

PROCESS SAFETY LEADERSHIP IS THE KEY TO SUCCESSFUL PSM IMPLEMENTATION BOTH IN THE UK AND ON A GLOBAL SCALE

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If an organisation's Process Safety Management (PSM) system is to be successful and sustainable it requires the commitment of the entire workforce, starting at the top. Process safety is integral to a company's business performance. Without detailed policies and effective monitoring and management systems, the risk of a major accident and its consequences increases sharply.

Whilst it is essential that competent personnel are charged with managing process safety, experience has shown that if not properly directed this often leads to reactive compliance, meaning that company resources are not necessarily targeted to best effect. Since it is senior management and board directors who ultimately approve the finance for the implementation of changes and initiatives to underpin safety, it makes sense that they understand how hazards and risks are identified and assessed.

As a Centre of Excellence for Process Safety within the National Skills Academy for Process Industries, HFL Risk Services is an accredited provider for the new Process Safety Leadership (PSL) training course specifically for board members, directors and senior executives. Led by experienced safety and business improvement practitioners it combines knowledge sharing presentations and interactive workshops to demonstrate the importance of good process safety leadership principles and how to implement them. A review of the organisation's progress against action plans is held following the training in order to ensure effective learning has taken place and real value has been added.

This paper discusses key points from the training course including the business case for Process Safety Management; the role of process safety policy deployment, based upon emerging standards and best practice; the importance of workforce engagement and how to achieve this and the importance and value of PSPIs and Improvement Plans to continually reduce risk. It also tackles the challenges of PSM implementation across UK and global organisations, based on common findings from the review sessions.

THE BUSINESS CASE FOR PROCESS SAFETY MANAGEMENT

In a climate where achieving a substantial profit margin is becoming increasingly challenging and budgets are stretched, the need to resist the temptation to spend on productivity improvements over plant safety remains ever present. However, as any company that has experienced a major accident will verify, plant safety and profitability are inextricably linked.

In chemical manufacture, storage and handling, potential loss of containment arguably poses the single largest business risk. Should a severe loss of containment occur, the consequences to people, the environment and the business itself can be catastrophic.

With the advent of the Corporate Manslaughter and Corporate Homicide Act 2007, companies rather than individuals are now liable for prosecution in the case of fatalities – should it be deemed that their conduct, in respect of health and safety matters, has fallen far below what could have been expected in terms of duty of care.

Although prosecutions under the Act are few and far between, the financial impact of a major accident can still be considerable. Dependent on the scale and nature of the event, these can entail: compensation claims for injured staff or contractors; fines; clean-up costs; forced production

downtime equalling lost revenue; rebuilding expenses – not to mention damage to business reputation. Transco will no doubt testify to this based on their experience following the fatal explosion at Larkhall in 1999, which resulted in fines of over £15 million.

THE NEED FOR PROCESS SAFETY LEADERSHIP

The Buncefield Major Incident Investigation Board stated 'Clear and positive process safety leadership is at the core of a major hazard business and is vital to ensure that risks are effectively managed' (Buncefield MIIB, 2008). As PSM becomes an ever burgeoning concern, senior management and board directors need to be able to demonstrate organisational competence in this area. Spending time evaluating risk assessments and determining the criticality of operations might seem like an unnecessary resource-sapping exercise for those more comfortable with figures. However, it is no longer sufficient to rely solely on operators and technicians at the coal face to direct, maintain and implement plant safety alone. There is now a growing requirement for a working knowledge of process safety at board level and clear policy on PSM – policy that is driven from the top and understood by everyone throughout the entire organisation.

There are considerable benefits to having your finger on the pulse. When senior management take a more active role in process safety they find that their understanding of how risks are identified and assessed for criticality aids them in the decision process. Since it is they that hold the purse strings with respect to financing the implementation of changes and initiatives to underpin safety, this allows them to channel budgets where they will be most effective.

This knowledge is also valuable in situations where middle managers charged with responsibility for different areas of safety are all competing for a limited budget. Each is looking to resolve his own particular safety issue without reference to the overall safety of the plant. Board members and senior management with an understanding of PSM and an appreciation of the issues at stake will be far better equipped to assess costs versus the benefits to be gained by allocating budget to the areas in question.

