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Process Safety Leadership and its Key to Successful PSM Implementation

Sarah Grindrod*, Julian Hought, Andrew Fowler

HFL Risk Services Ltd, Freeman House, Orbital 24, Oldham Street, Denton, Manchester, M34 3SU
sgrindrod@hflrisk.com

If an organisation's 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, KPIs and effective monitoring and management systems the risk of a major accident and its attendant consequences increases sharply.
There is a legal requirement for organisations to demonstrate process safety leadership and yet the recent inaugural PSM benchmarking programme for the chemical industry highlighted a heavy reliance on technicians and engineers to identify and address any problems.
Whilst it is essential that competent personnel are charged with 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 pioneers of the PSM benchmarking programme, HFL Risk Services are an accredited provider for the process safety leadership training course specifically for board members, directors and senior executives.
This paper discusses key points from the training course including the business case for Process Safety Management; the requirements of policy deployment, based upon emerging standards and best practice; the value of setting KPIs, the importance of workforce engagement and how to achieve this and the importance and value of Process Safety Improvement Plans to continually reduce risk.

1. Introduction

A considered and practical Process Safety Management (PSM) system is vital if an organisation is to continue to operate in a manner that is safe to people and the environment. However, no matter how detailed those processes might be, the whole system is almost certainly doomed to failure if it does not have the commitment of the entire workforce.
Process safety is integral to a company's business performance, which is precisely why senior management should take a leading role in policy development and implementation. Without detailed policies, Key Performance Indicators and effective monitoring and management systems the risk of a major accident and its attendant consequences rises sharply.
Despite the legal requirement for organisations to demonstrate Process Safety Leadership, our recent benchmarking studies into PSM within the chemical industry revealed a reliance on technicians and frontline operators to identify and address issues relating to plant safety, across the board.
Whilst it is essential that competent personnel are charged with 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.

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2. Commitment to Process Safety

Commitment is a cornerstone of process safety excellence (CCPS, 2007). Without visible commitment and strong leadership from board members and senior managers it is unlikely that a company will see any marked improvement. Conversely, once a workforce is convinced that the organisation fully supports safety as a core value it will tend to do things in the right way and at the right time – even without supervision.

The key elements of process safety that support efforts to create and sustain the appropriate level of commitment within the workforce are: process safety culture; compliance with standards; process safety competence; workforce involvement and stakeholder outreach. A number of frameworks also exist for ensuring a sustainable commitment to process safety. These are PDCA, POPMAR (HSE, 1997), policy deployment (Akao, 2004), policies, measurable metrics (HSE, 2006), auditing, review, benchmarking, rigorous compliance and corporate knowledge.

3. The Principles of Process Safety Leadership

In 2007 the Process Safety Leadership Group (PSLG), comprising industry experts and the COMAH Competent Authority was formed. Its purpose was to implement recommendations following the 2005 Buncefield incident, but primarily to set standards for Process Safety Leadership (PSL) within the high hazard industries.

The PSLG's Principles of Process Safety Leadership (HSE, 2009) recognise that 'clear and positive process safety leadership is at the core of managing a major hazard business and is vital to ensure that risks are effectively managed.' They also go on to cite board level involvement and competence, active engagement of both board and workforce, visibility and promotion of PSL throughout the organisation, monitoring of Process Safety Performance Indicators (PSPI's) and the sharing of best practice as essential elements of successful PSM.

HFL Risk Services has long been an advocate of the PSLG principles and the importance of positive PSL. During our accredited PSL training workshop events (Cogent SSC Ltd, 2011) we invite board members of the individual companies involved to complete a questionnaire with question sets based around a PSL checklist relating to the Principles. These are categorised under the 6 PSLG headings 'Board Champion', 'Visibility', 'Process Safety Improvement Plan', 'Policy and Expectations', 'PSPIs' and 'Review of Incidents from Other Companies and Sectors'.

4. Research results from PSL training workshops

The collated results (Fig. 1) all point to opportunities within the current system. For example it transpired that whilst most companies are strong in discussing general process safety at board level, many are unable to identify a champion. Review of process safety metrics within board meetings was also weak, since several organisations did not have these in place. 'Policy and Expectations' scored particularly low: very few companies had a clear statement or policy for process safety, with only around half confidently stating that they had a structured approach for managing the highest risks on site.

Visibility was recognised as being an important aspect and companies were giving due consideration to how it could be shown in practice throughout the company. Once again, however the companies fell at the final fence when asked about how visibility policy is delivered, since in many cases no such policy currently existed. PSPIs also revealed a mixed bag; a significant number of companies did not have PSPIs in place, however in organisations where they were in place they were reviewed by relevant personnel and also by the board.

When questioned about Process Safety Improvement Plans it transpired that the majority did not have any. For those that did it was related to the PSPIs, but did not cover the wider spectrum of safety management systems, plant and equipment hardware and human factors behavioural elements. Such plans were often not endorsed by the board.

