

Emotion Based Safety – The Role of Emotions in Occupational Health & Safety in the Workplace

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Abstract: People are injured and killed every day in the American workplace. After the event, we ask what happened. When we investigate, we find there was a guard missing, there was no PPE, a short-cut was taken, etc. We then attribute a cause like poor communication, lack of training, injured was distracted, injured' behavior was unsafe (whatever that means) etc. BUT, is what the right question? Shouldn't we ask WHY the event happened? If we know eye protection was not worn, how does that help us resolve the problem? Does "retraining the person so they now know they should wear eye protection" really help? Ever wonder what percent of eye injuries occur because the injured did not know they should be wearing eye protection? Most industrial workers know they need the PPE, but they do not always wear it. WHY? Do they want to lose their eyes....probably not. To reduce the frequency of these injuries, we need to find out WHY.

This paper reports the results of an investigation into the WHY question. It focused on events where a person may have been killed. Based on the investigation, six primary causes were identified. The factor connecting the six causes was the emotional distraction associated with a high percentage of the incidents. The list of six was used to develop an experiential intervention designed to help people remain focused on their work, to help them avoid getting "hijacked", and to help them avoid hijacking the people around them. The paper reports the investigation approach, the list of six causes and their significance, and describes the intervention and its results.

Keywords: emotions, hijacking, safety

1. Introduction

Picture the following scenarios – they are real. You are driving down the road going to a meeting. You are running a bit late. Suddenly, a car pulls out right in front of you and you have to slam on the brakes. Your coffee spills. You start: a) cursing; b) shaking your fist at the other driver; c) pointing a finger at the other driver; d) wanting to punch her/him. Your heart rate is up 30 bpm; your BP is up to 160/110. What is actually going on? You are having an emotional reaction to a non-event! You have been delayed by 30 seconds to a minute – at most - so why all the physical and psychological reaction? How does this affect your driving focus? How much does your reaction increase your risk of accident/injury?

Change the scenario to the factory floor. You are a unit operator in a running a batch process in a chemical plant. The job should consist of checking the equipment, manually opening and closing seven valves to get the chemical mix and catalyst into the production vessel, starting the process, doing minor maintenance or watching the control board while the process runs, packaging the product (filling and manually handling 55 gallon drums weighing more than 600 pounds), palletizing the product, completing the paperwork. The only hard physical part of the job is the packaging/palletizing. But, today, you come into work and find the packaging and palletizing was not done on the previous shift and so today you will start with that part of the job – Joe, your counterpart on the preceding shift has not done his job again. This is becoming way too common, and recently it is happening at least a third of the time. In addition the supervisor expects you to hustle to get both the packaging and today's production done during the shift. You suggest to the supervisor that something be done about Joe's work ethic, and you get the standard "I'll look into it and get back to you" – again.

How do you react? Is it some variation of the driving scenario? How is your job focus affected as you begin working, and how does this affect your risk of injury? In the actual event, the operator began packaging by changing a large six-pound filter which was coated with oil and was hot (SOP calls for waiting until the filter is cold, but then she would not be able to get thru Joe's work and hers). She was really angry, and jerked the filter out of its holder; as it came out, her hand slipped, she dropped the filter and when it hit the floor hot liquid splashed up in her face – 3rd degree burns to face and chest and three weeks lost time. She was "emotionally hijacked", stopped focusing on her work, and ended up injured. The accident investigation blamed her for her injury because the SOP called for waiting until the filter and fluid was cold – but then should could not meet the production quota and she knew which was really most important at the plant. The investigation never addressed the WHY of her behavior or the pressure both she and the supervisor felt to make the quota even if it meant taking some extra risks.

Getting distracted while doing any task is a common experience for all of us. Partly, it's a function of the way the brain works (what meditation practitioners call "monkey mind" – most work does not require full time attention and so our mind hops around to what we are doing after work, the super bowl, etc.); and partly it's a function of the interactions we all have with life (things don't go right, someone "insults" us, we are focused on the speeding ticket we got on the way to work, etc.). When we are doing one thing with our bodies and a different thing with our mind our risk of error (accident/injury) goes up dramatically.

