FOCUS ARTICLE

PROCESS SAFETY MANAGEMENT (PSM) PRACTICES FOR SMALLER BUSINESSES

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It is understandable that smaller businesses are more resource-limited in terms of personnel, tools, knowledge, and money than larger businesses. Regardless of the size of the facility, however, if the facility has any of the listed PSM covered Highly Hazardous chemicals, the site must comply with all of the elements of PSM. There are tools available to help small businesses develop and improve their PSM programs and bring them into compliance with the OSHA PSM standard.

PSM ELEMENTS

Even though the total recordable incident rate (TRIR) has declined, largely because of OSHA's PSM initiative, there is still an alarming rate of severe process-safety-related incidents today. These incidents do not have a preference in regards to small or large businesses. For the most part, small businesses can agree that a PSM program is necessary for the safety of the facility and people, as well as the local environment.

Often, the most challenging part of PSM is attempting to interpret and convert the PSM element requirements into practices that are unique to a particular business. It is not uncommon to see a business interpreting PSM elements differently than another business might. Smaller businesses tend to interpret the regulation in a minimalistic manner – limited to "compliance" – even after an OSHA citation. What should be noted is that by taking a minimalistic approach to PSM, they are also minimizing the benefits that their business could receive otherwise.

The PSM Element failures that often lead to more catastrophic incidents include Management of Change (MOC), Process Safety Information (PSI), Process Hazards Analysis (PHA), and Mechanical Integrity (MI). These PSM Elements are some of the more difficult to implement and sustain. The business must pro perly support the PSM Elements and the associated programs and activities, to help avoid these types of PSM failures. Also, it is important to understand each PSM Element and how it applies to each particular business. The PSM program development can be a tedious, costly, and time-consuming process in the beginning stages.

Failures seen in PSM can sometimes be the result of not completing a Management of Change. MOCs must be completed for any change that is not "like in kind". The MOC program is designed to make a group of knowledgeable employees communicate with each other, to think about the proposed change, the materials and equipment involved in the change and what effects the change could have on the process. Implementation of an effective MOC procedure can save time and money by helping prevent future PSM-related failures.

Compiling the documents for the Process Safety Information (PSI) Element can require considerable time and expense to develop completely. P&ID's take time to draw and verify for accuracy. Also, material and energy balances may have to be calculated, as well as ensuring the correctness of safe operating limits, materials of construction, relief system design, safety systems, and the design of ventilation systems. Once the information has been gathered, it is good practice to create a binder specifically for PSI so all the information is together and readily available.

Process Hazard Analysis (PHA) is an integral part of PSM, and it is probably one of the weakest elements in a lot of businesses. A PHA can be conducted "in-house" or a third party can be utilized for their expertise and independence. PHAs can identify many "potential" process safety problems before they occur, possibly with catastrophic consequences. The Risk Ranking of PHA action items is an integral part of a PHA, as is implementing the recommendations that address the problems with the higher-severity consequences, as soon as possible.

Mechanical Integrity (MI) failures often occur due to inadequate preventive maintenance on equipment, safety devices, and control systems. This may be due to inadequate resources (employees, contractors, equipment, or funds), or time during shutdowns. A good inspection program should be in place to perform testing and inspections as recommended by the manufacturer or by other recognized industry practices. Documenting and investigating the failures of "safety-critical" equipment are important because such failures may represent "near misses". If a failure occurs during the interval between the scheduled inspection or test, the frequency of the inspections or tests should be increased. Thus, with an appropriate MI program, the business can be assured of reliable performance of the inspected and tested equipment and systems.

EMPLOYEE PARTICIPATION IN PSM ACTIVITIES

It is essential for employees to take personal responsibility for the management of process safety. This begins by ensuring that each employee understands what PSM is, including the requirements and the scope of each of the Elements. Training programs for operators, mechanics, and supervisors should emphasize what they should do to prevent equipment failures, process upsets, and human mistakes to prevent catastrophic events from occurring. Employee participation, both at the management and employee level is a vital part of PSM.

