Process Safety Management (PSM) for Ag Retailers

August 31, 2015

Process Safety Management (PSM) is an OSHA standard that until recently did not apply to most retailers. To comply, one must first understand the definition of a process. A process is any activity or combination of activities including any use, storage, manufacturing, handling or the on-site movement of a highly hazardous chemical (HHC) as defined by OSHA.

PSM is an analytical tool focused on preventing releases of highly hazardous chemicals onsite at chemical facilities. Process Safety Management refers to a set of inter-related approaches to manage hazards associated with the process and is intended to reduce the frequency and severity of incidents resulting from releases of chemicals and other energy sources.

> **Note:** Bottom-line, retail farm centers with one or more HHC, such as anhydrous ammonia, are now subject to the same regulatory requirements that apply to a gas refinery or chemical manufacturing facility.

Background Information

OSHA's PSM standard became effective on May 26, 1992 and contained an exemption from coverage for retail facilities. The term "retail facility" was not defined, however the preamble to the final PSM standard explains that chemicals at retail facilities are those generally sold in small packages, containers, and allotments.

Following the promulgation of the PSM standard, OSHA issued a series of letters interpreting the exemption much more broadly. At the request of The Fertilizer Institute in 2001, OSHA interpreted a retail facility to be one that derived more than 50 percent of its income from direct sales of highly hazardous chemicals to the end user, otherwise known as "the 50 percent test." For most ammonia facilities this was welcome relief from a rule originally developed for manufacturing facilities.

What happened on July 22, 2015?

PSM popped back up on the radar screen as a result of the West Fertilizer explosion and the President's August 1, 2013, Executive Order 13650, *Improving Chemical Facility Safety and Security.* While admittedly the current administration has said that anhydrous ammonia was not a contributing factor to the West Fertilizer explosion, they are using the Executive Order as an opportunity to rescind the interpretation, stating "it should never have been interpreted to cover facilities engaged in distinctly wholesale activities." As a result, retailers are subject to PSM.

OSHA changed the rules on July 22, 2015 by rescinding the retail exemption in an announcement that surprised the agricultural industry. They simply changed their interpretation, which effectively rescinded the retail exemption. In a separate memo, OSHA announced they would focus their resources on providing compliance assistance to affected employers and exercise enforcement discretion during the first six months, refraining from citing employers for violations of the PSM standard at facilities that it would not have cited under the former PSM retail exemption policy. The only exception to this policy according to OSHA is if they discover conditions at such a facility that expose workers to an immediate and severe danger, and determines that the employer has not made a reasonable good faith effort to eliminate or substantially control the hazard.

What products are involved?
Anhydrous ammonia, aqua ammonia (>44% concentration) and nitric acid, among others, are on the list of regulated chemicals. Propane (LP-Gas) is not affected by the July 22, 2015 announcement provided the operation falls into the 44 or 45 NAICS code range.

Who is affected by this change?
Most agricultural retailers are classified under NAICS code 424910, which is defined as "Farm Supplies Merchant Wholesale," formerly SIC code 5191. As a result of OSHA rescinding the retail exemption, agricultural retailers that store and handle a HHC, such as anhydrous ammonia would be subject to the requirements of PSM. These facilities have 5-7 employees and are predominantly subject to the Risk Management Program Level 2 requirements based on their sales of ammonia to farmers. It is these facilities that developing and successfully executing a PSM program will be both expensive and the most difficult.

A small segment of the agricultural retailers classified under NAICS code 424910 receive ammonia by transport truck or rail for the specific purpose of reacting to make other liquid fertilizers such as ammonium polyphosphate solution. (10-34-0, 11-37-0, etc.) These facilities typically contract the services of a portable T-reactor to come to their facility for a few days each year. These facilities are predominantly subject to the Risk Management Program Level 3 requirements based on their operations. It is these facilities that will be minimally impacted by the loss of the retail exemption. These facilities will need to review the requirements associated with both Risk Management Program and PSM to ensure their program meets the full standard.

Are farmers covered?
Farmers are not subject to OSHA's PSM standard or EPA's RMP rule provided the ammonia stored and handled is solely for use in their own farming operation.

What's the relationship between PSM and RMP?
Loss of the retail exemption means the typical anhydrous ammonia facility must now comply with OSHA's PSM Standard. And, because the facility is now subject to PSM, it triggers EPA's requirement to prepare and submit a Program 3 Risk Management Plan (RMP) within the six month timeframe. PSM is designed to protect workers from onsite incidents while RMP is designed to address offsite incidents.

What's the difference between a Program 2 and 3 RMP?
In a word - LOTS! Flow drawings, Process & Instrumentation Diagrams (P&ID), Management of Change program to mention a few, plus stepped-up requirements within Process Hazard Analysis, Compliance Audit and Mechanical Integrity. An engineer will not be required for the typical retail facility but some do seek out their help especially for complex installations.

