

Chemical Process Hazard Analysis

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ACRONYMS

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
CCPS	Center for Chemical Process Safety
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
ERPG	Emergency Response Planning Guideline
EVC	Equilibrium Vapor Concentration
FTAP	Fault Tree Analysis Program
FMEA	Failure Mode and Effects Analysis
HAZOP	Hazard and Operability
HHC	Highly Hazardous Chemical
IDLH	Immediately Dangerous to Life or Health
IRRAS	Integrated Reliability and Risk Analysis System
IEEE	Institute of Electrical and Electronic Engineers
ISA	Instrument Society of America
JHA	Job Hazard Analysis
LFL	Lower Flammability Limit
M&O	Management and Operation
MCS	Minimal Cut Set
MOC	Management of Change
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
ORC	Organization Resources Counselors
ORR	Operational Readiness Review
OSHA	Occupational Safety and Health Administration
P&ID	Piping and Instrumentation Diagram
PEL	Permissible Exposure Limit
PHA	Preliminary Hazards Analysis
PrHA	Process Hazard Analysis
PSI	Process Safety Information
PSM	Process Safety Management
PSR	Pre-Startup Safety Review
SAR	Safety Analysis Report
SHI	Substance Hazard Index
SOP	Standard Operating Procedure
TLV	Threshold Limit Value
TQ	Threshold Quantity
UFL	Upper Flammability Limit



GLOSSARY

Accident, Accident Event Sequence

An unplanned event or sequence of events that has an undesirable consequence.

Aggregate Threshold Quantity

The total amount of a hazardous chemical contained in vessels that are interconnected, or contained in a process and nearby unconnected vessels, that may be adversely affected by an event at that process.

Catastrophic Release

A major uncontrolled emission, fire, or explosion, involving one or more highly hazardous chemicals that presents serious danger to employees in the workplace or to the public.

Employee

Under 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals," an hourly, salaried, or contract person who works at a facility and comes in direct contact with a covered process.

Event

An occurrence involving process, equipment, or human performance either internal or external to a system that causes system upset. In terms of accidents, an event is either a cause or a contributing cause of a "near miss" or accident, or a response to the accident initiating event.

Facility

The buildings, containers, or equipment that contain a chemical process.

Flammable Gas

A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 13 percent by volume, regardless of the lower limit.



Flammable Liquid

Liquid with a flash point below 100 deg F (37.8 0 C), except mixtures where such liquids account for 1 percent or less of the total volume.

Hazard

A chemical property, energy source, or physical condition that has the potential to cause illness, injury, or death to personnel, or damage to property or to the environment, without regard for the likelihood or credibility of potential accidents or the mitigation of consequences.

Highly Hazardous Chemical

Toxic, reactive, flammable, or explosive substances, as defined in Appendix A of 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals."

Incident

An unplanned event that may or may not result in injuries and/or loss.

Near Miss

An event that did not result in an accidental release of a highly hazardous chemical, but which could have, given another "failure." Near misses, sometimes called "precursors," include:

- the occurrence of an accident initiator where the protection functioned properly to preclude a release of a highly hazardous chemical; or,
- the determination that a protection system was out of service such that if an initiating event had occurred, a release of a highly hazardous chemical would have taken place.

Normally Unoccupied Remote Facility

A facility that is operated, maintained, or serviced by workers who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks. No workers are regularly or permanently stationed at the facility. Such facilities are not contiguous with, and must be geographically remote from, all other buildings, processes, or persons. If workers spend more than 1 hour at a facility each day, that, facility is not considered to be normally unoccupied.



Probability

An expression of the expected likelihood of occurrence of an event or event sequence during an interval of time, or the likelihood of the success or failure of an event on test or on demand. By definition probability must be expressed as a number ranging from 0 to 1.

Process

Any onsite activity that involves a highly hazardous chemical, including any use, storage, manufacturing, handling, or movement of a highly hazardous chemical, or combination of these activities. Any interconnected group of vessels is considered a single process. Vessels with no physical interconnections located such that an accident in one vessel could spread to adjacent vessels are considered a single process.

Process Hazard

An inherent chemical or physical characteristic with the energy potential for damaging people, property, and/or the environment.

Process Hazards Analysis (PrHA)

The application of one or more analytical methods to identify and evaluate process hazards for the purpose of determining the adequacy of or need for control measures.

Process Safety Management

The application of management principles, methods, and practices to prevent and control accidental releases of process chemicals or energy.

PSM Rule

The Occupational Safety and Health Administration's rule "Process Safety Management of Highly Hazardous Chemicals," 29 CFR 1910.119.

Risk

The quantitative or qualitative expression of possible loss that considers both the probability that a hazard will result in an adverse event and the consequences of that event.

Threshold Quantity

As defined in 29 CFR 1910.119, the minimum amount of a toxic, reactive, or flammable chemical judged by OSHA as capable of causing a catastrophic event. The threshold quantity triggers application of the rule's requirements.



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