Chemical and petrochemical facilities should – as much as possible – utilize their employees to help with the development and effective conduct of all

PSM elements. This not only gives the employee a level of well-being, but also in-depth knowledge of the PSM requirements.

RISK REDUCTION IN PSM SYSTEMS

Small businesses that may have limited resources available to them should consider alternative methods of decreasing the risks associated with hazardous chemicals, even those that are not listed in the PSM standard. If the inventory of a highly hazardous chemical is above the Threshold Quantity, there may be several ways of avoiding the exposure of employees [and others] to the consequences of releases of that chemical.

One option that should be considered is to reduce the total inventory of the highly hazardous chemical, through "just-in-time" deliveries of smaller quantities, into a smaller storage tank. Also, hazards to employees in the workplace could be reduced through the use of small "day" tanks and remote tank farms, rather than large storage tanks near high populations of employees.

Reducing the onsite amount of PSM-covered chemicals may result in a reduction of the "worst-case" released quanitiy and the size or impact of a catastrophic incident. This may not, however, reduce the risk to the person who is handling and utilizing those highly hazardous chemicals. However, even if the inventory is reduced, the inherent flammability or toxicity risk is still there, and the "General Duty" clause requires that the employer is to provide a safe place to work. This requirement could be accomplished by analysis, evaluation, and control of the risks involved in the handling of hazardous chemicals.

After a PSM program is in place, internal self-auditing is another way to improve PSM programs and, therefore, improve the processes which utilize the hazardous chemicals. Performing routine PSM element audits allows the facility to locate and determine PSM program deficiencies and then correct these deficiencies. Internal audits also allow other employees in the facility to become more familiar with the different PSM elements and the requirements for compliance.

MANAGING AND COMPLIANCE OF THE PSM SYSTEMS

After the PSM system is established, it has to be administered and supervised. PSM programs are not self-managing systems, and it takes frequent interactions between site management, the safety organization, and employees to maintain and improve the effectiveness of each of the elements in providing process safety. One way this can be done is by developing effectiveness metrics that are evaluated at appropriate intervals. The metrics aid the facility management in seeing where there are improvements or where performance in one or more elements needs improvement. Metrics can be a valuable tool when they are managed correctly and when the data are analyzed, with recommendations for changes or improvements in elements that are not meeting expectations.

Training is an important part of PSM and is also an item that should be ongoing. Refresher training every three years is a PSM requirement for process operators, but other additional methods should be considered for operators and other employees. This would include videos, one-on-one training sessions such as Job Safety Analysis, simulated emergency process-control situations, hands-on field exercises, and participation in process-safety audits. Offering different types of training will keep the employees interested in the PSM subject and provide a good training environment.

Management commitment is most important for a successful PSM program. Employees have to be able to see that management is on board with PSM and with making the facility safe. If a company views PSM as "only" a regulatory requirement, the PSM program at that facility will probably be inefficient and ineffective. Management must view the PSM program as a cooperative effort for continuous improvement, rather than just a compliance activity. Employees are more apt to "come on board" to the requirements for a successful PSM program when they see that management is highly engaged in supporting the PSM effort.

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Lisa C. Hutto., B.Sc., MBA, SIIRSM is a Senior Process Safety Specialist at Chilworth Technology, Inc. with 20 years of HSE&S experience in manufacturing, chemical and oil and gas industries with 11 of the years specializing in Process Safety Management. She has an extensive background in health, safety, environmental and security, to include the reduction of incident rates, reduced emissions by implementing new projects, facility security development, as well as being the driver for supporting business and HSE objectives. Her PSM experience includes implementing and developing new Process Safety Management programs, PSM Audits and Gap Analysis, establishing management of change programs, developing procedures for all 14 elements of PSM, emergency response plan development and leading Process Hazards Analysis for oil and gas, chemical and manufacturing companies. She also has a strong background of upstream and downstream oil & gas experience, to include work on the North Slope of Alaska, with multiple oil & gas companies.

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