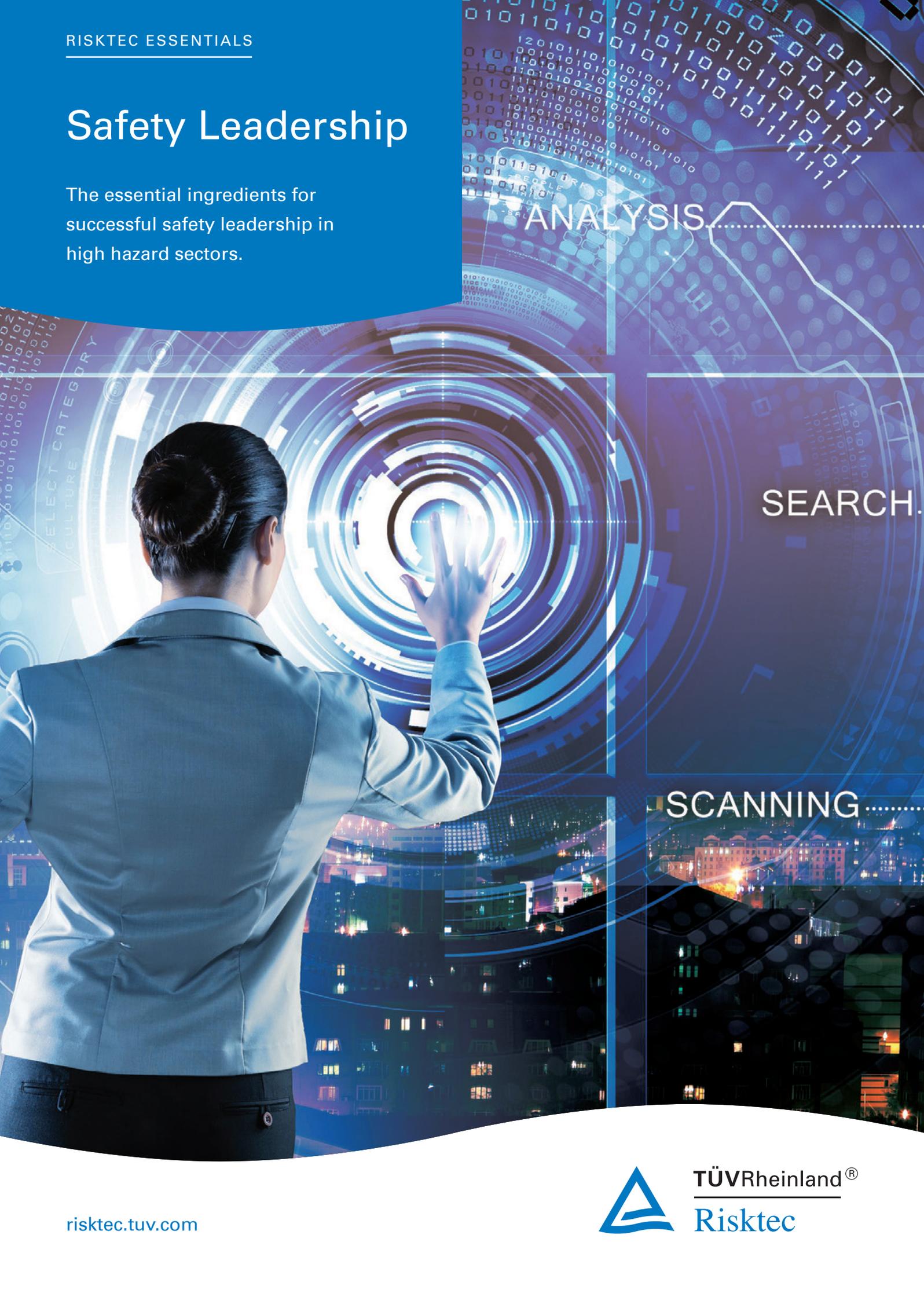


Safety Leadership

The essential ingredients for successful safety leadership in high hazard sectors.



ANALYSIS

SEARCH

SCANNING





Risktec is an established, independent and specialist risk management consulting and training company and is part of the TÜV Rheinland Group. At Risktec we believe in sharing our expertise and knowledge with our clients.

Contents

- 05** Foreword
- 06** Major hazard safety leadership
- 08** Black swan or blind spot?
- 10** Balancing personal and system safety
- 12** Safety as a value
- 14** Chronic unease
- 16** Mental traps in decision making
- 18** The integral safety leader
- 20** The impact of low oil prices on process safety
- 22** About Risktec



Foreword

Welcome to this volume of Risktec Essentials, which brings together a collection of short articles on successful safety leadership in high-hazard sectors.

Investigations into major accidents invariably highlight the importance of effective leadership in preventing disasters. But why emphasise leadership and not management? What issues does a leader need to understand? What does the leader need to do differently? We hope Risktec Essentials provides some useful insights that help to answer these questions.

Articles on other risk and safety management topics can be viewed at risktec.tuv.com/knowledge-bank.aspx

© Risktec Solutions Ltd. 2017

Major hazard safety leadership



BOX 1 - DOING THE RIGHT THINGS

- Does our Board have any competence in major hazard safety?
- What are the possible major accident events at our facility?
- What action is being taken for events at the upper end of the risk profile?
- Are the reporting lines of engineering authorities and major hazard safety specialists high enough in the organisational structure to have influence over decisions?
- Do senior management incentive systems incorporate measures of major hazard safety?
- How are the layers of protection (risk control systems) performing? Are there any warning signs such as more leaks, increasing maintenance backlog, etc?
- Are we identifying the root causes of our 'near miss' incidents where, under slightly different circumstances, a major accident could have resulted?
- Have we incorporated lessons learnt from major accidents in our industry?
- Do we ask open questions about major hazard safety during our management walk rounds?
- Do people in the organisation raise concerns and issues?
- Are we receptive to bad news?
- Do we regularly 'step back' and take a fresh look at our organisation?

Investigations into recent major accidents, such as the Texas City refinery explosion, the Gulf of Mexico oil well blowout and the Fukushima nuclear accident, all highlight the importance of effective leadership in preventing disasters in the major hazard industries.

But why emphasise leadership and not management? What does a leader need to do differently to assure major hazard safety as opposed to personal safety?

