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Process Safety Management for Storage Facilities

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Occupational Safety and Health Act of 1970

"To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health."

This guidance document is not a standard or regulation, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace. The *Occupational Safety and Health Act* requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.

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Process Safety Management for Storage Facilities

U.S. Department of Labor
Occupational Safety and Health Administration

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Purpose

This document does not cover the entire Process Safety Management (PSM) standard, but only focuses on aspects of the standard particularly relevant to storage facilities. For a full compliance guide to PSM, please refer to OSHA 3132[1] or the full text of the standard at www.osha.gov.[2] Although all elements of the PSM standard apply to a PSM-covered storage facility, the following elements of the standard are most relevant to hazards associated with storage facilities:

- Employee Participation
- Process Safety Information (PSI)
- Process Hazard Analysis
- Operating Procedures
- Training
- Mechanical Integrity (MI)
- Emergency Planning and Response

PSM is critically important to facilities that store highly hazardous chemicals. Implementing the required safety programs help prevent fires, explosions, large chemical spills, toxic gas releases, runaway chemical reactions, and other major incidents. This will ensure that employees, contractors, facility visitors and emergency responders are safe from these hazards. Compliance will also benefit employers by minimizing damage to facility equipment and neighboring structures in the event of an HHC release.

Between 1997 and 2013, there have been numerous incidents at storage facilities that have caused serious injuries and fatalities to employees. Several examples are included below:

- In 2013, a facility that stored and distributed compressed propane gas was largely destroyed by a series of fires and explosions. After receiving spent propane gas cylinders, employees would “bleed” any remaining gas into the air

1. www.osha.gov/Publications/osha3132.pdf
2. www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9760

before the cylinders were cleaned and reused. On the night of the incident, investigators believe, this practice resulted in a cloud of flammable propane gas at the facility, which was ignited by a spark from a forklift operating in the area. The resulting explosions and fires injured several employees—four critically.

- In 2008, a nearly 90-year-old storage tank catastrophically failed and released approximately 2.1 million gallons of liquid fertilizer. The collapsing tank seriously injured two employees, and the chemicals flowed over containment berms. Investigators determined that defective welds likely caused the tank failure, and inspectors condemned another tank at the same facility that presented an "imminent danger" of failure. Major contributing factors were the inadequacy of tank weld inspections and overestimates of the maximum liquid levels that the tank could safely accommodate. Further, some tank inspection and testing activities did not follow recognized and generally accepted good engineering practices. This is a recurring category of incident: between 1995 and 2008, 16 tanks at other facilities catastrophically failed, killing one employee and hospitalizing four others. Faulty welding caused 11 of these tank failures (CSB, 2009).
- In 2005, a fire and subsequent explosion(s) destroyed a facility that stored and distributed compressed gas, and propelled debris and projectiles. The incident was traced back to propylene gas cylinders in the facility's storage area that were directly exposed to sunlight. High temperatures from the sunlight exposure increased cylinder pressure enough to cause flammable vapors to leak from the cylinders and catch fire. Heat from the initial fire caused other cylinders to leak gas. The fire spread throughout the storage area and eventually consumed nearly 8,000 cylinders of compressed gas.
- In 2003, an industrial facility that stores and distributes chlorine received a routine railcar shipment of liquid chlorine. The chlorine was transferred to a bulk trailer, a procedure that the facility had conducted for many

years without serious incident. The loading process was equipped with a scrubber, which was designed to control chlorine vapors displaced during trailer filling. On the day of the incident, chlorine vapors overwhelmed the scrubbers' capacity, and up to 1,920 pounds of chlorine escaped into the air. This incident occurred in a process for which a process hazard analysis had already been conducted. However, investigators found that the process hazard analysis failed to consider the consequences of chlorine gases overloading the scrubbers (CSB, 2007).

