

TRAINING REQUIREMENTS OF PSM AND RMP; IT'S NOT JUST ON SOPs

*Presented at RET3 2014 Conference
November 4-7, 2014 - Atlanta, GA*

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One of the elements within both OSHA's Process Safety Management (PSM) standard and EPA's Risk Management Program (RMP) requires employers to implement a Training program [29 CFR 1910.119(g), and 40 CFR Part 68.71 respectively] for employees involved in operating a "process". The explicit requirements of PSM's Training element are very broad and wide-scoping as operator training is actually covered under and injected into many of the other elements of the PSM and RMP standards, and in fact has only three primary requirements in and of itself.

The first major requirement of the Training section addresses initial training. It requires that initial training include "an overview of the process and...the operating procedures", which are also required to be documented under the PSM standard. "The (initial) training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks."

The second major provision requires refresher training for employees who are involved in operating a process. Refresher training must be provided at least every three years, and more often if necessary, to ensure that the affected employees (i.e., operators) continue to understand the operating procedures. The employer must work with the employees in order to determine the appropriate frequencies for refresher training.

The last major topic included in the training element of PSM is that training be documented. Records must include the name of the employee, the date of the training, and the "means used to verify that the employee understood the training."

The explicit requirements of the PSM standard contained in the training element are able to be applied and implemented in a wide variety of ways. Facilities / companies that are subject to PSM have a lot of flexibility in how operator training policies are defined and written. However, the expectation of both OSHA and EPA that subject facilities operate within industry guidelines and standards is still implied.



In the ammonia refrigeration industry, for example, there are many safe work practices facing the operator that are intertwined with the implementation of PSM requiring ongoing training. Some of these may include the following:

- Respiratory Protection / PPE Policy including equipment-specific training
- Confined Space Entry training
- Lockout / Tagout training
- Line Opening Policy training
- Electrical Safety training
- Fall Protection training
- Emergency Action (evacuation) Plan training
- Emergency Response Team / HAZWOPER training

Training on the facility's Respiratory Protection and Personal Protective Equipment (PPE) policies enable ammonia refrigeration operators to conduct not only emergency operations, but also routine tasks such as oil draining and line breaking for maintenance. Most facilities require the use of specific PPE during routine operations (and many times for visual inspections!) of an ammonia refrigeration process such as: hearing protection, safety shoes, safety goggles / glasses, ammonia-rated gloves, etc. Some of this PPE requires special training to ensure proper use including hearing protection and gloves, which can sometimes be donned incorrectly.

The proper use of respiratory protection equipment can be necessary for routine tasks as well as emergency scenarios. It is imperative that the proper mask with the proper fit be used by the operator in a situation where life safety is a concern. *Is it appropriate to use a half-face cartridge respirator in a catastrophic ammonia release event where the vapor concentration in the affected area is unknown, and/or a situation where the cloud is believed to exceed 1000 ppm?* The answers to these types of issues must be taught to ammonia operators via training provided by the employer.



Additional safety-oriented training topics must also be provided to ensure the operators can appropriately respond to abnormal conditions and/or process upsets. Training must be provided to address the specific conditions or criteria that trigger an evacuation or response by the facility's emergency response personnel. And if the facility does not utilize an in-house emergency response team, the evacuation plan must be trained on and drilled routinely so that all staff members are aware of their responsibilities, including personnel who must interface with outside agencies like the Fire Department, Hazardous Materials Response Team, and/or the news media.

Many of the other elements of the PSM and RMP standards inherently require operator training including sections such as Process Safety Information, Process Hazard Analysis, Mechanical Integrity, Management of Change, Hot Work Permits, Incident Investigation, Emergency Planning & Response, and Employee Participation.

