

EDITION 2 - Managing Risk: The hazards that can destroy your business

A guide to leadership in process safety



Foreword

Major accidents kill people, ruin lives, damage the environment and destroy businesses. From Piper Alpha to Grenfell Tower, failure of leadership has been a significant causal factor in many major accidents across major hazard sectors, including nuclear, aviation, marine transport, rail, high rise residential buildings as well as chemicals & refining and oil & gas.

As a former senior leader in one of the UK's largest energy businesses, with responsibilities for managing and assuring process safety across operations in onshore and offshore oil & gas, bulk storage of hydrocarbons and both conventional and nuclear power generation, I am all too familiar with seeing first-hand how good - and poor - leadership can profoundly impact process safety.

In 2010, industry, unions and regulators jointly developed the eight Process Safety Leadership Principles that emerged from the 2005 Buncefield incident. These have been widely adopted across onshore and offshore major hazard industries. Subsequently, the COMAH Competent Authority has developed an operational delivery guide based on these principles. This guide has been used to conduct several inspections at COMAH regulated sites.

This report from the COMAH Strategic Forum sets out the key findings so far and has been developed within a working group of senior leaders from industry, regulators and the trade unions. Whilst there are some good examples of effective leadership, there is still much work to be done; this is reflected in the decision by the COMAH CA to issue three improvement notices specifically relating to leadership.

Our report starts by setting out the rationale for focusing on process safety leadership with the emphasis being placed on senior leaders across the organisation. It then summarises the findings so far, and most importantly, it explains in detail what the inspections have revealed and key lessons that leaders in major hazard organisations can directly learn from and apply. These lessons align to each of the eight principles of process safety leadership. Finally, this report summarises three areas of shared learning, highlighting what more senior leaders can do:

- The essential need for leaders to **communicate effectively** about process safety across the entire organisation
- The need for senior leaders, regardless of their role or responsibilities, to demonstrate an appropriate level of **process safety competency**
- The importance of having an effective set of **process safety performance indicators** that senior leaders understand and can challenge to continuously improve process safety performance

I encourage all senior leaders in major accident hazard businesses, including those regulated by COMAH but also those who manage major hazards that come under different regulatory regimes, to carefully read and act upon this report. It enables leaders to ask questions and receive assurance about how effective process safety leadership really is across their organisation, and to use the findings to develop an informed and achievable improvement plan

I strongly advise all business leaders in the Major Accident Hazard sectors to read and digest this report – and act on the recommendations and guidance that it provides.

Gus Carroll, Chair, COMAH Strategic Forum



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1. What is Process Safety and why develop a set of principles

Process safety is a term commonly used for managing the risks that, if not effectively managed, have the potential to destroy your business, kill & injure people and cause significant harm to the environment.

In practice, process safety concerns the design, maintenance and operation of plant and equipment to prevent unintentional release of chemicals, together with the management, mitigation and emergency procedures used to reduce the risk from a release. It is a useful abbreviation and we have used it in this guide for convenience.

People regularly confuse process safety with occupational health and safety and the misunderstanding can be catastrophic. Two distinctly different approaches are required to manage them effectively and success in occupational health and safety does not mean success in process safety and vice-versa.

Occupational safety ensures, for example, work at height is carried out safely, that the area people are working in is free from hazards, such as moving vehicles, and slippery floors, unguarded machinery or dangerous electrical installations and that safe, planned systems of work are followed. Occupational Health refers to the effective management of significant health risks, for example respiratory sensitizers and/or carcinogens, and the reduction of serious ill-health effects from the chemicals and processes that you use.

Process safety refers to the tools that are used to manage the integrity of hazardous processes and storage. It uses a mixture of engineering and management skills, and wider systems thinking aimed at preventing events such as explosions, fires and toxic releases. It focuses on three key aspects:

- Plant (hardware)
- Process (systems)
- People

Process safety is about managing risks effectively so that people, the environment and assets are kept safe. More complex operations, greater ranges of hazardous substances and larger inventories of those substances can all lead to increased risk. However, the discipline of process safety is valuable no matter what the scale or complexity of the business.