In this paper, we will discuss one approach to dealing with this distraction problem. It evolved out of a request from an underground coal mining company which had experienced five fatalities in less than a year, with all five happening to miners with more than twenty years of mining experience, and in every case the miner did something (chose to do something) that was obviously dangerous, violated company policy, and four of the five cases was an MSHA violation. The company contacted us in hopes of finding out what was going wrong and what might be done about it. Since we were good academics, our first thought was to do some research.

2. Methods

Since all of these miners (4 of them were supervisors) "chose" to do something that could lead to fatal results, our question was what makes a miner "choose" to risk his/her life on the job? Since we could not interview the deceased, we decided to talk to miners from all the mining specialties and esteem levels from bath-house attendant to mine superintendent. We developed an interview questionnaire and administered it one-on-one to miners while they were at their job-site. Nominally, it took an hour to administer the questionnaire, but actual time varied from 31 minutes to over two hours. Most of the questions were background and "fluff" questions designed to get the miners talking to us. The real focus was on these questions: 1) have you ever been in a work situation where you could have been killed; 2) please explain what happened; 3) how did you happen to get yourself into that situation; and 4) what were you thinking/what led to your making the choice to put yourself at risk of death for the company? It was question four that we was the focus of our interest, because the five dead men made this choice and did not live to talk about it whereas these interviewees had made the choice and did live to talk about it.

We felt that if we could discuss the risk-of-death/serious injury with a broad spread of miners doing different mining jobs at different mines and in both union and non-union mines, we could begin to understand what drove miners to risk their lives at work. We were able to collect data on the risk taking situation through interviews with 151 miners. Of the 151 miners, only two reported never perceiving that they were or had been at risk of losing their life while at work in the mines. We analyzed this data and condensed the results down to six general causes that resulted in the risk-of-death taking activity. The six general causes with their corresponding percentages of occurrence were:

- 1) Following management's orders (1-7%)
- 2) Inherent risk in situation (4-12%)
- 3) Making assumptions about the state of the situation (5-15%)
- 4) Miner did not know the danger existed (10-24%)
- 5) Unconscious Behavior (21-34%)
- 6) Conscious risk taking (24-39%)

Note: the numerical values represent the range of value obtained over four similar studies done in different work environments

A brief explanation and an example of each follow.

FOLLOWING MANAGEMENT'S ORDERS --- A person in authority directs a subordinate to violate the "rules"---- for example --- We have to meet the schedule and get the machine back on line---we don't have time for that inspection, maintenance, permit, etc.---just get it done now!

INHERENT RISK IN A SITUATION --- The job is as safe as we know how to make it---procedures in place, PPE used, etc. but there is residual risk ----for example --- The correct PPE is worn while working in the confined space, but the SCBA regulator has a random failure.

MAKING ASSUMPTIONS ABOUT THE SITUATION --- I assume that a particular condition exists in the process, but it doesn't --- for example --- A second person is assigned to help with the inspection---I assume he has locked out the power --- but he has not and I get a "charge" out of the job

MINER DID NOT KNOW THE DANGER EXISTED --- I do not know that the hazard exists --- for example --- I have never repaired this particular valve before – the valve has a hidden compartment where acid collects – not knowing that, I rotate it and splash acid all over myself

UNCONSCIOUS BEHAVIOR --- My mind is on one thing while my hands are on another --- for example --- I'm hurrying to get the job done so I can be home in time for my son's birthday party---my mind is on what I need to do at the party---my eyes are on the job --- or, Why did George yell at me this time?

CONSCIOUS RISK TAKING --- I know what the procedure calls for; I know what happens if I spill acid on myself or breathe the vapors; I bypass the procedure and wear no PPE --- for example --- No permit---no PPE---leaking line---I do it anyway--- I showed them I can do it my way---I get a “rush from taking chances --- this is easier and faster --- I'm too tired to go get the right equipment --- Accidents happen to someone else ...

Ask yourself, which of the six general causes is addressed by conventional safety training. In our opinion, it is number 4 – miner did not know the danger existed. This suggests that only about one-fifth of the potentially life-threatening situations are addressed by conventional –this is how you should do it – training. The remaining four fifths (80%) need to be addressed is some different way that addresses what is going on inside worker's head while they are working. In particular, in about one-third of the cases, the person is fully conscious of the risk and chooses to put their life on the line. While this behavior may make some sense for a firefighter, it does not make any sense for a miner or a chemical plant operator.