Where the respondents were particularly strong was in the 'Review' category. They had taken on board lessons from major accidents, but the approach was a little more ad-hoc for cross-industry learning and monitoring by the board.

As the above results demonstrate, there is clearly room for improvement relating to board level involvement in PSM policy and implementation. Operating and maintaining safe plant is paramount to a company's stability, but there is also a good business case for ensuring this is the case.

5. Why good PSM systems make good business sense

When it comes to profitability versus plant safety there should really be no contest. Unfortunately companies do not always see it this way until they are counting the cost of a major accident hazard. The truth of the matter is that plant safety and company profitability are actually very closely linked.
In chemical manufacture, storage and handling, potential loss of containment arguably poses the single largest business risk. The cost implications of forced downtime, compensation claims, fines, clean-up costs, rebuilding expenses, damage to reputation, and in the worst case scenarios, loss of human life will far outweigh any profit margin. When considered this way, making Process Safety a priority can be viewed as safeguarding those profits as well as the safety of employees.

6. A Legal Requirement

Should further inducement for the interest of top-level executives be required, consider this: In the UK there is the very real threat of prosecution under the Corporate Manslaughter and Corporate Homicide Act 2007. Fines levied under the Act are few and far between but, should it be deemed that duty of care has fallen far below what could have been expected, an organisation could be looking at compensation payments in the order of millions of pounds. It therefore makes sound commercial sense that process safety should be at the forefront of company-wide policy and importantly it should be led from the very top of the organisation.
Company directors should also remember that they can still be held personally accountable under UK health and safety law where there is evidence of gross negligence and ignorance of the law is no excuse.

7. The Need for Process Safety Leadership

Process Safety Management has long been a concern of the COMAH Competent Authority, but there is now the requirement for senior management and board directors to demonstrate organisational competence in this area. This means a thorough understanding of the risk evaluation process and active involvement in policy development and deployment for those areas which are risk critical. So whilst operators and technicians might be more than capable of maintaining and implementing plant safety day-to-day, in order to demonstrate organisational competence there needs to be a clear policy and working knowledge of PSM throughout the entire company championed by those in a position of ultimate power.
Understanding how risks are identified and assessed for criticality allows senior management greater control over the allocation of safety budgets and in decision-making as a whole with respect to safety. Whereas before money for change implementation might have been directed towards the middle manager who shouted loudest, or allocated to meeting the recommendations of an HSE ‘Hot Topic’, those holding the purse strings will now be in a better position to see the bigger picture with respect to safety. This will allow them to channel budgets where they will be most effective in underpinning the overall safety of the plant.

8. The Pitfalls of Reactive Compliance

Like every high hazard industry, the chemical industry is highly regulated. As a result companies are in receipt of regular communications from the COMAH Competent Authority citing findings and recommendations following intervention visits and worldwide incidents. Commonly referred to as ‘Hot Topics’ these typically include subjects such as Human Factors, Process Safety Performance Indicators, competence management and Emergency Response procedures.
Communications such as these are designed to provoke kneejerk compliance in companies whose PSM and Process Safety Leadership policies are not well-developed. Expending energy, resource and funding on these aspects is unlikely to be the best use of company funds and could divert attention from areas where there is a far greater risk. Each topic needs to be put into the context of a company’s own sites and situations.
For example, Emergency Response procedures might have proved disastrous for one organisation, but it does not necessarily follow that this is the weak point with all other companies. Emergency Response should always be seen as a last resort so, whilst it is important that appropriate measures are in place, the company safety budget would be better spent improving other safeguards through Layers of Protection Analysis (CCPS, 2001).
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.

The only truly effective way to avoid reactive compliance then is to take a more holistic approach to process safety, embracing risk assessment as a management tool to help assess the benefits from change rather than simply viewing it as an academic exercise necessary only to satisfy the regulators. This approach will naturally favour implementation of changes where the cost is proportionate to the level of risk reduction gained giving the best overall outcome for people and the environment. It goes without saying that all proposed activities should be led by board level and senior executives and be backed by company policy and procedures.

9. Budget versus Legislation

We have stated that it is not always prudent to channel all your resources into addressing the latest 'Hot Topic'. That being said, operators do obviously have a responsibility to comply with the law ensuring that risks are as low as reasonably practicable.

Policies should always begin with legal compliance and take into consideration relevant standards and best practice guidelines, advocating deployment of the most appropriate mix of physical and procedural risk reduction measures. Hot Topics should of course be evaluated and fed into the equation but only with an understanding of the plant and processes that are critical to safety, the environment and the business. Only then can the risk control systems which are essential for ongoing safe operation and maintenance be clearly identified so that Key Performance Indicators (KPIs), designed to detect failures within these systems, can be put in place to provide assurances that the business' statutory and moral obligations will continue to be met.

10. Why Policy Deployment is Essential

In the same way that financial targets give companies a common goal, policy deployment provides a shared vision, which aids long-term strategic planning, and gives focus to the entire organisation. Effective policy deployment aids sustainability and allows progress towards goals to be formally monitored in a visual environment. Moreover, from a legal standpoint it helps demonstrate compliance to the relevant authorities.

