What is the REAL Answer for Injury Reduction?

James E. Hurtte, CSP
Manager, Safety Operations
Peabody Energy, Midwest Group
Evansville, Indiana

Introduction

Mine explosions, drill rig fires, plane crashes, and many other incidents that result in multiple fatalities are real "headline catchers" in today's media coverage. The loss of life is a terrible tragedy in itself, and the economic loss from these incidents can bankrupt companies. Public outcries against these disasters seem to immediately fuel congressional action to write more and more stifling regulations to punish these so-called "bad actors" that are always accused of putting productivity ahead of employee safety.

Creating more regulations in itself, however, still does not answer these questions: "Is law compliance the best way to improve safety?" If not, then "What is the REAL answer for injury reduction?" Do we need even more regulations? How much is too much? What are the results of increased regulation on industries; on workers; and on the general public? What can companies do beyond law compliance in order to improve safety?

I believe that most companies probably already feel that they are over-regulated. But if regulations and law compliance are effective, why do industries continue to have people get seriously injured or killed every year? In today's society, "big business" is the so called evil actor in the ever-increasing class warfare propaganda that is being perpetrated in a large part by our own government. For an industry to survive and prosper in today's environment, it is imperative that they rise above similar companies and create a positive business environment with a strong focus on employee safety.

What Does Employee Safety Mean?

In order to create a safe working environment, one must first understand what safety is, and what it means to employees. All too often, the viewpoint of safety from an hourly perspective is quite different than that of the management team. Even though a company may have multiple items in place to define their safety system, it may not be totally followed or understood by their employees. Perception is reality, and what employees perceive as important to safety may be a long way from what management feels is a good safety environment. Occasionally, an employee perception survey can be utilized to help a company get a better idea on how effective their safety process really is.

There are numerous dictionary definitions of safety. A couple of these are shown below.

- ***Safety*** *is the condition of being protected against the consequences of failures, damage, error, or accidents.*

- *Safety can also be defined to be the **control** of **recognized hazards** to achieve <u>an acceptable level of risk</u>. This can take the form of being protected from an event or exposure to something that causes injury or property damage.* [1]

These formal definitions are all well and good, but defining safety and/or creating a positive safety culture can be highly complex and difficult to achieve. The best way to obtain employee buy-in and understanding is to find a way to <u>make safety personal</u> for the employees. My take on making safety personal is to relate safety to something that the majority of people hold on to as almost sacred….their families. Get employees to think about what consequences their unsafe actions may have on their spouse and / or children! What would their families do if the employee were seriously injured or killed? It may sound somewhat gruesome, but it definitely has a lasting effect when the employees consider their family when making a work decision.

Another way to relate this to the employee is to ask them if they would want their spouse or children to perform their job in the same way that they are about to perform the job themselves. Getting employees to involve their families in their job in other ways can also enhance safety performance. Depending on size of the business and resources available, family involvement can be in the form of safety newsletters sent to the house, poster contests for children, company picnics for families, etc. Be creative. Off the job safety is just as important as on the job safety.

Recognizing Hazards

No matter what your definition of safety is, recognizing and correcting hazards is a key element in creating a safe work environment.   Effective training in hazard recognition can go a long way in helping employees to identify what things could cause them or their co-workers harm. Various means to provide hazard recognition training can be utilized, but one of the most effective is to let employees look at pictures taken in their work environment and then ask them to identify potential hazards from the photos. The old adage that "a picture is worth a thousand words" can really ring true in exercises such as these.

Employee involvement in the safety process is crucial to its success. If possible, arm a group of employees with cameras and let them participate by conducting their own audits and taking pictures of what they see. This exercise normally helps them identify potential hazards that they may overlook on a daily basis, simply because they are accustomed to seeing their work environment from a different perspective, and haven't really focused on identifying potential hazards.

A good hazard recognition training process not only includes identifying potential hazards, but also teaches employees what to do in order to manage those risks.

Safety Versus Compliance

So far, I have tried to identify what safety is and how employees perceive safety. The next focus, and the topic of this article, is to identify what it takes to achieve a safe work environment and reduce or eliminate injuries.

In the introduction, several questions were raised regarding the effect of law compliance on safety. I contend that regulatory compliance and safety are <u>not</u> the same thing. They are two separate and distinct processes, although they are intertwined to a certain extent.   The depth of their relationship depends somewhat on the various industries that are regulated. One would

imagine that regulatory compliance in the nuclear industry should be more directly related to safety than say, regulatory compliance and safety in banking industry. Both industries are supposedly highly regulated, but it is hard to imagine that failing to inspect a bank statement would have the same injury potential as failing to inspect a nuclear reactor!

