

## **Zero Accidents was the Goal of the...Titanic**

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### **Prologue**

*On a moonless night and a beautiful calm sea, on 15 April 1912, the RMS Titanic was steaming majestically towards New York City. Passengers were mostly in bed, it was close to midnight. The Titanic struck an iceberg, ripping open the side of the hull. Water streamed into the ship's hull, and attempts to shut down water compartments could not save the ship.*

*News reached the office of the ship owners in New York that the Titanic was in trouble and White Star Line Vice President P.A.S. Franklin famously announced: "We place absolute confidence in the Titanic. We believe the boat is unsinkable."*

*When he made this announcement, the Titanic had already sunk to the bottom of the ocean and 1517 people were already dead—in one of the deadliest maritime disasters in history. Experienced engineers, using some of the most advanced technologies and extensive safety features of the time, designed the Titanic. It made the unsinkable Titanic go down in history as a symbol of human arrogance and the limitations of technology.*

*Many more disasters since then happened to seemingly unsinkable organizations. Union Carbide, owners of the chemical plant in Bhopal, where 3787 people were killed by a gas leak, was an industrial giant that gave us things such as Energizer batteries, Glad Wrap etc.*

*Occidental Petroleum, which owned the Piper Alpha Oilrig in the North Sea, where 167 men were killed in 1988, was and still is a leading oil and gas behemoth, with a very conscientious focus on safety, even at the time of the disaster.*

*BP, which employed the Deepwater Horizon oilrig operator who spilled millions of gallons of oil into the Gulf of Mexico and killed 11 employees, was and still is one of the largest oil companies in the world, with an otherwise enviable safety record.*

*There are many more examples: Sago Coal, Upper Big Branch Mine in Kentucky in which 29 miners were killed; Connecticut Power plant explosion that killed 5; the Challenger Shuttle disaster; and most recently, the Costa Concordia passenger ship disaster near Italy, a bigger and better Titanic, in which 31 passengers died or went missing...*

*There are many more, in companies who believed they were doing well in safety.*

*How could these events happen?*

*Our focus in safety is naive, mechanical, fallacious and shallow, and hasn't changed for decades. We still believe people's behaviour can be manipulated, hazards can be eliminated, and we will achieve a victory one day. Many business leaders believe that we are winning the safety game, thundering towards a decisive victory of zero harm to our employees and communities, because the numbers say so. This paper will contend that captains, not rocks, sink ships...*

***Business leaders are well intentioned, but unaware that the creative heart of the business (innovation) is slowly being suffocated by the clogging of arteries, by the safety system...***

## **Introduction**

Chief executive officers, managers, and supervisors are baffled by one question: "Why do we still have accidents? We have no limit to effort, lots of money and resources, and an enduring commitment to safety. Yet we still have ('stupid' but serious) accidents?"

What is the prevention? More devices, more systems, more procedures –because what else can we do? We have tried everything. Industry spends millions of dollars on safe operations, risk management, behaviour-based safety, cardinal rules, training...and yet, performance is not getting better. In fact, it may be getting worse.

In our high offices, executives are making decisions based on a sincere commitment (that look good in the Annual Reports) that create havoc down the organizational hierarchy. When accidents happen, the executives rightfully respond with the view that "something is wrong," that the system is broken, and they seek out reasons why people don't adhere to their policies.

For operational managers and front line supervisors, safety management has become a minefield. Every month they are confronted with a new safety "thing" from head office with *yet another* consultant in tow with *yet another* acronym. And every day they are confronted with growing mountains of safety paperwork. For the worker, it has become a killing field: Safety is killing initiative and innovation. and even the completion of a simple job in good time becomes a nightmare.

While other disciplines, such as engineering, operational management, human resources, environmental management, and processing, have made great and significant strides in their thinking, technology, and basic philosophies, safety management has remained stuck in the basic ideas of Heinrich's focus on human behavior of the 1930's and Frederick Taylor's command and control "scientific management" – which will soon be 100 years old!

In this time we have had many different types of organizations - the bureaucratic organization, the functional organization, the matrix organization, the quality organization, the learning organization...and many more.

Much to their credit, today's safety managers have created the '*safety organization*'. The

organization that does everything safely, chases after lofty safety goals, minimizes or eliminates risk, and creates a sustainable value for the business.

Does it really do that? Are we well served by the safety organization? This article will contest that. It will propose that the safety organization is killing the business. It is killing innovation and it is effectively preventing the flow of information up the hierarchy.

Today's CEOs (and managers) are like the fabled Emperor with no clothes. His 'people' are lying to avoid shaming the Emperor ...*or to let him know that we have reached the limits of our safety capability...*

*Dear Sir, you are invited to reflect on the things you do in the interest of 'safety'. While many of your initiatives and decisions are well-intentioned, consider for a moment that they may be ill-conceived.*

*With ability and skill you lead an organization through complex dealings and difficult times and have clear goals and strategies in mind. People look to you for guidance, for decisions and for a vision on where to go. They follow because you lead. You know your business; you know that at the heart of the business is 'profit' and you know how to make it. For the 'non-core' business processes, such as human resources management, sustainability, quality, safety and health, you rely on the advice of specialists. And specialists they are. But sir, while their advice has been consistent - has it been correct?*

*I want to discuss with you today those fables and fallacies in safety that could be killing your business, slowly and quietly...*

## **The first fable is about risky behaviour. Your safety specialists advise you to 'ban' risk-taking behaviour, as the root of all evil in the business.**

Let us take a look at the darkest, deepest corner of the business. What drives it? What *really* makes it grow or fail? What is most directly related to our core business of profit?

