Rethinking the Way We Think About Safety eBook

This eBook is designed to provoke readers to question assumptions regarding safety management and to consider new ideas that may be brought to bear on the SIFs problem with the goal that we can build productive and profitable organizations where everyone gets to go home each day the same way they came to work.

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Introduction

For the last half of a century the rates of injuries in the workplace have steadily fallen in most countries, particularly in the United States. However, when one looks deeper at the data, a disturbing trend arises – the rates of serious injuries and fatalities are not dropping as quickly as minor injuries. In fact, the latest data is in and it's not comforting. Recent data from the U.S. Bureau of Labor Statistics and other similar agencies regarding injuries in the workplace has identified that the rates of serious injuries and fatalities are leveling off. In fact, from 2010 to 2011 the rate of injuries involving days away from work stayed the same, and in the state of California the number of fatalities in the same time period increased.

In the safety profession, we call this the serious injuries and fatalities (SIFs) problem. The SIFs problem teaches us a very important lesson – not all injuries and accidents are created equal. The rates of injuries have fallen steadily over a half a century, meaning that our efforts at prevention are working. At the same time, the fact that the SIFs problem exists suggests that the preventative measures we're using for the minor injuries aren't as effective for the SIFs. The SIFs problem is a call to action for anyone concerned about safety in the workplace. The SIFs problem challenges us to think differently about hazards, risks, control measures and even about our employees. As Abraham Lincoln said, "we must think anew and act anew."

The eBook before you is a collection of thoughts based on this call to action. It is designed to provoke readers to question assumptions regarding safety management and to consider new ideas that may be brought to bear on the SIFs problem with the goal that we can build productive and profitable organizations where everyone gets to go home each day the same way they came to work.

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Hierarchy of Controls – Good for Safety, Good for Business

As discussed in this video, the hierarchy of controls is an extremely important concept in the safety world. Safety professionals use the hierarchy as a decision making tool that gives us a systematic way to identify the best forms of protection for people. When faced with a hazard or a risk you start at the top of the hierarchy and work your way down until you find a control method that is both feasible and controls the risk to an acceptable level.

The reason why the hierarchy of controls works is because as you move down the hierarchy of controls you increase defeatability. Using the tiger analogy from the video, wearing a tiger protective suit (i.e., using personal protective equipment, or PPE) is easily defeatable because the person can simply choose to not wear the PPE. Whereas as you move up the hierarchy a person's ability to defeat the control and expose him or herself decreases. You can't be attacked by a tiger if the tiger is not there because the tiger was removed through "elimination" or if the tiger is effectively controlled in a cage (i.e., engineering control).

This leads to a little known secret in the safety world – using the hierarchy of controls effectively not only makes people safer, but it can also cut costs. Think about it, if you want your controls to work and you're relying on the lower controls (i.e., warnings, administrative controls, PPE) how do you make sure they are working? The answer is supervision. As you increase defeatability you also increase the need for supervision to ensure that employees are protected. This means that supervisors need to devote more time to monitoring employees, it means more supervisor training, it means less time getting the job done. All of this translates to increased costs for your business.

Safety professionals get a bad rap sometimes for being a hindrance to getting the work done. Admittedly, this is many times our own fault. Safety professionals often times spend far too much time being "safety cops" – enforcing the safety rules, making sure everyone's wearing their PPE, chasing employees down to make sure they come to training classes on time. This doesn't make us the most popular people sometimes. However, we are strong believers that when safety is done right, using tools such as the hierarchy of controls and others such as safety management systems and prevention through design techniques (more information is provided on those in another video), safety makes jobs more efficient and more cost-effective. After all, when we're being "safety cops," what are we doing? We're enforcing the lower controls. We're making sure that our warnings, administrative controls and PPE are utilized and are effective. If safety professionals spent their time thinking of innovative ways to apply the hierarchy of controls maybe we could not only make everyone safer, but we could also save the organization some time and money. We might also be able to salvage the reputation of safety professionals everywhere ,and I can think of at least two safety professionals who would appreciate that.