Obviously, this analogy goes to the extreme end of the spectrum regarding potential consequences of failure to comply with regulations. In general, one can see that it would be "quite a stretch" for the consequences of non-compliance in the banking scenario to cause actual accidental physical harm to someone. On the other hand, non-compliance with regulations in the nuclear industry could have catastrophic effects on human life if that noncompliance led to a nuclear incident.

The distinction between safety and compliance may be less obvious, however, if one examines what could happen in a more commonplace scenario where someone fails to lock and tag a piece of equipment before performing work on it. We all know that failure to lock and tag is clear cut violation of regulatory issues, but it is also a distinct violation of safety rules that are put in place for the purpose of preventing potentially serious injuries. Should we consider a failure to lock and tag a compliance issue or a safety issue? Most people probably consider this both a safety and compliance issue. The consequences of failing to lock and tag would be the actual safety portion in this case, since the regulatory violation could result in an injury.

In many cases, failure to comply with regulatory requirements can result in personal injuries. Many "violations," however, have little or no effect on employee safety. The previously mentioned banking violation is an example of this type of violation. All of us can probably cite numerous similar examples, for instance, a fire extinguisher that has not been checked for over a year but is still fully functional; or an inspection that was done and documented per regulations but not signed properly. Again, these are regulatory violations but have no potential injury consequences associated with them.

This is not to say that regulatory compliance is not important; these are just examples to support my assertion that compliance and safety are not the same thing.

OSHA versus MSHA

Regulations for industries come from many different venues: the federal government, state agencies, counties, cities, and municipalities all create and enforce a plethora of laws and regulations. Most of these venues have multiple branches creating additional regulations that we must all comply with. For the next part of this discussion, however, I want to focus only on the difference between the federal agencies known as OSHA (Occupational Safety and Health Administration) and MSHA (Mine Safety and Health Administration). The facts and figures listed in the following paragraphs can be found on the agency websites: www.msha.gov [2] and www.osha.gov. [3]

Both of these agencies are branches of the United States Department of Labor. MSHA was established in 1969, with major Congressional revisions in both 1977 and 2006. The OSHA Act became law on December 29, 1970. Both branches have used congressionally mandated rulemaking processes throughout their history in order to address specific issues that were not identified or referenced in the original language of their respective acts. MSHA is focused solely on the mining industry which includes not only coal, but approximately 80 different types of minerals and commodities. Most people don't realize that almost every product produced in our country begins with either mining or farming! The media and general public normally seem to

associate mining with the coal industry, but coal mining accounts for only about 37% of all the mining activities in the United States. Coal mining takes place in 26 states, but MSHA actually governs mining activities in all 50 states, Puerto Rico, and the Virgin Islands.

OSHA, on the other hand, regulates the vast majority of all other industries in our country and has separate regulatory requirements for construction, general industry, agriculture, and maritime standards. In addition to the federal OSHA laws, 27 states or U.S. territories also have their own OSHA agencies. Despite the fact that both OSHA and MSHA are branches of the Department of Labor and are responsible for regulatory compliance issues, there are major differences in the agencies and their inspection methods.

- MSHA is responsible for 14, 264 worksites and 360,000 workers whereas OSHA has responsibility for approximately 8 million worksites and 130 million workers!
- OSHA has approximately 2200 inspectors, or one inspector for every 59,000 workers. On the other hand, MSHA has approximately 1000 employees, or one inspector for every 360 workers.
- Inspection priorities for OSHA include imminent dangers, fatalities, employee complaints, and targeted inspections. MSHA is mandated by law to inspect each underground mining operation *in its entirety* at least 4 times per year, and each surface mining facility *in its entirety* at least twice a year. MSHA also responds to all employee complaints and serious injuries. Mine inspectors are on-site at most medium to large underground coal mines on a daily basis throughout the year in order to complete the mandated inspections.
- In addition to the above-mentioned inspections, MSHA frequently conducts saturation inspections where anywhere from 6 to 15 or more inspectors show up at a mine and conduct inspections throughout the shift.
- OSHA has VPP, Compliance Assistance, and other programs to work with businesses whereas MSHA has none of these types of programs.

