1. Introduction

The Piper Alpha Oil Rig disaster in the North Sea, on the 6 July 1988, was one of the most pivotal events in safety around the world. It changed the thinking and focus of governments, whole industries and led to numerous books and papers. It resulted in new legislation, textbooks and a critical self-examination by the oil and gas industry.

In short, an explosion and fire occurred when a pipe started leaking gas and ignited. A temporary flange, with no safety valve, was used to block off this pipe during a maintenance operation the previous shift. The permit to advise operators not to start the pumps on this line was misplaced and lost. Several deficiencies, problems and system failures coincided. A key factor was that the water deluge system was inoperable at the time and failed to extinguish the large fire that erupted, followed by an even larger gas explosion. The accommodation unit, situated on top of the oil rig, was the main “killing field” – most men gathered here to await instructions (which never came) and where they died from smoke inhalation. Later, a large explosion of the gas pipeline from an adjoined rig exploded and killed more people.

The line of events and the associated system failures are all very relevant in the analysis of the accident, and provide the only insight into what caused the accident. But much “further back”, inside the organization’s culture, lurks more dark matter. The first inclination is to ask what was “deficient” in the culture. Did they not care enough about safety, or about their people? Did they have a culture where production decisions were more important than safety considerations? Did they ‘coerce’ supervisors and employees to ignore safety precautions or did they just “fly by the seat of their pants”?

Corrie Pitzer March 2010
The seven deadly delusions of accident-prone organizations

Not surprisingly, it is very difficult to identify the true nature of the culture in that business because in such an aftermath of death and destruction, no one dare say that the safety culture was a ‘positive one, focused and caring’ or that the company was doing well in safety and that this is only a freak accident. Indeed, there were many deficiencies in the organization’s systems and procedures, such as the permit to work system.

But there are some niggling questions: How is then that the Piper Alpha Oil Rig was actually considered the company’s most productive and safest oil rig in the North Sea? Why would this rig win a safety competition, 6 months before the disaster, with the deficient permit as its most outstanding successful system?

More tellingly, why did the manager if this rig later report that, when he was questioned about the fact why he did not know of all the deficiencies that were so readily uncovered in the inquiry: “I knew everything was all right, because I never got a report that anything was wrong” (Brian Appleton presentation)

This is a strong indication of a ‘delusion’. The manager was clearly deluded that his rig was safe, sound and well-managed. This is a manager who expressed his confidence, based on the lack of reports to him about problems.

But what is wrong with that? Isn’t this what all managers, everywhere, do every day: manage-by-exception? It is clearly impossible to manage and know of every detail in the business, every step of the way. You have to rely on reports, any manager will tell you, and you have to trust the people who work for you.

But what if they don’t trust you? What if they ‘feel’ that if they reported deficiencies to you that they will become the targets of being ‘shot as the messenger’? Or even more subtly, what if they feel that they dare not/want not to disturb the peace in a company that is clearly doing well on safety, with no incidents, accolades, lots of vision statements and goals about accident-free performance, celebrations of these milestones. Companies commonly announce and boast about their extreme safe performance, racking up millions of hours accident-free and, as a consequence, the next company’s achievement will be even more grandiose.

The “truth” is that, and many frontline operators in those organizations will attest to this, many accidents and incidents in those organizations are ‘hidden’ and/or not reported – a phenomenon called IBNR: Incurred But Not Recorded.

The culture in such an organization is not deficient or ‘faulty’ in the traditional sense of the word. It is ‘deluded’.

A series of such delusions have been identified in the research of the author, starting with a paper in 1997 about the incidence of mine disasters in Australia. Peculiarly, the more recent disasters in that industry (during the 1990’s and 2000’s) tended to be at mine sites that could hardly be described as deficient in their management of safety. They were operated by mining corporations who had a tremendous and sincere focus on safety and in some cases, could be described as the ‘best in the business’.