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Inherently Safer

In the previous section, we discussed how the top levels within the hierarchy of control require less involvement of people while the bottom of the list needs considerably more involvement of people. For example, we know that the use of PPE requires that the employee first recognize the need to use the PPE, then they are able to properly select the proper type of PPE, and then finally they must be able to properly wear it in the correct manner in order for it to provide the protection that is required. For this reason, we often refer to the top levels within the hierarchy to be inherently safer and therefore will provide more protection than those at the lower levels in the list.

Inherent is an interesting term. One dictionary defines the term inherent as something that is "involved in the constitution or essential character of something: belonging by nature or habit." Another dictionary defines inherent as, "existing in someone or something as a permanent and inseparable element, quality or attribute." Words that were listed as being synonymous with inherent included "built in," "integral" and "intrinsic." So clearly when you eliminate or substitute something, the situation would be inherently safer since these levels of controls build in safety as part of the process.

But does this concept also relate to people? Are some people more inherently safe than others? Do some have a "nature or habit," or more "inseparable element, quality or attribute" to follow the rules, take less risk, pay closer attention and remain more in control than others? Is safety more "built in" to some more than others? If you ask most safety professionals about people's behavior they will often cite anecdotal stories that some people just approach safety in a way that is different than others. Even most non-safety professionals can identify someone they know who is "accident-prone." These people just seem to be involved in more incidents than others. How do we know this? Because these people were involved in accidents.

What if there was a way to identify these people who are accident-prone before they are involved in accidents? After all, the bottom line is that sometimes we may never get the chance to identify someone who was "accident prone" because they may only be involved in one accident – the serious one that permanently disables or kills them. So we can't rely on trial and error to allow us to identify these employees. The trial and error cycle might be too late. If, instead, we were able to identify the intrinsic traits of people related to safety behavior, their "Safety*DNA*™," so to speak, we could then be in a place to better eliminate, reduce or control the risks related to unsafe behavior.

Think about it – although human behavior is only one piece of the puzzle of incident causation, it's a pretty common piece. Human behavior, and specifically human error, is directly related to the risk of a situation because human error creates an avenue for exposure to a hazard, therefore increasing the probability of an incident. If we could identify those employees most likely to make errors and substitute those employees with other employees who are less likely to make errors we are, in effect, reducing the risk by reducing the frequency of an event. This isn't to say that the employee(s) are the problem, but rather are part of the overall safety system that must be analyzed and controlled to decrease risk, just like any other part of the system. The bottom line is that if information related to risks to employees is readily available, wouldn't it be unethical to not take advantage of such information?

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Does Your Organization Practice Workplace Safety?

Those low frequency, high severity events that are talked about in this recent video really place a lot of pressure on organizations to rethink the way they define "safety" in the workplace. After all, if you measure safety by the absence of an event that doesn't happen very often that means you're looking for trouble. If something that normally doesn't happen very often doesn't happen on a given day, how can we say with confidence that our safety management system was working? Perhaps we just got lucky (or didn't get unlucky) that day. This is one of the dangers of using lagging indicators (i.e., injury rates, experience modification rates) to measure safety performance. Certainly lagging indicators have a place in a program to measure safety performance but if they are all that your organization is measuring you may be misleading yourself.

Perhaps a case study will be useful to illustrate this. BP is an organization that isn't high on many people's list of "good safety management systems." After all, in the last seven years BP has been involved in two horrifically catastrophic events, killing 34 people in the two incidents alone and one considered the worst environmental disaster in U.S. history. Of course I'm referring to the Texas City Refinery explosion in 2005 and the Deepwater Horizon explosion in 2010. Interestingly, in both cases, using only lagging indicators one would have concluded before both explosions that effective safety management systems were in place. In both cases the incidents rates were very low and were decreasing.

