

## **FACT SHEET 15**

# **OSHA STANDARD 29 CFR 1910.119 – THE PROCESS SAFETY MANAGEMENT STANDARD**

### **1.0 INTRODUCTION**

Process safety is a blend of engineering and management skills focused on preventing catastrophic accidents, particularly explosions, fires, toxic releases associated with the use of chemicals and petroleum products. The OSHA rule is intended to prevent or minimize the consequences of a catastrophic release of toxic, reactive, flammable or explosive HHC's from a process such as the one that occurred in Bhopal, India in 1984. A process is defined as any activity or combination of activities that involves the use, storage, manufacturing, handling or on-site movement of HHC's. A process includes any group of vessels which are interconnected and separate vessels which are located such that a HHC could be involved in a potential release. OSHA intends to accomplish this goal by requiring a comprehensive management program that integrates technology, procedures, and best management practices.

The OSHA Process Safety Management (PSM) standard (29 CFR 1910.119) was published in the Federal Register on Monday, February 24, 1992. The original rule as proposed contained twelve key elements. Two more elements, employee participation and trade secrets were added before the final rule was published.

### **2.0 APPLICABILITY**

The OSHA standard applies to a process which contains a threshold quantity or greater amount of a toxic or reactive HHC as specified in Appendix A of the regulation. The rule also applies to activities involving 10,000 pounds or greater amounts of flammable liquids and gases and to the process activity of manufacturing explosives and pyrotechnics.

### **3.0 EXCEPTIONS**

The OSHA PSM standard does not apply to retail facilities, normally unoccupied remote facilities and oil or gas well drilling or servicing activities. Hydrocarbon fuels used solely for work place consumption as a fuel are also exempted, if such fuels are not part of a process containing

another HHC covered by the standard. Atmospheric tank storage and associated transfer of flammable liquids which are kept below their normal boiling point without benefit of chilling or refrigeration are not covered by the PSM standard unless the atmospheric tank is connected to a process or is sited in close proximity to a process that is covered in such a manner that an incident in a covered process could involve the atmospheric tank.

## 4.0 REGULATORY REQUIREMENTS:

### 4.1 PROCESS SAFETY INFORMATION

This element requires the compilation of written process safety information (PSI). This includes hazard information on HHC's at the site, technology information, and equipment information on the covered processes.

### 4.2 EMPLOYEE INVOLVEMENT

Compliance with this element of the regulation requires the employer to do the following:

- develop a written plan of action regarding employee participation;
- consult with employees and their representatives on the conduct and development of process hazard analyses and on the development of other elements of process safety management required under the rule;
- provide employees and their representatives access to process hazard analyses and to all other information required to be developed under the rule.

Employees include both work site and contractor employees.

### 4.3 PROCESS HAZARD ANALYSIS

This portion of the rule specifies that process hazard analyses (PHA's) must be conducted as soon as possible for each covered process using compiled PS in an order based on a set of required considerations.

Process hazard analyses must be updated and revalidated at least every five years and must be retained for the life of the process.

### 4.4 OPERATING PROCEDURES

PSM operating procedures must be in writing and provide clear instructions for safely conducting activities involving a covered process consistent with PSI. These procedures must include steps for each operating phase, operating limits, safety and health considerations and safety systems and their functions. The written procedures must be readily accessible to employees who work on or maintain a covered process, and be reviewed as often as necessary to assure they reflect current operating practice. Finally, the procedures must implement safe

work practices to provide for special circumstances such as lockout/tagout (LOTO) and confined space entry.

#### 4.5 TRAINING

Employees operating a covered process must be trained in the overview of the process and in the operating procedures for the process. This training must emphasize specific safety and health hazards, emergency operations and safe work practices. Initial PSM training must occur before assignment<sup>1</sup>. Documented refresher training is required at least every three years.