The answer: Power and Risk...and how they are harnessed. Power is about decisions, actions and reactions. It drives achievement in different ways.

Of the two, the most important is Risk. It creates the opportunities, rewards or failures in the business; it *is* the business.

When the operator starts his piece of equipment, he harnesses risk. His actions are at the edge of risk all the time and it is a fine edge between reward and failure. The more competent he takes the risk, the higher the odds for reward and not failure. The 'competence' is not only his technical skill to operate the equipment, but more so his skills to take the risks. The better he takes the risks - his risk competency - the more profit he creates...

Risk-taking is an innate human capability. It is what allows us to change, grow and innovate. Without risk-taking, we are robots doing tasks.

And you really want to ban this? Really?

Efficiencies can only be continually improved if the organization has an inherent capability to learn. Much had been written about the learning organization, suffice it to say that Peter Senge describes learning organizations as places *"where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole (reality) together."*

The problem is in this part of that definition: *"where new and expansive patterns of thinking are nurtured."*

In the modern 'safety organization', that is inherently dangerous and unacceptable. The safety organization wants to limit expansive patterns of thinking because that is the realm where risk-taking happens. That is the realm where the organization will lose its consistency, repeatability and routines – its safe routines and controls. Safe organizations are seeking compliance with its policies, not deviance. The reduction or elimination of human error is the main objective of the safety manager and it is 'attacked' with a considerable arsenal of rewards and consequences. Being engineers, human error is viewed as 'unwanted variability,' and the solution is to simplify human action.

What they fail to see is the human being's capacity to respond in varying ways; with innate abilities to make judgements and behaviour modifications, to sense threats and respond with lightning adaptations to changes is exactly what preserves us. Any production environment is a highly dynamic one and we should *increase* human variability, not decrease it. We should increase the worker's repertoire of risk responses, not limit them.

And to create a learning organization, we should allow risk-taking, encourage it, support it and elicit it. We should *want* people to push the boundaries in order for them innovate the basic production process they work in. So that we can create more profit...and be safer.

But the only reaction your safety manager understands when the word 'risk' pops up is control, mitigate, alleviate, diminish... never to optimize, innovate, and push boundaries...

We are killing the business, softly, safely, surely...

*My Lord, you are surrounded by advisors, court jesters, lieutenants, friends and 'the people' who are all keen to serve you, appease you, and make the right noises. Their main interest is to keep your head so high in the clouds that you don't see your nakedness.... or how much money they bleed from the business. Consider that risk-taking is the lifeblood of your business...without it nothing will ever change or improve.*

**Another fable is this one: When an accident happens, you quickly demand to know the cause(s), express concerns, write open letters to employees, and bang the table while shouting: "One accident is one too many! Prevent it! "**

The exact combination of direct causes and unique pathways of any accident will never be repeated. In the boundless world of human behaviour and interaction with dynamically changing environments, we don't have the science or the capability to quantify and reduce those dynamics into chunks we can understand and manage. Therefore we work with root causes. They are at the 'root' of the failure and they are small in number. These are the 'knobs' to change in the belief that it will prevent all other 'similar accidents'.

However, there are a few fallacies here:

The highly visible (and tragic) nature of fatal and serious accidents distorts information about them. In the first instance, the fact that the accident resulted in a fatal consequence is largely fortuitous. It could have just as easily been a near miss event, was it not for a few inches or a few seconds. If it was a near miss, it would not have been analyzed and dissected to its root causes. The fatal and serious ones are few and far between, and any apparent similarities between them or between their root causes are just that: appearance. Safety managers probe for trends in accidents so that they manage the critical few, draft protocols for them, and eliminate them. And to date, that was reasonable and largely effective. For example, working at heights is now ruled to be a potentially fatal activity and requires protections or procedures such as fall arrestors, etc. But the circumstances for other serious accidents are more hidden, more complex to identify and more difficult, even impossible to identify patterns.

Beyond the obvious and the readily available, this approach becomes nonsense, yet it is still probed with the same intention. We are still looking for the trends between events that are unlinked, and we still find 'links'.

A second problem is the quality of information that we are provided with by those close to this serious event. Highly trained accident investigators will acknowledge that the investigation process (gathering facts) is fraught with problems and cover-ups, distortions and falsifications – because people are protecting their exposures. We do not have the luxury in the workplace of sophisticated detective skills, and the average safety manager or supervisor stumbles through the process not really knowing what they are **not** knowing. The distorted information is then used to conduct root cause analysis with, a highly complex and iterative process that requires tremendous, specialist skills – again performed by the average safety manager or supervisor.

And remember, this is only what happens to the few critical events that happened to result in death or serious injury. For every serious accident, Frank Bird proclaimed 600 near misses (that are largely unknown to us), which are not but should have been subjected to the same rigorous-but-flawed root cause analysis. Then we have the 'near hits' (risks that had been taken but didn't result in even a near miss) It was a few meters away instead of a few inches, or a 20 seconds instead of 3 seconds between the near collision of two vehicles around a blind corner) which has no known ratio with the 600 near misses. Estimations of the author showed that ratio to be close to 120 000 for every 600 near misses. These are the chunks of information we could learn from, develop trends from and collect root causes for. But we will never know anything about them, because we don't have the methods, capabilities or the will to collect them. Worst of all, we simply don't have the money to do it either. It would be an enormously costly exercise to monitor and measure every bit of behaviour in the organization and much more to analyze that!

Despite our claims of doing a root cause analysis and getting into the fundamental antecedents of an accident, it fails one simple test: while a root cause has produced that accident,

it has not produced an accident countless times. For example, a ‘conflict between production and safety concerns’ is not a cause. It is a description of an organizational condition that exists everywhere, all the time and is inherent to the business. To root that out and to eliminate it completely (an impossibility!) will amount to a destruction of the business, if it is done effectively.

