

## Demystifying PSM for an Enabled Workforce

**By Srinivasan Ramabhadran, Process Safety Management Practice Leader, DuPont Sustainable Solutions**

Demographic change is emerging as one of the most significant challenges to business continuity. A rapidly aging workforce in developed economies; the lack of skilled workforces within process and extractive industries; increasingly stringent local employment requirements; and an increased reliance on contractors to perform specialized tasks are all contributing factors to declining institutional knowledge among businesses.

Complicating matters further, many companies in the process and extractive industries believe one has to be an engineer to understand the technologies relevant to those industries and how they operate. As a consequence, only those with the appropriate education or qualifications tend to be trained in advanced technologies, and some of these individuals are reluctant to share their knowledge or experience concerning specific processes and the associated risks of those processes within the organization.

These two trends are largely responsible for a scarcity of required knowledge and skills that significantly compromises the operational safety of many facilities.

While most companies understand the need to expand their training and skill development processes, the lack of a structured approach often hinders their progress. Organizations rely too often on discrete training initiatives and tend not to follow up with additional training to reinforce and sustain required skills. As a result, money is often spent by an organization without actually getting appropriate returns – a skilled workforce. Learning and development need to be a strategic imperative that is given a priority similar to a company's other strategic business goals.

This focus on continuous learning and development is particularly critical in the area of Process Safety Management (PSM) in order to minimize the risk of catastrophic incidents. A process safety incident can have potentially catastrophic impacts upon workers, local communities and a company's bottom line. Implementing a structured approach to learning and development and institutionalizing a learning and development function that focuses on professional development and building foundational knowledge and skills are vital to successful PSM.

### **Why Process Safety Management (PSM) is Critical**

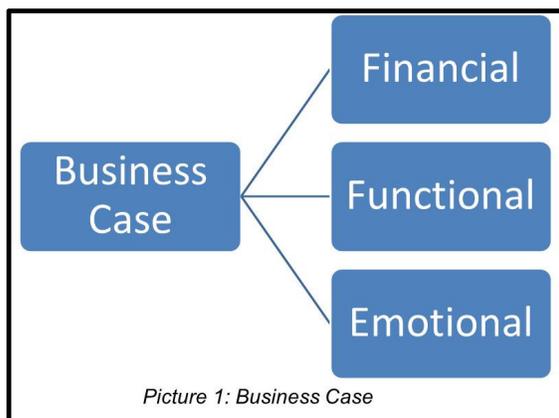
The heart of PSM is recognizing the hazards and associated risks within an organization. Most people consider PSM to be a safety requirement rather than an operations requirement. In fact, PSM impacts both the safety of the organization and its operations.

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An effective PSM system allows operations to run smoothly, contributes to increased productivity and efficiency, and thus extracts more value from company assets. But, if PSM is not implemented with rigor and discipline, it enhances risk and negatively impacts the productivity and efficiency of an organization.

A good illustration of this can be seen in a pressure cooker that is used in the kitchen. In order to cook, liquid and food is added to the pressure cooker, the lid is sealed, and the contents start heating. As the pressurized steam builds, it cooks the contents faster. But over a period of time, the gasket in the lid starts to wear down, and when that happens, steam starts leaking. This not only contributes to increased time and energy required to cook the same amount of food, it also increases the risk of injury. These consequences are similar to what can happen in the workplace, but multiplied exponentially in terms of intensity and impact.



A strong business case can be made for the implementation or improvement of a PSM system. Financially, an analysis of process safety incidents can be quite revealing in terms of the potential cost consequences of not implementing PSM. To fully quantify risk and its potential monetary implications, both the potential direct and indirect consequences of an incident should be taken into account, not just the direct results of an event that has occurred.

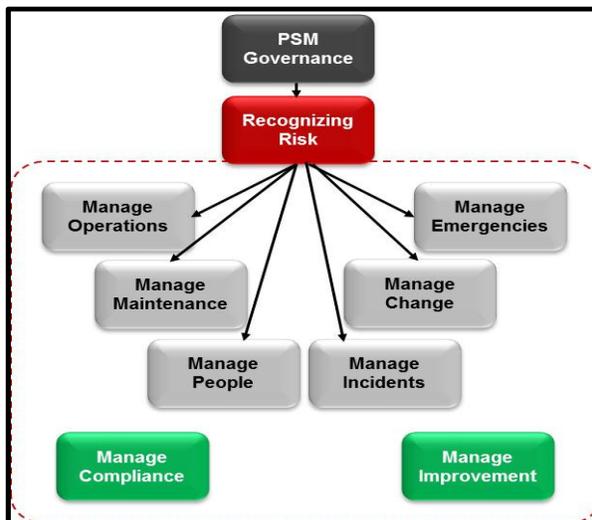
From a functional perspective, a structured framework for PSM can facilitate effective decision making on a daily basis and increase confidence among workers that they can take appropriate actions without fear of reprisal. For example, employees are often confused about their priorities due to mixed signals they sometimes receive from their line managers versus the safety manager. Workers understand the importance of continuing production, but when something goes wrong, such as an equipment malfunction, employees may feel as though they will be blamed for any stoppage.

Finally, at an emotional level, many CEOs are deeply concerned about the potential impact a single incident could have in terms of injuries to employees and damage to facilities – and consequently to the business itself. As CEOs do not want their legacy tied to a catastrophic incident that occurs during their tenure, emotion plays an important driver in supporting the business case for a strong PSM system.