A LEADER IS DIFFERENT TO A MANAGER

Leadership and management, while necessarily linked, are not the same thing and it is worthwhile thinking about the differences. The manager's job is to plan, organise and coordinate. The leader's job is to inspire and motivate. The American quality guru Peter Drucker arguably best described the difference, "Management is doing things right; leadership is doing the right things." So if major hazard safety leadership is about doing the right things to control major hazards, what are those things?

MAJOR HAZARD SAFETY IS DIFFERENT TO PERSONAL SAFETY

Whilst important for personal safety, holding the handrail and putting lids on cups of hot coffee will not prevent major accidents. Disasters don't happen because someone slips down the stairs or scalds their hand. They result from flawed ways of doing business that accept poor risk control.

Leaders must understand this difference. If they don't, they cannot focus on the right things. If they don't focus on the right things, why should anyone else? The best leaders focus intensely on what they know is right

and what needs to happen. Others see this and know what the leader cares about. This creates employee engagement and loyalty, and in this environment, employees choose to do the right thing as well.

FOCUSING ON THE RIGHT THINGS

All major hazard facilities operating in highly regulated environments will have a management system of some sort in place to control major hazards. For example, there will be operating and maintenance procedures, and standards covering risk assessment, management of change, incident investigation, emergency preparedness and audit.

Management is doing things right; leadership is doing the right things

Peter Drucker

This is the world of management and, whilst having these systems is important, what really matters is the shared beliefs and perceptions about major hazard safety – that is, the safety culture of the organisation. This is the world of leadership.

The Institute of Nuclear Power Operations (INPO) puts it very clearly, "Production behaviours will take precedence over prevention

behaviours unless there is a strong safety culture – the central focus of leadership".

Whereas a manager is more likely to accept the status quo, a core characteristic of a leader is to challenge and improve the systems and the culture. Indeed, the Australian professor Andrew Hopkins, author of several excellent books on major accidents, refers to "mindful leaders" as those who don't just assume that because systems have been put in place everything will be fine. Their mindset is one of "chronic unease" – they are preoccupied with the potential for failure and the possibility of a major accident, not solely on commercial matters, lost time injuries or climate change, for instance. Mindful leaders continually ask searching questions of themselves and their organisation to get a feel for whether the right things are happening (see Box 1).

CONCLUSION

To prevent major accidents leaders need to focus on things that make a difference. In this respect, a leader's role is to challenge the organisation on whether the right things are being done. And it is better to do this today rather than in the aftermath of a major disaster.

Further Reading:

- Leadership Fundamentals to Achieve and Sustain Excellent Station Performance, INPO, 2007.
- Corporate Governance for Process Safety, Guidance for Senior Leaders in High Hazard Industries, OECD, 2012.
- Understanding Your Culture, Hearts & Minds, Energy Institute.

Black swan or blind spot?

The duality of extreme events

A black swan is characterised by Nassim Nicholas Taleb (Ref. 1) as an event which:

1. Is a surprise (to the observer), an 'extreme outlier'
2. Has a major impact
3. Is rationalised by hindsight, as if it could have been expected

The phrase 'black swan' was a common expression in 16th century London as a statement of impossibility, on the presumption that all swans must be white because all historical records of swans reported that they had white feathers. But black swans were then discovered in Western Australia in 1697.

The phrase today is often rolled-out when there is a crisis, such as a major industrial accident, natural disaster or corporate financial collapse. But is this always strictly correct? For example, was the Fukushima nuclear accident a black swan?

FUKUSHIMA – A BLACK SWAN?

On the 11th March 2011, having survived a powerful Magnitude 9 earthquake (the largest recorded in Japanese history), the reactors at the Fukushima Daiichi nuclear power plant were shut down safely only to be compromised by the 14-15m tsunami that hit the site about one hour later, leading to core meltdown. But how does the Fukushima accident score against Taleb's three criteria?



The Japanese tsunami approaches the Fukushima Daiichi nuclear power plant.

1. SURPRISE? NO

At up to 15m in height the tsunami was larger than the 'design basis event' of 3.1m, but over the last 100

years Japan's east coast has suffered a number of large tsunami (>10m) associated with earthquakes; with more than one locally over 15m.

2. MAJOR IMPACT? YES

Whilst no site workers or members of the public were killed by the nuclear release, an exclusion zone of 20km radius still exists around the reactor site and 100,000 people were displaced from their homes. Germany, Italy and Switzerland declared their intention to halt current nuclear programmes. The site is no longer operational, leaving a long-term shortfall in electricity generation of around 2% of Japan's needs. In the short-term, nearly all of Japan's nuclear power plants were unavailable whilst safety reviews were being undertaken, with a loss of 30% of the country's electricity generation.

3. RATIONALISED? YES

The International Atomic Energy Agency (IAEA) identified that design basis tsunami for the Fukushima site underestimated the hazard, based on the accepted methods and the available



data (Ref. 2). The assumption that the site would definitely stay 'dry' (rather than be flooded) was not demonstrated, and represented a 'cliff edge' in terms of consequences. A series of 'Stress Tests' have subsequently been performed on all reactor sites across Europe, examining scenarios significantly beyond their design basis to determine the response to extreme events and identify if there is a 'cliff edge'. No fundamental weaknesses have been found.

OR BLIND SPOT?

Assessing other industrial major accident events against these three criteria similarly shows that while they tend to have an extreme impact and are rationalised by hindsight, they are rarely a surprise. Rather, they are actually organisational 'blind spots'.

A study of 18 high profile corporate crises (Ref. 3), which included the Texas City explosion and the Buncefield fire of 2005, as well as the Great Heck, Hatfield and Potters Bar rail accidents of 2000-2002, concluded that 'Board risk blindness' was one of 7 underlying causes of these crises. This blindness manifests itself in various ways (see Box 1).

- References:**
1. The Black Swan, Nassim Nicholas Taleb, 2010.
 2. Report on IAEA International Fact Finding Expert Mission of Fukushima NPP Accident Following Great East Japan Earthquake and Tsunami, 2011.
 3. Roads to Ruin, AIRMIC, 2011.



Swans were assumed to be always white, until the discovery of black swans in Australia. Rare, unexpected but highly significant events are much more common than we think.

The study concluded that several developments are necessary to address these risks effectively, including the need for boards to recognise the importance of risks that are not identified by current approaches, as well as focus on how to ensure missing risks are captured.

CONCLUSION

Many industrial major accidents are colloquially described as black swans, when in fact they were entirely foreseeable and preventable if it were not for organisational blindness. Whilst shining light on those risks that are hard to see is not necessarily simple, a good place to start is to foster a culture that has a 'collective mindfulness' of such risks.