- In 1999, a truck driver was killed and an employee injured when a chemical shipment was inadvertently loaded into the wrong tank. Due to this error, incompatible chemicals came into contact, reacted, and released a cloud of toxic gas containing lethal levels of hydrogen sulfide. In this case, the employer's failure to have adequate process safety information on chemical incompatibilities, its inadequate chemical unloading procedures, and its failure to implement appropriate controls all contributed to the incident (NTSB, 2001). Other similar incidents have been recorded. A 1998 incident investigated by the National Transportation Safety Board (NTSB) occurred when inadvertent mixing of incompatible chemicals at a facility's loading dock released toxic gases. That incident injured seven people—including two first responders—and caused 3,000 workers to be evacuated or instructed to shelter in place (NTSB, 2000).
- In 1997, three firefighters were killed by flying debris from an explosion in the storage area of a pesticide distribution facility. Investigators concluded that the explosion was most likely caused by a sack of thermally unstable material that had been placed too close to a hot compressor discharge pipe. The heat from the pipe caused the material to decompose and release flammable vapors, which eventually ignited and exploded. The investigators recommended that safety programs to review hazards should be implemented at all facilities that store, manufacture, handle, or use hazardous chemicals (EPA 1999).

Applicability

The Process Safety Management standard covers processes which involve a chemical at or above the specified threshold quantity (TQ) listed in Appendix A of the PSM standard[3], unless another Federal Agency has jurisdiction.[4] The PSM standard is also applicable to processes containing a Category 1 flammable gas (as defined in 1910.1200(c)) or a flammable liquid with a flashpoint below 100 °F (37.8 °C) on site in one location, in a quantity of 10,000 pounds (4535.9 kg) or more. A "process" is defined by OSHA in the PSM standard as "any activity involving a highly hazardous chemical including any use, storage, manufacturing, handling, or the on-site movement of such chemicals, or combination of these activities."[5] The standard also states that any group of vessels which are interconnected and separate vessels that are located such that a highly hazardous chemical could be involved in a potential release, shall be considered a single process.

The following operations are excepted from the PSM standard's scope, which may apply to some storage facilities:

- Retail facilities
- Hydrocarbon fuels used solely for workplace consumption as a fuel (e.g., propane used for comfort heating, gasoline for vehicle refueling), if such fuels are not a part of a process containing another highly hazardous chemical (HHC) covered by the PSM standard
- Flammable liquids with a flashpoint below 100 °F (37.8 °C) stored in atmospheric tanks or transferred which are kept below their normal boiling point without benefit of chilling or refrigeration. (Note: Atmospheric tanks are storage tanks designed to operate at pressures from atmospheric through 0.5 psig)

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3. Calculation of TQ for mixtures is explained in an OSHA Letter of Interpretation at www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=30848

4. Section 4(b)(1) of the OSH Act, 29 U.S.C. 653(b)(1), provides that OSHA has no authority to regulate a working condition if another federal agency exercises statutory authority to prescribe or enforce a standard or regulation addressing that working condition. Thus, except as noted, if another federal agency has or enforces a standard or regulation addressing accidental releases of regulated substances, the OSH Act does not apply to that working condition.

5. 29 CFR 1910.119.

- Oil or gas well drilling or servicing operations[6]
- Normally unoccupied remote facilities[7]

All storage facilities that do not fit under one of these exemptions should determine whether they fall under the OSHA PSM standard and comply with the standard if they do.

Storage facilities typically have considerably less complex process safety issues than facilities with large chemical manufacturing operations, which may make compliance easier and less costly. Some organizations and trade associations provide PSM compliance resources for their members. Those that may address storage activities include, but are not limited to:

- Insurance companies
- Local fire officials
- National Association of Chemical Distributors (NACD)
- Center for Chemical Process Safety (CCPS)
- Agricultural Retailers Association (ARA)
- American Chemistry Council (ACC)
- Society of Chemical Manufacturers and Affiliates (SOCMA)
- American Petroleum Institute (API)
- The Fertilizer Institute (TFI)
- Compressed Gas Association (CGA)
- National Fire Protection Association (NFPA)
- International Warehouse Logistics Association (IWLA)

Small businesses may contact OSHA's free On-site Consultation Program for help with identifying and mitigating workplace hazards. OSHA's On-site Consultation Program offers free and confidential occupational safety and health services to small and medium-sized businesses in all states and several territories, with priority given to high-hazard worksites. On-site Consultation services are separate from enforcement and do not result in penalties or citations.

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6. Letter of Interpretation: www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=23727

7. Letter of Interpretation: www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22592

Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing and improving safety and health programs. To locate the OSHA On-site Consultation Program nearest you, call 1-800-321-6742 (OSHA) or visit www.osha.gov/consultation.