AVOIDING REACTIVE COMPLIANCE

A holistic approach to process safety championed by board level and senior executives and backed by company policy and procedures is essential if companies are to avoid reactive compliance. The COMAH Competent Authority maintains focus by concentrating on special emphasis programmes, commonly referred to as 'Hot Topics', citing findings and recommendations following intervention visits and world-wide incidents. These include such subjects as Emergency Response, Process Safety Performance Indicators (PSPIs), Containment Policy and issues relating to human performance. Given their high profile and visibility, it is often tempting in these circumstances to concentrate all efforts and resources on compliance with the latest missive. Such temptation should be resisted, however.

Whilst 'Hot Topics' are valid and urge companies to address factors that have proved disastrous for other operators, each topic needs to be put into the context of a company's own sites and situations. For example, Emergency Response is a critical element of any safety programme, but it is a last resort which comes into play when all other avenues have failed. Just because it happens to be the latest 'hot topic,' is developing an A1 Emergency Response plan the most appropriate way to spend the entire safety budget? It's likely that those funds and resources would be better employed making improvements to other safeguards.

Similarly, following inspection of safety critical instrumentation, problems should be addressed, but there is no need to go into overdrive, setting Safety Integrity Levels and re-engineering many of the systems already in place. Fix the problem, but do so within the context of overall site safety.

Generally speaking, to avoid kneejerk reactions to recommendations on specific issues you need to firstly be asking yourselves whether the cost of implementing the latest change is proportionate to the risk involved; and whether this latest recommendation is the most cost-effective way of reducing your plant's overall risk to people and the environment.

GETTING THE BALANCE RIGHT

Obviously every company regulated under COMAH has a responsibility, in law, to ensure that risks are as low as reasonably practicable. So how do companies strike the right balance between making the most appropriate choices according to defined budgets whilst continuing to meet the expectations of the Competent Authority?

In a nutshell you need to put in place an appropriate mix of physical and procedural measures. The starting point should always be compliance with the law and relevant good practice guidelines. But risk assessment must be at the heart of the decision making process, using it to continually question what more can reasonably be done to provide assurances that the business' statutory and moral obligations continue to be met.

THE IMPORTANCE OF POLICY DEPLOYMENT

Policy Deployment (Hoshin Kanri) is a very useful strategic tool, not only for TQM, Akao Yoji, (2004), but also for any strategic management initiatives, including process safety. Like financial targets, policy deployment provides a shared vision, which aids long-term strategic planning, and gives focus to the entire organisation. Essentially it is a structured approach which is used to plan, monitor and control team and individual involvement in the achievement of company targets and objectives. It concerns all company goals, not just primary objectives on profitability and return on investment, although these will improve as a result.

The provision of a structure or framework within which to work formalises the way in which things should be done and eliminates any reliance on the experience of individuals. Additionally it provides alignment, involvement and cross-functional team working and ensures resources are directed where they are most needed – which befits both safety and the business.

Effective policy deployment aids sustainability and allows progress towards goals to be formally monitored in a visual environment. From a legal standpoint it helps demonstrate compliance to the relevant authorities.

MAKING IT WORK

The key elements of policy deployment are:

- Individuals and teams have clearly defined objectives and targets
- The link between each team or individual objective and the top-level business objectives can be clearly understood.
- Visually displayed KPIs or measures are openly available to monitor the progress of teams and individuals toward meeting their objectives
- Each team or individual has clear, visually displayed action plans (these can be electronic or paper-based) which illustrate the activities they will be completing to meet their objectives
- Each team or individual updates their KPIs/measures and action plans on a regular basis

- The management team hold regular reviews of the policy deployment system to monitor progress. If plans are not 'on track' corrective actions are taken.

SETTING PROCESS SAFETY PERFORMANCE INDICATORS (PSPIS)

Developing process safety indicators (HSE, 2006) provides guidance aimed at senior management within major hazard organisations in the development of performance indicators to give improved assurance that major hazard risks are under control.

A common issue identified during the PSL training is that although organisations have some PSPIS in place, they tend to be lagging indicators and they are not given the same visibility as other key performance indicators such as occupational safety, operational performance or finance.

Relying solely on reactive data to monitor performance has the effect that improvements or changes are only determined after something has gone wrong. However, the use of leading indicators will give early warning of dangerous deterioration within critical systems – they are therefore an essential part of the risk management tool kit.

Knowledge that business risks are being controlled in this way also has the benefit of increasing business efficiency since indicators can be used to show plant availability and optimised operating conditions – in fact anything that is critical to your business.