BOX 1 - BOARD RISK BLINDNESS

- Not focusing on 'licence to operate' risks (Railtrack)
- Not setting and controlling risk appetite (Texas City)
- Failing to appreciate risks presented by complexity, especially mergers and acquisitions (BP merger with Amoco)
- Failing to create an effective process safety culture (Buncefield, Railtrack, Texas City)
- Defective flow of important information (Texas City failing to absorb lessons from previous incidents at Grangemouth refinery)

Balancing personal and system safety

Holding the handrail and putting lids on cups of hot coffee will not prevent major accidents. That is the message coming through loud and clear in the aftermath of recent disasters such as the Texas City refinery explosion in 2005, the Gulf of Mexico oil well blowout in 2010 and the Fukushima nuclear meltdown in 2011. Disasters don't happen because someone slips down the stairs or bumps their head. They result from flawed ways of doing business that allow inappropriate risk control.

Many organisations implement initiatives and campaigns aimed at promoting personal safety in the workplace, both in attempts to achieve a measurable step change in safety performance and to demonstrate corporate commitment to good safety culture. This is very important, but don't expect those actions to lead directly to improved system safety, which concerns the integrity of the process or operations. Indeed, the year before the Texas City explosion the refinery had its lowest injury rate in history, nearly one-third of the oil refinery sector average.

DIFFERENT APPROACHES

The traditional 'accident pyramid' model mixes together personal safety and system safety. This is not very helpful because it implies "holding the handrail" will prevent an explosion. Today it is a far more useful concept to view the situation as two separate pyramids with some overlap (see Figure 1).

The role of incorrect mental models that don't reflect what actually

happens is well documented in major incidents, e.g. Three Mile Island, where operators believed a coolant leak could not lead to a rising coolant level (although this was well understood scientifically). So if management's mental model is that personal safety initiatives will prevent major accidents, is there a blindness to major risk? Moreover, what message is really being sent to staff by rolling out an occupational safety initiative at a facility with a history of leaking gas pipework?

What works for one company or location in achieving safe operations may not be applicable to another. For example, the portfolio of risks present for a major hazard site such as a refinery will be very different to a manpower intensive, low hazard environment like an office, as will the way in which those risks are managed. It would be reasonable to suggest that the former will require both occupational and system safety approaches, whereas the latter will focus primarily on occupational issues.

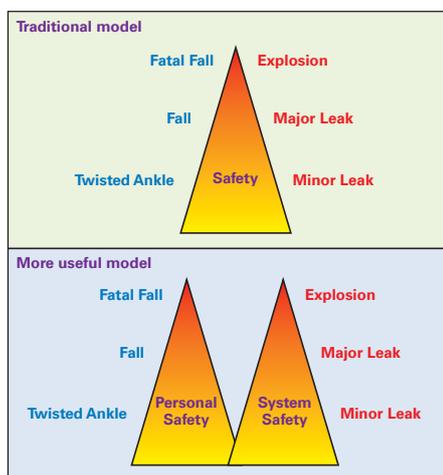


Figure 1 – Contrasting hazard models



DIFFERENT MINDSETS

With occupational safety there is a direct and visible link between the action (holding the handrail) and the benefit (avoiding a fall). As such it is generally easier to make improvements by bringing about changes in safe behaviours, and its traditional lagging metrics, e.g. loss time injuries, are familiar and easy to measure.

Creating the right mindset is not an effective strategy for dealing with hazards about which workers have no knowledge...

System safety on the other hand is less visible and more complex because it focuses on the integrity of the design, operation and maintenance to prevent major incidents. Its metrics, particularly proactive ones (e.g. percentage of safety-critical equipment that performs within specification when inspected) are harder to define, measure and interpret. Although there is some overlap, believing that improvements in one means that the other is also improving is at best misleading, and at worst, dangerous.

Having a mindset to hold a handrail is not in itself a bad thing – it's simple, costs nothing and may prevent a fall,

but is it really rational to assume that this will prevent a pipeline leak? Yes, the mindset may mean that personnel are more proactive in major accident safety, but what really matters is top down leadership – that leaders have a focus on system safety when allocating resources and making decisions, that any cost-cutting is managed effectively, that bonuses are not solely tied to personal-injury metrics – and that the plant is properly designed, operated and maintained by competent personnel.

UNDERSTANDING RISK

While, globally, occupational hazards kill and injure more people than major accidents, a single catastrophic event can wreak widespread harm and jeopardise the survival of an entire organisation. So where should an organisation focus its efforts? This comes back to the very crux of the issue – an organisation that does not clearly understand its full spectrum of risks will not be able to manage those that are important.

CONCLUSION

The benefits of personal safety based initiatives are clear; properly conceived and implemented they will minimise injuries and save lives. But they should be viewed as one part of a balanced approach to risk management, based on a clear understanding of the wide landscape of risks faced by an organisation, and its leadership practices, culture and approach for assuring safety across the whole business.



Leadership matters: safety as a value?

Our first article focused on the things that leaders need to do right to assure major hazard safety. Whilst a list of things to do can be insightful for a motivated leader, the list simply adds to things that a leader already has to do, whether commercial, technical, human resources, etc. For example, traditional safety leadership tends to focus on what to do rather than addressing what may be considered to be 'deeper drivers' of safety leadership, such as holding safety as a value.

BELIEFS AND PERSONAL VALUES

One 'deeper driver', that more enlightened training in safety leadership explores, relates to the personal values of leaders towards safety (including health and the environment).

In order to understand personal values, it is important to first define what beliefs are. A belief is an idea that a person holds as being

true. A person can base a belief upon provable absolutes (e.g. mathematics), life experiences, the acceptance of cultural and societal norms (e.g. religion) or what other people say (e.g. peers, teachers or mentors).

Once a person accepts a belief as truth, they are willing to defend it. For example, the leader who truly believes that all incidents are

BOX 1 - ZERO HARM

If you are not convinced that all incidents are preventable, ask yourself why, if it is possible to achieve zero incidents for a period of time (many facilities go months or years free of any leaks or injuries), should it not be possible to achieve this level of performance all of the time?

preventable and the organisation's goal of zero harm is achievable, is likely to commit fully to that goal. The leader who does not believe that all incidents are preventable is unlikely to be as committed (see Box 1). As Henry Ford once said, "Whether you think you can or you think you can't, you're probably right."