The bullet points above illustrate some of the differences between the agencies regarding inspection priorities and frequency of inspections. Speaking of frequency of inspections, and using the numbers quoted above, if the 8 million worksites were divided evenly among OSHA inspectors, and each inspector visited a different worksite every working day, it would take over 15 years for every worksite to be visited just once!!

In addition to inspection priorities and frequency, there are other major differences between the agencies and their enforcement activity. MSHA is actually more pro-active in that they must inspect on a regular basis whereas OSHA, for the most part, reacts more to complaints and serious injuries or fatalities. Inspectors from MSHA have broad authority to look for any type of deficiency or non-compliance issue while OSHA utilizes more focused inspections and normally goes to a facility to look for specific items. Technically, OSHA requires a search warrant to visit a worksite; but refusing entry until a search warrant is produced is probably not the wisest decision a company can make. MSHA inspectors require no search warrants, and if someone refuses access for a MSHA inspector they can be arrested receive personal fines as well as possible imprisonment. (See below)

"Title 18, Part 1,Chapter 7, Section 111 of the United States Code makes it a federal crime to forcibly assault, resist, oppose, impede, intimidate or interfere with any person designated in Section 1114 of Title 18 while such person is engaged in, or on account of, the performance of his/her official duties. It is a crime to assault, intimidate or impede MSHA employees who are assigned to perform investigative, inspection, or law enforcement functions."

"Thus, any person who assaults, intimidates or impedes an MSHA inspector, while the inspector is engaged in, or on account of, the performance of his/her official duties, is subject to investigation and arrest by the FBI, prosecution by the U.S. Attorney in the federal courts, and to a fine and/or imprisonment." [4]

One final difference I want to mention is the difference in the regulations themselves. OSHA regulations are fairly detailed and specific, outlining not only what needs to be complied with, but in many cases, what one needs to actually do to comply. The MSHA regulations are more vague and inspectors have wide discretion on how they can individually interpret the law. Often one inspector says that a situation is totally in compliance with the regulation and the next inspector will cite the condition and shut down the piece of equipment or area of the mine. This broad authority for individual interpretation makes compliance an ever-changing target for mine operators.

Effects of Compliance on Safety

I have developed graphs (exhibits1 through 4) from public information available on MSHA and Bureau of Labor Statistics (BLS) websites in order to graphically depict some statistical information relating compliance efforts to fatality rates. Exhibit 1 illustrates the increase in citations issued to mine operators from 2004 to 2010. (A 51% increase in 2010 vs. 2004)
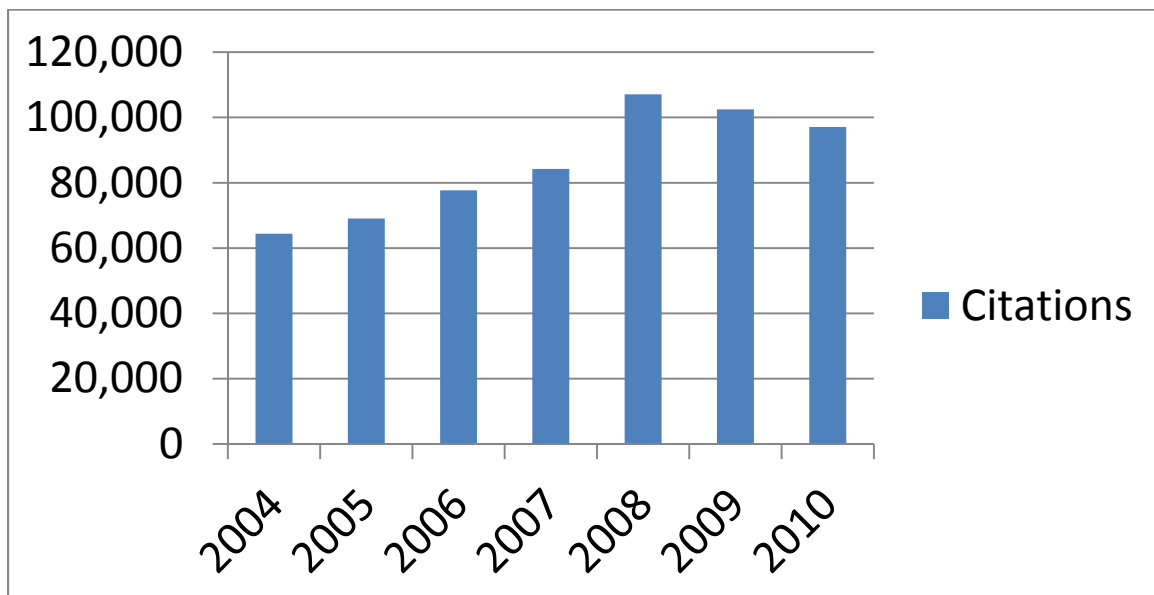

Exhibit 1. This depicts the number of citations issued by MSHA from 2003 to 2010.