It is vital to understand that although important, an exclusive focus on Occupational Health and Safety performance – for example reducing Lost Time Accident and personal injury rates, improving occupational health, reducing slips trips and falls - will not deliver success in managing process safety. Many high-profile incidents have been characterised by an over-emphasis on improving occupational safety at the expense of the less frequent but potentially more serious process safety incidents.

Following a number of these incidents, several industry sectors worked through their trade associations and in conjunction with the COMAH Competent Authority and Trades Unions to develop a set of Principles of Process Safety Leadership to help ensure that they work together to improve process safety performance. For those trade associations and companies involved improvements have been seen in the relationship with safety and environmental regulators, consistency in site based regulation (due to joint guidance development) and in identifying and tackling emerging issues.

Common benefits can be gained from a collaborative and joint approach and this should be considered in conjunction with your company's own policies with regard to ensuring the value of visible and effective leadership, worker engagement, monitoring and sharing best practice. Such initiatives are relevant to both occupational and process safety.

Adopting the following principles can help your business improve its performance and you will be giving additional protection to your people, to the environment, and to your business. In addition, the regulator takes the performance of a business managing its risks into account when determining where and to what extent it plans its inspections.

2. What do the principles say

The *Principles of Process Safety Leadership* were developed following the Buncefield explosions in 2005, and are designed to help companies understand how they can promote process safety within their own organisations and work collaboratively to improve standards. More than 20 years on from Buncefield the Principles are just as valid as they were then, and a sound basis for improving process safety leadership and management.

The principles are:

- 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;
- Process safety leadership requires board level involvement and competence. For companies with boards located outside the UK then the responsibility to show this leadership rests with the most senior UK managers;
- Good process safety management does not happen by chance and requires constant active engagement;
- Board level visibility and promotion of process safety leadership is essential to set a positive safety culture throughout the organisation;
- Engagement of the workforce is needed in the promotion and achievement of good process safety management;
- Monitoring process safety performance based on both leading and lagging indicators is central to ensuring business risks are being effectively managed;
- Publication of process safety performance information provides important public assurance about the management of risks by an organisation; and
- Sharing best practice across industry sectors, and learning and implementing lessons from relevant incidents in other organisations, are important to maintain the currency of corporate knowledge and competence.

Further information can be found here: [Process Safety Forum: Buncefield response](#)

2.1 What do the principles mean to my organisation

Any business that has the potential to cause harm to people or to the environment should have a clear understanding of these risks. The principles aim to help businesses understand and manage these risks. This can be done by ensuring that:

- everyone in the business understands what could go wrong and the role that they have in preventing this;
- managers, from the most senior to the front line:
 - are actively involved in process safety and are held to account for their performance
 - display by both actions and words the importance of process safety relative to other priorities such as schedule and cost;

- actively encourage and promote discussion with employees, safety representatives and contractors so that the risks can be better understood and improvements made;
- process safety performance within the business is monitored and any action taken as appropriate – not only when accidents happen but also failures that could lead to an accident; and
- the business looks externally for any lessons that could be learnt or changes that could be made to minimise the risks of an accident.

Adoption of the principles does not mean a fundamental review of what you do and how you do it, nor does it mean significant capital expenditure for people or equipment. The principles aim to influence the thinking within the business, making sure that process safety is understood at all levels, appropriate networks are formed and where weaknesses are identified action is taken.

2.2 Why should I adopt the principles

The principles were created to help business better manage their process safety risks. Adoption does require time and commitment however the benefits can be significant – by engaging with your workforce and with other businesses you have the opportunity to reduce the potential for a major hazard event in your company that could cause harm to people, the environment, your assets, your business, and disruption to your customers.

You will be able to demonstrate to your shareholders, your employees, your stakeholders and insurers that you are effectively managing the risk of major hazards through adoption of best practice. You will be better placed to show your compliance with regulatory requirements. It is also likely that you will have fewer minor disruptions to your business and reduce rework and waste.