Indeed, one such mine was Northparkes gold and copper mine, in New South Wales, Australia, owned and operated by North Mining in Australia - a mining company that for
The seven deadly delusions of accident-prone organizations

The seven deadly delusions of accident-prone organizations

years was, regarded as a leader in safety in the resources industry. (The mine was later taken over by Rio Tinto, in 2000.)

On the afternoon of the day shift on 24 November 1999 four men were killed at the Northparkes E26 Lift One underground mine as a result of a massive collapse of rock and the subsequent devastating airblast. While the inquiries into this accident focused mainly on the risks and technicalities associated with so-called block cave mining, there was an unique opportunity, unreported until now, to also study the safety culture and safety management systems of that mine, prior to the incident.

At that time, the resources industry of Australia operated an industry award system called the Minex Awards. This award was given annually to the best mine in Australia from a safety perspective, and the strength of it was that it was only given after a very rigorous audit and analysis was done of the participating mines' safety systems, culture and performance by a visiting team of trained evaluators. An iterative process ensured that the top award would only be given to a truly deserving mine. Northparkes Mine was a participant in this award process, and was given a “high commendation” by the Minex panel, prior to the disaster. The author was a member of the evaluation team in 1999, and had first-hand insight into the quality and design of Northparkes safety management systems and culture. It can be stated, unequivocally, was a top performing mine in safety. It can be stated, unequivocally, this mine was a top performing mine in safety, with rigorous and robust safety systems in place, an outstanding management team and very dedicated safety manager.

Another unique opportunity presented itself: In 1999, the Australian Minerals Council commissioned an industry-wide safety culture survey, with 42 participating mines and plants selected from all the mining locations, types of mining and commodities. Coincidently, Northparkes Mine was also a participant in this survey and analysis. The author’s company, SAFEmap, was responsible for the survey and subsequent report (see www.safemap.com).

The survey of safety culture had placed Northparkes Mine the third highest in the rank of ‘positive responses’ by employees and the safety culture, in several respects, was unequalled. This company’s responses levels are still of the highest ever recorded in the SAFEmap database of more than 200 companies and more than 100 000 employees – on of the largest in the world. The Minex panel gave the mine a High Commendation in the awards process. It is suggested that mine management was not ‘deficient’, it was simply too good for its own good!

Their huge focus on safety, the achievement of lofty goals and celebration of safety successes led to “mindset” that they are leaders in safety, protected by an extraordinary safety system and that their safety incident figures indicated a truly world-class safety performance.

It led them into the trap of the seven deadly delusions…

2. The delusion of (risk) control

The first delusion of risk control is the most persuasive and the most ‘attractive’ one.

In the safety profession, we create a myriad of rules and procedures that are supposed to defend us and create controls in the workplace. These are the very basis of most legislation and are often supplemented by the management of an enterprise. Many organizations have
very comprehensive safety management systems in place, either based on a commercially available package, such as the DNV risk management system, or they deploy their internally developed and audited systems. Organizations such as BP, Shell, ExxonMobil, BHPBilliton, etc all have very well developed systems and they operate sophisticated auditing of compliance. While these systems are largely successful, they eventually become a complexity of their own. Layer upon layer of risk controls actually create behavioral responses that expose the organization in unpredictable ways.

A key element of all of these systems is a clear and unabated focus: to ‘control’ risks in the workplace, which may be softened to ‘mitigate’ risks, in the sense ‘lessening or moderating’ the risks. However, from a purist perspective, no self respecting safety manager will be satisfied with ‘lessen’.

A key question to be asked, and almost too obvious, is this: Can risks be controlled? The immediate answer, by the self-respecting and purist safety manager, will be an unequivocal yes! If we reduce the likelihood of an event, reduce the exposure of people to it and limit the potential impact if an event occurs, then surely the risk has been ‘mitigated’.

Yes, but not controlled. The delusion that follows from extensive deployment of mitigating measures is the risk is now controlled and in the organizational mindset, the ‘comfort zone’ is reached. The organization develops a collective confidence that antecedents are identified, each control or managed and that the event(s) are now less likely. This is the most critical danger zone, and exactly what occurred in the NASA mindset about the nature of the O-ring risk. The classification on the risk matrix (unlikely-catastrophic-redundant) it was given placed the risk in the comfort zone and when the ‘deviant’ engineer Roger Boisjoly tried to alert his managers of the looming danger, his concerns were readily dismissed.