So what happened? Well, both events were very complex in both their physical and organizational root causes and we encourage readers to take some time to look at the respective incident investigation reports. The U.S. Chemical Safety Board, http://www.csb.gov, has a great video on the Texas City Refinery explosion on its website that, in our humble opinions, is mandatory viewing for any safety professional. (The associated video on Deepwater Horizon is expected to be released within a few months last time we checked.) However, it is very interesting that in both cases the organization used lagging indicators primarily to measure safety performance and, in both cases, the organization was blind to the forthcoming catastrophe.

The bottom line is that the low frequency, high severity events, those events that typically lead to serious injuries and fatalities require that we think about safety in a new way. It's somewhat counterintuitive, but you can't measure the effectiveness of the safety program merely by the absence or presence of incidents. Sure, having no incidents is the goal, but when other factors, such as luck, influence when an incident happens, how do we know that when a project happens without an incident that it was because of our efforts and not just plain old dumb luck? If all your organization does to measure safety performance is use lagging indicators it's sort of like saying that a car driver must be a good driver because he or she didn't get into an accident today. Intuitively we know that's not true - to know how safe the driver is, we'd want to look at how the person drove, did they follow the safe driving procedures, did they take advantage of the safety equipment available to them (i.e., wearing a seat belt), etc.

And this is the essence of what we call "leading indicators." We all know that if you want to avoid accidents in your car then you need to obey the rules of the road, practice good defensive driving techniques and use the available safety equipment. Therefore, if we wanted to identify the good drivers from the bad drivers we'd look for these things. In the same way, if you want to identify an organization's real safety performance you need to look earlier, before the incidents happen. What are they doing on a daily basis to minimize risks and prevent incidents? The sad trend in serious injuries and fatalities requires that we think about safety in a new way. Dr. Todd Conklin points out that safety is not the absence of incidents – safety is the presence of controls and defenses. If you want to know how safe your organization truly is look at the controls and defenses that are in place. That's how you identify your leading indicators and that's how you ensure that your organization doesn't have blind spots that may lead to catastrophe.

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Bridging the People-Environment Complexity Gap

One thing that seems to be constant in the business world is that things are getting more complex. New technologies, new regulations, new chemicals or raw materials, new management systems and techniques – our organizations are more complex and interrelated than ever. And the speed of these changes is breathtaking. The "latest and greatest" technologies become yesterday's news almost before you have a chance to read the instruction manual.

This increasing complexity and the speed with which it's being introduced into the workplace poses a significant challenge to safety and health professionals. There is an increasing mismatch between the complexity of the human beings in your workplace and the complexity of the work environment that the human beings work in. This mismatch leads to error traps, which in turn leads to incidents. To deal with the human-environment complexity mismatch we have two choices – decrease the complexity of the environment or increase the complexity of the humans. Obviously, you'll have a hard time convincing anyone to take steps backwards in terms of organizational complexity. These new technologies, new materials and new processes all help to give organizations a competitive business advantage.

So what are we left with? Do we just have to accept that there will always be a mismatch between the workplace and the humans that work in that workplace? Or can we go with our second option – increase the complexity of humans? The answer is yes - we can increase human complexity. How? Add more humans and have them interact with each other. The amazing thing about people is our capacity to rise to the occasion, but the greatest human feats are when people work together. This interaction between individuals creates something extraordinarily complex – it creates a system. This system, when managed appropriately has the capacity and requisite complexity to bridge the gap between people and their environment.

And this is why so many great safety thinkers stress the importance of safety management systems. If organizations want to create an environment where the humans are as complex as the workplace then the safety programs need to be turned into safety systems. These safety systems take the focus (and, in turn, the pressure) off of individuals. Humans make mistakes, and strong safety systems understand and embrace that reality. Safety management systems position themselves to anticipate not only the hazards and risks within the workplace, but also the errors that will trigger exposure to the hazards. They create robust investigation tools to systematically seek our hazards, risks and error provocative environments. These tools include a basic job hazard analysis or more complex tools, such as risk assessments, failure modes and effects analyses, fault tree analyses, process hazard analysis and many others.