Where there is a commitment to fully engage with your business sector you will have the opportunity to:

- Gain access to the process safety knowledge and experience of other similar companies:
 - ✓ several trade associations (including all those involved in the COMAH Strategic Forum) have dedicated committees and strategies in place to share process safety knowledge and good practice.
 - ✓ access to the learning from major hazard events in other companies enabling you to take proactive action to avoid them happening to you
- influence how your industry sector is regulated:
 - ✓ industry works together with the Competent Authority through the COMAH Strategic Forum (CSF) to agree strategy and direction for maintaining and improving major hazard management and leadership.
- Improve their understanding of how the adoption and demonstration that you work in accordance with the principles can potentially influence the level of regulatory intervention:

- ✓ the COMAH Competent Authority considers performance as part of the intervention planning process
- Influence joint regulator/industry guidance
 - ✓ joint Industry and COMAH Competent Authority guidance is regularly commissioned and developed through the Chemical and Downstream Oil Industries Forum (CDOIF) and individual trade associations, this ensures that emerging issues or areas where further information is required can be tackled quickly and consistently. Refer to: [The COMAH Competent Authority](#)
- Influence process safety training development
 - ✓ industry has worked collectively with the COMAH Competent Authority and COGENT Skills to develop a range of process safety courses. For further information refer to: [PSMB - Cogent Skills](#)

For the COMAH sector, these networks, forums and working groups are already well established and actively working with industry to help us all work more safely and efficiently.

For those businesses not regulated under COMAH but with process safety risks, the principles are still equally valid – guidance development through CDOIF and sector skills initiatives are not limited to those businesses operating under COMAH.

2.3 How do I put the principles into practice

Depending on the size and nature of your business adoption of the principles should be in a proportionate and scaled manner:

- **Process safety accountabilities** - defined and championed at board level. Board members, senior executives and managers should be held accountable for process safety leadership and performance;
- **At least one board member** - should be fully conversant in process safety management in order to advise the board of the status of process safety risk management within the organisation and of the process safety implications of board decisions;
- **Appropriate resources** - should be made available to ensure a high standard of process safety management throughout the organisation and staff with process safety management responsibilities should have or develop an appropriate level of competence;
- **Organisations** - should develop a programme for the promotion of process safety by active senior management engagement with the workforce, both direct and contract staff, to underline the importance of process safety leadership and to support the maintenance of a positive process safety culture within the organisation;
- **Systems and arrangements** - should be in place to ensure the active involvement of the workforce in the design of process safety controls and in the review of process safety performance;

- **Business risks** - relating to process safety should be assessed and reviewed regularly using an appropriate business risk analysis methodology;
- **Leading and lagging process safety indicators** - should be set for the organisation and periodically reviewed to ensure they remain appropriate for the needs of the business. Information on process safety performance should be routinely reviewed at board level and performance in the management of process safety risk is published in annual reports;
- **Engagement** - companies should actively engage with others within their sector and elsewhere to share good practice and information on process safety incidents that may benefit others. Companies should have mechanisms and arrangements in place to incorporate learning from others within their process safety management programmes;
- **Corporate Knowledge** - systems and arrangements should be in place to ensure the retention of corporate knowledge relating to process safety management. Such arrangements should include information on the basis of safety design concept of the plant and processes, plant and process changes, and any past incidents that impacted on process safety integrity and the improvements adopted to prevent a recurrence.

A full copy of the principles of process safety leadership can be found here: [Process Safety Forum: Buncefield response](#)

The Institute of Directors (IoD) in collaboration with the Process Safety Forum (PSF) has developed a standard for [Business Risk Management Competency for Board Members](#). This standard of competence has been developed with the involvement of high hazard industry leaders, industry trade associations and leadership experts to define expectations of risk management competency within high hazard industries such as petrochemical, nuclear, rail, offshore energy, bulk liquid and gaseous storage, and biological research, amongst others. The work has been facilitated by the Process Safety Forum (PSF) who are custodians of the document.

The Organisation for Economic Cooperation and Development (OECD) has also produced a helpful publication Corporate governance for process safety: Guidance for senior leaders in high hazard industries: [OECD Web Archive](#)

3. Common themes from interventions

3.1 COMAH interventions

In 2019 the COMAH Strategic Forum launched its year of Process Safety Leadership. To coincide with this initiative, the COMAH Competent Authority (CA) published its Operational Delivery Guide *Inspecting Major Hazard Leadership and Investigating Leadership Failures in Major Accidents* and the supporting *Major Hazard Leadership Intervention Tool*.

