

YOUR QUICK GUIDE TO PROCESS SAFETY MANAGEMENT

Introduction

Major incidents are a constant threat to plants and teams involved in hazardous materials; whether it's for extracting hydrocarbons, processing ore variations or managing pipelines.

Companies need to constantly strive for ever-lower injury rates as an objective. By ensuring their process safety strategies continuously evolve, that objective becomes far more achievable.

However, at the same time, it's also important not to have process safety undermine sustainable business performance. A truly effective strategy will overcome this potential issue and improve reliability, support productivity, and reduce operational expenditure.



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PREVENTION THROUGH DESIGN (PTD)

PtD needs to take a higher priority in today's risk mitigation approaches. When plant teams conduct any risk mitigation initiative, there's an inherent need to ensure no other risk potential is introduced. There are three challenges which have to be acknowledged:

- 1** Through the normal chronology of a design, the best opportunity for decision making is when the least amount of data is available;
- 2** People don't want to risk untried solutions – this is a psychological barrier which can hamper project development;
- 3** And the situations related to using an EPCM contractor. From an operator's perspective, if they go with a unique solution, it's a good chance that competitive EPCM bidding will be reduced or excluded.

The early planning in concept development of a project is very financially and production-driven. To maximise preventability in the conceptual stage, safety has to be infused within a team that is working to commercial and production objectives. If you can emphasise serious safety considerations throughout the process design lifecycle, you'll promote early process changes which bring large safety benefits and – quite often – great commercial advantages too.

“It is during design that you have the maximum chance to deal yourself the strongest safety hand, because it is the very starting point of your new plant, and once completed, it is seldom practicable to go back.”

Tony Pooley
Associate Professor,
University of South Australia,
& Former NOPSEMA Advisor

KPIS AND STANDARDISED PROCESSES

At the outset of a major project, the aims of the EPCM contractor are not the same as for the client. There is constant tension (albeit below the surface) between two different objectives. The contractor usually wants to build a facility that meets the client handover conditions at the minimum cost.

As a result, the operability and maintainability of that facility (after the successful handover) is of fast-reducing interest to the contractor. All concern evaporates long before the design life of the facility has been reached.

The client cannot complain about this. They'd most likely have given greater weighting to price than any other review criteria (once sound safety management during the construction phase was reasonably assured).

Both client and contractors have to find a middle ground for genuine success and KPIs need to reflect long term operability and maintainability. However, don't wait for change. None of the individuals responsible will be in the same role when the plant learns by experience that it can't cope with changes in operating conditions (which always develop over time).

There should be a clear understanding of the critical controls for incidents – what the key equipment is, and the key control loops and alarm systems which might be in place. Operators and supervisors need to know what happens to – for example – pressure, temperature, flow, velocity and specific gravity as gas goes across a control valve.

“It's about looking at the key metrics to make sure we're not hurting people, plant or environment.”

Paul Cholakos
GM – PNG Operations, Oil Search

LEARNING FROM INCIDENTS

Be it in the oil and gas industry, mining, petrochemical or chemical process industries, major and minor incidents have occurred. These incidents often hold insights which can guide the strategic direction for process safety management.



Focus should be placed on improving experience feedback systems and fully utilising the existing incident knowledge base. Sharing the experience and knowledge with the process community from design, technical and operational areas will lead to a more holistic loss prevention effort.

The dissemination has to be proactive and continuous – only then will it overcome the ‘corporate precedent’ which overshadows inherently safer design (ISD). Uptake of ISD into the design process can be improved through a practical approach and further quantification.

“Reviewing past incidents is one thing; learning from them and building practical solutions is where you can make a real difference for process safety.”

Nigel Cann, Associate Principal – Risk & Security, Arup

RISK-BASED APPROACHES

The quantitative versus qualitative challenge in effective risk management highlights a significant consideration for process safety.

Oil and gas companies have traditionally applied a quantified risk assessment (QRA) through the development of fault and event trees. However, a prominent limiting factor of this practice relates to data collection and its usage.

If a consultant or operator uses the data which is collected from around the world and averaged, they'll get a number representative of that global average; but not representative of any one organisation or facility.

As a result, when you undertake a QRA, there is a chance that the site you're dealing with might be much better or much worse than the worldwide average. Some industries such as mining have used experience-based quantification (EBQ), which is designed for hazardous facilities involving substantial human interface and little or no statistics on failure rates.

The fault tree, because of its essential use as a mathematical model, can usually only show the causes of an incident; whereas an EBQ model can show both causes and their related controls by using a bowtie diagram. It is not easy balancing the benefits of mathematical and statistical purity with the benefits of plant-specific experience.

CONCLUSION

Safety has historically been treated as a separate focus from business performance, but now there are more tools available than ever before to change this.

Companies have an opportunity to weave together all the different technical and cognitive elements to not only mitigate risk; but align PSM with business objectives and make a real difference to the bottom line.



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PROCESS SAFETY MANAGEMENT 2014

- Main Conference: 25 – 26 November 2014
- Venue: Royal on the Park, Brisbane, QLD



Hear and learn more from 16 experts, including:

Process Safety in practice: There has been a major disaster in an under developed company – developing an action plan

Situation: A global company has sold a plant to a minor local player. There has been a major disaster. This interactive session based on role play will explore the decisions made in such a situation. It will shed critical insight on the factors that are taken into consideration and other influencers.

Tony Pooley, Associate Professor, University of South Australia, former Advisor, NOPSEMA

Measuring and improving the business impact of process safety management

- ▶ Exploring the business impact of process safety management
- ▶ Ensuring that the PSM strategy is aligned with the business strategy
- ▶ Embedding process safety across all plant processes
- ▶ Measuring the ROI of process safety management in your plant

Paul Cholakov, General Manager, PNG Operations, Oil Search

Integrating process safety and maintenance

- ▶ How is machine safety linked to process safety?
- ▶ Evaluating maintenance systems and understanding the inherent risks
- ▶ Maintenance controls and process safety

Nigel Cann, Associate Principal – Risk & Security, Arup

For more information about the summit call us on **02 9229 1000**
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