A cultural feature of the Northparkes mine supports the notion of a risk control comfort zone:

The safety culture survey prior to the disaster indicated a very high overall positive response rate, as mentioned, third highest in the database and still today in the top tier of the safemap norm range. Issues such as trust in management, safety policy and focus, balance between production and safety, and most of the 41 factors in the model were highly positive, except for one factor: Risk concern. The question (statement): “I am worried about dangers in my workplace” had one of the lowest response levels recorded in the database to date. In fact, a correlation analysis was done on the responses to this question and another converse statement: “This company has good standards for safety”. The result showed a significant inverse relationship of .89 – a strong indication that respondents were significantly more confident, the more they believed the company had things under control.

The above finding is entirely consistent with Adam’s risk compensation theory that states that humans have an inherent “risk thermostat” that we adjust according to the level of risk we perceive in our environment. Subsequently, if we think we see more risk, we will act more cautiously and conversely, if the think we don’t see risk, we act more risky, or tolerate more risk. This is the danger zone, or the delusion of control.

In a recent interview with the safety manager of the Northparkes mine, he concluded, on reflection that they (the management team) were very “naïve” at the time, to have had so much faith in the risk management systems...
3. The delusion of compliance

The advent of behavioral safety has been responsible for dramatic (claimed) improvements in safety in many organizations and for most it introduced a new golden age for safety in the 1980’s and 1990’s, and a golden age for achieving compliance. A traditional complaint of safety managers is that 'we have set the rules, trained workers to know and understand them and still, they break rules and take risks'.

While there can be no doubt that behavioral safety, and its glib formulae, has made the 'human mind' more understandable for the average manager and safety manager, and that it provided a very simple model for behavioral change, and that it was indeed successful to change the behaviors of many millions of managers, supervisors and workers, it also succeeded to increase the IBNR phenomenon, dramatically.

Secondly, it made significant progress toward a false goal of compliance...

Compliance is hailed as a savior, preventing accidents if people comply with safety rules, and what can be more obvious: if all drivers on the road adhere to all rules all the time, what can go wrong?

Well, plenty can go wrong.

If all drivers drive at or under the speed limit, accidents will not happen? Wrong, because most accidents happen at or under the speed limit. Most pedestrians are killed at pedestrian crossings and most jaywalkers are not killed, because they are very alert when they do cross the road. The higher actual risk they face has been reduced to a lower virtual risk by their risk response (alertness). They deal with the higher risk more competently than what the pedestrian does with the lower risk and the net result is more safety!

Complying to a speed limit on a very slippery road may be very risky and breaking the speed limit to overtake another car that is traveling under the speed limit is safer than the alternative: to slowly overtake and be exposed on the wrong side of the road for longer.

Or crossing to the opposite lane on a dual carriage road to avoid an accident sounds obvious, but it indicates that humans have to apply their risk judgment skills to stay alive, and not merely to comply with rules.

The examples above are simplistic and in very ordinary, everyday situations. The complexity and variation of the average workplace far exceeds this and it is in the first instance impossible to set rules for all possible situations and conditions in the workplace. And even if it was, there will be an endless number of times in a person’s work where slight variations of the actual conditions and dynamics of the task require him/her to respond in a complex way, judged at the moment and with lightning fast behaviors, without ‘thinking’.

The upside for the safety manager is that for the most part, accidents are largely prevented in an ordered world. But a reality of most industries today, also of traffic accidents in developed countries, is that plateaus of performance have been reached and which stubbornly persist. Reason (2000) reports that the aviation industry’s safety performance has been static for the past 20 years.

It is in these circumstances that the goal of compliance does not serve the goal of improvement anymore. In a highly ordered world, with low incidence rates, the lurking...
impact of ‘risk compensation’ causes havoc with the normal behaviors of people, create risk-taking behaviors that are not explained by simple ABC models and feed the delusion of risk control even further.