Process Safety Information (PSI): Operators must be trained regarding specific design features of the regulated process to ensure that he/she can safely and effectively operate the system. Piping and instrument diagrams (P&IDs) are a critical component of Process Safety Information that can sometimes not be intuitive for the operators to read and understand. Facilities should provide training to operators regarding the safety systems associated with the covered process(es) such as vapor leak detection, high and low level protection devices, compressor safety cutouts, evacuation alarms, etc. to ensure that they have the knowledge to be able to troubleshoot the system as needed. Another component of PSI that requires training is the safe upper and lower limits for system parameters (temperatures, pressures, flows, etc.) which can vary within a particular system as well as between facilities.

Process Hazard Analysis (PHA): There are many acceptable methodologies for conducting Process Hazard Analysis (PHA) studies including: Hazard and Operability (HAZOP), What-If, Failure Mode and Effects Analysis (FMEA), Fault Tree Analysis, and What-If/Checklist (as suggested by the International Institute for Ammonia



Refrigeration), etc. The regulations call for an appropriate team to conduct the PHA study (and subsequent revalidation studies) that includes “at least one employee who has experience and knowledge specific to the process being evaluated”, as well as a person who is knowledgeable in the specific PHA methodology being utilized. In order to effectively participate in evaluating the hazards of the process, training on the specific PHA methodology must be provided to the operators. In many instances, though the operators are knowledgeable about the regulated process, they may not have previous experience participating in PHA studies to identify and evaluate the potential hazards associated with the process.

Mechanical Integrity: Written procedures must be developed to address the ongoing preventative maintenance of process equipment. Both OSHA and EPA explicitly require additional training as part of the Mechanical Integrity element as stated below:

“The employer shall train each employee involved in maintaining the on-going integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee’s job tasks to assure that the employee can perform the job tasks in a safe manner.” [29CFR 1910.119(j)(3)]

Not only must operators receive training regarding the process and the appropriate procedures to operate and maintain the equipment, they must also receive training on how routine preventative maintenance tasks should be completed. For example, an operator new to a particular process might not be knowledgeable of the correct (expected) way to fill out a daily log sheet including what conditions are abnormal enough to take further follow-up action. They must be trained on how to do so. A couple of examples from the ammonia refrigeration industry would be the different potential testing methods for compressor high discharge pressure safety cutouts (manual adjustment of setpoint vs. closing discharge valve), and high level float switches on primary suction vessels (isolating and filling up level column vs. using a magnet to make the switch). In some



cases, certain of these duties may be assigned to outside contractors which could limit the in-house training requirements.

Management of Change: Prior to starting up a modified process, employees who may be affected by the change (including maintenance staff and/or operators) must be informed of and trained in the change. Many times this will require a meeting (or meetings) be held (and documented) that includes a review of the changes to the system that could include information such as: normal operating conditions, safe upper and lower limits (pressures, temperatures, flows, etc.), P&IDs, materials of construction, safety / alarm / protection devices, inspection and testing procedures / frequencies, standard operating procedures, etc. In many cases, contractors may also need to be involved in these types of meetings to ensure that they not only provide training on process changes that they have implemented, but also that the facility makes them aware of process changes that may affect their future work at the facility.

Hot Work Permits: To properly and safely implement a hot work permitting policy, employees and/or contractors must undergo specific training, and in many cases certification (ex: welding). In addition to the PSM and RMP standards that require hot work permits be issued for work done on or near the covered process, most fire hazard insurance companies require the implementation of a hot work permit that is typically applied more broadly throughout the facility. Hot Work Permits require clearly designated individuals to conduct specific activities associated with the hot work job including the welder (or similar), and a fire watcher who verifies the effectiveness of the safety controls in place and also does a follow-up check of the area to make sure that the risk of an accidental fire has been minimized / eliminated. In order for facility employees and/or contractors to perform these roles, they must be trained and informed of their responsibilities.

Incident Investigation: Another PSM element that may require training of personnel is investigating incidents related to the covered process. Many companies have policies



that define the prescribed methodologies for incident investigations, such as Root Cause Analysis, that require training for proper and effective implementation. Personnel who serve as Incident Investigation Team Leaders must be knowledgeable in the company policy to be able to follow the protocol in the data collection and analysis phases of the investigation. Some techniques may require training from outside sources, but in many cases in-house training on Incident Investigation methods may be sufficient.