Exhibit 2 shows the amount of penalties assessed in millions of dollars during the same time frame. Despite the significant increase in violations issued and the astronomical increase in fines assessed (approximately 500% increase), the total number of fatalities has not decreased in any dramatic way. (See Exhibit 3) Unfortunately, this is still a "black eye" for the coal industry. The industry did, however, show significant improvement in 2009 and 2011, their lowest fatality years ever. A couple of major explosions during the past 5 years, however, have kept the overall numbers high. During this time frame, overall incident rates have decreased, but it is difficult to

relate any increase in fatalities or decrease in incidents directly to the increased compliance activity.
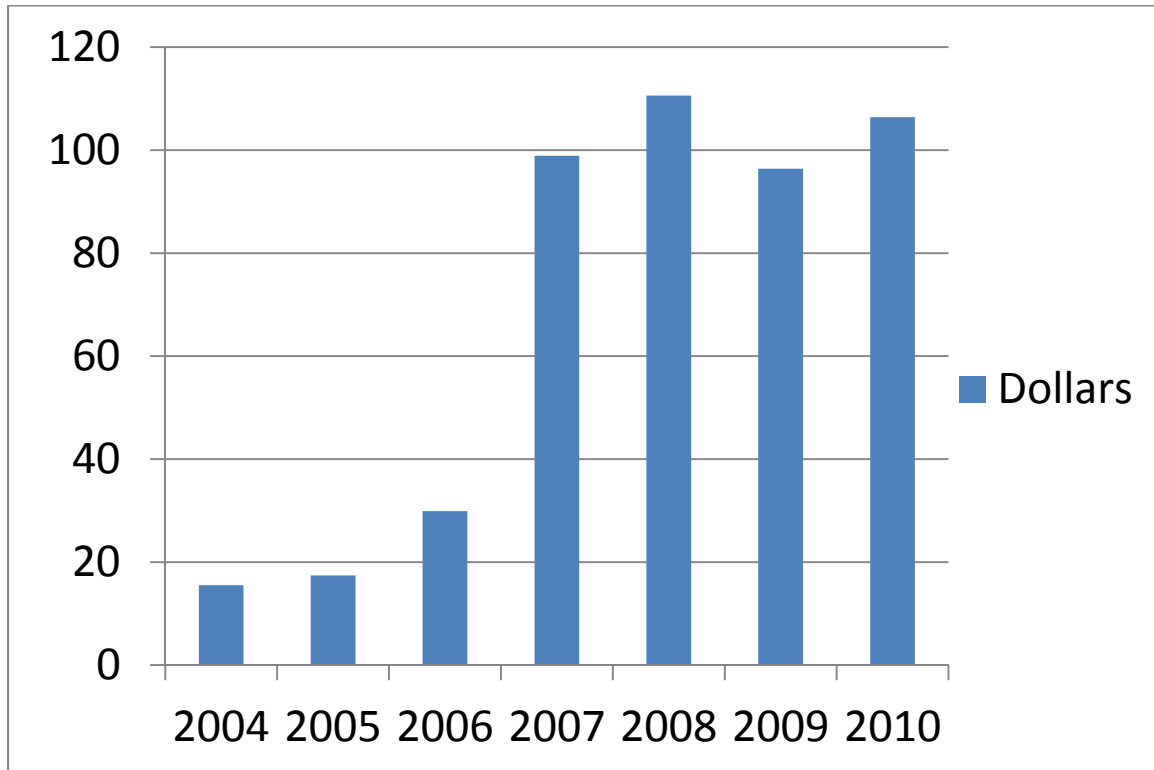