Values are stable, long-lasting core beliefs about what is important to a person. They reflect a person's sense of right and wrong. They reflect who we are and why we do what we do. They guide how we make choices and the order we do things. A belief will evolve into a value when the person's commitment to it develops and they see it as being important. From these values individual attitudes are formed, which in turn direct the person's behaviour. For example, if you hold safety as a strong personal value and you are leaving work in a rush to get home in time to watch your favourite sports team but notice one of your car tyres is somewhat underinflated, you would still take the time to inflate the tyre even if it means missing the start of the game.

YOUR PERSONAL VALUES

It follows that you should be able to articulate clearly your values in order to

be rational, responsible and consistent in your decision-making. Leave your values ambiguous and you'll constantly wonder how you keep getting into so many messes. An insightful exercise for any leader is to write down the ten values that are most important to them.

Running this exercise during safety leadership training reveals some commonly held values, such as happiness, achievement, family, integrity and faith. Most people will also choose health. Some people will hold a value about environmental responsibility. But even when safety is included on a list of values to select from, it is surprisingly unusual for someone to pick it.

At first glance this might suggest that safety is strongly related to other values often chosen by leaders. For example, virtually everyone will hold family as a top personal value; but what could be more important to a family than the safety of everyone in it? Indeed, one way for a leader to build meaningful relationships with others is to relate safety to values such as family and health by telling pertinent personal stories and using impactful language, e.g. "everyone goes home safe, everyday, everywhere."

SAFETY AS A VALUE RATHER THAN A PRIORITY

Many organisations hold safety as a high priority, publically stating that "Safety is our number one priority". But priorities shift around depending on current circumstances. Values are more constant than priorities and are rarely compromised. It makes sense for leaders to talk about safety as a value rather than a priority because personal values guide our behaviour. When our actions are inconsistent with our values, we willingly adjust our behaviour to align with them. Simply pointing out the inconsistency can be sufficient to result in a positive change.

CONCLUSION

It is generally accepted today that treating safety as a value makes sense – it is an ethic that guides everything we do, rather than a top priority on a par with production. Because leaders create the safety culture and a culture is simply a set of common values, if leaders as individuals believe in safety as a value then the organisation's safety culture will be strong...and a vision of zero harm becomes achievable.

Chronic unease - the hidden ingredient in successful safety leadership

Leaders working in high hazard industries are faced with a difficult personal challenge: how do you avoid complacency about major accidents such as a nuclear release, oil spill or train derailment, when such events rarely happen? How do you not 'forget to be afraid'?

The importance of avoiding complacency when it comes to industrial safety risks has long been recognised, particularly in High Reliability Organisations (e.g. Ref. 1). One term that is now being used by the oil and gas industry to describe this important state of mind is 'chronic unease'. This term actually appeared earlier in the literature than other related terms such as mindfulness, restless mind or safety imagination, when Professor James Reason introduced it as a 'wariness' towards risks as far back as 1997 (Ref. 2).

SO WHAT IS CHRONIC UNEASE?

Put simply, chronic unease is the opposite of complacency. It is a healthy scepticism about what you see and do. It is about enquiry and probing deeper, really understanding the risks and exposures and not just assuming that because systems are in place everything will be fine. It is not just believing in what you see or what you hear or what the statistics tell you. It is about resetting your tolerance to risk and responding accordingly and continually questioning whether what you do is enough.

The thought process of a leader therefore changes from "We haven't

had an incident, we are doing so well," to "Is there anything we're overlooking and what else do we need to do?"

ATTRIBUTES OF CHRONIC UNEASE

Chronic unease can be defined as a state of psychological strain in which an individual experiences discomfort and concern about the control of risks (Ref. 3). That is, chronic unease is not driven by a concern about risks per se, but rather about the way these risks are managed and controlled.

Ref. 3 identifies five attributes as the principal psychological components of this state of mind, see Box 1. The extent and likelihood of a leader to experience unease depend on these attributes.

The origin of unease starts with the leader's perception of risks, which will be influenced by his or her vigilance and experience. Evaluating the degree of threat inherent in the risks is then determined by the individual's personality characteristics, especially the propensity to worry, pessimism and the ability to imagine worst-case scenarios.

When leaders use chronic unease in their work it enables them to:

- Think flexibly
- Not jump to conclusions ("think slow")
- Encourage employees to speak up
- Listen to others
- Be receptive to bad news
- Show safety commitment

BOX 1 - FIVE ATTRIBUTES OF CHRONIC UNEASE

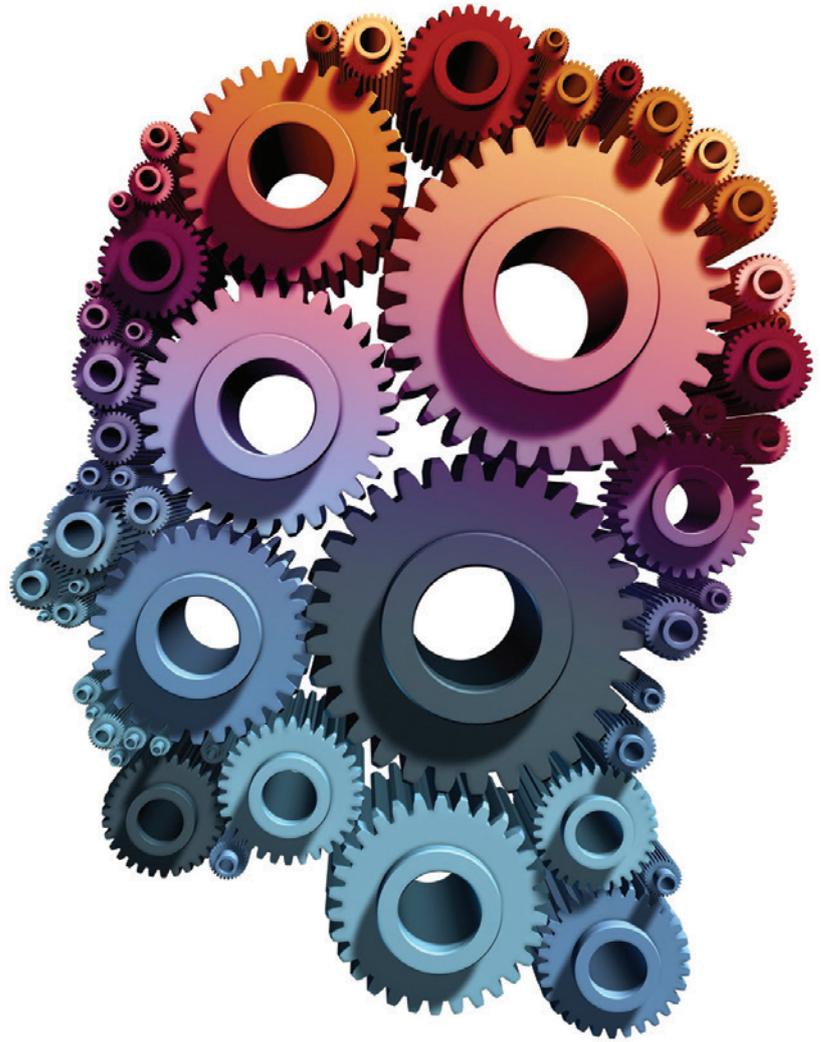
Vigilance: Being alert to weak indicators of risks like near misses, process upsets and localised.