Note: No one can develop your PSM program, nor your RMP Level 3 program for you! These are not regulatory requirements like a SARA Tier II Report that are prepared annually and filed away until next year. As you will see by reading on in this special report, everyone at your facility is affected by these rules and must understand the contents of your program.

PSM Cost Estimates: Time & Money

We estimate 100 man hours to develop the PSM program for a typical retail facility of average complexity. This includes the upgrade to a Program 3 RMP. The estimated time of 100 hours could be reduced by 50% if the retailer uses industry-standard tools. The ongoing commitment of time is estimated to be 2-4 hours per week.

Regarding consulting firms, the estimates we have received from credible firms have ranged from $18,000 to $30,000 based on the size and complexity of the installation. This includes travel and related expenses. As discussed above, the facility must be fully involved with the consultant as the program is developed, otherwise the facility personnel have no chance of understanding the information, implementing the program or even passing an OSHA inspection. Expect to commit 30-40 hours of your time to help the consultant develop the program and then 2-4 hours per week to implement the program.

How will PSM affect my facility and personnel?

To successfully implement PSM at your facility, it will require assigning the responsibility to an employee that will continually monitor the process and flow of information and activities associated with the 14 required sections of the standard. The following example demonstrates the interrelationship among the required elements (denoted in **bold** below) when something as simple as a valve is replaced. Each step results in required documentation designed to leave a traceable paper trail.

- During a routine inspection of equipment **(Mechanical Integrity)**, the maintenance worker discovers a valve that no longer meets the applicable code and must be changed.
- Because the type of valve is no longer made, a different type of valve must be selected and installed **(Management of Change)**.
- The type of valve selected may mandate different steps for the operators **(Operating Procedures)** who will require training and verification in the new procedures **(Training)**.
- The rationale for selecting the type of valve must be made available for review by employees and their representatives **(Employee Participation)**.
- When the new valve is installed by the supplier **(Contractors)**, a qualified and safe contractor must be selected to perform the work **(Contractor Management)**.
- The work will involve shutting down part of the process **(Pre-startup Safety Review)** as well as brazing some of the lines **(Safe Work Practices - Hot Work Permit)**.
- The employer must review the response plan **(Emergency Planning)** to ensure that procedures are adequate for the installation hazards.
- Although Management of Change provisions cover interim changes, after the new valve is in place the Process Safety Information will have to be updated before the **(Process Hazard Analysis)** is updated or revalidated, to account for potential hazards associated with the new equipment.
- Also, inspection and maintenance procedures and training will need to be updated **(Mechanical Integrity)**.

To summarize the requirements associated with simply replacing a valve, 12 PSM elements can be affected. An OSHA or EPA auditor would check a representative number of these elements to confirm that the required follow-up activities have been implemented for the new valve. Auditors routinely interview employees and ask to see the documentation generated for each of the activities above. Seven of the top ten PSM violations stem from failure to provide adequate documentation.

Have you established a culture of safety at your facility?
Your PSM program will only be as effective as the underlying safety culture permits within your organization. If an organization has a weak safety culture, PSM efforts are doomed to conflicting priorities, such as selling product or saving money. A strong safety culture is based on a commitment to strong core values on safety, health and environmental issues, and is backed by written policies, established goals and the day-to-day thought process that ensures all decisions are made with consideration of supporting safety.

Will PSM require me to upgrade my equipment?
Probably, some degree of upgrades will be required at most every facility based on coming into compliance with PSM. This is just an opinion based on our knowledge of the industry, the average condition of the equipment, the recent release of the current CGA 2.1-2014 (formerly K-61.1 ANSI) standard and a recent OSHA memo providing guidance on the enforcement of PSM's recognized and generally accepted good engineering practices (RAGAGEP).

How could RAGAGEP affect me?
The term RAGAGEP currently appears in the PSM Standard in two places: (1) the Process Safety Information section, where it applies to the design, construction, and operation of equipment covered under the PSM Standard; and (2) the Mechanical Integrity section, where it applies to the inspection, testing, and preventive maintenance of equipment included in a PSM program. OSHA has stated in its interpretation that published and widely adopted codes of long-standing usage such as the ANSI (CGA) standards qualify as RAGAGEPs. OSHA's memo also clarified that the use of "shall" in the consensus standards reflects a mandatory minimum requirement, while "should" indicates an acceptable approach. The result is that internal procedures will only be treated as RAGAGEPs if no other RAGAGEP exists, or if the internal procedure is more stringent than the consensus standard.