4. The delusion of consistency

The delusion of consistency is closely related to the delusion of compliance.

James Reason published an insightful article in which he made the controversial statement: “following safety procedures has killed people” and he cites examples such as the Piper Alpha disaster as just one such case, where workers who strictly followed the safety procedure were the ones killed in the fire, while those who jumped into the sea, against procedures, survived. This doesn’t imply that all safety procedures are wrong and shouldn’t be adhered to, but it does mean that human beings in a high-risk work environment should firstly apply their risk skills and risk judgment and that ‘consistency’ is not the be all and end all of safe behavior, as outlined with the pedestrian example above.

The range of human behaviors is infinite, complex and unpredictable, most of the time. The search for behavioral models and understanding in the field of psychology has led to the development of very simplistic models in safety, the so-called behavioral safety approach. It posits a very simple equation of Antecedent-Behavior-Consequence (ABC) and it ‘reduced’ human risky behavior to the same equation. The behavioral model is essentially a pavlovian view of the human being, who learns behaviors through a basic operant conditioning process, not unlike animals. The dog experiment with bells comes to mind… While it would be an unhelpful overstatement to allege that behaviorism reduces the human to animal-like behaviors and that we are conditioned in most if not all we do, there is still a significant oversimplification that occurs in the name of behavioral psychology.

Human beings learn to deal with risks though a complex process of cognitive adaptation, often developing an intuition and competence that defies reasoned thinking. This ‘capability’ allows them to deal with risk in a highly variable fashion, a readiness for any/many possibilities. But then our risk control logic says we should limit all variability and create consistency and compliance in the workplace. This logic seems flawed.

The safety models operating in high risk industries are very much an ‘engineering’ model that states that human variability is the enemy. Just as we, as engineers, seek to limit deviations from a standard operating procedure or process, we should also ensure that they perform, mechanically, against the specifications, with minimal divergence and to ensure the work environment is more predictable.

However, the human being’s ability to respond in variable ways, interpreting situations of risk, which dynamically change every moment, is the best defense we have – and by limiting that capability, we are eroding the overall safety systems most potent safeguards. For every mistake the human being makes, he or she has made many millions of safe and correct decisions.
5. The delusion of human error

The delusion of human error is closely linked with the stereotypes about humans that the safety profession holds, and also linked to the delusions discussed above. One of the long-standing ‘axioms’ in behavioral safety is that the majority of accidents are because of human error, and that behavioral observations will eliminate that. This linear approach wholly underestimates the complex interactions between humans and their dynamically changing environments. It also completely misses the point that human actions are only the visible sharp end of many behavioral systems that ‘create’ human error.

The overall safety management system and the associated ‘culture’ of the organization are intrinsically linked, combining in a dynamic way to create a social work environment that influences the human operator to take certain actions in a certain way. Human operators quickly pick up the signals from supervisors and managers about their preferences and priorities, they quickly notice what gets ignored or responded to and they act accordingly. They may fail to apply a certain safety procedure over a long period of time, without their being any ‘consequences’ from the supervisor for doing so and when an accident happens as a result of that failure, the clear culprit is the person who didn’t apply the procedure, while the unspoken social environment, or the behaviors of the supervisor, cannot be fingered so explicitly - and we have a clear case of “human error”!

The above is only one small example of the precipitating factors that ‘induce’ human error into the operational process. There are many, many such factors and dynamics that never become the focus of the accident analysis process, even though there is a strong focus for so-called root cause analysis. What cannot be admitted by anybody is simply that the behaviors of the supervisor and the operator, until the accident occurred, facilitated a more productive outcome for the organization. If the accident did not occur, the human error was actually a ‘good thing’!

