A. C. Macris Consultants

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Highlights

The issue of employee safety performance has historically been an important consideration in highly critical industries. Electrical construction is one of those industries and one where lapses in safety have significant impacts on the individual involved, that person's family and the individual's employer. Ironically, those responsible for worker safety are considered impairments to productivity.

This dichotomy in today's business environment is an anachronism. Safety and productivity are completely in concert with each other. If the perspective changes so workers and managers look at safety and productivity as a system that go hand-in-hand workers experience fewer injuries, families are happier and businesses are healthier. This article advances this argument and ends up with a real world example of this system.

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Safety and Training: a sure bet that saves lives and money

by
A. C. Macris and Claude Chapman

Introduction

This newsletter digresses from our most recent focus on leadership and addresses a very important issue of industrial safety. Safety in the workplace, particularly in the construction industry, and even more so for electrical construction, is essential for worker wellbeing, productivity and quality. The dilemma is the perception that working safely conflicts with productivity. In the highly critical electrical construction industry, even with a well-developed safety program on paper, without worker and supervisor buy-in, worker wellbeing is at risk along with the company's insurance and financial wellbeing. We will explore the relationship between safety, quality and productivity, presenting the argument that all three must work in harmony.

I am pleased to have Mr. Claude Chapman co-authoring this article with me. Claude and I have worked together for several years on various projects involving safety and training for electrical workers, and he is a veteran in the industry.

The cost of not working safely

Safety in the workplace is traditionally viewed as a necessary evil. Operational managers and workers know safety is important, but if they can take shortcuts and 'get away' with it, then the job gets done faster, with the obvious benefits. On the other side of the safety issue is the Safety Manager or company Safety Vice President. These people eat, sleep and live safety. They feel like they are on a crusade. This difference of opinion creates a cultural divide between operations and administration. Here are some real world figures that illustrate the impact of safety on a company.

Engineering News - Record (ENR) magazine wrote an article in March of 1991 that compared two companies and their respective safety results. One company had exceeded the national average for accidents for over 3 years. The other company had a better safety program and fell below the national average. Using the accident frequency of each company, the Experience Modification Factor (EMR) or, more commonly the "MOD" rate for insurance was established for each company. The idea behind the MOD rate is this; insurance companies want to reward businesses that have low accident frequencies and try to motivate others to improve their safety performance. To accomplish this, a percentage modifier is applied to the basic premiums of all but the smallest businesses. The MOD rate is a multiplier applied to the basic insurance premium. So for our example, the company with a 0.6 MOD rate would pay 60% of the base insurance premium, while the company with a poorer accident frequency (1.4 MOD rate) will end up paying 140% of the basic insurance premium. It is interesting to realize that a brand new company starts with a MOD rate of 1.0. It becomes readily apparent how the MOD rate can have a significant impact on a company's operating costs.

Now let's compare the same two companies and look at what we refer to as Direct and Indirect Cost of accidents. First, Direct Costs are those costs that are realized as a direct impact of an accident – including doctors, hospitals, attorneys, etc., since it is common for companies to be self insured to a particular limit. Self Insurance is like a deductible on an insurance policy. Direct Costs are the expenses the company has to pay just because the accident happened. Indirect Costs are more illusive and can have even more impact on a company's financial well being - things like the cost of having people on a job assisting in the accident but not doing productive work. The job came to a stop because of the accident, but the costs are still incurred because manpower and equipment for the job is not being used. Production is falling behind, yet the manpower and equipment needs to be paid for – get the idea?

If a company stands up and embraces safe work practices for its employees, the employees will certainly be happier. Provide them with unsafe equipment and they will be neither happy nor productive. Establish the ground rules and stick to them.