Propensity to worry: An emotional tendency to worry about risk and safety.

Pessimism: A personal tendency to resist complacency and anticipate failure.

Requisite imagination: Ability to imagine and visualise possible worst-case scenarios.

Flexible thinking: Ability to question assumptions, considering many aspects of a problem and not jumping to conclusions.



THE NEW WORLD

So what will the world look like when we have created a sense of chronic unease which replaces complacency? (Ref. 4).

Leaders will ask the right questions. They will be keen to know what vulnerabilities exist. Safety specialists will respond in clear terms, which anyone can understand and relate to. Operators will understand their role in safety management and will be encouraged to speak about their real safety concerns, without fear of repercussions.

Leaders will actively seek information which tells them where attention needs to be paid to address vulnerabilities. There will be a positive desire to learn from others and to share knowledge and experience, so that lessons do not have to be re-learned time and time again in different organisations.

Collaboration and information sharing will replace unhelpful turf protection. Corporate lawyers would also be challenged to help leaders communicate and share, rather than stand in the

way of sharing and learning. Systems safety knowledge and competence will be recognised as fundamental for all leaders within the major hazards industries.

WHAT'S THE DOWNSIDE?

Chronic unease might raise (in hindsight) unnecessary concerns, and it might slow decision-making processes. But this should be weighed against the impact of not taking action or making poor decisions – a major accident.

CONCLUSION

Research indicates that chronic unease is a desirable state for leaders at all levels in relation to the control of risks. When leaders are using chronic unease they will have developed a culture where they are alert to even the weakest signals of potential failure, and make effective and timely interventions.

- References:**
1. Managing the unexpected: Assuring high performance in an age of complexity, Weick and Sutcliffe, 2001.
 2. Managing the risks of organisational accidents, Reason, 1997.
 3. Chronic unease for safety in managers: a conceptualisation, Fruhen, Flin and McLeod, 2013.
 4. Process safety, focusing on what really matters – leadership, Hackitt, 2013.

Thinking power: Avoiding mental traps in risk-based decision making

In his international bestseller *Thinking, Fast and Slow*, Daniel Kahneman (winner of the Nobel Prize in Economics in 2002) describes mental life by the metaphor of two agents, called System 1 and System 2.

System 2, the slow thinker, is deliberate. It is in charge of self-control. It is much too slow and inefficient at making routine decisions. But it can follow rules, compare several attributes and make deliberate choices between options. It is capable of reasoning and it is cautious.

System 1 on the other hand is the fast thinker, it is impulsive and intuitive. It is more influential than your experience may suggest and is the secret author of many of the choices and judgments you make. It operates automatically and quickly, with little or no effort. It executes skilled responses and generates useful intuitions, after adequate training, but is the source of many mental traps or 'biases'. Despite what you might believe, high intelligence does not make you immune to these psychological biases and there are many biases which can have a profound impact when making risk-based decisions. This article briefly introduces just three of these.

GROUPTHINK BIAS

Groupthink is the desire for harmony or conformity within a group which results in an irrational or dysfunctional decision-making outcome – very few

people like to be the 'odd one out'. Groupthink was a significant contributor to the Deepwater Horizon oil well blowout in 2010 (Ref.1). The culture of drillers is of a group of highly skilled, opinionated technicians taking a personal interest in every well. They take on a leadership role, in practice if not in definition. The complexity of drilling operations is typically reflected in an obscure language with extensive use of technical slang and acronyms. What is more, peer pressure is extensive, with widespread use of teasing and competitive humour. 'Dumb' questions are not well received.

So it is perhaps no surprise that when one of the drillers proposed the 'bladder theory' as an explanation for the failed pressure test of the well integrity – a theory with no credibility in hindsight – the first and then eventually the second of the two company men in charge agreed despite initial scepticism. The failed test was 'reconceptualised' and the operations continued.

CONFIRMATION BIAS

Confirmation bias is the unconscious tendency of preferring information that confirms your beliefs – a tendency to selective

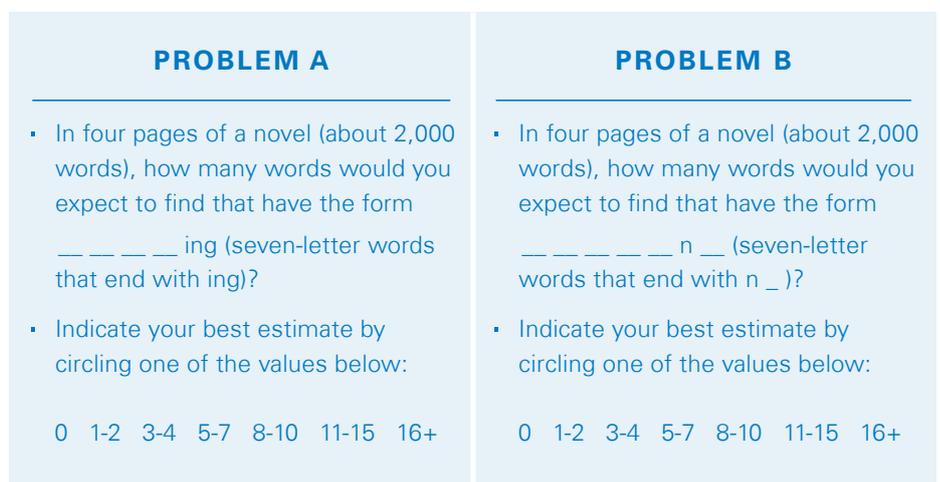


Figure 1 – The availability bias in action

use of information, while giving disproportionately less consideration to alternative possibilities. Put more simply, we see and hear what fits our expectations.