*Sire, the accident that happened is one of thousands that simply didn't happen - of which you know absolutely nothing at all and will never...because you were mostly fortunate they didn't.*

### **Fable number three: You deploy a myriad of safety rules and demand compliance while declaring: “A safe environment is a productive one!”**

It seems incomprehensible to make any other claim and every executive has made this claim at some stage of their careers and continue to make it. And there is certainly validity in this. But if it is claimed that one causes the other, this starts to muddy the waters.

Safe and productive can occur separately and independently. For example, a workplace can be dangerously productive by ignoring all safety concerns, that cost money and the slowdown of operation, or it can be safely unproductive if every step of the operation is bureaucratically hampered by risk concerns. Surely, both result from something else: constructive and disciplined management practices. Both are pushed into the realm of ‘excellent’ with sound and inspirational leadership and both are killed off by incompetence.

The truth is that what makes any environment safe and productive is a very complex social phenomenon. It requires the coming together of many variables: job design, work arrangements, logistics of supply and materials, quality of supervision, quality of employees (skills, training, motivation, commitment,), environmental factors, etc and this ‘coming together’ has some degree of randomness. The notion that all work output is an engineered, linear outcome of all controlled inputs is simply not a feasible one in a social organization such as a workplace. It may have been true at the time Frederick Taylor said it, but that was a 100 years ago! Today we know a little more about management theory than what he did...

There is little doubt that a productive organization has achieved a level of control that the unproductive one has not and that is the same with the safe versus the unsafe ones. The problem however is to pinpoint what that ‘level of control’ really means. The complexity and multi-factorial nature of the organization belies the study of it in such simple terms.

*[When Phil Rosenzweig looked at the research conducted by such notable authors as Jim Collins, Peters and Waterman, etc, he noted that their claims of greatness for certain companies did not hold under intensive scrutiny. Most of the great companies have now lost their greatness and some of the companies they branded as not so great are now greater. This highlights the problem we have in the world of consultants and airport paperback authors. They can make preposterous claims to suit their own ends and pockets, knowing that their claims are seldom tested scientifically or peer reviewed. In fact, Rosenzweig illustrates that the business performance of a company and what caused it cannot be scientifically scrutinized, because the studies are always retrospective looking into the past performance to ‘identify’ what caused it. Seldom if ever does a study of companies look into the future, predicting which ones will be great*

*without that bias of hindsight (known as the halo effect). By comparing a 'great company' with a 'not so great company' you still study with an entrenched bias of hindsight.]*

In safety, the same problem is even more dramatic: A company claims it had a fantastic safety record, with millions of hours accident or incident free. Even if it was true (I will dispute this later!) there is no way of knowing what 'almost happened' (but didn't). There is no information about that company beyond the obvious and the visible and what their employees were willing to tell. Companies tell you the reasons for their greatness in the knowledge (perception) that they 'are great' and there is no scientific scrutiny of the real world of business performance.

And then there is the cult of compliance. When 167 men evacuated to the accommodation block on the burning Piper Alpha oil-rig, they all did that in compliance to the rule for when emergencies happen. No one questioned whether it was the smart thing to do, even though it was blindingly obvious that the accommodation unit was located at the highest point of the rig, engulfed in smoke and flames from beneath. They walked to their death.

When people operate in the knowledge of operational systems, regulations and protection, they simply do what pedestrians do. Walk without consideration of risks. Not because they are stupid or robotic but because they are protected and, simply, because they are 'in the right'. Behaviour modification, the basis of our whole safety paradigm, creates 'dumbness'.

The safety profession has a truly myopic view of protection. It is hurtling down the path of protectionism. It paints lines for people to walk/work in, it clads them with every conceivable personal protection equipment, it protects them with airbags in steering wheels, with proximity alert systems, with safe bubbles around them and increasingly, workers know less and less of risks around them.

More and more today our workers lack 'risk competence' – a fundamental ability to deal dynamically with risks, based on their exposure to and learning from risks and risk-taking. Interestingly, this concept comes from child psychology:

“Taking risks is important to children’s well-being in many aspects...What we mean by this is the process of becoming knowledgeable and skilled in assessing risks and therefore acquiring the competence to take risks more safely. Children who have had opportunities to develop their physical abilities and motor skills, a good sense of balance and rhythm, and to experience their bodily limits will be more 'risk competent' in things like climbing a tree than children who have little or no sense of coordination, of gravity, of how much weight their arms will hold. Risk competent children have fewer accidents

This line of argumentation is supported by a statistical analysis of causes of death in the UK, conducted by Baillie (2005). His findings suggest that 'most fatal accidents to children result from them not having learned, or not being allowed to learn, how to look after themselves'. He calls this the 'Hatfield Effect' 1: *by avoiding dangers we expose ourselves to greater dangers. Avoiding hazardous activities has the effect that we do not acquire skills to manage risks, and consequently every activity becomes more dangerous. So rather than dying from taking too high risks, children are more likely to die as a consequence of having taken too few risks.*”

If you re-read the above paragraph, substitute 'child' for 'worker'...

This obviously doesn't simply mean: let workers take risks and we will be safer. It does mean that a simplistic focus on protectionism is leading us in the wrong direction. It needs a serious revision and it needs a serious rethink.

*Your Highness, a blindly compliant organization is not a safer or more productive one. It is a stupid one...*

## **Fable number 5: You scan over many safety performance graphs and measurements at Board and management meetings and declare we are going well or we are not, depending on the trends.**

What is a 'safer company?' One with fewer accidents on record than a comparable organization or one with a declining accident rate or no accidents? None of these! The problem is what is 'on record'.