Most importantly, safety management systems are built on a strong foundation of people working together. All safety management systems that we've seen and worked with stress the importance of safety culture, management commitment and leadership and meaningful employee participation in the safety management system. These systems create an environment where everyone works towards the common goal of making sure that everyone gets to go home at the end of the day the same way they came. That sounds like a nice place to work, doesn't it? In fact, these safety management systems, when done right, are also correlated with increased productivity, quality and profits. But don't tell the bean counters about that, they might actually start to like the idea!

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Safety Assessment: Prevention through Design

We've previously discussed the analogy of the tiger and the hierarchy of controls. We talked about how the best way to protect employees from a tiger is to eliminate the tiger. However, that's only part of the story. Because if we wait for the tiger to come to the zoo and then decide to remove the tiger to protect people from the tiger, haven't we exposed people to risk in between the time we brought the tiger on site and the time we removed it from the site?

This is why some listings of the hierarchy of controls list "risk avoidance" as the most effective control. The difference between risk avoidance and elimination is that elimination removes the hazard from the site after it has been introduced, i.e., after employees have been exposed to the risks. Risk avoidance, though, avoids bringing the hazards onsite altogether. Of course, your ability to avoid the risks relies on one key fact - that you're pro-actively identifying the risks you may face before they come on site. This is the essence of Prevention through Design (PtD). As discussed in this video, PtD is a concept that forces you to think about hazards and risks at the only point in time where the risks do not actually exist – during the conceptual design phase. In this way PtD is inherently proactive. It forces you to anticipate hazards and risks and to find ways to control those hazards effectively before employees are exposed to the hazards.

If you think about it, PtD borders dangerously close to common sense. Wouldn't it be nice if instead of always reacting to hazards and risks, your safety system was anticipating and controlling them before they even hit the front gate? Unfortunately, most organizations don't practice PtD principles, and those that do typically only do it in one area of their business (e.g., process safety management for chemical facilities). This means that most organizations are always playing "catch-up" with their safety systems.

Think about your organization – when do you identify hazards and controls for those hazards? If you're like most organizations you're doing it after the hazards are introduced. We wait until the chemical is brought on site to read the MSDS, employees have to be at their desks before an ergonomics evaluation is done, we add the lockout/tagout points once the machine is in the shop, or we wait until the employee is onsite to try and make them safe.

So, this means a couple of things. First, employees may be exposed to the hazard before the controls are introduced. Second, it typically is too late after the hazards are introduced to use the higher order controls. Once the machine or process is designed, it's hard to design out the hazards. This means we tend to rely on lower order controls, such as administrative controls and personal protective equipment (PPE), meaning that the level of risk reduction may not be sufficient. PtD is a mindset change, moving the focus from the operational phases of work to the design phases. It moves us from reactive safety to proactive safety. The focus moves from relying on front line workers to do the right things all the time to focusing on the entire organization, such as procurement, engineers and supervisors to make the safety program work. In this way, PtD is not just a hazard and risk reduction concept, it's a culture change concept.

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What Should I Do Now?

This short eBook touches on some key concepts in the field of safety management. Some of the concepts are familiar to the safety profession, but discussed in a new light, such as the Hierarchy of Controls. Others are cutting-edge concepts that safety professionals and organizational managers are beginning to utilize with great success, such as the concepts of safety assessments in hiring and Prevention through Design.

All of the concepts and subsequent discussions are designed not to be comprehensive surveys of the topic. Rather, the preceding discussions are designed to provoke thought, discussion, questions, and, ultimately, action. The SIFs problem requires such action. As the saying goes, "if you do what you've always done, you'll get what you've always got." When we're talking about SIFs we can't afford to "get what we've always got." Taking the focus off of reactive safety (i.e., the bottom of the hierarchy, dealing with problems and hazards after they are on-site) and putting the focus on prevention and proactive thinking holds the key to moving us towards the ultimate goal of preventing SIFs, with the added bonus of benefiting the bottom line as well.

To learn more about these and other safety-related solutions, check out our website.

Have questions? Contact Select International at (800) 786-8595 or by submitting a contact us request here.

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