Exhibit 2. The graph shows fines (in millions) assessed for citations issued from 2004-2010.
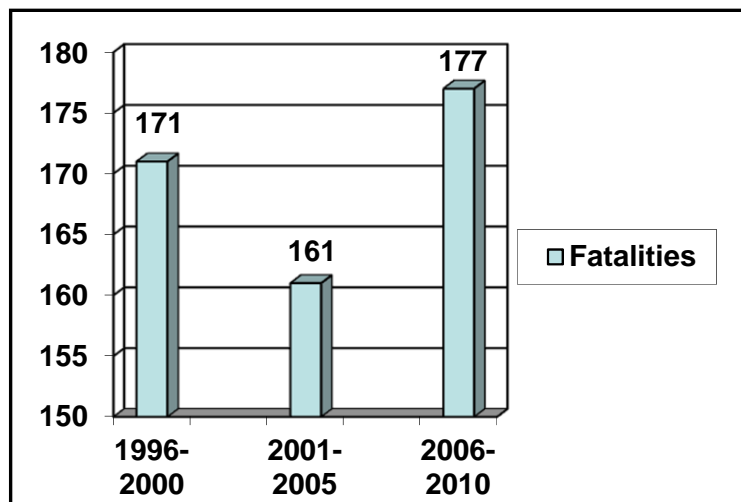

Exhibit 3. This graph lists mining fatalities in 5 year groupings.

OSHA statistics show a relatively slow but steady decrease in the number of workplace fatalities since 1992. There has been a more dramatic reduction in fatalities since 2008, but this could be

contributed to, in part, by the reduced number of exposure hours due to high unemployment on a national level. Exhibit 4 shows the total number of fatalities by year since 1992, as gathered from the Bureau of Labor Statistics (BLS) website. The data for 2011 is unavailable, and the preliminary data for 2010 lists 4,547 fatalities.
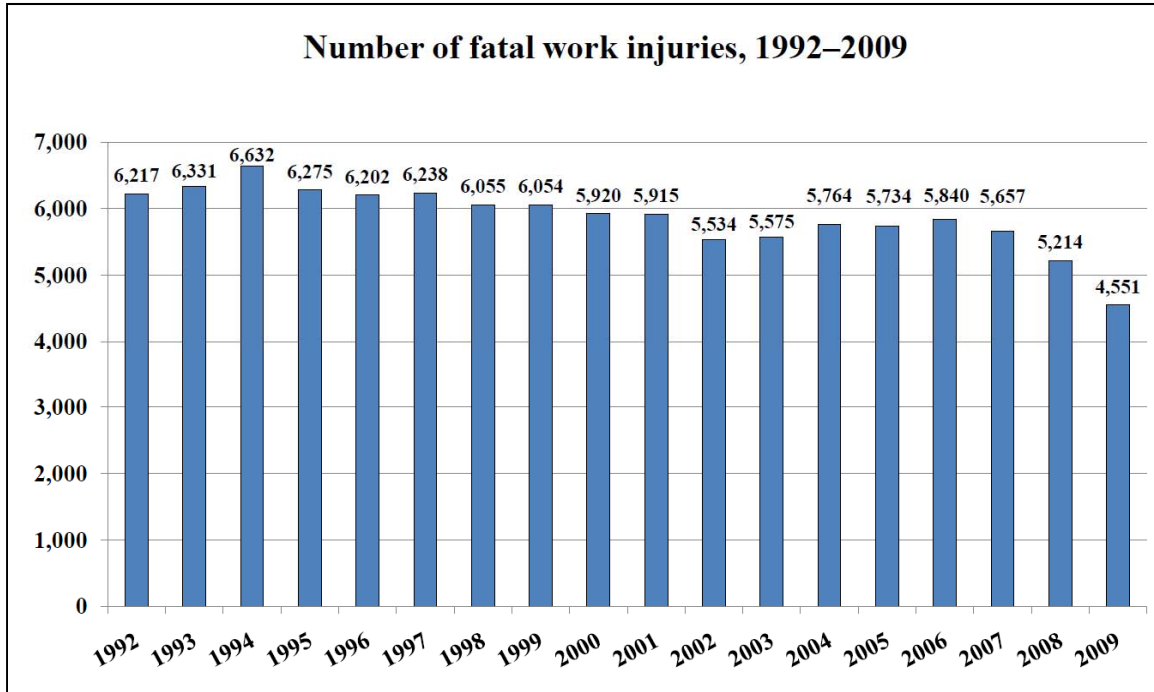

Exhibit 4. This chart depicts workplace fatalities from 1992 through 2009.[5]

Since 2006, MSHA has dramatically increased enforcement efforts and increased fines on mine operators, as can be readily seen from the exhibits shown above. Despite these efforts, the total number of fatalities remains high, although individual years have shown improvement. It should be noted, however, that during this same time frame the mining industry (specifically coal mines) has grown significantly, putting hundreds of inexperienced people in an unfamiliar mining environment. For the most part, as in all industries, inexperienced workers are more prone to being injured than the more experienced workers.