Let's put that into perspective:

*At 07.10 am a haul truck rolls over the pit wall of the mine because a tire blew out and kills the driver. On its way down, it smashes a personnel transporter and kills 14 more. The pit is shut down for a week by the inspectorate to complete an investigation. The findings are that your tire management program was inadequate and that you were pushing the limits on tire usage on trucks (due to a significant shortage). Your actions are deemed to be callous and the safety department's root cause analysis nails it: 'production concerns overriding safety concerns'. There is nothing you can say because the 15 mangled pieces of evidence say you are wrong. You cannot say that you have had many trucks (with bad tires) that did not roll over, especially none at that particular point where the berm was washed away nor when the personnel carrier passed by at the wrong moment. It is best to keep your mouth shut because anything and everything will be held against you.*

*And then on another day, another mine, at 07.10 am, a haul truck suddenly slips on the haul road, twisting sideways and comes very close to the low berm, recovers and continues on. The driver hardly flinches. A few levels below, the driver of the personnel carrier is telling a joke. People laugh, joke back. It's good times. That afternoon, at the shift change meeting, the shift supervisor asks: "Any incidents out there today?" No one responds and the supervisor smiles: "Well done. Another safe day!"*

*It is a lie. We all know it is a lie, but no one will tell that to the leaders in the high offices.*

A business produces products and everything about these products we know through measurement. We establish budgets on the basis of our operational capability to produce X amount of 'product'. We then measure all possible parameters that impact on the final amount X. Quantitative indicators are things such as the number of products, direct costs, such as for fuel, consumables, labour, cost of downtime, accidents. Qualitative indicators are cost per hour of production, cost per quantity of products, etc.

These all make good sense and we all know that 'what is measured is managed'. All of the indicators are readily measurable and can be transformed into graphs, trends and sophisticated



statistical enquiry. But there is one small problem - one very, very small problem. This can't be done with accidents.

Accident data are simply lumped into our overall data and are crudely treated with basic statistical methods, creating moving averages of lost time incident frequency rates. With all the other measures there are "large numbers" such as thousands and millions of tons and variations in data are detectable and valid. The minuscule size of accident data makes detection of variation impossible and yet it is used in studies for making management decisions and evaluations of safety interventions. For this and many other reasons given below, the data tell us nothing and the information is at best useless, at worst dangerous.

There is also distortion or noise in the data that can be classified into two groups: IBNR or RBNI, acronyms for Incurred But Not Reported and Reported But Not Incurred.

Incurred But Not Reported (IBNR) is the biggest problem in industry because most organizations have incentive systems for good safety performance (no accidents) and this actively discourages individual or groups to record incidents. Even in the absence of incentives systems, but with a strong 'demand' for safety, this distortion continues. Accidents are regarded as 'failures' and in high achievement environments, failures are hidden and accidents underreported as much as possible. Serious accidents and deaths are not hidden, but they are small and random in numbers.

Management knows about this problem, but they can't help themselves either. It flows from the top of the organization where the CEO can and only wants to see the 'exception' - the 3% decline in revenue at Site A, the cost of a truck accident at Site B and the death of Adam Sinclair, a worker at Site C. He cannot and does not want to see the myriad of indicators underlying the 3% decline, the nature and cost of many thousands of other incidents and failures or the hundreds of near miss accidents before Adam was killed. He needs to see the outcomes, results and exceptions - so he lets people know that. This knowledge cascades down the organization in powerful and destructive ways to the supervisor who says after each shift: "Well done. Another safe day!" What he is really saying is: "Don't dare having accidents!" If the claimed thinking sounds harsh and not representative of your organization, think again. Try to get an employee at the bottom of the ladder to be honest with you and ask him or her.

And when an organization has reached that transparent culture of risk reporting, almost without exception reporting is about hazards. The physical and visible occurrence of structural deficiencies is often readily reported: A sharp bend in the road, a bad tire on a truck, a loose metal on the back of a pickup truck, poor haul road conditions. These are all actioned, sometimes with great vigor and at significant cost. Seldom, if ever, will employees talk about a fellow employee or themselves speeding or taking a short cut on a work procedure, or of a near miss accident as a result of a person not seeing or misjudging a risk. And this 'behavioural' portion of risk constitutes by far most of the direct causes of accidents - of which we are kept in the dark, effectively hidden away from scrutiny or action. This is the dark underbelly of any organization, no matter how progressive and transparent they think they are.

The Reported But Not Incurred (RBNI) problem occurs in organizations where compensation for accidents are attractive or where accident reporting is used as leverage in the power play between management and workers (mostly by unions). In these circumstances the data is equally rubbish and useless, and it simply isn't good enough to claim: "But that is all we

have”. Researchers often acknowledge the deficiencies in the validity of their information and then still continue to make inferences from it! There is hardly any research work that uses ‘accident data’ that can be regarded as valid.

*Your Highness, your graphs and statistics are distorted data and quite simply invalid. People tell you what you want to hear or what they want to tell you and then dress their deceit in clever statistical clothes...*

## **Fable 6: On the basis of the graphs and statistics, you reward and punish workers, teams, sites and divisions.**

This brings us to the problem of rewards. There is hardly any aspect of business or life where rewards don’t exist. Our society is based on the achievement of goals, success and the resulting rewards for it, in whatever shape or form. Making a profit is a reward, increasing revenue has rewards, changing a workplace procedure has rewards and every employee receives payment for their efforts: the reward. When the natural forces of the moment or the situation do not produce the required results, rewards do.

