Vessel Inspectors, National Association of Corrosion Engineers, American Society of Exchange Manufacturers Association, and model building code groups.

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Process Hazard Analysis (PHA): An organized, systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals, a PHA provides information to assist in making decisions that improve safety and reduce the consequences of unwanted or unplanned releases of hazardous chemicals. A PHA considers potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals. It focuses on equipment, instrumentation, utilities, human actions (routine and non-routine), and external factors that might impact the process. The PHA is dependent on good judgment, and any assumptions made during any study must be documented and understood by the team and reviewer and kept for a future PHA.

Generic PHA: Many small businesses use processes that are not unique, such as cold storage lockers or water treatment facilities. Where employer associations have a number of members with such facilities, a generic PHA, evolved from a checklist or what-if questions, could be developed and used by individual employers effectively to reflect their particular process; this would simplify compliance for them.

Operating Procedures and Practices: Tasks to be performed, data to be recorded, operating conditions to be maintained, samples to be collected, and safety and health precautions to be taken, may all be described by operating procedures and practices documentation. Procedures need to be technically accurate, understandable to employees, and revised periodically to ensure that they reflect current operations. They should include specific instructions or details on what steps are to be taken or followed in carrying out the stated procedures, applicable safety precautions and appropriate information on safety implications, and the logic of any software in use as well as the relationship between the equipment and the control system. If workers are not fluent in English, then procedures and instructions need to be prepared in their language.

Reductions of Inventory: A reduction in the inventory of the highly hazardous chemical will result in a reduction of the risk or potential for a catastrophic incident. Ordering smaller shipments and maintaining the minimum inventory necessary for efficient and safe operation may result in more efficient inventory control.

Dispersal of Inventory: The employer might consider dispersing inventory to several locations on site, where a release in one location will not cause a release in another location.

Hands-on Training: When employees can use their senses beyond listening, they learn better. For example, operating personnel who will work in a control room might be trained at a simulated control panel, with upset conditions of various types displayed on the simulator and the employee performing the proper operating procedures to bring the simulator panel back to normal operating parameters. A training environment could be created to help the trainee feel the full reality of the situation under controlled conditions.

Incident Investigation: When an employer finds out why accidents are happening, they can address underlying causes to prevent more, and more serious, accidents.

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