WHITE PAPER

Catastrophic Events: Eight Questions Every Senior Leader Should Ask

The post-Gulf Oil Spill environment is a time to pay attention to leadership and workforce engagement to reduce your exposure to catastrophic events. We find the risk management processes of most major oil companies and their major contractors are structurally almost identical. Yet the occurrence of fatal and serious incidents among the top five oil companies varies greatly.[i] This variation relates to how — via human interactions, communications, teamwork, etc. — the technical risk management systems are implemented, not what they are.

This environment presents a strategic opportunity to lead with safety.[ii] As consultants to organisations for the past 30 years we have seen and helped many companies develop and implement this strategy with remarkable results. As safety improves, so do other operational outputs.

Our consultation focuses on "human sciences" — preventing employee injuries and fatalities, process incidents and the destruction of property, through assessments of organisational behaviour; workforce engagement (embedded safety assumptions and values), climate (current safety perceptions) and leadership; creating a culture of care using applied behaviour analysis; executive coaching; line employee engagement; aligning organisational values and priorities with day-to-day operations; and developing and implementing strategic plans for safety improvement.[iii]

Technical failures made possible by failures resulting from the interactions between people and processes and equipment are at the root of virtually all man-made catastrophic events in the past 50 years. This has been documented by various investigations. The common finding following Chernobyl, Piper Alpha, Challenger, Columbia, and Texas City is that leadership fails to establish a culture that values safety adequately.[iv]

In each of these incidents, development of sophisticated technical operating systems capability outpaced leadership's ability to assure behavioural reliability, i.e. the consistent performance of safety-specific activities.[v] This article suggests eight questions that leaders can ask to learn how to reduce exposure to catastrophic incidents.

1. Do You Understand Your Personal Safety Ethic and Motivation?

Not every senior executive understands about safety with the same passion that great safety leaders do. Senior executives who rise through non-operations channels often have little knowledge or experience with even the most basic core concepts of leading edge safety management. More importantly, they may not recognise the kinds of outcomes that are possible, or they may have homespun theories about why accidents occur, how they are prevented, and what their role in that prevention is. Unfortunately, most turn safety over to the people who report to them, rather than leading the charge to create radical change themselves. This practice will not bring about the kind of high reliability performance needed in the oil and gas industry.

Fundamentally, looking out for safety requires that as a leader you understand what is truly important and make decisions accordingly. What's important is not what you say you value, but what you actually value - the ethic manifested in your personal behaviour. Your organisation's culture receives and hosts the effects of your personal safety ethic – your value for safety. These elements influence safety decision-making, interactions with subordinates, the priority you place on safety, and how you drive success. You do not need to become the perfect safety leader. You just need to understand what your personal values are and be willing to act from a position of informed commitment.

2. Are You Demonstrating Critical Safety-Related Leadership Behaviours?

To prevent low frequency but high consequence catastrophic events, businesses need employees' discretionary efforts in safety and other performance areas. Leaders who use an authentic style are more successful at creating the will to go "above and beyond" self-interest. But authentic leaders do more than move people to action. They give people a sense of purpose, belonging and understanding regarding the work they do, which allows them to deliver better operations results.
Authentic leaders use behaviours such as:

> Promoting original thinking
> Encouraging others to take initiative
> Coaching and counselling others
> Helping followers achieve levels of performance beyond what they felt possible
> Expressing optimism about goal attainment
> Helping followers develop emotional acceptance of challenges
> Sacrificing self-gain for the gain of others
> Creating a sense of joint mission and ownership[vi]

3. How Does Your Organisation Measure up to Nine Cultural Factors that Correlate to Safety Performance?

Safety and health programs function within the broader context of culture and safety climate. Safety climate refers to the level of interest and importance placed on safety by the organisation's leadership. Culture refers to the unwritten assumptions that influence decision-making, attitudes and beliefs, and guides the behaviour of those in the culture. Sustained over a long enough period of time, safety climate can become part of the culture.

In 1999 nine factors were identified in the research literature that independently correlate to safety performance and which make up the **Organisational Culture Diagnostic Instrument (OCDI)**. Interestingly, only three of the six dimensions are safety specific:
> Procedural Justice - The extent to which the individual worker perceives fairness in the supervisor's decision-making process.
> Leader-Member Exchange - The relationship the employee has with his or her supervisor. In particular, this scale measures employees' level of confidence that their supervisor will advocate for them and look out for their interests.
> Management Credibility - A perception of the employee that what management says is consistent with what management does.
> Perceived Organisational Support - The perception of employees that the organisation cares about them, values them, and supports them.
> Workgroup Relations - The perception the employee has of his or her relationship with co-workers. How well do they get along? To what degree do they treat each other with respect,

listen to each other's ideas, help one another out, and follow through on commitments made?