The Operational Delivery Guide is part of the COMAH CA strategy for encouraging strong leadership and preventing major accidents in major hazard industries. It underpins the CA's programme for ensuring effective major hazard leadership in preventing, controlling and mitigating major accidents.

Inspections by CA partners began in 2021. The following is based on the themes and trends emerging from the COMAH CA on the first 19 Major Hazard leadership inspections against each of the eight principles.

1. Safety leadership is at the core of managing a major hazard business
 - *Major Hazard Leadership should be clearly defined and written into every senior leader's job description*
 - *Change management is critically important and there should be a robust system in place*
 - *The environment is also part of COMAH compliance and must be considered when effectively managing the business*
2. Major hazard leadership requires board level involvement and competence
 - *Competence on Major Hazard Leadership is required at Board level – it should not be left to one individual*
 - *Read and understand the key elements of the Safety Report*
 - *Senior leaders headquartered outside of the UK may not have a clear understanding of the UK COMAH regulations and the risk-based approach to safety*
3. Good major hazard management does not happen by chance and requires constant active engagement
 - *There is no one-size-fits all solution to Major Hazard Leadership, each business and each site is unique and has unique challenges*
 - *Plan changes appropriately and with plenty of time. If there are known delays (for example in updating Safety Report) advise the COMAH CA as required*
4. Board-level visibility and promotion of major hazard leadership is essential to set a positive safety culture throughout the organisation

5. Engagement of the workforce is needed in the promotion and achievement of good major hazard control leadership
 - *Communication within the business is key, both upwards and downwards*
6. Monitoring major hazard performance is central to ensuring business risks are being effectively managed
 - *Be aware of your Safety Management System and monitor how effective and efficient it is*
7. Publication of major hazard performance information provides important assurance about the management of risks by an organisation
 - *Key Performance Indicators (KPI's) for process safety should be understood, reviewed and refreshed to avoid complacency*
8. Sharing best practice across industry sectors, and learning & implementing lessons from relevant incidents in other organisations, are important to maintain the currency of corporate knowledge and competence
 - *The COMAH CA is open to working together with COMAH Operators to improve Major Hazard Leadership. If there are concerns or queries, these should be directed in the first instance to either COMAH Intervention Manager or the HSE email at COMAH.Intervention-Support@hse.gov.uk. Relevant Trade Associations may also be able to assist sharing best practice and lessons..*

3.2 UK Continental Shelf production operators interventions

In January 2022, HSE Energy Division initiated a targeted inspection programme across a sample of the United Kingdom Continental Shelf (UKCS) production operators. A total of 14 operators were inspected against the inspection program, conducted using established HSE guidance on Major Hazard Leadership and carried out by a dedicated core team to ensure consistency of approach and comparison of performance. The organisations sampled covered the range of operating models in the UKCS and the different types of installations in use.

Benchmarking of Duty Holders against their industry peers was not conducted, neither were scores assigned.

Strengths arising from the intervention process:

- Senior leaders understand their responsibilities for MAH management and were clear on their expectations and exhibiting the correct behaviours.
- MAH performance is regularly reviewed at leadership meetings.
- Industry has responded positively to the initiative and proactively engaged with HSE and industry peers.
- Significant time and effort has been invested by organisations into assessing their own performance against the principles and identification of any gaps. Improvement plans have been developed and are now being resourced and targeted at the key areas.

- Increased collaboration between organisations with greater sharing of lessons learned from the inspection programme, discussion of areas of good practice and areas for improvement.
- Workforce engagement and utilisation of the Elected Safety Representative (ESR) function is a strong positive.