#### 4.6 CONTRACTORS

This element identifies responsibilities of the work site employer and contract employers with respect to contract employees involved in maintenance, repair, turnaround, major renovation or specialty work, on or near covered processes. Contract employers are required to train their employees to safely perform their jobs, and document that employees received and understood training. They are also required to assure that contract employees know about potential process hazards and the work site employer's emergency action plan. The contract employer is required to assure that employees follow safety rules of the facility, and advise the work site employer of the hazards that the contract work itself poses and any hazards identified by contract employees.

#### 4.7 PRE-STARTUP SAFETY REVIEW

The standard mandates a safety review for new facilities and significantly modified work sites to confirm that the construction and equipment of a process are operated in accordance with design specifications. The review also assures that adequate safety, operating, maintenance and emergency procedures are in place and process operator training has been completed. In new facilities, the PHA must be performed and recommendations resolved and implemented before start up of the process. Modified facilities must also meet management of change requirement.

#### 4.8 MECHANICAL INTEGRITY

Requires the on-site employer to establish and implement written procedures, such as preventive maintenance for the ongoing integrity of process equipment. This is particularly important for those components which contain and control a covered process.

#### 4.9 HOT WORK

Hot work permits must be issued for all hot work operations such as welding, cutting, and brazing that conducted on or near a covered process. This permit process involves documenting the type of inspections required under Subpart Q of the welding standards. A more complete perspective can be obtained from NFPA 51B.

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<sup>1</sup> Employers may certify that employees involved in the process prior to May 26, 1992, have the required knowledge, skills and abilities.

#### 4.10 MANAGEMENT OF CHANGE

The work site employer is required to establish and implement written procedures to manage changes except "replacements in kind" to facilities that affect a covered process. The standard requires the work site employer and contract employers to inform and train affected employees on these changes prior to start-up. Process safety information and operating procedures must be updated as necessary.

#### 4.11 INCIDENT INVESTIGATION

Employers are required to investigate, as soon as possible (but no later than 48 hours after), any incidents which did result in or could reasonably have resulted in a catastrophic release of chemicals covered by this standard. The standard calls for an investigation team, including at least one person knowledgeable in the process involved, (a contract employee when the incident involved contract work) and others with knowledge and experience to investigate and analyze the incident, and to develop a written report related to the incident. All incident investigation reports must be retained by the employer for five years.

#### 4.12 EMERGENCY PLANNING AND RESPONSE

The emergency planning and response element requires employers to develop and implement an emergency action plan relative to chemicals covered by the standard. The emergency action plan must include procedures for handling small releases.

#### 4.13 COMPLIANCE AUDITS

This element requires employers to certify that they have evaluated compliance with the process safety requirements at least every three years. Prompt response to audit findings and documentation that deficiencies have been corrected is required. Employers must retain the two most recent audit reports at their facilities.

#### 4.14 TRADE SECRETS

This portion of the regulations establishes requirements similar to trade secret provisions of the 1910.1200 Hazard Communication standard. It requires information maintained under the PSM standard to be made available to employees (and employees representatives). Employers may enter into confidentiality agreement with employees to prevent disclosure of trade secrets.

This Appendix contains a listing of toxic and reactive highly hazardous chemicals which present a potential for a catastrophic event at or above the threshold quantity.