The Lexington aircraft crash in the USA in 2006 is a case study in confirmation bias (Ref. 2). A regional jet took off from the wrong runway in darkness and failed to get airborne in sufficient time to clear trees at the end of the runway, causing the deaths of 49 passengers and crew. Multiple cues were missed by the pilots that should have alerted them to the fact that they were on the wrong runway. Instead, it is believed that the crew talked themselves into believing they were in the correct position. For example, in response to a comment about the lack of runway lights, the first officer said that he remembered several runway lights being unserviceable last time he had operated from the airfield.

AVAILABILITY BIAS

Availability bias means you judge the probability of an event by the ease with which occurrences can be brought to mind. You thus implicitly assume that readily-available examples represent unbiased estimates of statistical probabilities.

Try the simple test in Figure 1 before reading on.

If you answered a higher number for Problem A then you are in good company – most people do. But all words with seven letters that end in ing also have n as their sixth letter. Your fast thinking System 1 has fooled you. Ing words are more retrievable from memory because of the commonality of the ing suffix.



The availability bias can create sizeable errors in estimates about the probability of events and in relationships such as causation and correlation. Be aware, your risk analysis assumptions may not always be right, especially when they are backed by quick judgements.

SO WHAT'S THE REMEDY?

Think slow! Engage your System 2. Control your emotions and the desire to jump to conclusions. Take your time to make considered decisions and be ready to ask for more evidence, especially when pushed to make a fast decision. Request explicit risk trade-off studies. Challenge groupthink, and base your opinion on facts. Never be afraid of speaking up, you could save the day.

Consult widely and generate options. Involve a diverse group of people

and don't be afraid to listen to dissenting views. Seek out people and information that challenge your opinions, or assign someone on your team to play 'devil's advocate'. Learn to recognise situations in which mistakes are likely. Try harder to avoid mental traps when the stakes are high. And finally, practice, refine, practice.

CONCLUSION

It is human nature to think in short-cuts, which bring with them a host of associated psychological biases. When making risk-based decisions it is essential to slow down our thinking, and apply formalised processes backed by science and data.

The integral safety leader: Thinking about the whole

Put yourself in the mind of a line manager responsible for the safety of personnel. You have been warned of many deficiencies in a part of the business, including a strong indication that a significant accident has a worryingly high potential. How do you begin to think about this problem?

It is not easy, the problem is complex. There is a great deal to think about – technology, procedures, competency and cost, just to start. Einstein once said, “You cannot solve a problem from the same thinking that created it.” But how can you learn to see the world anew? Would an ‘integral theory’ of safety leadership help?

INTEGRAL THEORY

Ken Wilber, an American philosopher and writer, published the Integral Theory in 1997 (Ref. 1). He asserted that each of the dozen most influential schools of consciousness, such as cognitive science, neuropsychology and eastern traditions, has something irreplaceably important to offer our understanding of consciousness. What he created was a general ‘whole’ model sophisticated enough to incorporate the essentials of each of them.

Integral simply means comprehensive, balanced and inclusive. It helps make sure that

nothing gets left out. A useful theory will change perspectives, which will then lead to the implementation of new strategies, actions and behaviours. Integral theory helps those who are ready to use it. It would be a mistake to force it on anyone.

AN INTEGRAL MODEL FOR SAFETY

An integral model for safety, based on Wilber’s integral theory, focuses on the four perspectives of safety performance, or ‘quadrants’, as shown in Figure 1. The four quadrants – which are the four basic ways of looking at anything – turn out to be fairly simple: they are the inside and the outside of the individual and the collective.

The right side is the objective, outside, external view. It is observable and measurable. It is how we act, our ‘doing’. Most organisations in the high hazard industries are dominated by technical people such as engineers, scientists and accountants, and so it is not surprising that they understand this

side of the model. However, they sometimes struggle to understand the left side because it is the subjective, internal view – you cannot reliably observe or measure what is in the minds of people. It is how and what we think, our ‘being’. Arguably the greatest opportunity for improvement in safety performance would appear to stem from this left side...but let’s take a closer look.

The upper right quadrant is the domain of behaviour. It is all the things that you see the individual doing or working with. Improvements in this area come from working with individuals to modify their behaviour. Having a well developed behavioural-based safety programme is crucial to success in this domain.

The lower right quadrant is the domain of systems. It includes organisational structures, procedures, formal and informal processes, metrics and rewards. A robust and effective safety management system is critical here. Change in this domain is driven by good management.