> **Example:** Storage tank used for anhydrous ammonia that has an illegible or missing ASME dataplate and U-1A report. The Authority Having Jurisdiction (AHJ) such as the State Department of Agriculture or State Fire Marshall sets the standard for tanks used within their State. This may conflict with the federal standard, which requires all such tanks to have both a legible ASME dataplate and U-1A report. Typically, the AHJ requirements/provisions prevail. Absent an AHJ or established requirements/provisions for pressurized vessels and tanks, federal OSHA may elect to use RAGAGEP to require the owner of the tank to follow certain current codes such as CGA 2.1-2014. RAGAGEP may be used by an agency to require any number of inspections and/or tests to re-qualify a tank.

The 14 Elements of PSM

A successful PSM program requires integrating the following elements into a fully-supported management system. All of the elements mentioned below are interlinked and interdependent. There is a tremendous **interdependency** of the various elements of PSM. All elements are related and are necessary to compliance. Each element either contributes information to other elements for the completion or utilizes information from other elements in order to be completed.

1. Process Safety Information
2. Process Hazard Analysis
3. Operating Procedures
4. Training
5. Contractors
6. Mechanical Integrity
7. Hot Work
8. Management of Change
9. Incident Investigation
10. Compliance Audits
11. Trade Secrets
12. Employee Participation
13. Pre-startup Safety Review
14. Emergency Planning and Response

Note: Those with years of experience say the regulations should be considered the starting point only, representing minimum essential levels of practice. PSM is a performance-oriented standard, which means the management at each facility must consciously decide the pathway to effectively complying with the rule for their particular situation. PSM was established more than two decades ago, giving the typical OSHA inspector ample time to fully understand the rules. Bottom-line, the agency has more than twenty years of experience on the subject, while ag retailers are faced with a steep learning curve. Expectations by the OSHA inspector may be for additional requirements that go beyond the regulations, based on what they have seen elsewhere in their experience.

The 14 Elements of PSM Described

1. Process safety information

This section contains one of the most highly concentrated list of requirements of all the elements. The compilation of written process safety information is required to enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals. Process safety information must include information pertaining to the hazards of the highly hazardous chemicals used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

2. Process hazard analysis (PHA)

This section includes a comprehensive what-if evaluation. The process hazard analysis must be appropriate to the complexity of the process, and identify, evaluate and control the hazards involved in the process. The PHA must be conducted as a team and includes a review of the facility siting for possible hazards. After an initial PHA is conducted, the process hazard analysis is required to be updated and revalidated by a team no less than every five years.

3. Operating procedures
Employers must develop and implement written operating procedures, consistent with the process safety information, that provide clear instructions for safely conducting activities involved in each covered process. OSHA believes that tasks and procedures related to the covered process must be appropriate, clear, consistent, and most importantly, well communicated to employees.

4. Training
(Initial) OSHA believes that the implementation of an effective training program is one of the most important steps that an employer can take to enhance employee safety. Accordingly, PSM requires that each employee presently involved in operating a process or a newly assigned process must be trained in an overview of the process and in its operating procedures. The training must include emphasis on the specific safety and health hazards of the process, emergency operations including shutdown and other safe work practices that apply to the employee's job tasks.

(Refresher) Training must be provided at least every 3 years, or more often if necessary, to each employee involved in operating a process to ensure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, must determine the appropriate frequency of refresher training.

The employer must determine whether each employee operating a process has received and understood the training required by PSM. A record must be kept containing the identity of the employee, the date of training and how the employer verified that the employee understood the training.

5. Contractors
PSM includes special provisions for contractors and their employees to emphasize the importance of everyone taking care that they do nothing to endanger those working nearby who may work for another employer. PSM applies to contractors performing maintenance or repair, turnaround, major renovation or specialty work on or adjacent to a covered process. It does not apply, however, to contractors providing incidental services that do not influence process safety, such as janitorial, food and drink, laundry, delivery or other supply services.

6. Mechanical integrity
OSHA believes it is important to maintain the mechanical integrity of process equipment to ensure it is designed and installed correctly and operates properly. The employer must establish and implement written procedures to maintain the ongoing integrity of process equipment. Employees involved in maintaining the ongoing integrity of process equipment must be trained in an overview of that process and its hazards and trained in the procedures applicable to the employees' job tasks. Inspection and testing must be performed on process equipment, using procedures that follow recognized and generally accepted good engineering practices. The frequency of inspections and tests of process equipment must conform with manufacturer's recommendations and good engineering practices or more frequently if determined to be necessary by prior operating experience. Each inspection and test on process equipment must be documented, identifying the date of the inspection or test, the name of the person who performed the inspection or test, the serial number or other identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed and the results of the inspection or test.

7. Hot Work Permit
This is such a simple element, but it is so easy to violate if management and maintenance personnel become complacent. A permit must be issued for hot work operations conducted on or near a covered process. The permit must document that the fire prevention and protection requirements in OSHA regulations have been implemented prior to beginning the hot work operations; it must indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit must be kept on file until completion of the hot work.