CHEMICAL NAME	CAS*	TQ**
Acetaldehyde	75-07-0	2500
Acrolein (2-Popenal)	107-02-8	150
Acrylyl Chloride	814-68-6	250
Allyl Chloride	107-05-1	1000
Allylamine	107-11-9	1000
Alkylaluminum	Varies	5000
Ammonia, Anhydrous	7664-41-7	10000
Ammonia solutions (greater than 44% ammonia by weight)	7664-41-7	15000
Ammonium Perchlorate	7790-98-9	7500
Ammonium Permanganate	7787-36-2	7500
Arsine (also called Arsenic Hydride)	7784-42-1	100
Bis(Chloromethyl) Ether	542-88-1	100
Boron Trichloride	10294-34-5	2500
Boron Trifluoride	7637-07-2	250
Bromine	7726-95-6	1500
Bromine Chloride	13863-41-7	1500
Bromine Pentafluoride	7789-30-2	2500
Bromine Trifluoride	7787-71-5	15000
3-Bromopropyne (also called Propargyl Bromide)	106-96-7	100
Butyl Hydroperoxide (Tertiary)	75-91-2	5000
Butyl Perbenzoate (Tertiary)	614-45-9	7500
Carbonyl Chloride (see Phosgene)	75-44-5	100
Carbonyl Fluoride	353-50-4	2500
Cellulose Nitrate (concentration greater than 12.6% nitrogen)	9004-70-0	2500
Chlorine	7782-50-5	1500
Chlorine Dioxide	10049-04-4	1000
Chlorine Pentafluoride	13637-63-3	1000
Chlorine Trifluoride	7790-91-2	1000
Chlorodiethylaluminum (also called Diethylaluminum Chloride)	96-10-6	5000
1-Chloro-2,4-Dinitrobenzene	97-00-7	5000
Chloromethyl Methyl Ether	107-30-2	500
Chloropicrin	76-06-2	500
Chloropicrin and Methyl Bromide mixture	None	1500
Chloropicrin and Methyl Chloride mixture	None	1500
Cumene Hydroperoxide	80-15-9	5000
Cyanogen	460-19-5	2500
Cyanogen Chloride	506-77-4	500
Cyanuric Fluoride	675-14-9	100
Diacetyl Peroxide (concentration greater than 70%)	110-22-5	5000
Diazomethane	334-88-3	500
Dibenzoyl Peroxide	94-36-0	7500
Diborane	19287-45-7	100
Dibutyl Peroxide (Tertiary)	110-05-4	5000
Dichloro Acetylene	7572-29-4	250
Dichlorosilane	4109-96-0	2500
Diethylzinc	557-20-0	10000

Diisopropyl Peroxydicarbonate	105-64-6	7500
Dilauroyl Peroxide	105-74-8	7500
Dimethyldichlorosilane	75-78-5	1000
Dimethylhydrazine, 1,1-	57-14-7	1000
Dimethylamine, Anhydrous	124-40-3	2500
2,4-Dinitroaniline	97-02-9	5000
Ethyl Methyl Ketone Peroxide (also Methyl Ethyl Ketone Peroxide; concentration greater than 60%)	1338-23-4	5000
Ethyl Nitrite	109-95-5	5000
Ethylamine	75-04-7	7500
Ethylene Fluorohydrin	371-62-0	100
Ethylene Oxide	75-21-8	5000
Ethyleneimine	151-56-4	1000
Fluorine	7782-41-4	1000
Formaldehyde (Formalin)	50-00-0	1000
Furan	110-00-9	500
Hexafluoroacetone	684-16-2	5000
Hydrochloric Acid, Anhydrous	7647-01-0	5000
Hydrofluoric Acid, Anhydrous	7664-39-3	1000
Hydrogen Bromide	10035-10-6	5000
Hydrogen Chloride	7647-01-0	5000
Hydrogen Cyanide, Anhydrous	74-90-8	1000
Hydrogen Fluoride	7664-39-3	1000
Hydrogen Peroxide (52% by weight or greater)	7722-84-1	7500
Hydrogen Selenide	7783-07-5	150
Hydrogen Sulfide	7783-06-4	1500
Hydroxylamine	7803-49-8	2500
Iron, Pentacarbonyl	13463-40-6	250
Isopropylamine	75-31-0	5000
Ketene	463-51-4	100
Methacrylaldehyde	78-85-3	1000
Methacryloyl Chloride	920-46-7	150
Methacryloyloxyethyl Isocyanate	30674-80-7	100
Methyl Acrylonitrile	126-98-7	250
Methylamine, Anhydrous	74-89-5	1000
Methyl Bromide	74-83-9	2500
Methyl Chloride	74-87-3	15000
Methyl Chloroformate	79-22-1	500
Methyl Ethyl Ketone Peroxide (concentration greater than 60%)	1338-23-4	5000
Methyl Fluoroacetate	453-18-9	100
Methyl Fluorosulfate	421-20-5	100
Methyl Hydrazine	60-34-4	100
Methyl Iodide	74-88-4	7500
Methyl Isocyanate	624-83-9	250
Methyl Mercaptan	74-93-1	5000
Methyl Vinyl Ketone	79-84-4	100
Methyltrichlorosilane	75-79-6	500
Nickel Carbonyl (Nickel Tetracarbonyl)	13463-39-3	150
Nitric Acid (94.5% by weight or greater)	7697-37-2	500
Nitric Oxide	10102-43-9	250
Nitroaniline (para nitroaniline)	100-01-6	5000
Nitromethane	75-52-5	2500
Nitrogen Dioxide	10102-44-0	250