Although all elements of the PSM standard apply to a PSM-covered storage facility, the following elements of the PSM standard are particularly relevant to hazards associated with storage facilities:

Employee Participation

Employees with experience in hazard identification and prevention are vital to workplace safety. Workplace safety is taken seriously if employees are committed to following health and safety procedures and have a sincere interest in developing them.

The PSM standard requires that employers covered under the standard:

- Develop a written plan of action regarding how they will implement employee participation.
- Consult their employees and their representatives regarding conducting and developing process hazard analysis (PHAs) and other elements of process safety management.
- Ensure that their employees and their representatives have access to PHAs and all other information required to be developed by the PSM standard.

Process Safety Information

Employers are required to compile written process safety information (PSI). The compilation of written process safety information will help the employer and the workers involved in operating the process to identify and understand the hazards

involved in their processes. Process safety information must include information on the hazards of the highly hazardous chemicals used or produced by the process, information on the technology of the process, and information on the equipment used in the process. Process safety information for the storage of highly hazardous chemicals will usually be considerably less extensive than that required for the manufacture or use of such chemicals.

Information on Highly Hazardous Chemicals

For every highly hazardous chemical, PSM requires that employers compile information on chemical toxicity, permissible exposure limits, physical data, reactivity data, corrosivity data, thermal and chemical stability data, and hazardous effects associated with inadvertent mixing of chemicals that may occur. Facilities are required by OSHA's Hazard Communication standard to have Safety Data Sheets (SDSs) for hazardous chemicals in their workplaces, which often contain some of this information. If an employer does not already have an SDS, it must obtain it from its chemical suppliers.

Storage facilities should be aware of reactivity hazards including unstable substances or incompatibility issues. The Center for Chemical Process Safety (CCPS) provides basic guidance on chemical reactivity, which facilities can consult on the CCPS webpage.[8]

The NOAA/EPA/CCPS Chemical Reactivity Worksheet[9] is available to aid in identifying potentially incompatible chemicals.

Information on Process Technology

Process technology is likely much less complicated when the employer only stores chemicals, rather than processing, mixing, or deliberately reacting them.

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8. www.aiche.org/ccps/topics/process-safety-technical-areas/chemical-reactivity-hazards/reactive-material-hazards
9. www.aiche.org/ccps/resources/chemical-reactivity-worksheet-40

Process technology information must include:

- Diagrams (Block, Process Flow) – an example of which is shown in non-mandatory Appendix B of the PSM standard,
- Maximum inventory levels for all chemicals in the PSM-covered process,
- Safe upper and lower process limits for such items as temperatures, pressures, flows or compositions, and
- An evaluation of the consequences of deviation, including those affecting the safety and health of employees, that could occur if operating beyond the established process limits.

Information on the Process Equipment

Many storage facilities may have minimal process equipment. Nevertheless, facilities must collect information on equipment that is part of the PSM-covered process. Typical equipment may include: storage tanks, piping, pumps, containers, pressure relief systems, dikes, ventilation equipment, alarms, controls, process safeguards and monitoring equipment.

Employers are required to collect equipment information on materials of construction, piping and instrument diagrams (P&IDs), electrical classifications, relief system design and design basis, ventilation system designs, and safety systems. For facilities using packaged storage systems, the manufacturer will provide most, if not all, of this information.

Facilities without piping such as those that store small containers only, typically will not have P&IDs. Questions on applicability of specific PSM requirements pertaining to unique situations should be referred to OSHA's Directorate of Enforcement Programs or the appropriate OSHA Consultation Program Office.

Employers must document that all equipment complies with recognized and generally accepted good engineering practices (RAGAGEP). OSHA has published guidance[10] clarifying

10. www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=30785

RAGAGEP requirements and identifying potential sources of RAGAGEP. In all cases, the RAGAGEP must be both "recognized and generally accepted" **and** "good engineering practices".

In addition, depending on the classification of the stored contents, storage tanks may bear a marking identifying compliance with the appropriate codes or standards under which the container is constructed, such as the ASME Boiler and Pressure Vessel Code. Other markings may also be required by the National Board of Boiler and Pressure Vessel Inspectors. Typical information on storage tanks may include this information as well as manufacturer name, installation date, materials of construction (to ensure compatibility with the commodity being stored), pressure rating, wall thickness and volume. If the compliance traceability of the storage tank design is unknown, most applicable RAGAGEP states that the tank cannot be used until inspected and certified by an appropriate certifying authority. For pressure vessels with no "traceability," such as those with no nameplate and minimal or no design or construction documentation, the employer should verify the fitness-for-operations integrity of the vessels by utilizing the procedure contained in API 510, Section 6.7 or other appropriately recognized standard. Employers should also collect data on transfer hoses, vapor control systems, pressure relief systems, level controls, spill control and containment mechanisms, and other equipment associated with the process.