By focusing on human errors, accident-prone organizations become obsessed with the sharp end of the failure process only and become absolved of any guilt for the failures at that sharp end. The analogy of being so busy with swatting mosquitoes comes to mind. This delusion doesn’t allow time or willingness from the leadership to drain the swamp, because ‘we have to kill the mosquitoes…”

6. The delusion of predictability

A key aspect of modern risk management approaches is that risk has a certain ‘probability’ (likelihood or chance) and if the risk is analyzed, its probability can be identified and cautionary actions taken. However, unlike the risk insurance industry, there is little objective and hard data available about events in most organizations. There simply isn’t enough data to achieve the goal of risk quantification, and risk assessments often become a subjective guess, often by unqualified people who have a vested interest in a certain guess and easily manipulated for “organizational politics”. It creates the delusions that risks are quantified, which exactly what happened with the O-rings on the Challenger Space Shuttle, as mentioned above.

The impact of this delusion is that the management of the organization creates all operational systems based on this notion of predictability, and has little or no contingencies or adaptive response put into place – so that when deviations from the predicted path occur,
they are more exposed to, often catastrophic, adverse outcomes than they would have been.

This ‘unpredictable’ dynamic is most clearly shown by the phenomenon of ‘risk migration’.

Risk migration is the tendency of risks to be moved around, changed or morphed into other types of threats, or other locations of the same threat.

A dramatic example occurred in Vancouver, BC, Canada:

A young gas station operator tried to stop a thief from filling his car with gas and fleeing. He jumped on the hood to stop him, but he was thrown from the speeding car and tragically killed.

The government issued a new ruling, in the interest of ensuring each person has the right to a safe work environment, that all motorists have to pay first and then fill the car with gas. It seems a very logical solution that will prevent this incident from re-occurring and one that can be readily predicted. But what would be the response of the would-be thief? They still do not have the money to pay for the gas and they still want to fill up their cars. They now have no other option than to become honest, law abiding citizens of society? Probably not. They will in all likelihood rob the attendant of one gas station and then go and fill up at another, and in this process, the new, unpredicted, event has become more violent, more serious and more likely.

Organizationally, the focus on risk management is also biased towards the least productive end of the process: most risks assessments spend the majority of time on the risk evaluation process, using a risk matrix of some design and endlessly trying to quantify the risks. The decisions about likelihood of risk events are almost always a purely subjective assessment for most operational risks and add little value. Organizations are strongly recommended to spend more resources on the risk identification process and less on the attempted quantification process – for which we do not have adequate data.

Similarly, the traditional ‘hierarchy of risk control’ advocated widely by the risk management profession is an outdated and no longer very useful guideline for controlling risks. It is fundamentally a hazard control guide and it has little impact on the dynamics of human variability and error reduction.

This precedes catastrophic events because such deluded organizations are obsessed with predicted, known risks, based on their assessment of known causes and known potential outcomes. This delusion lets them know more and more of what they already know, and less and less of what they don’t know: unknown events with unknown causes and unknown outcomes.

7. **The delusion of statistical trends towards zero**

The saying: lies, damn lies and statistics is a famous one in the world of business research and reporting, but nowhere as damaging as in the world of safety statistics.

There is a significant demand for improving safety performance, as measured by graphs and statistics – resulting in all kinds of ‘treatments’ of the data. Workers are quickly ‘rehabilitated’ to return to work before a certain cut off period, incidents are “argued away”
The seven deadly delusions of accident-prone organizations

as not work-related or large incentives often drive reductions in the rate of accident reporting as described above, the IBNR phenomenon.

There are two aspects to this delusion:

There is hardly an organization today that does not boast an improving accident rate trend. It is a function of better and better risk control/mitigation, the lie-factors mentioned above are just a reality of an outcome-based world. There is also hardly an organization today that has not experienced the well-known "flat end" of the (opposite) hockey stick. Significant and dramatic (sometimes dramatized) reductions have slowed down as the technology and capabilities run out of puff. The behavioral safety era is one such out-of-puff flavor of the last decade.

The plateau-limited organizations are still seeking the trend towards zero and they are under pressure to maintain that. Often such organizations show the odd outlier event – a burst of serious accidents, or even the odd catastrophic event. The first part of this delusion is that the trends are sustainable, but also that its statistical performance provides a valid measurement of its actual safety performance.