Nitrogen Oxides (NO; NO <sub>2</sub> ; N <sub>2</sub> O <sub>4</sub> ; N <sub>2</sub> O <sub>3</sub> )	10102-44-0	250
Nitrogen Tetroxide (also called Nitrogen Peroxide)	10544-72-6	250
Nitrogen Trifluoride	7783-54-2	5000
Nitrogen Trioxide	10544-73-7	250
Oleum (65% to 80% by weight; also called Fuming Sulfuric Acid)	8014-94-7	1000
Osmium Tetroxide	20816-12-0	100
Oxygen Difluoride (Fluorine Monoxide)	7783-41-7	100
Ozone	10028-15-6	100
Pentaborane	19624-22-7	100
Peracetic Acid (conc. greater 60% Acetic Acid; also called Peroxyacetic Acid)	79-21-0	1000
Perchloric Acid (concentration greater than 60% by weight)	7601-90-3	5000
Perchloromethyl Mercaptan	594-42-3	150
Perchloryl Fluoride	7616-94-6	5000
Peroxyacetic Acid (conc. more than 60% Acetic Acid; also called Peracetic Acid)	79-21-0	1000
Phosgene (also called Carbonyl Chloride)	75-44-5	100
Phosphine (Hydrogen Phosphide)	7803-51-2	100
Phosphorus Oxychloride (also called Phosphoryl Chloride)	10025-87-3	1000
Phosphorus Trichloride	7719-12-2	1000
Phosphoryl Chloride (also called Phosphorus Oxychloride)	10025-87-3	1000
Propargyl Bromide	106-96-7	100
Propyl Nitrate	627-3-4	2500
Sarin	107-44-8	100
Selenium Hexafluoride	7783-79-1	1000
Stibine (Antimony Hydride)	7803-52-3	500
Sulfur Dioxide (liquid)	7446-09-5	1000
Sulfur Pentafluoride	5714-22-7	250
Sulfur Tetrafluoride	7783-60-0	250
Sulfur Trioxide (also called Sulfuric Anhydride)	7446-11-9	1000
Sulfuric Anhydride (also called Sulfur Trioxide)	7446-11-9	1000
Tellurium Hexafluoride	7783-80-4	250
Tetrafluoroethylene	116-14-3	5000
Tetrafluorohydrazine	10036-47-2	5000
Tetramethyl Lead	75-74-1	1000
Thionyl Chloride	7719-09-7	250
Trichloro (chloromethyl) Silane	1558-25-4	100
Trichloro (dichlorophenyl) Silane	27137-85-5	2500
Trichlorosilane	10025-78-2	5000
Trifluorochloroethylene	79-38-9	10000
Trimethoxysilane	2487-90-3	1500

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Footnote\* Chemical Abstract Service Number

Footnote\*\* Threshold Quantity in Pounds (Amount necessary to be covered by this standard.)