So once we had a better understanding of the problem, what could be done about it? For items 2 and 4, there was little we could do – we could not “fix” the risk, and conventional training was trying to address the “what are the risks’ and how to avoid them problem. For item 1, 3, 5, and 6 (which account for somewhere between 51 and 80+ % of the life threatening events) the workers’ thought patterns and ability to avoid being “hijacked” needed to be addressed. That is, their EMOTIONS and their importance to their behavior needed to be addressed. We developed a flexible content three day hands-on classroom based experiential training program followed by intensive individual follow-up. The classroom training provided the participants with an understanding of safety behavior in their work group and gave them tools to use to help them recognize 1) situations where they may become “hijacked”, 2) the physical/emotional signs they are getting hijacked, and 3) actions they may take that may mitigate the effects of being “hijacked”, and 4) behaviors that they manifest that may be “hijacking” other people in their work group. The follow-up involved a series of one-on-one meetings focused on individual responses to the program and its implementation in their work lives. The follow-up was found to be a critical part of the overall intervention – people do not change because they sat through a class or listened to a “motivational speaker”, they change because they see it as of value to them to make the change. The follow-up was very personal and focused on individual issues with safety and their behavior choices. Ultimately, we chose to call the program Emotion Based Safety.

2.1. Examples

Let us look at a couple of examples. Jerome was a roofbolter who had almost been killed when his bolting partner lost his temper when another defective roofbolt stopped his work and lowered both of their production outputs. When his partner finally got the defective bolt out, he was seriously “hijacked” and he threw it at the mine rib passing an inch above Jerome’s head. The defective bolts had been an ongoing problem that mine management had done nothing about and there had already been two injuries related to the defectives. After the class and during the first follow-up instead of the usual “this place is the pits” discussion, it was steered to being proactive and solving the problem (miners being proactive in problem solving had not been encouraged – that was a management prerogative). Management had participated in the class and follow-up and they agreed to consider a change in the way problems were solved. Jerome contacted the manufacturer who of course said there was nothing wrong with the bolts but they sent a rep to the mine to look at the bolts. The rep looked at the bolts, declared them defective, arranged for them to be sent back to the factory and a replacement truckload sent to the mine. The choice to make a behavioral change on the part of BOTH management and labor led to improved production and a huge reduction in accident risk. The opportunity for any of the roofbolters in the mine to get “hijacked” by the defective roofbolts was eliminated.

In a different example, Jerry, a first level supervisor, was thoroughly “hijacked” by life – a recent divorce, a collapsing coal industry that had resulted in a demotion at work, and a transfer to a poorly funded mine with old equipment where his salary was dependent on the coal production by each workshift. Jerry was well known as the man to steer clear of because he would yell, curse, and threaten when things went wrong which they frequently did. As indicated above, one aspect of the class understood your own “hijacking” related behavior and how to self-intervene. There was major equipment failure which completely stopped production. Everyone was afraid to be the one to tell Jerry. Finally someone told him. He excused himself, went alone into a nearby crosscut, spent a few minutes meditating, and came back to the group with a “come on guys, let's see if we can fix the problem”. No yelling or cursing and no getting “hijacked: or “hijacking” anyone else. Jerry's behavioral issues had come out during the “safety” of the class, and we had worked closely with him during the follow-up sessions. He

chose to change his behavior - and not let his emotions rule him - because as he explained, "once I understood what the result of my angry behavior was, I had to make a choice and either change or have things keep deteriorating – facing the reality of my behavior was not easy but work is better for all of us now and production has gone up".

At this point the reader may be curious – what did the class consist of? We were not miners or plant operators and though we had all worked in factories, none of us were skilled line workers – so we could teach them how to do their job correctly or safely. Rather the class focused on exposing them to a set of facts and activities that helped them experience comfortable and uncomfortable interactions with themselves and others. We quickly discovered there was considerable repressed anger related to their workplace, and the handling of safety issues, so we began each three day class with an open-ended discussion of safety within the workgroups participating in the class. This typically took 3 to 4 hours, which may seem a waste of time, but until the bit..... was done and out of their system, they could not even hear what we were saying. We took notes and passed the concerns that surfaced to the safety department and/or the plant/mine manager. Many of these items were corrected, which raised our credibility. The bit..... session gave people a venue to vent their frustrations and safety concerns which they had given up bringing up because management response had been underwhelming.