Quality is the key rather than quantity in determining PSPIS. Proactive monitoring of every single aspect of a risk control system is simply not necessary. In order to allow PSPIS to meet your own particular business' needs you should ideally be identifying those activities and operations which without question must be undertaken correctly on each and every occasion – in other words, those that are critical. In addition those critical elements need to be monitored in order to detect early signs of failure. Activities which are undertaken most frequently should also be identified with a focus on which aspects of the system are liable to deterioration over time.

Measurement generates energy, Nadler (1977), and aids in promoting the desired culture. The setting and monitoring of PSPIS means businesses can benefit from an increased focus on risk management; a protected reputation in terms of safety performance; and risk controls which are appropriate and proportionate. Furthermore cost savings can be made through the fact that time has not been wasted collating and reporting irrelevant performance information; and system weaknesses are identified early on, pre-empting expensive incidents. The PSPIS information that is collected is meaningful and can be used for other purposes, for example quality management.

CREATING AND MAINTAINING A PROCESS SAFETY CULTURE

Evidence has been seen that a process safety focused culture in the process industries is in its infancy and responsibility

tends to lie with those people in roles directly relating to process safety rather than the majority of the workforce.

Every type of safety system relies on plant, equipment and personnel doing what they are supposed to do at the requisite time. Even the most detailed PSM programme is liable to failure if employees do not buy-in to what the company is trying to achieve. This is why training programmes are so essential to the success of PSM systems. Operatives need to understand fully the reasons behind why a procedure is undertaken in a specific order and in a particular way and the risk to site and personal safety if they are not compliant with those procedures. Training of this type will help to eradicate violations where an employee might flout regulations to cut corners or believe that their way of doing things is better because it speeds up productivity.

Given the link between site safety and finance, safety and financial targets should be given equal prominence. If cross-functional teams at all levels are involved in the formulation of safety policy, then this will foster a feeling of ownership and shared vulnerability throughout the company, from the factory floor, right through to the directors' offices.

PSM IMPLEMENTATION ACROSS UK AND GLOBAL SITES

The challenge for any organisation is to operate a world class process safety management system which is appropriate for all sites regardless of geographical location or language.

Since July 2011 HFL Risk Services have been engaged in benchmarking, training and facilitating workshop activities at over 30 COMAH sites from SME to international organisations. The engagements have all involved senior management with representation from, if not all, the board of directors, focusing on ensuring a common understanding of PSM, the key elements and assurance of process safety management Systems and the principles of process safety leadership including promoting a positive process safety culture and continuous improvement. The training programmes are delivered in line with the new Cogent Industry Training Standard for Process Safety Leadership (2011). Workshop activities focus on a review of Major Accident Hazards across the participating sites; the identification and implementation of process safety management Systems including critical risk control systems; and developing a risk-based approach to PSM.

The benchmarking activities are undertaken at individual sites with the purpose of comparing individual site performance against best practice guidelines and to identify common strengths and weaknesses. The results of the benchmarking studies and PSL workshop activities have been used to inform and develop local or corporate strategies for the organisation as appropriate.

COMMON FINDINGS

The four pillars from the US Center for Chemical Process Safety (CCPS) (2007) have been used as the framework for

reporting the findings of the benchmarking, workshops and training activities. As expected, results within the sites were variable, with some being further along the process safety journey than others. What emerged, however, was that whilst it is recognised that countries may operate under differing regulatory requirements and that sites may have differing cultures, irrespective of geography or language, the same safety issues arose.

Figure 1 summarises the actions taken by the participating organisations, the majority of improvement actions agreed revolved around understanding hazards and risks and managing risks with commitment to process safety following very closely behind. Learning from experience was found to be the area of least priority.

The common threads emerging are as follow:

COMMITMENT TO PROCESS SAFETY

Commitment to process safety is fundamental in providing the foundations for the PSM system and needs to consider process safety culture, compliance with standards, competency, workforce involvement and stakeholder outreach, Center for Chemical Process Safety (CCPS) (2007). Key findings covered:

- Recognition that organisations need to ensure a policy is in place, which fits with existing policies, and promotes:
 - Recognition that policies and procedures are necessary
 - Common objectives and targets
 - A shared sense of vulnerability
 - Prioritisation of process safety over production
 - Appropriate and proportionate use of risk assessment
 - Open communications
 - Continuous improvement in process safety
- Key to effective PSM culture is leadership from the top, ensuring:
 - A sponsor is determined at board / senior level and this is communicated throughout the workforce
 - Visibility of the senior management team focussing on process safety

