

Hitchhikers Guide to Human Error

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ABSTRACT

The safety science is trapped in the management concept that ‘what gets measured gets done’, and the belief that incidents rates are actually validly and reliably measuring safety performance. We give incentives based on false data, and we spend huge resources on misconceptions, achieving little more than looking very busy.

The more recent focus on the art of leadership, as against the ‘science of management’, has brought a deep and different understanding of people in the work place - that human motivation is a complex but powerful force that can be harnessed. The approach argues that if people are given authority and trust, they will excel. If people understand and believe in the true purpose of safety, they will sign up.

When it comes to promoting job-site safety, how much messaging is too much? How much risk-identification and management is too much? Is there such a thing as too many safety rules and guidelines? While most people argue that job-site safety can never be promoted enough, one safety-industry researcher suggests otherwise.

Corrie Pitzer argues that many organizations suffer from delusions when they think about safety. He suggests that by driving risk-identification and risk-management strategies, as well as promoting “unrealistic” goals such as zero accidents, safety managers unwittingly create organization-wide delusions that actually cause more harm than good.

Because Pitzer uses strong language to describe his approach, he’s often characterized as not caring about ordinary men and women who risk injury or death in dangerous workplace situations. Nothing could be further from the truth. Rather, Pitzer and his team study traditional approaches to safety through unusual means, and the conclusions they draw are based on data gathered through years of careful study.

Analysis shows, quite clearly, that some of the modern approaches to workplace safety have fostered more harm than good. Although the approaches themselves are not without merit—it’s reasonable to want to control risk, and it’s laudable to want to reduce accident rates—as a society, we have arrived at a point where organizations drive such approaches harder than ever, to the point where these notions are being followed slavishly and without any regard to their broader consequences.

According to the author, accidents are largely not preventable. As organizations are operating increasingly closer to ‘zero’, accidents are increasingly random events, caused by chance circumstances and inherent risks that randomly interact. Moreover, by creating illusions of compliance and consistency, where workers are encouraged to follow rules and procedures unquestioningly and without relying on their own common sense and instincts, safety systems can actually promote disaster.

The author describes seven deadly delusions from which organizations suffer.

1. The Delusion of Compliance

The delusion of compliance is rooted in the notion that workers everywhere must observe sets of rules to ensure safety. And while the spirit of that notion is unquestionable, its application in all situations is less assured. Consider that most car accidents occur when drivers drive at or below posted speed limits, and most pedestrians are injured at pedestrian crossings. On the other hand, rule breakers such as jaywalkers, tend to be injured less frequently—and herein lies the key —because they are alert.

It is argued that a prevailing workplace culture that installs rules for any situation is harmful to workers because it encourages workers to switch off their common sense. These workers put so much faith in the rules and technology that surround them that they become overconfident and reduce their responsiveness to risk.

In other words, compliance feeds into worker complacency, which itself is an innate form of human behavior that is nearly impossible to eliminate.

It is impossible to set rules for all possible situations and conditions in the workplace. Even if it were possible to do so, there would be an endless number of times in a person's work where slight variations from the norm require the worker to respond in a complex way—quickly and without careful thought. A person's risk responsiveness is therefore critical to his or her safe working conditions."

The most dramatic, and tragic example of this is the Piper Alpha Oil Rig disaster in July, 1988, when 167 men blindly followed a rule to congregate in the accommodation block in the event of emergency. They all died there, while 26 workers survived because they intuitively decided to rather jump overboard, or fell overboard.

2. The Delusion of Risk Control

One of the ways that organizations promote safety is by controlling or mitigating risk. Rules are put in place to reduce the likelihood of accidents, reduce workers' exposure to risk and limit the potential impact of loss incidents. Although such systems are largely successful, they also create complexity.

Extensive risk-mitigation measures lead to a false sense of control, of collective comfort and the belief that incidents are less likely to occur as a result. The reality is that total risk control is impossible to achieve. As a result, workers who believe that risk is controlled can be left exposed to unplanned situations without the tools to respond.

In other words, when people think they see risk, they tend to act more cautiously. When they think they see less risk, their tolerance for risk rises – a natural human response call risk homeostasis. The delusion of risk control is such that risks appear to be minimized when, in fact, they are still prevalent or even more likely unfamiliar or unexpected forms.

