

Issue Brief: OSHA Ammonia Requirements

Anhydrous ammonia is widely used as a refrigerant in food processing facilities and cold storage warehouses. Ammonia is considered a health hazard because it is corrosive to the skin, eyes, and lungs. Accidental releases of ammonia from refrigeration and freezing facilities have resulted in injuries and deaths to employees as a result of contact with both liquid and vapor forms of ammonia. Because refrigeration and freezer systems operate at elevated pressures, additional care must be taken to maintain and operate these systems so as to prevent releases with potentially catastrophic consequences.

The Department of Labor's Occupational Safety and Health Administration (OSHA) has developed regulations that cover employers involved in the operation and maintenance of ammonia refrigeration and freezer systems. This Issue Brief provides a high-level summary of OSHA's regulations. AFFI members are advised to consult with legal counsel regarding specific compliance obligations. ^{1/}

Legal Framework

Ammonia refrigeration systems with 10,000 pounds or more of ammonia are a covered process subject to the requirements of the OSHA Process Safety Management (PSM) standard. ^{2/} The major objective of the PSM is to prevent unwanted releases of hazardous chemicals, especially into locations that could expose employees and others to serious hazards. Along with the regulations, OSHA has established compliance guidelines and recommendations about implementation of the PSM. ^{3/}

The PSM requires the following:

- **Process Safety Information:** Employers must compile written process safety information as a prerequisite to conducting a process hazard analysis. ^{4/} This includes information concerning process chemicals (e.g., toxicity information; permissible exposure limits), process technology (e.g., chemistry; safe upper and lower limits for items such as temperature,

^{1/} Additionally, AFFI members should be aware that 25 states have OSHA-approved State Plans and have adopted their own standards and enforcement policies. For the most part these standards are identical to the federal requirements, but members should consult with legal counsel to determine if any variations apply in the states where their facilities are located.

^{2/} 29 CFR § 1910.119 (addressing highly hazardous chemicals, including ammonia, that have the potential to cause a catastrophic incident). PSM is "the proactive identification, evaluation and mitigation or prevention of chemical releases that could occur as a result of failures in process, procedures, or equipment." 29 CFR § 1910.119, Appendix C. See <https://www.osha.gov/SLTC/processsafetymanagement/>

^{3/} 29 CFR § 1910.119, Appendix C.

^{4/} *Id.* § 1910.119(d).

pressures, flows, or compositions), and process equipment (e.g., ventilation system design; safety systems).

- **Process Hazard Analysis (PHA):** As a key component of the PSM, employers must perform an initial PHA on processes covered by the PSM standard. 5/ The PHA is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals. 6/ It is directed toward analyzing potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals, and major spills of hazardous chemicals. The PHA focuses on equipment, instrumentation, utilities, human actions (routine and nonroutine), and external factors that may impact the process. All of these considerations are assessed in determining hazards and potential failure points. The PHA must be updated and revalidated at least every 5 years.
- **Operating Procedures:** Employers must 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. 7/ These often are viewed as the standard operating procedures (SOPs) for operations. Procedures must address steps for each operating phase (e.g., initial startup; normal operations), operating limits, safety and health considerations, and safety systems and their functions.

Operating procedures must describe 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. For example, the operating procedures for addressing operating parameters will contain operating instructions about pressure limits, temperature ranges, flow rates, what to do when an upset condition occurs, and what alarms and instruments are pertinent if an upset condition occurs.

- **Employee Training:** All employees involved with processes involving ammonia use, including maintenance and contractor employees, need to be appropriately trained. 8/ Training must include an overview of the process and the operating procedures, as well as an emphasis on the specific safety and health hazards, emergency operations (including shutdown), and safe work practices. Refresher training must be provided at least every 3 years and training must be documented.
- **Contractors:** Employers who use contractors to perform work in and around processes involving ammonia use must establish a screening process so that they hire and use contractors who accomplish the desired job tasks without compromising the safety and health of employees at a facility. 9/

5/ *Id.* § 1910.119(e).

6/ In some respects, this is analogous to the hazard analysis conducted as part of a Hazard Analysis and Critical Control Points (HACCP) program.

7/ 29 CFR § 1910.119(f).

8/ *Id.* § 1910.119(g).

9/ *Id.* § 1910.119(h).