Emergency Planning & Response: A large portion of the total set of training requirements for many operators relates to Emergency Planning & Response issues. The minimum requirements for all subject facilities include an emergency action plan which has intrinsic training requirements for multiple levels of facility personnel. These include proper evacuation routes and assembly areas, methods for accounting for all people present at the facility, the signals that can trigger an evacuation (audible / visual alarm, personal notification, radio / PA announcement, etc.), notifying off-site emergency response agencies such as the Fire Department or HazMat Response Team, notifying regulatory agencies such as the State Emergency Response Commission and the National Response Center, interfacing with the media, etc. OSHA also suggests that facilities conduct routine evacuation drills involving all facility employees. Each of these responsibilities associated with an evacuation plan are typically divided up amongst key facility / company personnel and require training / awareness for effective implementation.

Facilities that maintain an in-house emergency response team have an additional set of training requirements. These include: Hazardous Waste Operations and Emergency Response (HAZWOPER) training plus annual refreshers, Incident Command System training, PPE training such as SCBAs or supplied air masks (fit testing + medical evaluations), emergency operations procedures / shut-down of the covered process, coordinating emergency response personnel / teams / equipment with outside response agencies, etc.



Contractor Safety: Many companies employ the use of contractors for various purposes related to covered processes including: routine preventative maintenance and service, and construction / modifications to a process. Subject contractors must be trained by the facility in the “known potential fire, explosion, or toxic release hazards related to the contractor’s work and the process” [29CFR 1910.119(h)(2)(ii)], as well as “the applicable provisions of the emergency action plan” [29CFR 1910.119(h)(2)(iii)]. If contractors are used as process “operators”, they must also be trained on the written Operating Procedures prepared per the PSM and RMP standards. Not only does the employer have responsibilities to train the contract employer, the contract employer must also ensure that their employees who are going to work on or near the covered process are trained (and documented) on the appropriate safety policies including the emergency action plan, hot work permitting, line breaking policy, lockout / tagout, confined space entry, fall protection, respiratory protection, etc.

Employee Participation: Part of the overarching philosophy of the PSM and RMP regulations is that employees must have access to, and in fact input into how the elements in the PSM and RMP programs are developed and defined. Specifically, the regulations require that employers develop a written plan that details employee participation and involvement in the ongoing development and implementation of the various elements of the PSM program. In order to accomplish this, employees should be trained regarding the details of the requirements of each element in the PSM and RMP standards so that they can make informed decisions on the development of their employer’s policies and procedures.

In addition to training for process operators, PSM/RMP facilities have obligations to train other types of employees who work near (but not on) the covered process. These training topics include communications on the potential hazards that exist in the workplace (HazCom), emergency action plan training (what conditions signal an evacuation, specific routes / exit doors to take to the pre-designated assembly area, roles and



responsibilities such as taking employee roll call and communicating with alternate assembly areas and the media liaison), PSM/RMP awareness and rights of access, portions of the Process Safety Information regarding the covered process equipment in the areas where they work, etc. For example in many food manufacturing facilities, production employees need to be aware that certain equipment located near their primary work area(s) such as process freezers and/or evaporator coils and the associated piping and valves, use anhydrous ammonia.

Though the Training element of the Process Safety Management and Risk Management Program standards are very broad and provide for a great deal of flexibility in defining training policies, many other elements within the PSM and RMP standards either mandate or imply additional training criteria. Some of the additional training requirements can be found in the following elements of the PSM and RMP programs: Process Safety Information, Process Hazard Analysis, Mechanical Integrity, Management of Change, Hot Work Permits, Incident Investigation, Emergency Planning & Response, and Employee Participation. Employers and operators of covered processes must take a much greater perspective than just the written Operating Procedures in order to develop and implement a truly effective and comprehensive training program.





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National Conference
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