3. The Delusions of Predictability

Closely related to the risk-control delusion is the notion that risk is predictable. It is argued that it is not, and that organizations have little hard data at their disposal to accurately quantify risk. As a result, personnel make subjective guesses about risk that can easily be manipulated to meet organizational needs.

The impact of such a delusion is that management bases its operational systems on this idea of predictability. It has few, if any, contingencies in place to account for variations from accounted-for risks. As a result, when deviations do occur, workers are exposed to new adverse outcomes that are frequently catastrophic.

The attempt to create predictability in unpredictable situations leads to a number of safety problems—risk migration among them. Risk migration occurs when risks are moved or changed as a result of workplace dynamics. Consider, for example, the case when traffic lights became standard at many intersections. The introduction of such risk controls shifted the nature of accidents from right-angle collisions to rear-end collisions. It did nothing to reduce the frequency of accidents. In other words, risks were not controlled as a result of the introduction of traffic lights. Instead, they were migrated to new places.

Organizations become obsessed with tracking predicted, known risks, based on their assessment of known causes and known potential outcomes. The delusion of predictability helps 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.

4. The Delusion of Consistency

The term “situational judgment” is often bandied about safety circles as something to be eliminated. The thinking holds that workplace safety procedures should be developed and installed to account for and control all risk, and therefore eliminate a worker's need to improvise in a time of apparent danger.

For millennia, human beings have learned to deal with risk through a highly complex process of cognitive adaptation. We have honed an intuition and competence that defies reasoned thinking and which allows us to deal with risk in a variable fashion. Modern risk-control logic that creates consistency and compliance in the workplace defies such human nature.

For every ‘mistake’ a human has made, he or she has made millions of safe and correct decisions.

By limiting workers' innate abilities to respond to crises in variable ways, organizations erode their safety systems' most potent safeguards. Humans are our strongest link, not the weakest, in the safety chain. Yet the “safety science” purports exactly the opposite.

5. The Human-Error Delusion

It's easy to suggest that human error leads to accidents, but such an inference oversimplifies the myriad interactions between workers and their complex and dynamic environments.

When workplace environments are oversimplified due to technological advances, workers become over-reliant on technology. When such systems fail—and they all eventually do—our over-reliance prevents us from responding appropriately.

Human error isn't always the reason an accident occurs. It may be the most visible sign of an accident, but it is seldom an accident's only cause. Accidents typically occur when a set of related events occur and stack upon one another. When these conditions are met, one wrong decision — from among the millions a worker makes in his or her day — can be catastrophic.

6. The Zero Delusion

The “trend to zero” is the safety industry's new buzz term. It holds that workplaces and industries can reach goals of zero accidents. Increasingly, safety managers across all industries proudly state their companies are well on their way to achieving such a noble target and proudly point to their long list of “near achievement” of the goal. The most popular (and fallacious) argument being...if we can do it for a day (or a week or a month), we can do it forever...

Statements such as “process safety accidents can be prevented” are founded on overly simplistic thinking, and promote inherently false goals. The paradox of such a statement is this. If the statement is

false, the safety professional who says so acknowledges that he or she will fail in his or her work, and that someone, eventually, will be killed on the job. From a moral standpoint, such a notion is unthinkable.

However, if the statement is true, then the end result of all safety endeavors has to be the total elimination of all accidents—fatal and otherwise. Moreover, near-miss incidents will also have to be eliminated, since the difference between a near miss and an accident is only luck. Further, if we are to eliminate near misses, we must eliminate all mistakes and all events that could yield misjudgments. To achieve that, we have to achieve situations of zero hazards and zero risks.

A key problem is that safety is being viewed as a “key performance indicator” for businesses today and the demand for “good safety numbers” starts in the Boardroom. Most organizations have at meetings their safety charts as part of the agenda, or even the first point on the agenda, and it seems logical that ‘statistical trends’ give enough evidence of performance. Pitzer counters with the fact that most recent disasters (Texas Refinery, BP’s Horizon Rig, Upper Big Branch Mine, Chernobyl, Piper Alpha, etc.) were all immediately preceded with excellent trends in their safety KPI’s.

Clearly, zero is a delusion that runs contrary to a basic theory of nature, namely that perfection is impossible (or entropy, the second law of thermodynamics.) Zero, in the context of health and safety, requires perfection.

7. The Delusion of Invulnerability

When companies report that they have enjoyed long periods of time without reported workplace accidents, they fall more into the delusion that zero is possible. More than this, they begin to adopt a view that risks are controlled, human error has been curtailed, compliance is achieved and behavior has become consistent and predictable. In other words, they fall into a trap of believing they are invulnerable.