Process Hazard Analysis (PHA)

A process hazard analysis is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing and handling of highly hazardous chemicals. A PHA team must be comprised of personnel that are knowledgeable in engineering and process operations, at least one employee familiar with the process being evaluated, and at least one employee knowledgeable in the specific process hazard analysis methodology being used.

The team analyzes potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals, and major spills of hazardous chemicals. The team conducting the PHA must make recommendations for additional safeguards to adequately control identified hazards or to mitigate their effects. Safeguards may include inherently safer or passive approaches to hazard control, or suggesting new engineering controls (e.g., improved fire detection and suppression systems at facilities that store heat-sensitive chemicals) or administrative controls (e.g., new operating procedures, inventory control measures, separation of highly hazardous chemicals into different storage areas).

Employers that operate more than one storage facility with identical equipment and processes may be able to develop just one hazard analysis and then customize it based on the specific hazards present at each facility.

Process hazard analyses must be reviewed and revalidated at least every five years.

Employers must develop systems to promptly address hazards identified and the process hazard analyses' findings and recommendations, document how each item was resolved, and inform affected employees of any process changes made.

Specific items storage facilities may consider when conducting a PHA include:

- Making sure incompatible materials are separated, e.g., oxidizers and combustible/flammable materials
- Siting hazards – such as vehicle impact and appropriate separation of occupied buildings
- Temperature hazards – are you storing materials with temperature stability limits?
- Toxic hazards – ventilation issues
- Potential impacts of on-site accidental releases
- Fire zone separation

The PSM standard allows PHAs to be conducted by many different methodologies, enabling facilities to address their unique process safety challenges in a manner that is most appropriate and cost-effective for them. Typically, storage facilities should be able to use less sophisticated techniques such as What-if, Checklists, or a combination of accepted methods. Additional guidance can be found on OSHA's Hazard Identification and Assessment, and Hazard Prevention and Control webpages.[11, 12]

Operating Procedures

Employers are required to develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information. Operating procedures must cover not only normal operations, but also other situations such as startup, temporary operations, and emergency shutdown. Important safety information, including the basic hazards encountered or that could be encountered in the process, shall be included in the operating procedures. The procedures need to be available to all operators, and be accurate and current. Employers should check the date of the operating procedure(s) being used be checked prior to each use to verify that only the most current version is being used before proceeding. The operation may need to be placed on hold if an out-of-date procedure is discovered or an error affecting form, fit, or function in the process is noted, unless the facility has developed and implemented a Management of Change (MOC) procedure to address the situation. Employers must certify annually that their operating procedures are current and accurate.

Helpful resources to consult in developing effective written operating procedures include input from equipment manufacturers or designers, facility employees with unique insights into operations, chemical suppliers, or external references.

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11. www.osha.gov/shpguidelines/hazard-Identification.html
12. www.osha.gov/shpguidelines/hazard-prevention.html

Although storage facilities typically have relatively few procedures, when highly hazardous chemicals are involved, it is still critically important that these procedures are thorough, clear, and communicated effectively to employees. Operating procedures must be covered in training courses for employees involved in the process and reviewed during mandatory three-year PSM compliance audits. Employers must ensure that employees both understand and routinely follow the procedures.

Examples of storage facility operating procedures include:

- Container transfer/storage procedures – including proper handling of the container to avoid loss of containment; appropriate locations for stored chemicals; and signs of damaged storage containers
- Storage tank loading/unloading procedures – including proper connection/valve operating sequence, maximum intended inventory, maximum intended pressure, and receiving documentation procedures
- Administrative procedures – including limited personnel access to toxic or flammable storage areas, restrictions for forklift access or ignition source introduction
- Emergency operations – including loss of containment, fire response, and evacuation procedures

Training

Employers must provide initial and refresher training to every employee involved in operating a PSM-covered process. Training must also cover the facility's procedures for emergency operations, such as loss of containment scenarios. The level of training may vary for each employee. For example, those who work in the area or operate the equipment will receive more extensive training than visitors or other non-operational personnel, which would require awareness training. Employers must also train contractors or temporary employees on known potential fire, explosion, or toxic release hazards associated with their work and the processes.