The problem with statistical performance is that it is a (fudged) account of minuscule events in the organization. The ratio of deviations to conformance in any situation of work is simply mind boggling. One deviant decision or action is literally a needle in a haystack of good, conforming decisions and actions, and even then, it is very seldom that the deviant action actually results in an accident. In most modern organization, well managed and defended, chance plays a significant role in the accident/event.

Similarly, highly at-risk organizations can, by chance and sheer luck, avoid disasters and adverse impacts. A personal experience of the author during a risk assessment exercise at a gold mine in Papua Niue Guinea was a dramatic case in point: During a visit to a mine pit, the team of risk observers identified six potential situations in which a fatal accident was highly likely (near misses), in the space of two hours! The production superintendent reluctantly admitted these as potential events, but as “unlikely”. During the same week, another mine in Canada, owned by the same company, suffered a fatal accident—a mine where the safety defenses were extremely well-developed and robust.

The natural response was that Mine B was mismanaged, exposed and weak in its safety system integrity.

Clearly, in the description above, the use of statistical performance as a measurement of actual safety performance has to be questioned. There is no more dramatic example of this than the explosion at the BP Texas Refinery, an organization that boasted exemplary safety statistics, before the explosion killed 14 people.

The now famous Baker report starts with an emphatic announcement:

"Process safety accidents can be prevented.

On March 23, 2005, the BP Texas City refinery experienced a catastrophic process accident. It was one of the most serious U.S. workplace disasters of the past two decades, resulting in 15 deaths and more than 170 injuries.”
And then one of the key findings:

**BP mistakenly used improving personal safety performance (i.e., personal injury rates) as an indication of acceptable process safety performance at its five U.S. refineries; BP’s reliance on this data and inadequate process safety understanding created a false sense of confidence that it was properly addressing process safety risks at those refineries.**

The second aspect of this delusion is ironically contained in the above dramatic announcement: "Process safety accidents can be prevented"

If the statement is false, it will be an acknowledgement of the safety profession that it will fail in its endeavor and that people will be killed. Clearly, from a moral standpoint there is no room for that in any self-respecting safety manager’s vocabulary.

If the statement is true, then it means that the end result of all (process) safety endeavors has to be the total elimination of fatal accidents from the workplace.

For that to be achieved, all ‘accidents’ will have to be eliminated. Then all incidents have to be eliminated. We also can have any near miss incidents, because the difference between a near miss and an incident is largely fortuitous (one second, one meter).

To eliminate near misses, we have to eliminate all mistakes…not as single misjudgment, all workers always absolutely vigilant, “situationally aware” (the new jargon), so that there is no single event that could remotely have resulted in any type of near mishap…not near, not close, not even remotely possible…

To achieve that, we will have to achieve a situation of zero hazards, zero risks and to achieve that, we all know, we must have no work…

Many, if not most organizations have fallen into the zero delusion. And long periods of (reported) zero accidents increasingly feed the belief that “zero” is possible, is happening and that in turn feeds the belief that risks are controlled, human error has been curtailed, compliance is achieved and behavior is consistent and predictable: all the delusions discussed so far are fed and fostered.

In the safety culture survey of the Australian mining industry mentioned above, one of the questions was: "It is possible to achieve zero accidents". It was believed by less that 24% of employees, and in focus group challenges, the author has seen the disbelief rate as high as 93%. Nobody believes it, but everybody professes it.

The biggest downside of this is that the “safety business” is shrouded in fallacy, skepticism and cynicism.

The difficult question is this: do we then have to accept that accidents are inevitable? The brutally honest answer is: “Yes, that is reality” and it will always be so in the real world, but we dare not say this publically.

There is also no evidence to support the view that workers/people who accept that accidents are inevitable, are now fatalistic, less aware of risk or less motivated and are
having more having accidents. It is another delusion that pervades the safety profession, with no basis in science. On the contrary, James Reason postulates that employees in so-called HROs (high reliability organizations) are more aware, more committed because they accept failures will happen. They constantly fear an accident may happen, while we blindly believe it will not.