> Teamwork - The extent to which the employee perceives that working with team members is an effective way to get things done.

> Safety Climate - The safety climate scale measures the extent to which the employee perceives the organisation has a value for safety performance improvement.

> Upward Communication - The extent to which communication about safety flows freely upward through the organisation.

> Approaching Others - The extent to which employees feel free to speak to one another about safety concerns.

These nine factors can be measured and expressed as percentile scores contrasting one organisation with many others. Based on the specific profile, the organisation can develop interventions that leverage the high functioning areas to improve lower scoring areas.[vii]

4. Is Your Organisation Blinded by Cognitive Biases Relating to Safety Issues?

Decision-making processes are subject to biases, identifiable cognitive short cuts that simplify decision-making and have the benefit of being correct most of the time. "Most of the time" is good enough for most day-to-day decisions, but it is reliable only in that it produces predictable errors. The effective management of high-hazard technology requires very high levels of reliability, at the decision-making and behavioural level.

Cognitive biases are responsible for all types of errors in judgment, risk assessment and decision-making, wherever the cognitive process requires assessing probabilities.[viii] This applies directly to all kinds of risk management, where methodologies assume that risks can be quantified with some accuracy.

5. Has a "Normalisation of Deviance" Occurred Within Your Organisation That Has Allowed for Safety Lapses?

Relative to the Gulf Oil Spill disaster, an example that illustrates the effects of cognitive bias is the "boiled frog syndrome." The story goes that if a frog is placed in boiling water it will jump out, but if it is placed in water that gradually warms it will be killed. (This is admittedly a metaphor, not a scientific fact.)

Some have called this the "normalisation of deviance," a finding of the investigation following the Columbia Space Shuttle tragedy.

The potential impact of damage to shuttle thermal insulating tiles from degradation of foam on the external fuel tanks during launch was known to NASA engineers, and they had classified this as a risk that would stop the launch. But NASA gradually became accustomed to stretching its compliance with this standard. At the same time the space shuttle was successfully flown, multiple times. Gradually it became acceptable for the organisation to operate outside its own rules.

Estimates of the number of off-shore oil wells that have been drilled in the Gulf of Mexico range as high as 50,000 in the past 40 years. In 2006, 3,858 oil and gas platforms operated in the Gulf, according to the National Oceanic and Atmospheric Administration. Given that there have been no serious explosions in the Gulf since 1979 (off the coast of Mexico), and much financial success, it is not hard to see how the frog got boiled.

6. Is There an Over-Emphasis on Injury Rates in Your Organisation?

The frequency of employee injuries is not a reliable predictor of process safety outcomes. For example, BP's Texas City refinery had a very low recordable injury rate during the year it exploded.[ix] And a group of BP leaders were visiting the Deepwater Horizon platform to celebrate a good employee safety record on the day it exploded.[x]

The fact that an organisation has not experienced a catastrophic incident is not reassuring. The level of safety results of an organisation is not a perfect predictor of what will happen, especially in the short run. The difference between a catastrophic accident and a near miss is often random.

Especially in situations where safety systems are redundant, it takes more than one thing going wrong to trigger the incident.[xi] The identical situation, exposure, decision-making, and related behaviours can produce a near miss today and a catastrophe tomorrow. This means that a culture of carelessness can exist for days, months and years without an incident.

To manage safe performance, use of leading indicators is crucial. One best practice is to manage using a comprehensive dashboard of leading indicator data, including audit findings, operational errors, high-potential near misses, observations of safe practice and a culture of care, and corrective actions taken as a result of these indicators.

7. Are Your Reward and Recognition Systems Beneficial or Detrimental to Safety Performance?

Many organisations deploy incentive systems that create consequences detrimental to safe operation.[xii] Performance objectives that determine bonuses for manager and line employees sometimes take into account the **safety performance** target of reducing the number of injuries. This often leads to hiding or under-reporting injuries. Incentives based on increasing production quantity and speed and decreasing downtime are similarly counter-productive. In many cases they create an "ends justify the means" thinking giving managers and workers high incentive to take risks and shortcuts.

8. Are Your Safety Incident Root Cause Analyses Overly Simplistic?

The catch-all attribution of an incident to "human error" or to "mechanical failure" is inadequate, and implicates an abdication of leadership.

Root cause analysis sequentially answers the question, "Why did this happen?" It begins with the event itself and works back to its origins, the causal roots responsible for the outcome. One benefit of root cause analysis is that it reveals causal factors within an overall system that might not otherwise be apparent.