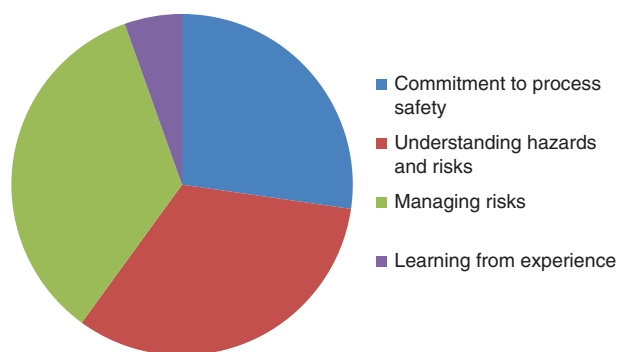


Figure 1. Agreed improvement focus areas

- Process safety is given at least equal importance of other business areas such as financial control and productivity
- Engagement of the hearts and minds of an organisation are key to sustaining a positive process safety culture throughout the entire workforce. This can be achieved through:
 - Setting of standards, objectives and targets
 - Structured training
 - Follow-up through appraisal process
 - Visual management of process safety
 - Management, operations and engineering
 - Programme monitoring, audit and review

UNDERSTANDING HAZARDS AND RISKS

Although it is evident that as an organisation hazards and risks are understood, the level at which the knowledge is embedded throughout the organisation differed greatly. Common improvement actions in this area cover:

- Increased communication of existing knowledge such as:
 - Review of site major accident hazards and COMAH safety report
 - Sharing of knowledge with the whole of the management team
 - Process safety management training for all employees
 - Forum for regular process safety communications
- Taking a holistic approach to process safety incorporating:
 - People, plant, processes and procedures
 - Predictability failure
 - Identification of critical equipment in relation to major accident hazards
 - Agreement, documentation and implementation of critical operating parameters
- Understanding the critical design intent of the plant and processes and methods to maintain it.

MANAGING RISKS

Results in this area echo findings from the original chemical industry benchmarking programme – namely that scores were strong across the board for the Organisation, Planning and Monitoring elements taken from HSG65 (1997). However the responsibility for day to day management/compliance lies mainly with technical employees rather than a systems based approach for process safety. Key findings include:

- Process safety management policy deployment is seen as adding value and needs to incorporate:
 - Criticality assessment
 - Application of standards
 - Use of appropriate procedures
 - Data collection and review
 - Monitoring and use of Process Safety Performance Indicators (leading and lagging)

- Programme audit and review/Compliance
- Integration with existing systems/standards
- Development of process safety performance indicators was seen as a critical area of focus amongst most organisations and ensuring a robust review process is key to the success.

Management of Change whether to staffing levels, procedures, roles and responsibilities, organisational structure, the use of contractors or any other factor can affect the management of major hazards either directly or indirectly. Being able to anticipate the potential effect of those changes on site and process safety is an essential part of the risk assessment process. Many sites had an impressive record in this aspect and are employing management of change principles not only to process/plant changes but organisational changes. Their methods and approach to Change Management demonstrate good practice on such topics as:

- Process, plant and procedures
- Use of appropriate and proportionate risk assessment
- Authorisation
- Document management
- Action tracking and close-out
- Permanent, temporary and emergency modifications

LEARNING FROM EXPERIENCE

As previously stated this area has received the least level of focus to date. This may suggest that the systems for understanding and managing risks need development/refinement prior to taking the next steps in learning from experience. However organisations were keen to:

- Share process safety management knowledge with clients
- Understand best practice for process safety
- Benchmark own sites and identify gaps/opportunities

CONCLUSIONS

The training, workshops and benchmarking activities conducted amongst UK and global sites have underlined a number of factors relating to the implementation of PSM

systems. In order to meet the needs of the business, organisations need to develop and implement corporate policies, objectives and targets aligned to those needs. In this way it will be able to determine the scale of its success. In addition it can be concluded that any procedures which were local to specific sites need to comply with corporate policies.

Monitoring of PSPIs at both site and group level is central in confirming that the key Risk Control Systems are operating as they should.

Having worked with hundreds of companies, we know that the best results are achieved by fostering a positive process safety culture right through the organisation and this has been further validated during the benchmarks, training and facilitated workshops. This means process safety leadership from the top, with senior management having a thorough understanding and committed role in the development of PSM policy and its deployment.

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