Depending on the facility, training required for employees at storage facilities may include instructions on how employees handle storage containers, including proper operation and correct grounding during storage and transfer. For instance, even though some containers may be small and may appear non-threatening, it is important to inform workers of the dangers of the chemicals they contain. Storage facility training must also focus on any administrative rules followed in the facility, such as designation of hazard areas, temporary access locations, and designated smoking areas. Training must also include loss of containment scenarios. Some chemical releases at storage facilities may appear small and seemingly not highly dangerous, but employees need to be trained to recognize the dangers posed by even small releases and how to appropriately respond to them. In addition, various other OSHA standards (e.g., Hazard Communication, Hazardous Waste Operations and Emergency Response, Personal Protective Equipment, and Powered Industrial Trucks) have training requirements that may apply to storage facility employees. In addition to initial training, refresher training in accordance with the PSM standard shall be provided at least every three years, and more often if deemed necessary in consultation with employees.

Mechanical Integrity

Mechanical Integrity requires storage facilities to implement written procedures that ensure that critical process equipment are properly fabricated, tested, inspected, repaired, and maintained. Mechanical integrity programs must address pressure vessels, storage tanks, piping systems (including piping components such as valves), pumps, relief or vent systems and devices, emergency shutdown systems, and controls (including monitoring devices and sensors, alarms, and interlocks). While large chemical manufacturing facilities and petroleum refineries sometimes have hundreds—or even thousands—of such components, storage facilities with PSM-covered processes typically have less equipment to maintain, making compliance less challenging, although no less important.

A starting point for creating a mechanical integrity program is listing all equipment, instruments, and components that need to be considered. In many cases, the equipment that is part of the MI program will have inspection and testing recommendations from the manufacturer. If the covered equipment does not have any MI related manufacturers recommendations, then employers should look for applicable codes/standards or industry best practices. Inspections and tests must follow Recognized and Generally Accepted Good Engineering Practices (RAGAGEP), and inspection and test frequency must be consistent with manufacturer's recommendations and good engineering practices, or more frequently if indicated by operating experience. If employers and employees are unfamiliar with these RAGAGEP references, they should consult with others as needed to understand the RAGAGEP. Consultation with local fire officials may also provide references for appropriate fire codes.

Employers must train each employee involved in the maintenance of the integrity of equipment used in an ongoing process. These employees must be provided an overview of the process, its hazards, and the procedures they must follow in their assigned tasks to ensure they can perform the tasks in a safe manner. This is important because maintenance employees may not be fully versed in process hazards—particularly in cases where storage facilities contract out much of their inspection, testing, maintenance, and repair duties.

Each inspection and test to verify current equipment integrity must be documented. This documentation serves as proof of compliance, and the records can also be used to assess trends in longer-term equipment degradation which is then used to determine if inspection and testing frequencies should be adjusted. Any deficiencies identified during inspections and tests must be addressed before further use, or in a safe and timely manner when actions are taken to assure safe operation pending repairs. When equipment is determined to be deficient, a management of change (MOC) procedure must be established and implemented prior to continuing operation of the deficient equipment outside of established operating

limits. The MOC procedure must include a determination of the safety and health impacts of continued operation of the deficient equipment.

The final element of mechanical integrity programs is quality assurance. PSM-covered facilities must ensure that equipment for newly constructed operations is suitable for the intended application and that equipment in existing processes is properly installed and consistent with design specifications. Quality assurance requirements also apply to maintenance materials and spare parts to ensure compatibility with the equipment and the process.

Emergency Planning and Response

The PSM emergency planning and response requirements largely refer to other OSHA standards, particularly the Emergency Action Plan standard[13] which requires an emergency action plan, employee alarm system, employee training on the plan, and provisions for reviewing the plan; employers may also be covered under the Hazardous Waste Operations and Emergency Response standard.[14] Chemical storage facilities with a PSM-covered process should already be complying with these standards. Storage facilities should consider addressing:

- Procedures for reporting emergencies
- Procedures for handling small releases
- Emergency evacuation procedures
- Procedures for employees who must implement critical operations before evacuating
- Procedures for accounting for all evacuated employees
- Procedures for employees who perform rescue or medical duties
- A list of contacts for employees with specific duties and responsibilities in emergencies

13. 29 CFR 1910.38
14. www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765

Storage tanks must be properly labeled with their contents as required by OSHA's Hazard Communication standard (29 CFR 1910.1200). This enables first-responders to recognize the hazards of stored commodities and implement appropriate emergency actions. While not required, OSHA recommends that facilities keep track of the location of portable containers of highly hazardous chemicals so that emergency responders can be accurately directed to their location in the event of an incident. In order to facilitate a successful response effort, OSHA encourages facilities to coordinate with their local emergency responders and to perform practice drills whenever possible.