It therefore seems logical and obvious that we should have rewards for safety. But there are few areas of the workplace where rewards are as destructive.

First there is the problem of accident concealment as discussed above: employees hide accidents in order to gain the safety bonus on offer. This consequence of risk secrecy is stark, well known and rife – but we even reward it!

Secondly, the distortions of behaviour to gain rewards are very damaging to the organization. They contribute to the farcical image of safety, detract from the trust in management and supervisors and ensure that risk data are contaminated.

But there is more.

When a mining company introduced a bonus for their miners to install roof bolts (to secure the integrity of tunnel roofs, or the “hanging wall”) they were astonished to see the high rate of compliance and no negative impact on the production output. (Roof bolting is a time consuming activity - and inevitably holds up production). The astonishment turned to shock when it was discovered, after several months, the miners were achieving this mean feat by cutting roof bolts in half and so saved enough time to keep up with the production. Even this ‘discovery’ was quickly swept under the carpet and the roof area with only cosmetic support is still unknown. Only a major tragedy will reveal the truth, if ever. The above story illustrates the damage of rewards, especially when ill-conceived and poorly designed.

*Sire, I contend that all safety performance-related rewards are ill-conceived.*

There are four distinct problems with rewards:

### **Rewards actually punish people**

The carrot is almost the same as punishing people with the big stick, because it still is about behaviour manipulation or control, even though it is by seduction. People who do not get the reward are in fact punished and therefore there is a tendency to hand out rewards to all and

implicitly losing the effect of the reward for excellence! While the reward is offered (for no accidents) the implied threat is that ‘if you don’t attain the stated goal’ (have an accident) there is a long drawn out punishment!

And there is a double whammy here because after people have achieved the goal and the reward, if they then fail in future attainment and lose the reward, the punishment is worse, demoralizing and often demeaning.

### **Rewards fracture relationships**

When an organization tries to develop a collaborative environment with joint responsibility and accountability for safety, or interdependence, the application of rewards destroys that noble goal. The fact that the managers have control over the rewards and workers over the means to attain the goal exacerbates the differences between the levels. The design of safety bonuses even pits employees against each other, though it is purported to foster interdependence. If one section of the team, or one individual, fails and has an accident, relationships are severely scarred, blame and guilt abound.

A collaborative work environment will allow for mistakes to be made and learning from it to happen. The rewarded work environment still has mistakes, but because they are hidden away, learning does not happen. The organization as a whole loses all opportunities to learn and grow, and the relationship between givers and receivers of rewards is also scarred. No wonder that investigators find in the aftermath of disasters that the latent causes were known but hidden from leaders.

### **Rewards ignore reasons**

When workplaces fail, it is imperative that the causes are identified and rectified. But because the application of rewards successfully changes the behaviours, the need to know the reasons for failures is obviated. Again, we lose the prospect to learn and the opportunity to grow. The only opportunity for learning comes from the actual failures themselves (accidents) which are very few and very far apart – and random! There are many failures before this accident that are not known and therefore we cannot discern any patterns or trends of risky behaviours that would have allowed us to become pre-emptive in our approach.

### **Rewards discourage risk-taking**

In safety this is obviously the “devil himself”. We don’t want any risk-taking. Or do we?

Risk-taking in positive terminology means we are experimenting, pushing the boundaries and innovating. Why wouldn’t we want that? With rewards, we don’t get that. When working for a reward, we are doing exactly what is necessary to get it and no more. When chasing a reward, we will not look at other possibilities because they may not pay off. We will be sticking to the rulebook at every corner, every obstacle every little risk. We become a stifled, blind and a stupid organization – and enjoy every minute of it, because we get the results and the rewards.

“Do rewards motivate people? Absolutely. They motivate people to get more rewards.”

Rewards are the cornerstones of the modern behavioural focus on safety, and probably the single most dangerous thing we can do in safety management! On the night when the Deepwater Horizon disaster happened, there were 4 executives of BP on the oilrig to congratulate the crew for achieving 7 years without an incident...

*Your Highness, rewards and punishments create the deceit and are precisely why the data are veiled in distortion. Such action ignores the knowledge we have about human motivation...At this very moment you are rewarding deceit, falsification, fudging and illusionary safety goals. No matter how sincere and committed you are.*

*As they say, beware of what you want. You might just get it!*

## **Fable 7: You focus your eyes on zero accidents/zero harm and proclaim the First Commandment of Safety: “Thou shalt not believe in any other god but Zero...”**

The goal of all safety is to achieve zero accidents. How can it be anything different? It simply cannot be to achieve one or two or three accidents, even though that may be so much better than the 10, 20 or 30 of last year.

Morally, it can only be zero.

If you say anything else, you are accepting that someone is going to die and you are at the very least saying this out loud and at the very worst, by implication, condoning this. You are saying to employees that your operational planning will go only as far as you need to go to, but no further. You are saying people’s lives are a financial issue. If you were genuinely serious about attaining zero accidents you wouldn’t have spared one cent to achieve it. And soon you will be asked: *“Why are you not spending every cent to make it happen? You can completely automate all your operations with robots. That technology exists now and with all your billions of dollars of profits, surely you can do it. I am sure your shareholders will understand!”*

You will retort that this line of argument is bizarre and stupid. No business can do that and you will say that you are targeting the goal in incremental steps. You will achieve it one day. For example, you now have 30 accidents a year, next year you will try to reduce that. An improvement from 30 to, say, 20 accidents is significant – a 30% improvement cannot be scoffed at. But now you are admitting that 20 will be injured and the emotional trick that the safety manager will play on you is simple: “What if your son is one of the 20?” Or, my personal favorite: “If 20 is the number, let’s put names to it!”