8. Management of change
OSHA believes that changes to a process must be thoroughly evaluated to assess their impact on employee safety and health and to determine needed changes to operating procedures. The standard contains a section on procedures for managing changes to processes. Written procedures to manage changes (except for replacements in-kind) to process chemicals, technology, equipment and procedures and change to facilities that affect a covered process, must be established and implemented. Employees who operate a process and the maintenance and contract employees whose job tasks will be affected, must be informed and trained on the change prior to startup of the process or startup of the affected part of the process.

9. Incident investigation
A crucial part of PSM is a thorough investigation of incidents to identify the chain of events and causes so that corrective measures can be developed and implemented. PSM requires the investigation of each incident that resulted in, or could reasonably have resulted in, a catastrophic release of a highly hazardous chemical in the workplace. Such an incident investigation must be initiated within 48 hours following the incident. The investigation must be by a team consisting of at least one person knowledgeable in the process involved, including a contract employee if the incident involved the work of a contractor and other persons with appropriate knowledge and experience to investigate and analyze the incident thoroughly.

10. Compliance audits
To be certain the process safety management program is effective, employers must conduct an audit and certify that they have evaluated compliance with the provisions of PSM at least every 3 years. This will verify that the procedures and practices developed under the standard are adequate and are being followed. The compliance audit must be conducted by at least one person knowledgeable in the process and a report of the findings of the audit must be developed and documented noting deficiencies that have been corrected.

11. Trade secrets
Employers must make available all information necessary to comply with PSM to the personnel responsible for compiling the process safety information, developing the process hazard analysis, responsible for developing the operating procedures and performing incident investigations, emergency planning and response and compliance audits, without regard to the possible trade secret status of such information. Nothing in PSM, however, precludes the employer from requiring those persons to enter into confidentiality agreements not to disclose the information.

12. Employee participation
The employee participation element is perhaps the one with the shortest number of mandates, but with one of the largest impacts. The stated intent of this section is for employees, production, maintenance

and staff to be involved in all aspects of the PSM program at your site and to have representation in the development, discussion and eventual solution to issues around the process hazard analysis. Simply put, your employees need to know what's going on that might affect their safety. Your employee participation program must be written and all meetings well documented.

13. Pre-startup safety review

It is important that a safety review take place before any HHC is introduced into a process. PSM requires the employer to 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.

14. Emergency planning and response

It is essential that emergency pre-planning and training make employees aware of and able to execute, proper actions. An emergency action plan for the entire facility must be developed and implemented. The emergency action plan must include procedures for handling small releases of hazardous chemicals.

What should I do first?

Based on sound business practices, we recommend every retailer review the economics of continuing to store and sell HHCs such as anhydrous ammonia. As soon as possible, but before proceeding with any expenditures towards compliance with the new PSM standard and the RMP Program 3 upgrade, priority should be placed on determining if continuing to sell the product is the right thing to do for your specific situation. Can it be profitable and also within your capabilities of successfully complying. Are you and your organization prepared to make the commitment that comes with handling PSM-regulated products in the future? The following list of considerations (not all inclusive) may help you in making your decision:

- How many tons do you sell a year?
- What is your profit margin?
- Do you currently have the safety culture required to comply with PSM?
- If not, is it possible to develop the safety culture within your organization?
- What affect would continuing to sell or eliminating ammonia have on your insurance costs?
- Are you located close to schools, day cares, nursing homes or other places with groups?
- Does your tank have a legible ASME dataplate? (May have to be replaced before 2030)
- Is your tank rated at less than 250 PSIG? (May have to be replaced before 2030)
- Are equipment upgrades needed for your installation? If so, how much will it cost?
- What future market, personnel or safety considerations may be specific to your site?

Are there any other regulatory requirements on the horizon?

EPA will also respond to the President's Executive Order soon with a Proposed Rule to update and upgrade the RMP requirements. OSHA is anticipated to follow with a Proposed Rule to update and upgrade the PSM requirements.

If you think safety is expensive...

"There's an old saying that if you think safety is expensive, try an accident. Accidents cost a lot of money. And, not only in damage to plant and in claims for injury, but also in the loss of the company's reputation." **– Dr. Trevor Kletz**, recognized as the father of process safety. Don't wait for an accident to happen at your facility, register with ResponsibleAg and proactively work to comply with the Federal rules, many of which have been in place since the 70's.

Additional Resources:

July 22, 2015 OSHA Announcement Rescinding the Retail Exemption
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=29528

July 22, 2015 OSHA Enforcement Policy
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=29525

June 5, 2015 RAGAGEP Memorandum
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=29414

OSHA List of PSM-Regulated Chemicals
https://www.osha.gov/pls/oshaweb/owadisp.show_DOCUMENT?p_table=STANDARDS&p_id=9761

OSHA Process Safety Management Standard (29 CFR 1910.119)
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9760

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