Storage facilities with PSM-covered processes should also ensure that contractors and visitors who may be present at the storage facility understand how to respond during emergencies. Employers can assign hosts, escorts, or evacuation wardens when visitors first enter the premise, and provide visitors with evacuation procedures and emergency response information.

OSHA has developed a short checklist that employers are encouraged to review which offers additional tips for developing effective emergency response plans at PSM-covered facilities.[15] Additional resources include NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity/Continuity of Operations Programs*; NFPA 1616, *Standard for Mass Evacuation and Sheltering* (to be published at end of 2016); and NFPA 1620, *Standard for Pre-Incident Planning*.

15. www.osha.gov/SLTC/etools/evacuation/checklists/eap.html

APPENDIX: Misconceptions and Frequently Asked Questions

This appendix documents many PSM-related questions that storage facilities commonly ask of OSHA. These questions are meant to provide storage facility owners with responses that will help with PSM compliance.

"A major incident will not occur at a facility that only stores hazardous chemicals…" The mere presence of large quantities of highly hazardous chemicals at storage facilities creates a risk of a catastrophic incident. There are many examples of incidents where stored chemicals have leaked, decomposed, polymerized, combusted, or exploded. With a proper PSM program in place, employers at storage facilities can fully evaluate hazards and implement measures that prevent life-threatening incidents.

"Aren't PSM programs extremely expensive for storage facilities?" PSM compliance costs are directly related to the complexity of the covered processes. PSM compliance for storage purposes are usually less complex than formulation or reaction processes, resulting in lower costs. PSM compliance costs are small when compared to the very significant costs caused by catastrophic incidents. Employers are encouraged to view the time and resources devoted to PSM programs as worthwhile investments and not as burdens. PSM programs benefit all facilities that store highly hazardous chemicals, even those facilities that store hazardous chemicals in quantities that do not trigger mandatory PSM compliance. Many employers have found that implementing a comprehensive safety management program, as required under PSM, translates into more efficient operations and increased profits.[16]

"My facility has stored chemicals for decades without incident…" This is a common reaction in the field of process safety. Catastrophic chemical-related incidents do not occur often, and it is not unusual for a facility to have incident-free operations for many years before tragedy strikes. In fact,

16. www.aiche.org/ccps/about/business-case

for most of the case studies referenced in this guidance, the facilities in question had no previous records of major incidents. Employers should be aware of the dangers of operating on a false sense of security based on an incident-free past. Maintaining a sense of vulnerability is essential to ensuring that process hazards are adequately controlled.

"My facility already has effective safety programs…" Many facilities that store highly hazardous chemicals may already have safety programs that address specific issues, like confined space entry, hot work, emergency response, and fire protection. Some facilities might also have specialized safety programs recommended by their insurance underwriters. While these programs address certain hazards associated with storing and handling highly hazardous chemicals, they may not provide the comprehensive safety assessment required under PSM. The good news is that, if your facility's safety program is comprehensive enough, it may already be in compliance with PSM storage requirements or need only minor revisions to be compliant.

"How complex must a PSM program be?" An employer's PSM program must reflect the complexity of the covered processes and its hazards. Storage facilities, which generally do not conduct chemical reactions or have complex, interconnected processes, are expected to have considerably less complex process safety issues than those found at refineries and large chemical manufacturing operations.

"How much time does it take to develop a new PSM program?" What makes a PSM program effective is the extent to which it identifies, evaluates, and controls hazards—not the amount of time an employer spends developing it. Implementing PSM at storage facilities, with their lack of manufacturing or processing activities, should not be a burdensome process. Some employers who are concerned about resources or proper implementation can hire consultants to help, as discussed further below.