Emotionally therefore, it can only be zero.

With that ploy you have no recourse. Of course you don’t want anybody to be injured or killed on your watch. So zero it is. But deep down you (and the safety manager) knows it ‘ain’t going to happen.’ People *will* be injured, even killed. There is risk, there is failure and there is coincidence.... But you dare not say this! So zero it is. No ifs, no buts...

However, we all know the truth. In the most closely engineered system, under the most extreme control of all variables, failures occur. Man has not and will not achieve this nirvana of zero accidents or the latest: zero harm. There is no condition in nature where perfect exists; there are physical laws of nature that determine imperfection, called entropy - the tendency of a system towards spontaneous change. Any system will approach chaos, diffusion, breakdown, always, unstoppable...as James Reason puts it: entropy defeats all systems in the end. He also makes a

very important point: The target 'zero conveys a dangerous misrepresentation' of the realities of risk – (the illusion) that your safety endeavors will end in a decisive victory, one day.

But just think about what you are saying. In your company you will achieve a condition that forever more there is only perfection? Not a single person makes a single smallest mistake, for the next 10 or 20 years and in perpetuity? Not a scratch, not a tool dropped from a bench, not a slip of the hand? In order to do that we will have to achieve zero risk, because where there are risks, there will be failures.

*(A case in point: One of the 10 biggest killers of the human race is traffic accidents, and projections are that by 2020 it will rank second only to heart attacks. Yet we can solve this problem to (almost) zero by simply putting a speed limit in place around the world's roads of 5 km per hour. We will gain a massive improvement in road safety but will pay for it in economic terms beyond reason. Economies will grind to a halt and many more millions of people will die of starvation. There is a balance between risk and gain and risk and loss.)*

When confronted by this questioning and the above statement of the obvious, managers respond with: *"It is possible but not probable. Theoretically it can be achieved but practically not"*. Another absurd statement, but at least one that gives the manager a way out...because anything is possible! Another word game.

The next defence is: it is an 'aspirational' goal. We give our people something to aim for; it inspires them and motivates them.

Aspirational? Motivational? Aspire to the impossible? How is that motivating people? How 'aspirational' is to an athlete setting a goal of running the 100 metres in 2.5 seconds or breaking the mile's one minute barrier: "Start practising because it will motivate you. Don't give up, aspire to it! You will jump a distance of 92 metres or height of 12 metres!" All aspirational goals! Do you honestly believe this nonsense?

This line of reasoning is contrary to everything we know about human motivation. There isn't one motivational model that supports this drivel and yet safety and operation managers bandy this around at every occasion. Is this what leaders do? Create these illusions and self-delusions and think that it will inspire employees to work safer? Do you really think people actually believe you?

But, again, you dare not say anything else but zero. Safety managers around the world have become all-powerful as a result of this little game they play with their managers and are trapped in. It appears on our safety policies, goal statements, annual reports, websites, it has become a brand of its own. It has many variations of zero: accidents, incidents, harm, and even zero risk.

Even if we want to, we cannot escape it. And just like the global warming issue, the debate has been declared over and if you contradict it, you will be ostracized, the same category as holocaust deniers, pedophiles and zoophiles.

We operate on that fine edge all the time, but now the game has changed. The safety managers have changed it forever to a game you cannot win. It conjures the image of the Pied Piper Safety Manager dressed in funny clothes and playing the flute, followed by a long line of managers, supervisors and employees down to the river...

*Sire, deep in your heart you know it cannot be done...that there is no condition on earth and in nature where the absolute perfect (zero risk) exists. The second law of thermodynamics, or entropy, contradicts all your good intentions!*

*But most important of all, it has put you on a path of self-delusion and defeat. It focuses you on the symptoms of a broke system, or a broke culture. It is a bit like swatting mosquitoes, while the real problem is the swamp. Or imagine the medical profession, in its battle against measles, declaring their goal as "zero red spots"!*

*Your Highness, the "zero thing" has put you on a desperate and treacherous path. The closer you get, the more excited you become about the 'progress' you are making and while some of that progress is real, some of it is not. Some of it is because workers are increasingly hesitant to tell you what you don't want to hear. In the long run, it is the "Rumsfeld" principle: you don't know what you don't know!*

### **Fable 9: You make glib slogans for your company, like: "Nobody gets hurt" or "Safety is our core value" or "The goal is zero" and it's plastered on walls, letterheads, business cards and more.**

When you make a commitment you should state it clearly - so why not state it in curly letters, on a bigger banner in the foyer, on every office wall, at the site gates, etc. It has been a hallmark in safety (and has become an industry of its own) that safety is proclaimed through posters, slogans, grand visions. In public life, safety on the roads is much targeted through advertisements and campaigns.

They are clever and cute, demanding or persuading, but with what effect? What does seeing a sign that says: 'Think safety!' do to the observer? Or the clever sticker on wash room mirrors: "You are looking at the person responsible for your safety today." Will the observer start to think about safety at that moment or remember his/her accountabilities on safety and then be inspired into action? Probably not. We are foolish to think it will have any lasting effects. Yet safety is still largely today a poster process, an attack on people's mindsets and attitudes that are 'not right'.

And lately, since safety has become 'a value', employees are bombarded with messages about their families and even that they should realize their families care about them and would suffer dire consequences if they have accidents. Cute campaigns again: factory walls adorned with family photos, messages about loved ones, etc.

These approaches may be well-intentioned, but are they effective? Does it translate into safer behaviours? We do know they are sending strong condescending messages to the employee:

- What right do we have to assume employees don't care about their family's well-being if they would be involved in an accident?
- Who says they don't care?
- Is it because of 'lack of care' that they engage in risky activities?