Weaknesses arising from the intervention process:

- Industry has reached 'normalisation of deviance' with organisations more willing to accept degradation of Major Accident Hazard (MAH) barriers without acting.
- Cumulative risk continues to be a challenge.
- Audit and assurance is ineffective and is failing to identify areas of weakness.
- Industry headcount has reduced significantly with many organisations potentially under-resourced in critical areas, which is having a direct impact on MAH management.
- Increase in the number of new recruits in industry (commonly referred to as 'green hats') is placing a burden on the offshore workforce.
- Contractor engagement remains focused on personal safety with limited consideration of the impact that contracting organisations can have on MAH management.
- Effective process safety leadership is being driven by individuals instead of an ingrained part of the organisational structure or culture.
- There is an absence of a structured MAH competency framework and training for senior leaders.
- There are early indications of a drop-off in workforce understanding and appreciation of MAH risk.
- Learning and improving. The PSLP inspection programme has not identified any new themes which have not been identified by HSE previously either through routine inspections or other key programmes.

3.3 Summary of strengths and weaknesses

A summary of the strengths and weaknesses for both the COMAH and UKCS operator interventions is provided in the table below.

	PSLG Principle	Strengths	Weaknesses
1	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.	<p>Senior leaders are aware of their responsibilities for MAH and exhibit appropriate behaviours.</p> <p>Accountability is acknowledged as a foundation for safety culture in multiple reports.</p>	<p>Accountability is often implied rather than explicitly assigned and tracked, leading to gaps.</p> <p>Behavioural assessment of accountability is lacking.</p>
2	Process safety leadership requires board level involvement and competence. For companies with boards located outside the UK then the responsibility to show this leadership rests with the most senior UK managers.	<p>Many organisations have at least one board-level member conversant in process safety.</p> <p>Leaders show growing awareness of the principles and engage proactively.</p>	<p>Lack of structured training or competency frameworks for senior leaders is common.</p> <p>Some leaders prioritize financials over safety decisions.</p>
3	Good process safety management does not happen by chance and requires constant active engagement.	<p>High awareness of MAH risks and controls among leaders, with strong understanding shown in survey responses.</p> <p>Positive sentiment towards ongoing safety training and implementation of competency frameworks.</p>	<p>Lack of structured MAH competency frameworks across most organisations.</p> <p>Competency often reliant on individual initiative rather than systemic processes.</p>
4	Board level visibility and promotion of process safety leadership is essential to set a positive safety culture throughout the organisation.	<p>Leadership visibility and commitment to safety is seen as a cultural strong point.</p> <p>HSE inspections noted visible engagement and behavioural role-modelling in many organisations.</p>	<p>Some senior leaders are not consistently engaging with operational realities.</p> <p>Engagement not uniformly systemic—still reliant on key individuals.</p>
5	Engagement of the workforce is needed in the promotion and achievement of good process safety management.	<p>Strong ESR involvement and two-way communication noted in inspections.</p> <p>Workforce feels involved in safety conversations and hazard discussions.</p>	<p>Limited involvement in decision-making processes and contractor engagement still focused mainly on personal safety.</p>

	PSLG Principle	Strengths	Weaknesses
6	Monitoring process safety performance based on both leading and lagging indicators is central to ensuring business risks are being effectively managed.	Regular MAH risk reviews and cumulative risk tool development are underway in many organisations.	<p>Difficulty in assessing cumulative risks and justifying decisions to continue operations under rising risk.</p> <p>Over reliance on HSE inspections for operator's audit and assessment process</p> <p>Risk discussions often underrepresented in long-term planning and commercial decisions.</p>
7	Publication of process safety performance information provides important public assurance about the management of risks by an organisation.	Widespread use of process safety indicators (leading and lagging), with regular reviews in leadership meetings.	<p>Indicators often not meaningful or aligned with risk exposure.</p> <p>Limited challenge or inquiry into the meaning of KPI trends by leadership.</p>
8	Sharing best practice across industry sectors, and learning and implementing lessons from relevant incidents in other organisations, are important to maintain the currency of corporate knowledge and competence.	Industry collaboration has improved significantly, with shared learning from inspections and external incidents increasing.	<p>External sharing remains weak; companies are reluctant to share learnings broadly.</p> <p>Lack of systemic mechanisms to integrate external learning into internal processes.</p>

4. What more can we do

The COMAH Strategic Forum Leadership Working Group analysed the common themes emerging from Major Hazard Leadership inspections. It identified supplementary areas that leaders can focus on to improve overall safety performance and better understand the Major Accident Hazards that could impact their business.