The next step was to move through the class topics which included the history of how we came to put the class together, the working of the brain and the limbic system, how these relate to getting "hijacked", the importance of our personal values, habits, and emotions in our behavior – and in particular what happens when we are asked to behave in a manner that is inconsistent with our own internal management system, the development of self-awareness of our behavior and its effect on us and others, emotional intelligence and how it can affect us and those around us, techniques for focusing including meditation, communication skills (to reduce the amount of verbal "hijacking"), how to work in teams, individual responsibility for our own safety, problem solving, and individual and team goal setting. The amount of time devoted to each section varied class to class depending on the needs and interests of the class.

3. Results and Discussion

What were the results of the program (classes + follow-up)? It is always a bit tricky to measure the results of safety programs since they do not get implemented in a vacuum. There are other things going on in the plant/mine that may affect safety. In addition, the number of injuries/illnesses is usually small so interpreting a change for 5 to 4 injuries is sketchy at best. With this in mind, two measures of effect were considered. First was the obvious one of "body-count". In the mine, within the participating group the injury frequency dropped from a historical rate of 2 to 4 injuries per year to 0 during the year after the program (the mine was sold to another company at that point and we lost access to the mine). In the other plants, the injury rates dropped by a half or more, and at one plant where the program was carried on for four years, the recordable rate dropped from six at the beginning to zero during the last year (and the plant was in the process of being closed during this year). Was it successful? It's a value judgement which depends on how important not injuring your people is – almost every plant/corporation talks about how important safety is (sometimes claiming it is number one) but we all know the reality is that profit is number one. The process – it's really more of a process than a program – takes a significant investment in time by management who must convince front line supervision and labor that they really do CARE about their people. So, like we said before, it is a value judgment and management must decide what it really values.

The second evaluation tool used three standard psychological tests that were deemed to be indicative of the skills that workers should have to be successful and safe at work. The tests were the problem solving inventory, the self-efficacy scale, and the self-confidence scale. Pre and post program tests were done for each. The results showed a statistically significant ($\alpha=.025$) improvement on each test. Again, the question is does this mean the process worked? Again, it is a value judgment – the statistics say yes it worked, but in the real world of working people, do p values mean very much? Finally, there was a qualitative evaluation of the results of the process. This involved having the participants respond on a Likert scale to a series of questions about the way in which the process had affected them. Depending on the plant, the responses showed that between 2/3 and 3/4 of the participants felt that their personal safety, the facility's safety, and their ability to deal effectively with personal "hijacking" were improved. In the final analysis, maybe this is the most valuable outcome – that people feel safer, feel they and their co-workers act more safely, and there is less overall stress in their workplace.

4. Conclusion

Occupational safety and health professionals and workers in general have been trying for most of history to find ways to reduce the frequency and severity of work related (and life related) injuries. The focus has been on making the work "safer" using techniques such as guarding, PPE, and SOPs that set rules for work. This effort has had great success in reducing the number of injury causing accident events. In spite of this, there continues to be thousands of workplace injuries every year. There are many factors at play here. One is the continued focus of management on the bottom line, with insufficient regard for the effect on safety – or as one facilities VP told us, "OK, I know we should have waited until we had the right equipment, but

we saved money and got the process back on line a half day sooner....and no one got hurt did they?" We added ...this time. The other is the continuing failure to ask WHY an event happens along with what happened. Had someone been hurt in the preceding event, the investigation would have said "used the wrong equipment", the fix would have been "use the right equipment", and the decision to use the wrong equipment by the VP would have gone unchallenged. Similarly, the agreement by the worker to use the wrong equipment rather than saying it is unsafe and I won't do it until it can be done safely will go unquestioned. In that case, "I was following orders" would be little compensation for a life spent in chronic pain or without an arm or leg. We must start addressing the emotional side of the safe/unsafe decision process if we hope to significantly further reduce the number of injury events.