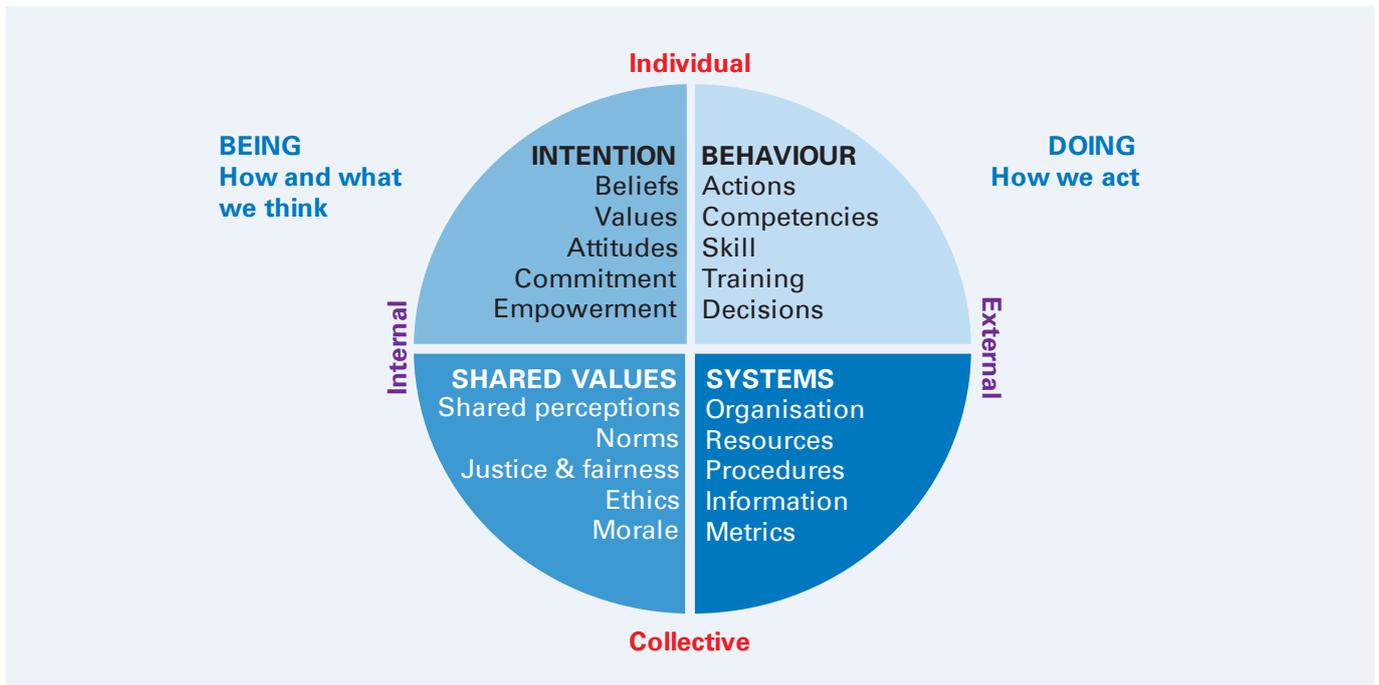


Figure 1 - An integral model for safety

The upper left quadrant is the domain of intention, the view from the 'interior' of the individual, their consciousness, their self. It is the language of "I" and includes the values and commitment the individual brings to all situations. Improvements in this area come from working with individuals, through leadership and coaching. Change in this area is typically perceived as difficult and requiring time. In reality a change in intention, such as commitment to safety, can happen in an instance – the "aha" light-bulb moment.

The lower left quadrant is the domain of shared values, the view from the interior of the group. It is the language of "we" and includes the shared

perceptions, norms and standards of the group. It is here we find the ethics, morale and sense of justice that is commonly held by the group. Positive change in this domain, such as creating a 'just' safety culture, has its origin in leadership. This quadrant is itself often labelled as 'culture', but a broader interpretation is that culture embodies all four quadrants – the whole.

THE INTEGRAL LEADER

Our overall safety performance will only be as good as our least developed quadrant and how well all four quadrants work together. Any solution that does not genuinely succeed across all four worlds will be inherently lacking. When the line manager we introduced earlier starts to look through

the integral lens, thinking about issues in each quadrant, everything has the potential to come into focus. With focus comes clarity and with clarity comes better decisions. The intent is to be as all-inclusive and caring as possible.

CONCLUSION

Being receptive and open minded to an integral approach presents many possibilities for improvement in safety performance and, ultimately, transformation – for you and your organisation. If you feel it has some potential, just try it and see.

Boom or bust: The impact of low oil prices on process safety

“We know from past experience how low oil prices impact upon business thinking about process safety – and it’s not good”. That’s how Judith Hackitt, the chair of the UK’s health and safety regulator, described the impact of a low oil price on process safety in early 2015 (Ref.1). A subsequent report from Marsh (Ref. 2) would appear to support Hackitt’s claim, with a telling graphic showing the historical occurrences of major losses compared with the oil price (see opposite).

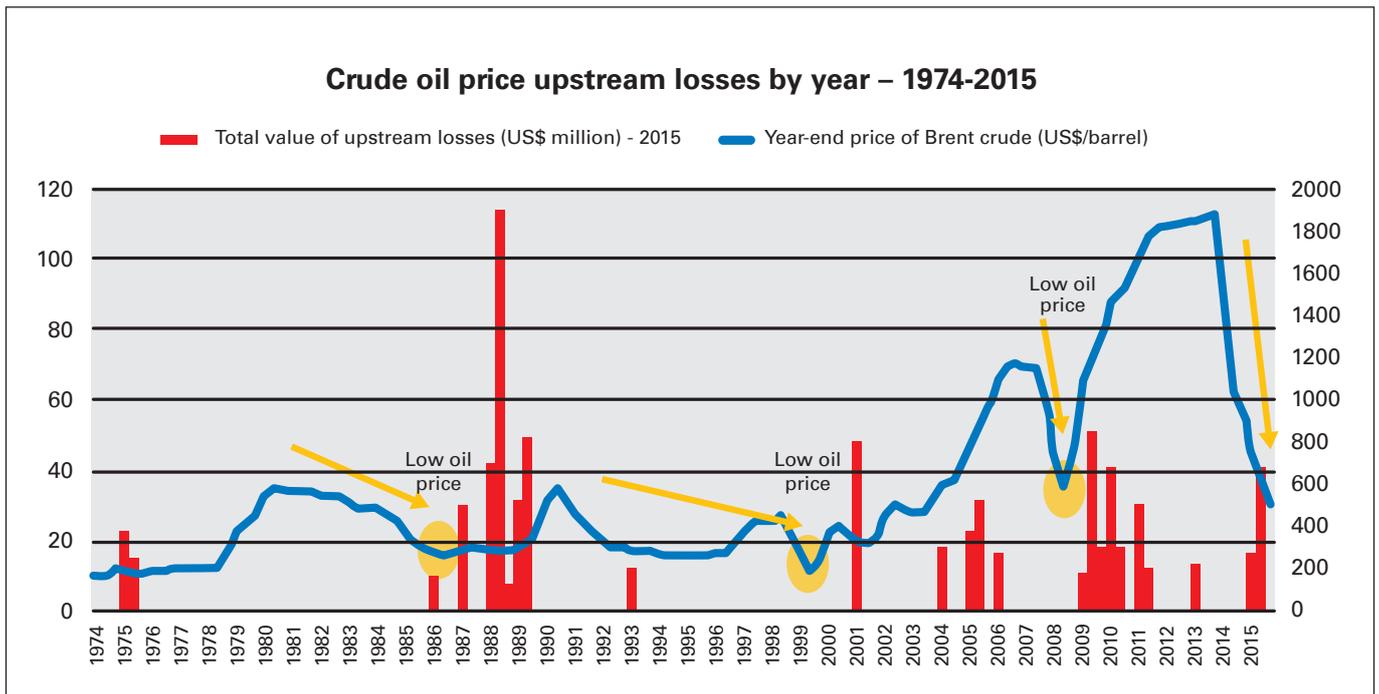
LOSSES FOLLOW OIL PRICE DECLINES

2014 and 2015 was not the first time the oil industry has seen falls in the price of crude oil. Significant reductions in the crude oil price also occurred between 1980 and 1986, in the late 1990s and again in 2008. Looking at the distribution of upstream losses, we can see that there was a significant increase in large losses in the years that followed each of these periods.