"Can employers use consultants to develop PSM programs?" Yes. Many employers originally implemented and continue to run their PSM programs entirely on their own. Others seek outside assistance, typically by hiring consultants. This is not uncommon for businesses run by managers with limited or no engineering background. Either approach is acceptable, provided the PSM program focuses on and comprehensively addresses the *facility-specific* hazards, equipment, and operating procedures—and is not based on generic checklists, boilerplate language, or other resources that do not focus on the facility's hazards. However, keep in mind that ultimately the **employer** is responsible for PSM compliance!

"Must employers inform OSHA if the standard applies to them?" No. Unlike various other environmental, health, and safety regulations, the PSM standard does not have notification or reporting requirements. This means employers do not need to inform OSHA whether or not they meet the PSM applicability criteria. They need only ensure that they fully comply with the mandatory PSM requirements for all processes that meet the applicability criteria. Out of caution, some employers may choose to implement these elements in processes that use highly hazardous chemicals in quantities that do *not* exceed the applicability criteria—but this is not required.

"What should employers do if they realize their processes have met the applicability criteria for many years?" For any non-exempted process that meets the regulation's applicability criteria, employers should immediately take steps to comply with all PSM requirements, regardless of whether the process met the applicability criteria for decades or just recently did so.

"Can a facility alter its highly hazardous chemical storage practices to avoid PSM?" Yes. When OSHA enacted the PSM standard, it did so in an effort to eliminate or minimize catastrophic incidents involving highly hazardous chemicals. PSM programs are risk reduction strategies. When implemented correctly, reducing storage inventories of

highly hazardous chemicals and isolating stored quantities in distinct facility areas are acceptable risk reduction strategies. Employers at storage facilities may therefore choose to safely alter their storage practices to reduce chemical risks—and fall below PSM applicability criteria—instead of complying with PSM. However, such facilities must still comply with other applicable OSHA standards and section (5)(a)(1) of the OSH Act, the "General Duty Clause" (which requires that employers provide workplaces free from recognized hazards that are likely to cause death or serious physical harm).

"Who should I contact for any other questions about PSM applicability? " Employers who have read the requirements of the standard and still have questions about whether the standard applies to their processes should either:

- Contact a local OSHA area office. Refer to OSHA's website (www.osha.gov/html/RAmap.html) for locations and contact information; or
- Request an official interpretation by writing to:

  U.S. Department of Labor
  Occupational Safety and Health Administration
  Directorate of Enforcement Programs
  200 Constitution Ave., NW
  Washington DC 20210

Workers' Rights

Under federal law, workers are entitled to working conditions that do not pose a risk of serious harm.

For more information on how to assure a safe and healthful workplace, see OSHA's Workers page.

OSHA Assistance, Services and Programs

OSHA has a great deal of information to assist employers in complying with their responsibilities under OSHA law. Several OSHA programs and services can help employers identify and correct job hazards, as well as improve their safety and health program.

Establishing a Safety and Health Program

Safety and health programs are systems that can substantially reduce the number and severity of workplace injuries and illnesses, while reducing costs to employers.

Visit www.osha.gov/shpguidelines for more information.

Compliance Assistance Specialists

OSHA Compliance assistance specialists can provide information to employers and workers about OSHA standards, short educational programs on specific hazards or OSHA rights and responsibilities, and information on additional compliance assistance resources.

Visit www.osha.gov/dcsp/compliance_assistance/cas.html or call 1-800-321-OSHA (6742) to contact your local OSHA office.

Free On-site Safety and Health Consultation Services for Small Business

OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. On-site consultation services are separate from enforcement and do not result in penalties or citations.

For more information or to find the local On-site Consultation office in your state, visit www.osha.gov/consultation, or call 1-800-321-OSHA (6742).

Under the consultation program, certain exemplary employers may request participation in OSHA's **Safety and Health Achievement Recognition Program (SHARP)**. Worksites that receive SHARP recognition are exempt from programmed inspections during the period that the SHARP certification is valid.

Cooperative Programs

OSHA offers cooperative programs under which businesses, labor groups and other organizations can work cooperatively with OSHA. To find out more about any of the following programs, visit www.osha.gov/cooperativeprograms.

Strategic Partnerships and Alliances

The OSHA Strategic Partnerships (OSP) provide the opportunity for OSHA to partner with employers, workers, professional or trade associations, labor organizations, and/or other interested stakeholders. Through the Alliance Program, OSHA works with groups to develop compliance assistance tools and resources to share with workers and employers, and educate workers and employers about their rights and responsibilities.