8. The delusion of invulnerability

Like the Titanic, the delusion of invulnerability is the most deadly of them all. It pervades the minds of individual workers, supervisors and managers and eventually becomes ingrained in the culture of the organization.

It is caused by three factors or ‘conditions’ in the organization:

- high levels of perceived safety protection through systems and programs,
- low levels of incidents occurring and
- the increasing trend of workers (and supervisors and managers) to hide risk-taking, risks and potential safety problems away.

This is largely a result of a well-intentioned, but poorly deployed, focus on zero accidents as discussed above – a number chased by all, mystified by gurus and used as a large stick against all “heathens”. It is a delusion that evolves on the back of all the delusions discussed above and can be described as a pervading culture of self-confidence in the organization.

In light of the dramatic successes of safety improvements over the recent decades, the fact that adverse incidents are few and far between, that fewer and fewer adverse conditions are being reported, that near 100% “safe behaviors” graphs are donned on sites’ notice boards, the safety professional believes that the “safety war is being won”.

This confidence is in many ways justified, because the technological advances in this day and age is astounding, and the ability to control risks and human error are seemingly at an all time high. But it is also this confidence that is the Achilles heel of the company. It is a confidence that permeates into the daily operations, the perceptions of the operator and the supervisor and it is only occasionally or rarely disturbed by the odd, “freak” accident. It remains intact, unless the event is of a catastrophic nature.

This delusion of invulnerability was tragically at play before a disaster in South African gold mine, in 1995:

On a cold day in May, 1995, a group of night shift miners went to work as they had many times before. They are joking and laughing, teasing a fellow worker, having a lot of fun:

They jammed into a double-decker steel cage, 104 of them, 52 people on each deck, like sardines in a tin. The cage shuddered, bells rang, doors closed and at high speed they sank down a mine shaft, to the belly of the earth, starting another shift, like many shifts before.

Suddenly, after just a few minutes, above their heads, there was a massive jolt!
They could hear the rumbling and smashing of metal against rock, their cage shaking wildly before crunching to a halt. Something was very, very wrong!

Then, an enormous blow to their cage roof bent the metal and crushed the roof. Metals pieces penetrated and killed several workers and others were injured, bleeding profusely. Panic set in. They screamed and yelled, some cried out for help, but then a free fall began, rolling against the sidewalls of the shaft, twisting and turning them, breaking the cage apart. They hit the shaft’s bottom 500 meters down, disintegrating. Blackness and silence...all 104 men crushed, dead...

On that fateful day, a runaway locomotive smashed through shaft gates moments after the cage had gone past that level, tumbled down the shaft on top of the cage and smashed it to 18 inches of muddled steel and mangled flesh at the shaft’s bottom. The only indications that they were human were fingers and toes...

The runaway locomotive should have been stopped by at least 8 protection devices, designed specifically to prevent runaway locos, such as a ‘dead man switch (that was bridged out with copper wires), two gates, a RSJ stopper, two wooden stop blocks (“aeroplane sprags”), a “tank” trap, a failed start-up procedure and several other procedures. All of these devices were out of action, disabled or broken. Hundreds of people, workers and supervisors, routinely walked up and down this tunnel, passed these devices, not seeing, not caring, not acting...all too confident that there will be a second device, a third, a fourth, to safeguard us.

It comes back to pedestrian that crosses the street, confident that I am protected, I am right, you are wrong...

9. Conclusions

The safety profession is big business world-wide and has a long history of lies, facades and delusions. Organizations are caught up in the competitive cycle of publically pronouncing how safe they are and citing impressive accident free achievements. Some organizations and consultancies have built up huge reputations with many “millions of hours accident free”, selling their expertise and magic tools and yet, most of these claims are simply false.

