Sustainability of Safety Culture in Time of Turbulence

Ir. Lee Chang Quan

Ir. Lee Chang Quan *graduated with a Mechanical Engineering degree and MBA. He is currently the HSE manager in a PETRONAS subsidiary. He is also a committee member in Oil, Gas and Mining Technical Division, IEM.*

Safety is always easier said than done. In the oil and gas industry, companies have established policy statements to make safety and health a priority in business operations. Such a commitment, normally in the form of a company policy statement on Health, Safety and Environment (HSE), will be put to test amidst cost cutting pressure resulting from the fall in price of crude oil. The price of crude oil tumbled to US$45 per barrel (Brent Crude, at the time of writing in Aug 2015) from the price range of US$90-100 per barrel in year 2013, causing a sharp profit drop among the oil majors. With the economic challenges clouding the oil and gas industry, how can the industry prevail in upholding the high standards of safety? Let us look at two major safety cases in the oil and gas industry for some insight.

PIPER ALPHA EXPLOSION 1988

The Piper Alpha explosion in July 1988, which had caused the death of 167 people, remains a painful learning experience for the oil and gas industry. The incident has become one of the most common case studies in the industry. Many of the lessons learnt from the Piper Alpha explosion incident have been incorporated for improvement in operations. The industry safety standards, e.g. pressure relief valves management, emergency shutdown valves design and installation, permit-to-work (PTW) management system and emergency evacuation were also established after the incident. Hazards identified from investigations and lessons learnt are dealt with through hazard elimination, engineering control, operational control or administrative control. People are up-skilled through training to ensure they can carry out their routine tasks safely.

However, all these measures will be futile if safety does not have priority over production or profitability, especially where there is an imminent threat to human lives, damage to equipment or impact on the environment. For example, in the Piper Alpha incident, the severity of the explosion could have been reduced if the neighbouring platform had adopted safety-priority behaviour. This means if they had cut off the production as soon as they were aware of the fire, they could have avoided further fuelling the fire at the Piper Alpha platform.

Will we suffer the same fate 37 years after the incident if we are posed with the same threat today? Will the front-liners be "courageous" enough to make the decision to stop production, risking revenue loss, customer loss and management action against him or her?

BP TEXAS CITY REFINERY EXPLOSION

In 2005, an explosion occurred at BP Texas City Refinery, United States. The incident claimed 15 lives and injured 180 people. The explosion and fire occurred during the plant start-up of an isomerization unit. A raffinate splitter tower (distillation tower) was overfilled, causing the pressure relieving devices to open. This led to flammable liquid streaming from a blowdown stack which was not equipped with a flare system.

Following the incident, the U.S. Chemical Safety Board (CSB) investigation team found several lapses in process safety. These included shift hand-over, alarm failure and start-up safety management. The investigation team also raised concerns about the safety management system effectiveness and corporate safety culture. Meanwhile, the Baker Panel, which examined the investigation of the incident, came up with a few key learning points (Hopkins, 2010):

- A lack of operating safety culture and discipline, together with tolerance for serious deviations from safe operating practices, posed serious process safety risks.
- Top management must provide effective leadership and establish appropriate goals for process safety, articulating a clear message and matching this with policies they adopt and actions they take.
- Developing and implementing a process

safety management system to ensure that all levels of management possess an appropriate level of process safety knowledge and expertise. Poor hazard identification or risk awareness throughout the organisation had contributed to the inability to see risks and therefore, toleration of a high level of risk.

- A good process safety culture requires a positive, trusting and transparent environment with effective lines of communication between the management and the workforce.

In addition, it was found that there were unclear accountabilities and communication across the organisation which had gone through frequent structure modification without improving the safety behaviour required. Poor communication across functions, either vertically or horizontally with workers tending to work in silo, had created confusion in work and deviation from the basic requirements for safe and efficient operations.

POOR ORGANISATION SAFETY CULTURE AS COMMON TRAITS OF MAJOR INCIDENTS

There is a similar trait in these two major accidents that points to organisation safety culture as an underlying cause. Organisation culture is "how we do things around here" and it is also "a shared perception of daily practices" (Hofstede, 1997). Meanwhile, organisation safety culture is how safety is perceived and practised in daily work.

Currently, though oil and gas companies are facing economic headwinds and taking multiple cost-cutting measures, organisation safety culture should not be neglected. Capital projects may be postponed, training budgets reduced and manpower downsized; however, the way safety is perceived and practised in daily operations, should continue to be of the utmost importance in order for companies to uphold high safety standards.

In fact, poor organisation safety culture is the cause of many major accidents in the oil and gas industry. It was also identified as one of the causes in the Columbia space shuttle disaster in 2003 which killed the seven-member crew and shook NASA to the core.

Studies on major incidents have established links between organisation safety culture and major incidents (Hopkins, 2006). Therefore, it is necessary to always improve safety culture based on the lessons learnt from incidents. Quite often, companies take pride in providing the best protective gear, high-standard operating procedures, high-capital engineering control, intensive training and development on operation standards rather than emphasise on the sharing of learning.

Other than knowing what incident had happened, it would be more crucial that companies turned the "know-what" to "know-how". The safety department should understand why the incident had happened and then reflect on the current practices before coming up with any action to avoid a similar incident. To prevent repeated failures, the safety fraternity can take the Kaizen approach to safety of continuous learning, effective root cause analysis and sharing of lesson learnt.