Not only are they condescending, they also exposing a perception of people that can only be described as archaic and showing an extreme lack of understanding of the human being. The

workplace is a dynamic and complex social environment and the 'field forces' on employees to take risks are inherent to that environment, much more so than inherent to people values or attitudes.

Safety is the one aspect of the organization where the human being's most complex behaviours and mindsets come together. It is about human motivation, risk perceptions, cognitive processing, social interaction and risky behaviours. It is the human being at its most complex - and yet we manage and drive safety through outdated and nonsensical stereotypes. The quality movement of the 60's and 70's, and the philosophy of Edward Deming have known for a long time that quality is not a problem of broke workers, but of broke systems and culture. Deming's key principle is "drive fear out of the business!"

Safety managers, the functional specialists, with all due respect, know very little of organizational and individual psychology, yet they are 'in charge' of the functional discipline that most directly affects people. They design the slogans and the communications, the posters and the incentive systems that are supposed to herd people towards complex goals. And maybe 'herd' is the right choice of a word: it suggests the same regard for employees as we have for cattle.

We target human behaviour, and based on a science that studied rats (behaviourism), we will change the behaviour of all these humans. And we inject fear into the business!

*Sire, these are empty window dressing. They look fatuous and what's more, they damage your credibility with your people as you fail them every day. If your people say they believe, it's only because they know that's what you want to hear. Even if they actually believe (which they don't), who says it makes them work safer? There is no evidence for this...*

**Fallacy 10: You are an engineer and you believe in the 'engineering' of safety: If you do A – then you will get B. If 'your people' follow rules, they will be safe. If they behave, they will go home tonight.**

The complexity of risk management is shown in the actions we have to take to prevent an accident from happening. Often, the actions are in terms of a traditional 'hierarchy of controls' of engineering, safe work practices, administration or personal protective equipment. The controls of choice are engineering and changes in work practices, but they are also the most complex to implement. An engineering control eliminates or protects people from the hazard, while changes in work practices are targeting the same through avoidance.

Three problems ensue:

The installed control is mostly done in hindsight and for a particular set of circumstances that produced the accident. Changing the work practices may eliminate that set of circumstances, but the next accident hardly ever, if never, follows the same pattern. It will follow a slightly different pattern at some future point, by which time corporate memory and the reasoning of the first set has been lost, and a new change is made.

A second problem is the adaptive behaviour of people in that environment. This phenomenon, called risk compensation, works in ways that are strange and unpredictable, but

devastating to the intentions of the safety manager. And here is the reason: Risk is a probability. As such it is a dynamic, fluid and iterative process. The risk-taker has a perception of the risk, the risk is taken and the probabilities change from moment to moment. A worker, John Peterson, is given a task to remove a valve that is located 3 meters from the ground. He knows the rules; he has a safety harness and a fall arrestor. When his buddy returns from the stores, he finds John's body, still in the harness but not attached to the fall arrestor. No one knows what happened - only John and he are not talking. We conclude: his behaviour was at risk for unknown reasons. Root cause: non-compliance and we need to get back to basics: compliance to our zero harm policies.

But the buddy knows. He knows it's sometimes impossible to work with the fall arrestor attached all the time, especially to switch from loosening the top bolts to the row of bolts behind the steam pipe. They have done this job many times before. Only, John never slipped before at that switchover. But 'buddy' is not talking either.

These adaptive behaviours result in a third problem - that risk 'migrates' in the workplace, from one control intervention to the next. On a particular mine site a small vehicle overtook a large haul truck, killing the driver. The system of getting permission on the radio from the truck driver to pass failed for various reasons. A work practice change was introduced, that large haul truck could not be passed by any other vehicle at all on the haul roads. The result was an increase in right angle near misses and incidents at intersections, because trucks were being 'raced' by small vehicles, to avoid being caught behind a slow moving truck on long hauls.

This is a 'natural' response. People have a 'natural level' of risk they tolerate and the will to maintain that level. If one avenue of behaviour is closed down, behaviours may seek another avenue - individually or collectively. People want to take risk. There is no way of denying this fundamental of human nature, yet that is exactly what the safety profession does.

*(What governments do is even worse. It regulates the symptoms of the system. In British Columbia, Canada, a worker at a gas station got killed when he raced after a person in a car who fled without paying (\$12.30). This resulted in a rule that the 100's of thousands of motorists in that province must now pay before they fill their cars with fuel to prevent this accident. It is sad and tragic, but maybe that worker should not have chased after the car? Maybe all gas station workers should attend a training course: how not to chase after cars. Or maybe all thieves should attend a course on how to pay/not to flee...*

*"Policies, rules or laws are seldom designed to solve an identified problem. Their primary purpose is to reflect well on the good intentions of the person or group proposing it."*

*Your Highness, many other things may work like that (from A to B to C), but not people. The science of 'psychology' teaches otherwise.*

**Number 11: Your messengers trumpet behavioural safety as the new saviour in safety, because what you always knew is now proven: worker behaviour is the problem.**

Finally we come back to the starting point: Why do we have accidents?



Disciples of the 'safe place' approach will tell you that the ergonomics of workplace design is the all-inclusive answer. Make it safer and simpler and safer and...

Disciples of the 'safe person' school will tell you that it is all about worker behaviours. Every accident can be shown to involve a risky behaviour, so we need to modify their 'at-risk behaviours' to become 'safe behaviours' and who can argue with that notion?

The problem is to define the next level of causation - why that behaviour was risky. Then in walks the Behaviourist with the magical formula of "ABC."