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### Demystifying PSM

Many organizations already spend too much time and resources developing standards and procedures. When an incident occurs, it often results in more procedures and more documentation. As illustrated in the figure to the right, organizations tend to focus their energy on managing operations, incidents and emergencies, when in fact, it's more important to recognize risk and the conditions in which it occur.



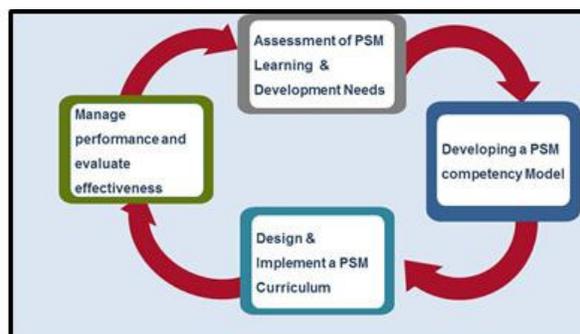
Recognizing potential risks requires an understanding of the hazards of materials, equipment design basics and process design basics. This risk determination provides a fundamental basis to differentiate potential risks by level of severity and by likelihood of occurrence, and then allocate resources accordingly based on these two factors. If the risk is higher, then there is an obvious need to have more layers of protection and detailed plans in place with the corresponding allocation of time, money and resources.

Of course, one's individual experiences can greatly impact how they perceive severity of risk. Accordingly, an employee who has worked in hazardous environments, with little or no prior repercussions, may be daring and take significant risks while working. Another person, who has experienced significant incidents and has not been exposed to hazardous environments, may be afraid to work in a particular area.

To ensure uniformity, a comprehensive Process Hazards Analysis (PHA) and its results should drive the design and implementation of process safety requirements—standard operating procedure and safe work practices; mechanical integrity and quality assurance; training of personnel including contractors; incident management, changes in technology, facilities and personnel; and emergency management. Over the years, DuPont has realized the importance of engaging workers down the line, including operators and technicians, in PHA to create a better understanding and appreciation of risks and “why” workers are expected to perform their actions in a particular way. This gives the workforce a sense of ownership that benefits both the employee and the business.

### Enabling the Workforce to Effectively Implement PSM

Implementing successful PSM requires that all levels of the organization



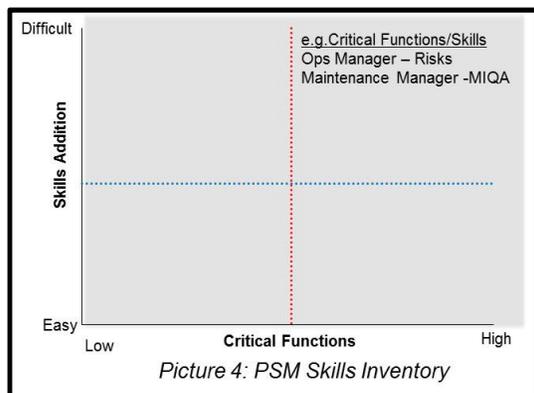
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Picture 3: Learning & Development Process

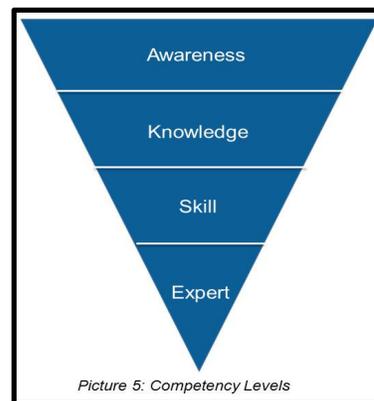
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understand the consequences of following or not following prescribed PSM requirements and the impact they can have on the business in terms of injury, reputation, and cost. It is equally important that employees receive the critical training, coaching and mentoring to build skills and competencies in order to avoid negative consequences.



Providing this training requires a structured process that first assesses the learning and development needs of an organization by mapping the critical functions and skills required (see Picture 4). When developing an inventory of needed skills, the complexity of the skills, skill maturity period, availability of resources with existing PSM skills, and attrition rate should all be taken into account.

It is not possible, or necessary, to make everyone in a company a PSM expert. Nor is it practical to build PSM skills and competencies overnight. But developing a PSM competency model that is customized to the organization will help address employee needs. The competency model should take into account the various roles and the levels of awareness, knowledge, skill and expertise required to implement and maintain PSM (Picture 5). It should be used to develop an overall roadmap for building required skills and competencies over a 3-5 year horizon.



Once an existing skills assessment and competency model have been completed, a learning and development curriculum can then be designed based upon three inputs: Inventory of critical functions and skills; competency building roadmap; and the level of competencies required for the overall organization. Importantly, the curriculum should not merely be viewed as training, but rather an ongoing process that includes frequent reinforcement in the form of on-the-job mentoring. This approach to learning and development not only develops critical PSM skills in workers, it also creates a pool of future talent knowledgeable in the organization's safety procedures.

Finally, it is important to develop a method for evaluating the effectiveness of the learning and development program through a combination of leading and lagging metrics. For example, the number of overdue PHAs that result due to lack of availability of competent resources could be a leading indicator.

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### **Conclusion**

To build the capability and improve the productivity of an organization, individual employee skills and capabilities must be developed and prioritized as a key business imperative. A structured learning and development process can motivate, engage and build important skills among employees while maintaining business and operational continuity, all of which contributes to a safer, more productive organization.

*Srinivasan Ramabhadran is Global Practice Leader for Process Safety & Operational Risk with DuPont Sustainable Solutions, based in Singapore. Through its work with a number of clients across a variety of industries, DuPont Sustainable Solutions has established a structured learning and development process to help organizations cultivate an enabled workforce.*