This last delusion is particularly dangerous. It fosters a culture in which safety managers manage by exception. They believe nothing is wrong in the business because they hear no evidence to the contrary. Worse, such a culture discourages others from speaking up when they see or suspect something is wrong. To do so runs contrary to organizational thinking and attacks the company’s hard-won reputation of realizing zero accidents.

No matter the organization or industry, accidents will happen and are not preventable. To make this statement does not lead to the acceptance of death as inevitable. It is the start of an appreciation of the complexity of workplace safety. Gone are the days when safety professionals got away with ludicrous ‘theories’ such as the one’s we peddled to line managers: domino theory, accident ratio triangles, ABC of human behavior, the three E’s, et cetera, as the silver bullets. Or, to put it in other words, safety is not rocket science...it is far more complex than that!

Dispelling Delusions

The key to promoting workplace safety and dispelling organizational delusions is to balance risk rewards with potential harm. To do so, organizations must develop skills in people to deal with risks competently, and explore new and better ways to engineer and build things. It also requires managers and supervisors who are truly inspirational and compassionate...the characteristics of true leadership.

Safety should be a key part of strategic planning and thinking and integrated in every activity so that eventually it becomes a seamless and automatic consideration before any decisions are taken. To

eventually, make safety invisible in the business, we need to replace the delusions on safety with the new principles of safety.

Delusions	New Principles
<p>1. The <i>delusion of linear causation of accidents</i> is a (mistaken) belief that causes of accidents can always be traced to a single root or original cause, and prevented by eliminating/changing the causal lines.</p>	<p>1. The new principle of multiplicity states that accidents are the outcomes of dynamic, multiple interactions of activities, and that complex threats are best managed through random and multiple risk techniques.</p>
<p>2. The delusion of compliance describes a ‘cult of conformance’ under all circumstances. It often triggers catastrophic events, because people (and organizations) naturally respond ‘pedestrian-like’ when acting inside the perceived protection of rules.</p>	<p>2. The principle of agility restores the innate risk-handling capability of the human operator (and of organizations) to act swiftly and alertly when danger looms, and install that to the situations where it is most required: the safety of protections and rules.</p>
<p>3. The delusion of consistency follows from the cult of compliance, which holds that variability should be eliminated to increase efficiency, and that it will also deliver safe outcomes. However, the production system is significantly different from the safety system.</p>	<p>3. The <i>principle of adaptation</i>, also following from the principle of agility, requires an organization to be quick to respond to changes, and to remain flexible and innovative in its structures and responses to threats at the shop-floor level.</p>
<p>4. The delusion of human error is based on a perception/belief that humans cause most accidents, either as a result of intentional risk-taking, or as a result of human imperfection and that it can be eliminated.</p>	<p>4. The principle of competence holds that most human risk-taking is a <i>symptom</i> of systems and culture around them, and that fallibility can be augmented by a focus on human risk proficiency.</p>
<p>5. The delusion of risk control is based on views that risks can be mitigated by analyzing and preventing known risks (accidents) – without realizing that these measures (to prevent) create new and unexpected risks.</p>	<p>5. The <i>principle of complexity</i> introduces a new and proactive focus on risks, especially unknown ones, with a dynamic capability that flows from the above principles: anticipation of risks.</p>
<p>6. The proven ‘laws’ of management states that ‘what gets measured gets done’, but in safety measurement it is a delusion of quantification. The <i>absence</i> of accidents does not equate to the <i>presence</i> of safety, because incidents are the miniscule tips of the iceberg of near misses, risks, mistakes etc.</p>	<p>6. The <i>new principle reliability</i> accepts that ‘safety’ is a broad and uncertain ‘condition’ in the organization as we approach ‘near zero’, where the truest performance indicator is the amount and reliability of effort and not the traditional safety metrics anymore.</p>
<p>7. The delusion of invincibility is a result of effective safety management and control of risk, leading to over-confidence in safety defenses. The ‘evidence’ of the absence of accidents – near zero – supports it, which culminates into the acute atrophy of systems.</p>	<p>7. The new principle of resilience is a capability to withstand adversity and to grow stronger from it – and to maintain processes that revitalize a constant focus on macro-risks, on random events and on the ‘aliveness’ of systems to do so.</p>

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