In a nutshell, Policy Deployment 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, but also such elements as customer service, plant efficiency and plant and process safety. Those with specific responsibility for analysis of company finances will find that effective Policy Deployment on this level will have a positive impact on the bottom line.

For PSM Policy Deployment to be successful it needs to be plainly understood by the entire organisation – from frontline operators to boardroom executives and everyone in between. Individuals and teams within an organisation should be given clearly defined objectives and targets. Furthermore the link between these given objectives and top-level business objectives needs to be clearly comprehended. Individuals have to understand why processes should be undertaken in a particular manner and the consequences non-conformity can have on the safety of the entire plant.

When we undertook the UK's first PSM benchmarking study for the chemical industry a common theme that emerged was a lack of detail in high level policies and in the deployment of those policies. By developing and implementing a structure or framework within which to work and formalising the way in which things should be done, it eliminates reliance on the experience of individuals and improves organisational safety as a whole.

Visibility is a vital component of effective Policy Deployment. Visually displayed Key Performance Indicators (KPIs) should be openly available to monitor the progress of teams and individuals toward meeting their objectives. The activities each team will be undertaking to complete their objectives also need to be displayed in a clear visual manner. This can be electronic or paper-based and should be updated on a regular basis so that progress can be monitored regularly by the management team. Such transparency between departments and the involvement of the management team allows swift corrective action to be taken if plans are not 'on track' with company objectives.

This marrying of financial and safety objectives not only helps to keep financial targets on track, it also provides alignment, involvement and cross-functional team working and ensures resources are directed where they are most needed. The visible committed role of senior management in PSM policy development and deployment also fosters a positive process safety culture throughout the organisation – this is a cornerstone for continuous improvement.

11. Setting Process Safety Performance Indicators (PSPIs)

The goal of any PSM system is to ensure that the risk of a major accident or incident is as low as reasonably practicable. When setting objectives and KPIs for individuals and teams this needs to be foremost in the minds of those responsible for policy development. Investigating data from incidents in the past which have compromised safety (lagging data) is a good starting point but a PSM system will be far more effective when a proactive approach is taken. Relying solely on reactive data to monitor performance has the effect that improvements or changes are only determined after something has gone wrong. By contrast the use of leading indicators is an essential part of the risk management toolkit since they will give early warning of dangerous deterioration within critical systems.

Identifying and concentrating on those activities and operations which are risk critical will allow you to develop PSPIs which meet the needs of your own particular business. These are the activities which must be undertaken correctly on each and every occasion to avoid compromising plant safety. Monitoring every single aspect of a risk control system would be time-consuming and unnecessary, so the focus should always be on quality over quantity. An initial HAZID or HAZOP audit will identify those areas requiring particular attention, but in addition frequent activities should be monitored to ascertain which aspects of the system are liable to deterioration over time.

The setting and monitoring of PSPIs will help develop corporate knowledge and understanding and allow businesses to 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 PSPI information that is collected is meaningful and can be used for other purposes, for example quality management. Knowledge that business risks are being controlled through PSPIs has another added benefit – the indicators can be used to show plant availability and optimised operating conditions, so business efficiency can be increased.

12. Fostering and Sustaining a Culture of Process Safety

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. The process of educating personnel in the importance of doing tasks in a specified order or a particular manner is an essential element of the process safety management regime, if it is to be effective. The risk to site and personal safety must be fully understood in order to eradicate violations such as corner-cutting based on learned historical practices to speed up productivity.

Interestingly, in line with the collective responsibility that a process safety culture engenders, it has been shown that the degree to which a team or individual employee feels they have ownership of an area of plant or piece of equipment, i.e. the degree to which they can see the positive outcomes from their actions and behaviours, the more reliable it is and the more likely it is to continue to be operated and maintained in the correct manner.

13. Conclusions

An organisation’s plant safety and finance are inextricably linked. The involvement of cross-functional teams of all levels in determining safety policy is essential in the combined understanding of which areas of the business are safety-critical and therefore pose the greatest risk to plant and financial stability.

Board and senior level personnel need to give safety and financial targets equal prominence and become actively involved in the development and deployment of a proactive PSM policy.

Effective Process Safety Leadership will help to create a process safety culture, a feeling of ownership and shared vulnerability, from the factory floor, right through to the directors’ offices.

From a financial point of view, the involvement in and comprehension of process safety policy allows company budgets to be spent where they will be most effective in controlling overall plant safety. Safeguarding plant safety in this manner not only helps meet legislative requirements, but also has the benefit of improving business productivity and efficiency. Potential risks are identified and controlled and the threat of a major accident, which can prove extremely expensive in terms of lost revenue, compensation and material damage, can be avoided.

By addressing it in this way, process safety management will become an integral part of the business management function, driven by the board and embraced by the workforce, and not seen simply as a necessary appendage, as is all too often the case.

Figure 1: PSLG Principle Audit Results

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