- **Pre-Startup Safety Review**: Employers must perform a pre-startup safety review for new facilities and for modified facilities when the modification is significant enough to require a change in the process safety information. 10/
- **Mechanical Integrity**: Employers must implement written procedures to maintain the ongoing integrity of process equipment, including pressure vessels, storage tanks, piping systems, controls, and pumps. 11/
- **Incident Investigation**: Within 48 hours of an incident, employers must investigate each incident that resulted in, or could have resulted in, a catastrophic release of ammonia. 12/
- **Emergency Preparedness**: Employers must implement an emergency accident plan for the entire plant in accordance with 29 CFR § 1910.38. 13/
- **Compliance Audits**: At least every 3 years, employers must certify that they have evaluated compliance with the provisions of the PSM. 14/ A written report documenting audit findings also is required.

OHSA has developed an eTool to assist employers and employees in identifying and controlling the hazards associated with operation and maintenance of ammonia refrigeration systems. The tool consists of two modules, addressing (1) ammonia receiving and storage (covering requirements from 29 CFR § 1910.119) and (2) emergency response (addressing requirements from 29 CFR § 1910.38).

In addition to being required to comply with the PHM, employers using ammonia must comply with the following OSHA regulations:

- **Emergency Response**: An emergency response plan must be developed by all employers, except those who do not permit any of their employees to assist in handling the emergency if the employer provides an emergency action plan in accordance with 29 CFR § 1910.38. 15/
- **Personal Protective Equipment**: Employees who work regularly with anhydrous ammonia and are subject to overexposure either to the liquid or the vapor must be provided with proper protective equipment (e.g., clothing; respiratory devices; protective shields) for eyes, face, head, and extremities. 16/ OSHA has developed specific regulations regarding eye and face protection 17/, respiratory protection 18/, and hand protection 19/.

10/ *Id.* § 1910.119(i).

11/ *Id.* § 1910.119(j).

12/ *Id.* § 1910.119(m).

13/ *Id.* § 1910.119(n).

14/ *Id.* § 1910.119(o).

15/ *Id.* § 1910.120(q); see <https://www.osha.gov/SLTC/hazardouswaste/index.html>.

16/ 29 CFR § 1910.132; see <https://www.osha.gov/SLTC/personalprotectiveequipment/index.html>.

17/ 29 CFR § 1910.133; see <https://www.osha.gov/SLTC/eyefaceprotection/index.html>.

18/ 29 CFR § 1919.134; see <https://www.osha.gov/SLTC/respiratoryprotection/index.html>.

19/ 29 CFR § 1919.135.

- **Hazard Communication:** Employers are required to communicate the hazards associated with working with ammonia to appropriate employees. 20/

Recent Developments

In December 2013, OSHA published a "Request for Information" (RFI) in the Federal Register, seeking comments on potential revisions for the PSM standard, including:

- Clarifying the PSM exemption for atmospheric storage tanks,
- Revising the PSM standard to require additional management-system elements,
- Amending the PSM standard to require evaluation of updates to applicable Recognized and Generally Accepted Good Engineering Practices (RAGAGEP),
- Clarifying the PSM standard by adding a definition for RAGAGEP, and
- Revising the PSM standard to require third-party compliance audits. 21/

OSHA took this action in response to Executive Order 13650, *Improving Chemical Facility Safety and Security*, which (among other things) requires OSHA to publish an RFI designed to identify issues related to modernization of the PSM standard and related standards necessary to meet the goal of preventing major chemical accidents. 22/ AFFI joined several other organizations in filing comments in response to OSHA's December 2013 RFI. 23/

OSHA also is engaged in ongoing enforcement of the PSM for frozen food manufacturers, including issuing and publicizing citations from facility inspections and reaching a settlement with a major member of the industry.

Issues to Watch

- After reviewing comments, OSHA may issue a proposed rule following up on the issues raised in the RFI.
- Enforcement likely will continue to be an agency priority.

20/ *Id.* § 1910.1200; see <https://www.osha.gov/dsg/hazcom/index.html>

21/ 78 Fed. Reg. 73756 (Dec. 9, 2013). Comments were due March 31, 2014. 79 Fed. Reg. 13006 (Mar. 7, 2014) (extending original comment period).

22/ 78 Fed. Reg. 48029 (Aug. 1, 2013).

23/ Docket. No. OSHA-2013-0020-0040.

AFFI Action Items

- Review current programs for compliance with the PSM standard, with a particular focus on areas that have been cited by OSHA in other food facility inspections.
- Engage with OSHA regarding possible PSM revisions.

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