The Antecedents cause Behaviour, which results in Consequences. The Consequences reinforces the Behaviour and voila - we have the answer! Change the Consequences and we change the Behaviours. The C becomes the A for the B we want. All people are like that and it isn't rocket science. But we miss the point. If the external inducements break down, the motivational process fails. If the rewards lose value, or attainability of immediacy, the 'do-this-get-that-equation' is worthless and in fact regressive, damaging and negative. We have to start again and again to keep safety alive. Human behaviour is the term used to identify what can be studied scientifically. Behavioural psychology is this science and it has reigned in the world of safety for the past two decades and posits the (simple) equation of ABC. From that flows the simple dogma: manipulate the consequences through rewards, feedback and recognition and you manipulate behaviours. This science doesn't talk of values, risk cognition, motivation, etc. It mostly ignores it, diminishes it, waters it down... (*If I am a little harsh here, it is just a little!*)

It misses and actually damages 'the value of care' as the basis for safe behaviours of people who care about the next person's safety and well being and of their team's well-being and safety. It rebuffs that the motivation for safety can be intrinsic and value-based, i.e. people *want* to work more safely and more productively for the sake of it, for the 'worth' of it. Or because the organization they work in *intrinsically values* that.

*But hold on, did the safety department not declare safety as a 'core value' and we have a value-based safety process? Don't we have photos of families on the walls? Everybody is doing this new values thing in safety. What are you talking about?*

Sir, everybody is just talking about it and mostly on posters. You are not *doing* it. Have you ever been to a shift change meeting where the supervisor says to his team, "Guys, I care about each man in our team. Have a good one today"? (It is deliberately an all-male team?). The best value-based safety message we ever get to is a condescending one: "Guys, be safe today so you can go home to your families tonight!"

Every aspect of your safety approach and program design is in terms of the extrinsic management models. Your savior, behaviour-based safety, is an extrinsic model. Crafty, showing results of 'reducing' accidents, but devious. It confirms stereotypes about people. It patronizes people and reduces humans to the level of Pavlovian responses. It has a ring of operant conditioning to it and essentially it is: "Be safe, well done, go home tonight!"

Behaviour-based safety has an important aim: compliance. The logic is simple and pervasive - that if rules are followed, accidents will not happen. But it is not that simple. That world of behavioural perfection does not and will not exist, so we need people who have risk

competence. A competence to see and judge risks, a competence to sense and take risks, expand the boundaries of their thinking.

We also *need* people to have courage to take risks, to challenge old practices and to rectify fellow workers' behaviours when these are incompetent.

*Your Highness, some aspects of behaviourism are to psychology what Dr Phil's advices are to love... This doctrine reduces the human being to a little formula called: the ABC model of behaviour.*

## Epilogue

Our failures in safety performance, around the world, in many industries, are inexplicable when you consider the huge effort and resources we throw at this. If however you consider the relatively little progression we have made in safety *thinking*, it is no surprise.

Driven by the advent of behavioural safety in the 1990's, the goal is to attain a compliant workforce. It seems obvious and naively logical that there could be any other goal. Accidents happen because people don't follow the rules and behavioural safety is essentially an intervention to increase rule compliance.

Safety management has become false, farcical, a big lie – one could call it the Great Safety Swindle. We implement a host of safety rules, complex management systems, pocket cards, hand out trinkets, bombard all and sundry with safety messages and throw our hands up when a worker does another stupid thing (again). We measure trends on accidents, severity rates, leading indicators and declare, hand on heart, our total and absolute commitment to safety. This all happens in the offices of the site, in the passages of the corporate building and at crew meetings every morning. Workers call that (PowerPoint) slide-based safety!

But that is not what we *really* do. When the truck engine fires up, when the dozer crunches away, when the pneumatic drill starts its ear-numbing clatter, things change. The *real* world starts, with only intermittent, irritating hindrances from the safety department.

We are deluded that safety is a simple matter of *control* and *correction*. I suggest that we have to review our safety approaches extensively, that answers to safety's vexing questions lie in organizational and cognitive psychology:

- Why don't employees comply with obvious and intelligible safety rules?
- What motivates a person to take an obvious risk?
- How do we get them to believe in and accept our (believable) goals?
- How do we counteract gain commitment?
- How do we become leaders of safety, not managers of risk?
- How do we achieve the ideals for safety: integrated, invisible, competence, at the shop floor, driven by the production manager and supervisor?

All of the above complex questions about risk perception and human motivation fall outside the skills and knowledge sets of the average manager, safety manager or supervisor. Yet they are the people charged with the responsibility to achieve the safety goals through the 'hearts and minds'

of employees. They are good people, sincere and serious about their tasks. But they can't be expected to do it.

## **The Final Act**

*Sire, in your high offices, you are debating the intricacies of the difference between a hazard and a risk, safety priorities, accountability, zero targets, behaviours, awareness, accident root causation, compliance to zero harm policies, incentives, slogans, strategizing, enduring value, sustainability, holistic approaches, contextual frameworks, buzz, buzz, buzz...*

*But, my Lord, Gil Kelly, an operator on one of your sites, in Danny Sullivan's crew, told me, in a whispering voice, that he doesn't give a damn about any of that. He also told me that the other day your safety department conducted a safety attitude survey among workers. (I am sure you have seen the report). One of the multi-choice questions was: "How committed are you to safety: None at all; A little bit, Quite, Very or Extremely?" In his head he thought: "You gotta be kidding me!"*

*But his hand dutifully selected the 'Extremely' option... (Names changed, but a true story)*

***Your Highness, dare I say you have no clothes on?***

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