CAUSATION OR COINCIDENCE?

The Marsh report rightly points out that “correlation does not mean causation: the fact that a relationship is observed between two variables does not always mean there is a direct linkage between them.” The report further emphasises that “the cause of every major loss is a combination of a unique and complex interaction of faults and failures of hardware systems, management systems, human error, and/or emergency procedures.”





Yet there are fundamental reasons why a declining and low oil price could adversely impact process safety, and why causation is more probable than coincidence. Lower prices inevitably lead to cost-saving initiatives that can compromise asset integrity, such as:

- A reduction in maintenance and inspection of engineered systems.
- A reduction in manpower leading to lower morale, fatigue and a tendency to cut corners.
- Organisational changes culminating in a loss of expertise and corporate memory, with an increased chance that less experienced personnel will make a serious mistake.
- Reduced training that fails to maintain competencies of workers.
- A decline in investment in new equipment, placing a greater reliance on existing and possibly antiquated systems.
- Hasty decision making to improve efficiency, maintain production and reduce unplanned downtime, without considering all the process safety implications.

PROCESS SAFETY LEADERSHIP

So what can be done? Although the oil price has fallen, the standards required to protect workers' lives have not changed. And we all know the cost of major accidents – BP accounted for the total cost to its business of the 2010 Deepwater Horizon disaster as a staggering US\$61.6 billion. The bottom line is that leaders need to step up to ensure that the right decisions are made so that asset integrity does not suffer. Areas requiring specific attention include:

- 1. Chronic unease:** There should be a heightened sense of vulnerability amongst all leaders – from supervisors to senior management. Everything cannot be assumed to be well and decisions should not be assumed to address process safety.
- 2. Risk assessment:** All decisions impacting asset integrity should be thoroughly risk assessed by competent people, whether organisational, engineering or procedural changes.

- 3. Performance monitoring:** A great deal of effort in recent years has been put into implementing process safety performance indicators. These should be scrutinised diligently, especially those leading indicators which act as precursors of loss events, to detect any signs of adverse trends, e.g. near misses, leaks, maintenance backlog.

CONCLUSION

Periods of declining and low oil prices since the 1970s have been followed by spikes in upstream losses. Will the industry buck the trend this time or is it already too late? Have decisions already been taken that mean that large losses are inevitable? Or has the industry learnt enough lessons that this time it will be different? We really hope so.

About Risktec

Risktec is an established, independent and specialist risk management consulting and training company. We help clients to manage health, safety, security, environmental (HSSE) and business risk in sectors where the impact of loss is high.

OUR SERVICES ENCOMPASS:

CONSULTING

Specialist risk management services, delivering packaged and proportionate solutions to help reduce and manage risk.

TRAINING & EDUCATION

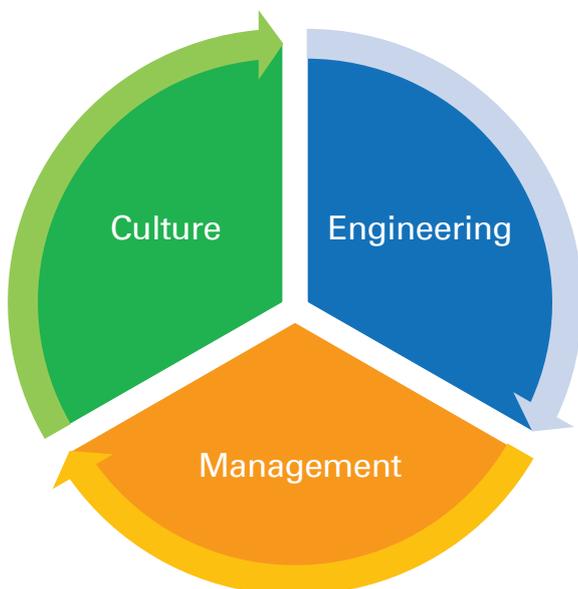
Online and classroom training and postgraduate education to help develop competent risk management professionals.

RESOURCE SOLUTIONS

Specialist risk, HSSE and engineering associates to work at client locations to help fill resource and skills shortages.

Consulting

Our experience ranges from delivering small self-contained work packages to managing complex multi-disciplinary projects with a large number of stakeholders.



Our services recognise that controlling risk requires understanding engineered and technological systems, management systems and organisational, cultural and behavioural factors.

ENGINEERING

Identifying, analysing, evaluating and reducing the risks associated with facilities, operations and equipment to acceptable levels.

MANAGEMENT

Identifying, developing and implementing effective policies and procedures to maintain control of risks and minimise loss.

CULTURE

Accelerating cultural and behavioural improvement, and ensuring a solid foundation for building sustainable improvements in risk control.

Training and Education

We provide a unique training and education service, from a single training course to a Risktec professional qualification or a tailored master's programme in Risk and Safety Management, all developed and taught by our experienced consultants. Our courses encompass the breadth and depth of our consulting services.

- Postgraduate Certificate, Diploma or Master's Degree (MSc) in Risk and Safety Management
- Degree Apprenticeship in Risk and Safety Management
- Risktec Professional Qualification (RPQ) in Risk and Safety Management
- Training courses from single modules to multi-year programmes for corporate clients
- Game-based learning
- Computer-based training
- Delivery via face-to-face, distance or blended learning
- Accredited by professional engineering institutions and industry bodies
- Our whole approach is flexible to meet client needs

Resource Solutions

We provide resource to support our clients' activities by working at their main offices, project locations or industrial sites, anywhere in the world. The support is delivered by our professional resource solutions business, ASTEC, which has access to a huge pool of professional associates.

We provide associates who:

- Are well known to us.
- Are suitably qualified and bring the required specific skills and experience.
- Have many years' experience and hence can make an immediate and positive impact on projects.
- Can be supported by work packages from consultants in our own offices.

TÜV Rheinland

As part of the TÜV Rheinland Group we have access to a very large range of services via the group's 20,000 employees in over 65 countries worldwide, including:

Testing, inspection and certification services to ensure the safety, reliability and regulatory compliance of assets and components throughout their lifecycle; as well as technical consulting and training to industrial, transportation and healthcare sectors.



TÜVRheinland[®]

Risktec

risktec.tuv.com
enquiries@risktec.tuv.com