Despite the "bad press" that mining receives for both safety and alleged environmental issues, the mining industry safety record has improved significantly from the early days of mining. Less than 50 years ago, the mining industry ranked at or near the top of the list as the most dangerous type of industry in regards to injury and fatality rates. Now, it does not even rank in the top 15 in fatality rates per 100,000 workers according to the Bureau of Labor Statistics. Table 1 (on the next page) was developed from statistics publicly available on the BLS website. These statistics show that mining is #17 on the list of fatality rates per 100,000 workers. Commercial fishing is listed as the most dangerous occupation, with a rate of 200 fatalities per 100,000 workers. Mining is actually listed as being just a little bit safer than driving a taxi cab. Remember that the next time you hail a taxi for a ride across town!

Occupation			
Fishing	200		
Aircraft pilots/crew		57.1	
Logging		56.1	
Farming		38.5	
Roofers	34.7		
Iron & Steel Workers		30.3	
Refuse & Recycling		25.2	
Oil & Gas Extraction		21.6	
Water Transportation		19.4	
Industrial Maintenance		18.5	
Drivers/sales/trucking		18.3	
Construction Laborers		18.3	
Construction Supervisors			15.2
Landscaping		15.0	
Power Line Work		14.7	
Taxi Drivers		14.6	
Mining	12.7		

Table 1. This table lists fatality rates per 100,000 workers by occupation.[6]

Based on these statistics, I find it difficult to say that compliance alone is the answer to improving safety. In my experience, I have found that only a very small percentage of people have been injured due to violation of some rule promulgated by a regulatory agency. This is not to say that injuries and even major disasters have occurred for lack of regulatory compliance, but the majority of injuries seem to have employee behaviors as a root cause.

Behavioral Safety

What about behavioral safety? Most of us are at least somewhat familiar with the term, if not the practice, of behavioral safety. Whereas regulations are written to force people to comply with a specific item in a specific way, behavioral safety is based more on the concept of training people to recognize potential hazards and actually "think" of how to mitigate the hazard. The end result of behavioral safety is to alter the way people behave or perform their jobs so that they can adapt to different situations and avoid injury. Hazard recognition training is an important element in the behavioral safety process. Once people learn to recognize potential hazards, they can learn how to alter their behaviors and manage the risks.

There are several well-known behavioral safety processes. Like all other programs or processes, they will only be as effective as the amount of effort, training, and persistence that is applied to make them successful. Having been associated with several different behavioral processes throughout my career, I can say that they will all work some extent, and most show good results in the early years of the process. I have assembled some information from personal experiences to show how a couple of companies have had success with behavioral safety processes. Neither company used the same behavioral safety process.

Exhibit 5 shows incident rates for "Company A" both prior to and after the introduction of a behavioral safety process. Note that there is a pretty significant decrease in incident rates after implementing their behavioral safety process. Even so, Exhibit 6 shows an even more dramatic

decrease in severity rates for that same company. Not only did incidents decrease, but the types of incidents became less severe.

Exhibit 5. Incident rate is on the y-axis and years are shown on the x-axis.
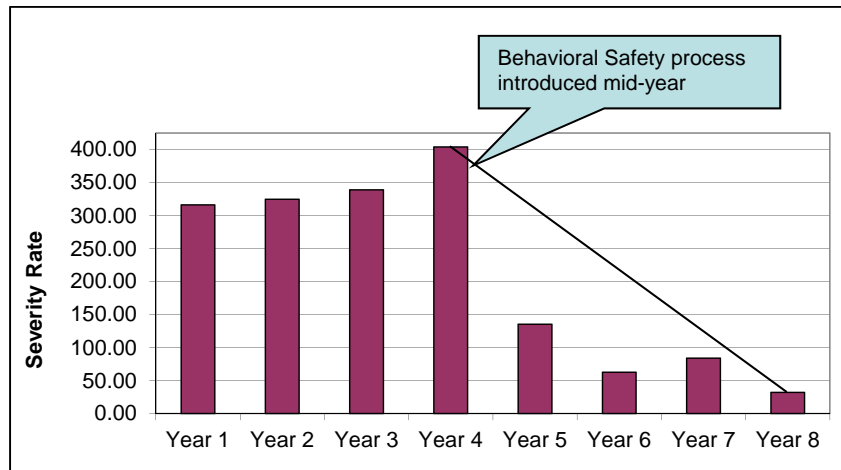

Exhibit 6. Severity rates vs. years are shown on this graph.