Now, using the average Direct and Indirect Costs of accidents for the same two companies, assumes they are submitting bids for the same job. For this example (as is commonly the case in the industry), both companies have the same labor, equipment and overhead costs. They are bidding on a job estimated at 10 million dollars. Considering MOD rate and cost structure, the ENR publication example stated that the difference can be as high as 12% between the two companies. Twelve percent on $10 million is $1.2 million. Who do you think will win the bid? Remember, this does not factor in what we refer to as 'good will.' Good will means how the customer feels about doing business with a particular company. If a customer feels that they are at risk by doing business with the company with a bad safety record (a MOD rate greater than 1.0), they probably won't even consider their bid. Another concern regarding a high MOD rate is that it takes 3 years to change it for the better once it becomes greater than 1.0. The only reprieve is that it takes 3 years to change once it is good. We have provided a very tangible example of how safety can have a very direct impact on whether a company can be profitable, bid on projects and even stay in business. Once again, let's take even a different look at safety and the costs of not working safely. Any incident involving "serious injury" (i.e. back surgery) can cost a company $100,000 in Direct Costs at any given time. How many jobs have that type of profit built in? Remember we have said that Indirect Costs were illusive, typically aren't tracked and are too hard to establish. Also, recall what we said about Indirect Costs during an accident? Consider the effect on production, when more people will be helping the injured person than working. Another problem is the lost productivity after a serious accident. Several insurance companies state that productivity is affected by as much as 50% for several weeks after a serious accident or death.

Insurance data suggests that the ratio between Direct and Indirect Costs can range from 1 to 1 all the way up to 1 to 10. Historically, the average a ratio of 1 to 4 means the $100,000 Direct Cost accident will now cost $400,000 in Indirect Costs plus the original $100,000 Direct Cost for a total of $500,000. Again, how many companies have factored this kind of money into their profit margin? To put it into perspective, if a company made 2% profit after taxes, it would have to gross $25 million just to pay for the one $100,000 accident without any profit. At 5% profit they would still have to gross $10 million in order to break even.

All of the discussion of figures and costs above do not include OSHA penalties. Once accidents occur, the OSHA rules become keenly important. Penalties can range from a few hundred dollars to $500,000 and may even have criminal implications.

The behavioral side of Safety

Claude and I have been involved in the behavioral side of this whole safety issue for years. This section will discuss those attitudinal and behavioral aspects of safety and the associated benefits. First, let's talk about employee attitudes, and how the company people work for can shape those attitudes such that workers are safe and the company prospers. If a company stands up and embraces safe work practices for its employees, the employees will certainly be happier. Provide them with unsafe equipment and they will be neither happy nor productive. Establish the ground rules and stick to them. How does an accident affect an employee? In every case where an employee has a lost time accident, he/she experiences a negative economic impact. That means it costs them money when they get injured.
Is that an incentive to ask them to work safer? Will they be better employees when an employer wants to protect them? The general answer is yes. Back to establishing the ground rules, if there is an employee who doesn't appreciate a safe workplace, that person has no place in the company.

Let's look at another perspective, one that is rather common from workers. Their argument against safety is "do you want safety or do you want production"? For some reason, and we

believe there is a historical and cultural influence here, workers and even their foremen and general foremen have the notion that there is an inherent conflict between working safely and being productive. We are attempting, with this article, to dispel this notion. This type of attitude becomes a risk issue. What is the risk appetite of a worker, his crew and his supervision? If they have a high risk appetite then they are inclined to take more chances and circumvent safety procedures thinking that "it won't happen to me." The irony is that without safety the crew can lose all the productivity they gained or hope to gain for a long time. The consequences are so far reaching and significant that any potential payoff by not working safely is completely lost with costs that can take hundreds or even thousands of man-hours to just get back to a baseline.

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As a result of our work and several safety assessments in the industrial arena, we have been able to characterize three factors that contribute to injuries. They are complacency, blatant disregard for safety, and accidents. Most people know the fundamental difference between right and wrong work practices. A worker's experience is based upon this knowledge, whether it has been gained through direct or indirect involvement. Where experience becomes problematic is in job/project-specific situations. The short term experience on a job tends to create a sense of what can and cannot be "gotten away with." Success with repetitive tasks creates complacency. Complacency is the initial phase of a degradation of safety performance. As near-term experience is gained, complacency leads to blatant disregard for safety practices. Of course, there are other complicating factors that, when occurring simultaneously, create a synergistic effect that endangers a crew's ability to work safely (late in the day, lack of supervision, before holiday weekends, etc.). Finally, accidents will happen. There are situations where the unexpected and unplanned event occurs. In a healthy safety culture we like to think accidents are really the exception and happen very infrequently.