Communication

Communication is key. Senior leaders should:

- ensure staff at all levels within the business are actively engaged, including operators, supervisors, health and safety professionals and managers, to determine if there are any issues that are concerning them
- understand the effectiveness of their major hazard leadership by discussing with others within the organisation, including managers, supervisors and operators
- have exposure to all relevant safety information, including any actions required from planned interventions by the COMAH CA such that they do not only react or take action when an enforcement notice is served or prosecutions occur (refer also to Key Performance Indicators below)
- determine how relevant safety information, including actions required by the regulator can be clearly communicated through all levels of the business to encourage understanding and improvement.

Competency

Those senior leaders who were exposed to and aware of the Process Safety Leadership Group (PSLG) Principles of Process Safety Leadership, and who had attended relevant Safety Leadership training were able to better understand the challenges to their business and respond more effectively to the questions raised as part of the Major Hazard Leadership inspection.

Senior leaders should:

- use the information provided in the references and resources section of this document to understand and become conversant in the PSLG Principles of Process Safety Leadership
- ensure that they and their senior management team have the appropriate training to give them a clear insight into how to embed process safety management and promote a positive safety culture throughout their organisation
- ensure that sufficient resource is provided to continually develop staff competency, and a robust competency management plan is in place

Key Performance Indicators (KPI)

KPI's for process safety (sometimes referred to as Process Safety Performance Indicators, PSPI) are an essential tool to understand the safety performance of a business.

Senior leaders should:

COMAH Strategic Forum

The COMAH Strategic Forum is a high level joint chemical industry and regulator forum working to improve major accident hazard management and raise standards across industry.

- work with their teams to ensure that KPI's are meaningful, useful and give the correct information.
- understand and be prepared to challenge the information that they are given
- ensure that they take notice of any warning signs, and be prepared to act on them

5. Conclusion

The COMAH Strategic Forum believes that adoption of these leadership principles can benefit all industries which have the potential for major incidents that can harm people or the environment. The principles do not represent large capital expenditure, but instead a philosophy of how we can work better to manage major hazard risks and collectively help to reduce major incidents.

The feedback from early work on leadership interventions by the major hazard regulators shows that although progress is being made and business leaders are adopting or demonstrating the principles in their approaches, there are areas that leaders can focus on to improve their overall major hazard safety performance.

For any business access to process safety knowledge and expertise from within their own sector and beyond is invaluable. The principles of process safety leadership are a mechanism by which this can be achieved. Several trade associations work closely with their members to deliver the principles and have very active participation in the various joint industry and regulator forums. We encourage you to engage with your relevant trade association to find out more about how they can help.

By bringing industry and the COMAH Competent Authority together to share and agree on good practice we can help ensure a thriving, safe and sustainable industrial sector with a regulatory regime that supports business growth, high standards and strong compliance.

GB industry has many good practices and the challenge is to make those good practices into common practices. Through your involvement and help we can together Help Great Britain work well.

6. References and Further Reading

The following guidance and resources are available to all businesses to help improve Major Hazard Leadership:

[Inspecting Major Hazard Leadership and Investigating Leadership Failures in Major Accidents](#)

[Major Hazard Leadership Intervention Tool](#)

[Process Safety Leadership in the UKCS](#)

[Senior Leaders: What you need to know about major hazard leadership](#)

[Template Safety Leadership Charter: Our commitment to good major hazard leadership](#)

[Process Safety Leadership Group \(PSLG\) - Principles of process safety leadership](#)

[IoD PSF Standard - business risk management competency for board members of high hazard industries](#)

[Corporate Governance for Process Safety - Guidance for senior leaders in high hazard industries](#)

[Developing process safety indicators: A step-by-step guide for chemical and major hazard industries](#)

[Process Safety Leadership Training Standard](#)

[Chemical and Downstream Oil Industries Forum Guidance Adapting to Climate Change](#)

Businesses are also actively encouraged to engage with their relevant Trade Association. Trade Associations often have access to extensive information, peer-to-peer resources and be engaged in relevant discussions with the COMAH CA and other relevant stakeholders.