Company B, using a different behavioral safety process, also had some dramatic improvements in their safety record. Exhibits 7 and 8 show their improvement in incident rate and decrease in worker's compensation costs, respectively. Although Company B's incident rate improvement was not as dramatic as that of Company A, their savings in worker's compensation costs was tremendous! Prior to implementation of the behavioral safety process, Company B was averaging nearly $6,000,000 per year in costs for worker's compensation. The change in types and severity of injuries when using their behavioral safety process was definitely the biggest factor in money savings for their company. Year 1 is when their process started.
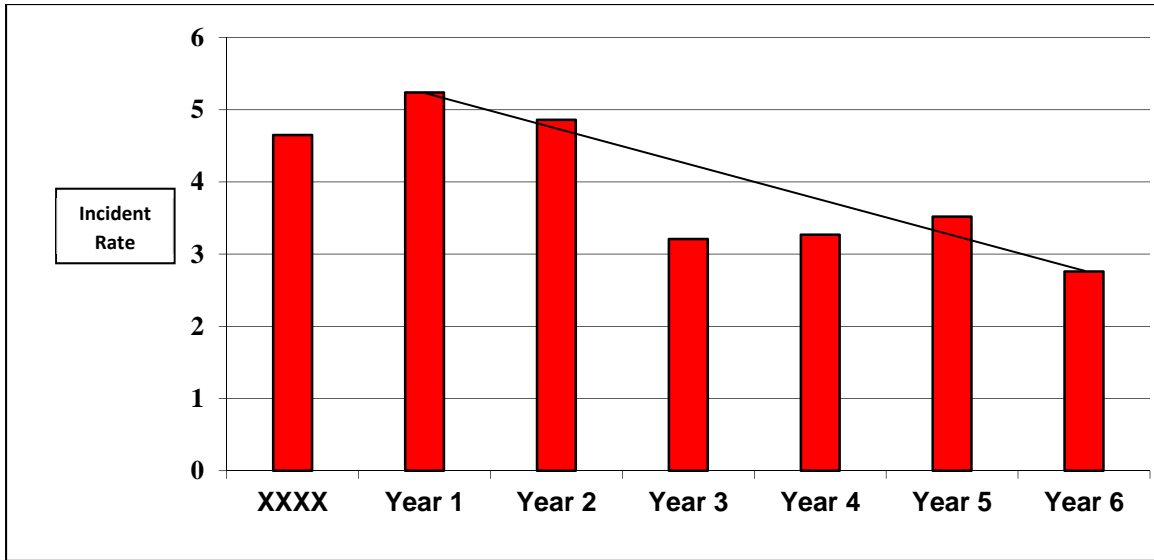
Exhibit 7. This graph shows incident rate vs. years of behavioral process for Company B.
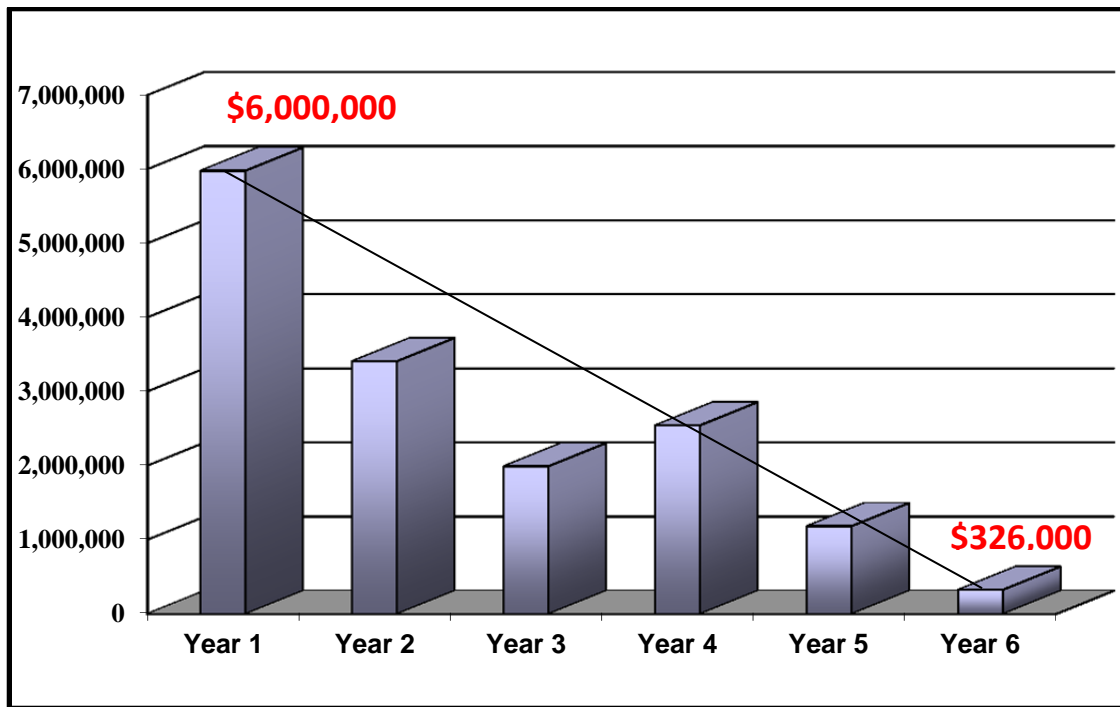