At the foundation of a long series of contributing causes to the Gulf Oil Spill are the root causes: senior executive leadership within the drilling organisations failed to establish a culture that supports risk analysis, understanding, communication and decision processes needed for adequate operational safety and reliability. Government regulators failed to set adequate safety standards and enforce compliance. Both failed to heed warnings of problems, act on the knowledge of problems, and failed to prepare adequate response plans.

The root cause of an incident may trace back years to a decision that was made at a very high level. What we determine about staffing levels, **supervisory development,** promotions, budgets or new projects all introduce changes into the systems that provide consequences for organisational behaviour.

Looking Forward

These questions bring into focus actions senior leaders can take to assess if they and their organisations are doing what is necessary to prevent catastrophic incidents. These actions infuse the organisation's culture with safety values, beliefs and practices that stick. The beneficial outcomes: demonstrated competence and commitment, restored reputation, regulatory compliance, and the capacity to meet operational demands.

References

[i] - Occupational Safety and Health Administration. Establishment Specific Injury and Illness Rates. 1996-2007.

[ii] - Krause, T. (2005) Leading with Safety. Wiley-Interscience. P. 2

[iii] - Krause, T. (2005) Leading with Safety. Wiley Interscience. xvii – xix

[iv] - Zebrowski, D. (1991) "Lessons Learned from Man-Made Catastrophes." See also:

Perrow, C. (1984) Normal Accidents: Living with High-Risk Technologies. Basic Books.

Columbia Accident Investigation Board Final Report, Volume I. (August 2003)

Columbia Accident Investigation Board Final Report, Volumes II-VI. (October, 2003)

The Report of the BP Refineries Independent Safety Review Panel. ("The Baker Panel Report") (January 2007)

Mogford, J., Investigation team leader, Fatal Accident Investigation Report: Isomerization Unit Explosion, Final Report, Texas City, Texas, USA. (December 9, 2005)

[v] - Borenstein, S. (July 12, 2010) "Technology's disasters share trail of hubris." Association Press.

Clarke, L. (2006) Worst Cases. The University of Chicago Press. vi Krause, T. (2005) Leading with Safety. Wiley-Interscience. p.39-44.

[vii] - Krause, T. (2005) Leading with Safety. Wiley-Interscience. p.67-81.

[viii] - Kahneman, D., & Tversky, A. (1972). Subjective probability: A judgment of epresentativeness. Cognitive Psychology, 3, 430–454. See also:

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. Cognitive Psychology, 5, 207–232.

Kahneman, D., P. Slovic, and A. Tversky, (1982) Judgment Under Certainty: Heuristics and Biases. Cambridge: Cambridge University Press.

Kahneman, D., & Tversky, A. (1984). Choices, values and frames. American Psychologist, 39, 341–350.

Kahneman, D., & Lovallo, D. (1993). Timid choices and bold forecasts: A cognitive perspective on risk-taking. Management Science, 39, 17–31.

Kahneman, D., & Tversky, A. (1996). On the reality of cognitive illusions. Psychological Review, 103, 582–591.

[ix] - Mogford, J., Investigation team leader, Fatal Accident Investigation Report: Isomerization Unit Explosion, Final Report, Texas City, Texas, USA. (December 9, 2005)

[x] - Gas surge shut well a couple of weeks before Gulf oil spill." (May 10, 2010). New Orleans Times-Picayune.

[xi] - Reason, J. (1997). Managing the Risks of Organisational Accidents. Ashgate Company.

[xii] - Krause T.R., and R.J. McCorquodale (1996) "Transitioning Away from Incentives." Professional Safety.

DEKRA Organisational & Process Safety

DEKRA Organisational and Process Safety are a behavioural change and process safety consultancy company. Working in collaboration with our clients, our approach is to assess the process safety and influence the safety culture with the aim of 'making a difference´.

In terms of behavioural change, we deliver the skills, methods, and motivation to change leadership attitudes, behaviours and decision-making among employees; supporting our clients in creating a culture of care and measurable sustainable improvement of safety outcomes is our goal.

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients to understand and evaluate their risks, and work together to develop pragmatic solutions. Our value-adding and practical approach integrates specialist process safety management, engineering and testing. We seek to educate and grow client competence to vide sustainable performance improvement; partnering with our clients we combine technical expertise with a passion for life preservation, harm reduction and asset protection.

We are a service unit of DEKRA SE, a global leader in safety since 1925 with over 45,000 employees in 60 countries and 5 continent. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

We have offices throughout North America, Europe, and Asia.
For more information, visit www.dekra-uk.co.uk/en/dekra-organisational-and-process-safety/
To contact us: dekra-ops.uk@dekra.com
To contact us: +44 (0) 23 8076 0722

Would you like to get more information?

Contact Us