Voluntary Protection Programs (VPP)

The VPP recognize employers and workers in private industry and federal agencies who have implemented effective safety and health management programs and maintain injury and illness rates below the national average for their respective industries.

Occupational Safety and Health Training Courses

The OSHA Training Institute partners with 27 OSHA Training Institute Education Centers at 42 locations throughout the United States to deliver courses on OSHA standards and occupational safety and health topics to thousands of students a year. For more information on training courses, visit www.osha.gov/otiec.

OSHA Educational Materials

OSHA has many types of educational materials to assist employers and workers in finding and preventing workplace hazards.

All OSHA publications are free at www.osha.gov/publications and www.osha.gov/ebooks. You can also call 1-800-321-OSHA (6742) to order publications.

Employers and safety and health professionals can sign-up for *QuickTakes*, OSHA's free, twice-monthly online newsletter with the latest news about OSHA initiatives and products to assist in finding and preventing workplace hazards. To sign up visit www.osha.gov/quicktakes.

OSHA Regional Offices

Region I
Boston Regional Office
(CT*, ME, MA, NH, RI, VT*)
JFK Federal Building, Room E340
Boston, MA 02203
(617) 565-9860 (617) 565-9827 Fax

Region II
New York Regional Office
(NJ*, NY*, PR*, VI*)
201 Varick Street, Room 670
New York, NY 10014
(212) 337-2378 (212) 337-2371 Fax

Region III
Philadelphia Regional Office
(DE, DC, MD*, PA, VA*, WV)
The Curtis Center
170 S. Independence Mall West
Suite 740 West
Philadelphia, PA 19106-3309
(215) 861-4900 (215) 861-4904 Fax

Region IV
Atlanta Regional Office
(AL, FL, GA, KY*, MS, NC*, SC*, TN*)
61 Forsyth Street, SW, Room 6T50
Atlanta, GA 30303
(678) 237-0400 (678) 237-0447 Fax

Region V
Chicago Regional Office
(IL*, IN*, MI*, MN*, OH, WI)
230 South Dearborn Street
Room 3244
Chicago, IL 60604
(312) 353-2220 (312) 353-7774 Fax

Region VI
Dallas Regional Office
(AR, LA, NM*, OK, TX)
525 Griffin Street, Room 602
Dallas, TX 75202
(972) 850-4145 (972) 850-4149 Fax
(972) 850-4150 FSO Fax

Region VII
Kansas City Regional Office
(IA*, KS, MO, NE)
Two Pershing Square Building
2300 Main Street, Suite 1010
Kansas City, MO 64108-2416
(816) 283-8745 (816) 283-0547 Fax

Region VIII
Denver Regional Office
(CO, MT, ND, SD, UT*, WY*)
Cesar Chavez Memorial Building
1244 Speer Boulevard, Suite 551
Denver, CO 80204
(720) 264-6550 (720) 264-6585 Fax

Region IX
San Francisco Regional Office
(AZ*, CA*, HI*, NV*, and American Samoa,
Guam and the Northern Mariana Islands)
90 7th Street, Suite 18100
San Francisco, CA 94103
(415) 625-2547 (415) 625-2534 Fax

Region X
Seattle Regional Office
(AK*, ID, OR*, WA*)
300 Fifth Avenue, Suite 1280
Seattle, WA 98104
(206) 757-6700 (206) 757-6705 Fax

* These states and territories operate their own OSHA-approved job safety and health plans and cover state and local government employees as well as private sector employees. The Connecticut, Illinois, New Jersey, New York and Virgin Islands programs cover public employees only. (Private sector workers in these states are covered by Federal OSHA). States with approved programs must have standards that are identical to, or at least as effective as, the Federal OSHA standards.

Note: To get contact information for OSHA area offices, OSHA-approved state plans and OSHA consultation projects, please visit us online at www.osha.gov or call us at 1-800-321-OSHA (6742).

How to Contact OSHA

For questions or to get information or advice, to report an emergency, fatality, inpatient hospitalization, amputation, or loss of an eye, or to file a confidential complaint, contact your nearest OSHA office, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

For assistance, contact us.
We are OSHA. We can help.

OSHA®
www.osha.gov

U.S. Department of Labor

For more information:

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)