Exhibit 8. This graph shows decrease in worker compensation costs.

Despite the improvements in both Company A and Company B after implementing behavioral safety processes, one cannot just attribute the improvements solely to the behavioral processes. In my opinion, behavioral safety plays a major role in improving the safety culture within an

organization, but there are many more pieces to the safety puzzle! This brings us to finally determine "What is the REAL answer for injury reduction?"

Conclusions

We have discussed a few of the many aspects of injury reduction, starting with trying to define safety, which in itself, is subject to various interpretations. Other topics included hazard recognition and regulatory compliance and enforcement procedures by OSHA and MSHA, as well as the effect of compliance on safety. Finally, a couple of case studies on companies that have used behavioral safety processes were reviewed. All of these things are necessary elements for improving safety within an organization. But there is much more. Exhibit 9 shows many more pieces of the puzzle that are essential in developing an effective safety culture.

Exhibit 9. These are critical pieces of the puzzle for an effective safety culture.

When looking at Exhibit 9, we see that there are several puzzle pieces that we have not yet discussed. An effective safety culture has to begin with leadership at the highest echelons of the company. An effective process, however, must also include accountability, audits, inspections, investigations, emergency preparedness, training, and proper PPE. You cannot say enough about the importance and value of effective communication, as well as how the communication and interaction enable employees to participate and "buy-in" to the safety culture. Everyone must be held to the same standards, including contractors, employees, and management!

So what is the REAL answer to injury reduction? YOU ARE! If you are committed to safety, and I'm sure you are, then use your knowledge & skills to influence others in your organization to work together to put the puzzle pieces in place to create the safety culture

necessary to reduce injuries. This takes time, it takes teamwork, and it takes commitment! Never underestimate your abilities, never give up, and never be satisfied with your gains. You need to set high goals for your organization, and once you reach them, set higher goals. Be pro-active, not reactive, and lead the way by setting a good example for others to follow. It is imperative to "Make Safety Personal" to each and every employee. Don't forget that off-the-job safety is just as important as on-the-job safety. Once every employee, both management and hourly, realize that what they do affects not only themselves, but their families and fellow workers, their attitude toward reducing injuries will improve significantly. Remember what is really important to all of us….our families!

Exhibit 10. Make sure your family gives you a "thumbs up for safety."

Bibliography

1. Wikipedia, the Free Encyclopedia (http://en.wikipedia.org/wiki/Safety)
2. Mine Safety and Health Administration (MSHA) (http://www.msha.gov/)
3. Occupational Safety and Health Administration (OSHA) (http://www.osha.gov/)
4. Title 18, Part 1, Chapter 7, Section 111 of the United States Code (http://uscode.house.gov/download/pls/18C7.txt)
5. Bureau of Labor Statistics (BLS) (http://www.bls.gov/iif/oshcfoi1.htm#19922002)
6. Bureau of Labor Statistics (BLS) (http://www.bls.gov/iif/oshwc/cfoi/cftb0249.pdf)