IMPROVING THE SAFETY CULTURE

Other than lessons learnt from incidents, how can companies improve their safety culture? Fortunately, we don't need to apply rocket science to find out. There have been many research works done on the subject of safety culture. According to Reason (1997), an effective safety culture organisation would have:

- A transparent and easy-to-access safety information system that collects, analyses and disseminates information on incidents, near misses and audit findings;
- A transparent reporting culture where people are prepared to inform any near misses, errors, mistakes and non-compliance, without fear, irrespective of rank;
- A culture of trust and accountability throughout the hierarchy, where people understand the roles and responsibilities towards safety.
- A strong will to continue improving its safety system.

To apply the above points to further improve the organisational safety culture, leadership and commitment are essential. Leadership is the key to changing safety culture. Leaders can influence safety through "walk the talk" exemplary actions. Perception and demonstration of safety behaviours by senior managers will shape the behaviour of workers and therefore, the safety performance of the organisation (Clarke, 1999).

Similar emphasis should also be given to supervisory level employees due to the longer contact time and intermediary role between senior management and workers at ground level. The synergy between the senior management and supervisors can play an influential role in moulding the safety behaviour of the workforce. Frequent and open communications among the managers, supervisors and shop floor workforce are instrumental to good safety performance (Parker, *et al.,* 2006).

Assessing the current state of organisation safety culture is beneficial to identify opportunity for improvement to safety performance. There are various tools and studies available in the market for this. Parket, *et al.,* (2006) have also formulated an organisational safety culture maturity framework. Using research work on oil & gas company executives, they developed and proposed a set of short cultural descriptors. Companies can use the following sample questions and descriptors to do a quick assessment of their organisation safety culture maturity:

In the eyes of management, who causes accidents?	• Are individuals blamed? Are faulty machinery and poor maintenance identified as causes as well as people? Or • Does Management accept that it is their responsibility, that they could have done something to remove the root causes? They can take a broader view, looking at the interaction of system and people.
What happens after an accident? Is the feedback loop closed?	• The focus is on the employee after an accident. An accident report is not shared to the line if possible. Or, • The top management shows a personal interest in individuals and the investigation process. All employees take accidents to others personally.
Balance between Health, Safety, Environment and profitability	• Profitability takes priority and safety is seen as a cost. Operational factors dominate. Or, • HSE and profitability are in balance. The business accepts delay to ensure contractors live up to the safety standards.
Work-site job safety techniques	• A standard worksite hazard management technique is brought in but without much systematic use. Or, • Job safety analysis or safety observation techniques are accepted by the workforce and revised regularly for improvement.

How do employees feel about safety meetings?	• Meetings are seen as a waste of time and attended reluctantly. Or, • Meetings can be called by any employee. Toolbox meetings are short and are focused on ensuring that everyone is aware of risks that may arise from work.
Who checks safety on a day-to-day basis?	• There is no formal system. Cursory site checks are performed before management/external inspector visits. Or, • Internal cross safety audits take place. Everyone checks for hazards. There is no problem demanding shutdown because of hazard.
What is the size/ status of the HSE department?	• The department is small and has little power but is sometimes seen as police force. Or, • HSE is seen as an important job given to high flyers. All senior people in operation must have HSE experience. Department is small but powerful with equal status to other departments.

[Source: Parker, et al., (2006)]

During economic turbulence, other than protecting the thinning bottom line, companies must pay attention to the health and safety of the stakeholders, especially employees. The last thing a company needs is having to manage a crisis due to a major accident as this cost lives and money. Therefore, it is important that companies commit to their pledges in safety and health policies and review the business wholesomely, together with the safety and health management system, before making any drastic change to the organisation. Any change has to be assessed on its risks. Any change has to be followed through deeply for a smooth and clear changeover on how routine work is conducted. A good understanding of the organisation safety culture will enable a company to grasp, assess and manage the risk of change more effectively. Open communication and well-informed workforce on safety incident, near-misses, safety learning and sharing, violations and safety improvement action will propel the organisation to a higher safety culture maturity.

In a nutshell, cognisance in the organisation safety culture, together with improvements in procedures and safety systems, will mean improvements in safety performance. Even though organisation safety culture improvement is not rocket science, it still requires leadership and commitment to engineer the change as well as consistent follow-up to sustain the culture. So will oil and gas companies be able to keep the safety standards and their commitment to safety when faced with economic challenges? Only time will tell. ■

REFERENCES

[1] Clark, S., 1999. Perception of Organizational Safety: Implications for the Development of Safety Culture. Journal of Organizational Behaviour, 20(2), 185-198.

[2] Columbia Accident Investigation Board, 2003. Report, Vol.1. Washington NASA.

[3] Hopkins, A., 2006. Studying Organization Cultures and Their Effect on Safety. Safety Sciences 44, 875-889.

[4] Hopkins, A., 2010. Failure to Learn: The BP Texas City Refinery Disaster. CCH, Australia.

[5] Hofstede, G., 1997. Cultures and Organizations. McGraw-Hill, New York.

[6] Lutchman, C., Maharaj, R., and Ghanem, W., 2012. Safety Management: A Comprehensive Approach to Developing A Sustainable System. CRC Press, Taylor & Francis Group.

[7] Parker, D., Lawrie, M., and Hudson, P., 2006. A Framework for Understanding The Development of Organizational Safety Culture. Safety Science-Pergamon, (44), retrieved from www.elservier.com

[8] Pennachio, F., 2008. Going Beyond Limits. Occupational Hazards, 70(9), 34-35.

[9] Reason, J. 1997. Managing the Risks of Organizational Accidents. Ashgate.

[10] U.S. Chemical Safety and Hazard Investigation Board Investigation Report: Refinery Explosion and Fire, 2007. Downloaded from http://www.csb.gov/file.aspx?DocumentId=345