A significant drawback in safety is the many cycles of fads and buzz words that soak up resources for little real return, other than creating a lot of ‘busy-ness’. We have, as an industry, fired off many silver bullets in our relentless pursuit of the zero goals and we are increasingly aiming at the worker. We are now fast turning to the next fad and silver bullets from the worlds of psychology, neurology and cognitive sciences, again aiming at the worker to ‘switch’ them on and make them situational aware - while the answer to safety lies within our organizations and well within our grasp: true and credible safety leadership at all levels, especially our first line supervisors.

True leaders share and lead with their values, make decisions based on values, challenge traditions, inspire and enable people to act. Value-based leadership creates the accountability and values for safety we so desperately seek and it creates the ‘safe culture’
that is able to reach into the deepest crevices of our organizations, where our systems and defenses cannot. Leadership is a process that an organization can acquire, nurture and develop.

It is felt that safety in our industry is at or near a critical turning point. Continuing with the same safety management philosophies and behavioral fads may take us quicker and further towards the comfort zone, unless we make fundamental shifts in our safety thinking. However, societal pressures, the safety profession and accident-chasing lawyers may not allow us to change direction.

Step changes in our near-zero safety performance are not likely anymore - and we will continue to experience random fluctuations in accident rates, and larger spikes if we have a disaster. And as we relentlessly push for incrementally better accident rates, so risk secrecy increases and so does the likelihood for catastrophic events.

10. A vision of safety – 20 years from now...

Today, safety and risk are seen as opposites, where we have to move from a condition of danger to a condition of safety or absence of harm. In this approach, we analyze accidents and prevent them, we set rules and enforce them, we educate our people not to take any risks and we ask them to identify hazards which we as management will eliminate or mitigate.

But risk has potential to have both positive and harmful outcomes. If we don’t dare, we will not achieve, if we don’t venture we will not discover and if we don’t innovate, we will recede. We therefore have to find the fine balance between risk rewards and potential harm. If the front line worker starts up the dozer (machine) to move dirt (whatever), he deals with risk. And how well he does that is the ultimate competitive edge of the business. The operation of that piece of equipment needs to be at the edge of risk all the time. It’s an edge where the worker operates at the limits of capability – speed, efficiency and risky. It is the collective effort of all workers’ ability to take risks that ultimately determines the success of any business.

The new world that safety will be entering is one where risk-taking is harnessed, not vilified, to ensure workers at all levels are optimizing the way they work, innovating new and more valuable ways of doing the job.

Twenty years from now, it may be a scary new world where safety has become invisible - no safety slogans, no safety programs and no fancy behavioral systems. It’s a world where there is a balance between risks and rewards and where the safety practitioner/safety consultant has disappeared from the organizational chart - like the dinosaur, he devoured his own world.

Safety in these terms is a process through which we seek opportunities in a responsible way, develop skills in all our people to deal with risks competently, and confidently explore new and better ways to engineer and build things. It is part of the strategic planning and thinking and is integrated in every activity so that eventually it will become a seamless and automatic consideration before we make any decision.

In this world, operations’ managers and supervisors are truly and entirely accountable for safety. They manage and coach people to develop competence and recognize them accordingly, gaining the trust and support of all. Supervisors are true leaders, because they
The seven deadly delusions of accident-prone organizations

are trusted. Employees will grow from being safe workers to be safety champions who are trusted by their leaders to make their own decisions. It is a world where there are fewer but extremely resilient safety systems, where there is little regulation and lots of reliability, not compliance but competent precision.

This organization deals with safety as its most complex business process, where the various sciences of engineering, risk management and organizational psychology interact. It is pre-occupied and ruthlessly honest with its smallest failures and has the flexibility to constantly change and adapt its operating procedures. It never states a safety goal because safety will never be ‘achieved’. By definition the safety journey never ends.

In this context, safety isn’t defined by the absence of a number (zero), but is defined by the peaks of energy, motivation and competence: not zeros but zeniths.

Bibliography

Appleton, Brian, Technical Assessor of the Piper Alpha Disaster Inquiry. Video recording during ICI training course, 1990.


Wilde, Gerald. Target Risk, PDE Publications, Toronto, 2001

Corrie Pitzer March 2010