Hopefully we have illustrated the business consequences of not working safely. In addition, we want to reinforce the behavioral aspects that contribute to a company's safety culture. A final thought regarding safety is the impact that injuries and fatalities can have on a worker's family. So we know it makes good business sense to work safely, we know that we can improve safety and the safety culture through behaviors, and we all know that we want our workers and loved ones to come home safely and without injury. The big question is HOW do we do all this? Let's finish with one more statistic: The National Safety Counsel estimates that for every $1 spent on safety the return will be $4.

A Framework for Success

Now we are going to provide a framework for creating a successful safety culture and start reaping the commensurate rewards. This framework consists of six items:

1. Commitment
2. Performance Based Training
3. Onsite follow-up
4. Ongoing assessment
5. Feedback and change
6. Keeping the data

Realizing the scope of this newsletter we will provide highlights of each item, recognizing that books could be written on these topics.

Commitment

This item is perhaps the biggest, and, in many case, one of the most difficult to implement. Ken Blanchard very aptly noted the difference between interest and commitment. He says, "***There is a difference between interest and commitment. When you're interested in doing something, you do it only when it's convenient. When you're committed to something, you accept no excuses, only results."***

In the business of safety there can be no excuses, there is no convenience, therefore there is no mere interest – it must be commitment. What does this mean? It means commitment at every level of the organization. More so it has to start at the highest level in the organization. So the scenario goes like this: the President and Vice Presidents make proclamations that safety is #1, that safety is their priority, etc., etc., etc. We have all heard that. Then they put some 'rules' into effect and assume their job is done and leave to those who do the work to worry about safety. Not enough – it is never enough and has never been enough. Safety is not a proclamation, it is a daily vigil. A quick story: in the UK, the railway industry has companies referred to as Infrastructure Maintenance Companies. They perform all the heavy maintenance on the rails, switches, etc. One particular company had some safety issues and people were hurt. Realizing that the safety culture was degrading, the CEO of this company took action. He created his 10 Commandments of Safety. Ah ha, a proclamation! But more than that, and more importantly, he personally went to every worksite and met with all of his 2300 employees and explained his 10 Commandments of Safety along with his expectations. Then to make sure it stuck, he did the circuit again in about 3 to 6 months. You can rest assured that his direct reports as well as his employees knew exactly where he stood on safety, and that he was willing to

take the time to make sure everyone got his message directly. That is commitment.

Performance-Based Training

Making a safety program viable and effective requires a change in historic approaches to things. Safety involves complying with OSHA requirements, as well as implementing safety procedures and practices within a company. Training is an area where a tremendous amount of potential benefit can be gained. Performance-Based Training (PBT), simply explained, is training people for the job they are doing. It means training on the specifics of the job requirements and tasks to be performed. It also means scheduling and implementing training to correspond to task/work assignments. In contrast, PBT is not training for the sake of training in topics that are not pertinent to the job people are performing. We coined the term "Bureaucratic Approach to Safety" because of one of the safety assessments we conducted. We use this term when all the motions to be in compliance are fulfilled but there was little improvement in worker performance – actually, there may have been degradation in performance because the training provided was inappropriate and confused workers unnecessarily.

We suggest that training be based on the task-specific requirements, provided in a job-specific context with pre and post-testing to measure learning. We also recognize that a one-time classroom or workshop will not change behavior. Retention degrades rather quickly once a student leaves a classroom. There are four levels to measure learning:

- Level I : Reaction
- Level II: Learning
- Level III: Transfer
- Level IV: Business results

Levels I and II are commonly addressed. Level I measures participants' initial reactions to a course. This, in turn, offers insights into participants' satisfaction with a course, a perception of value. Level II measures the amount of information that participants learned. Trainers usually assess this with a criterion-referenced test. This is the pre and post testing referred to above. It is Levels III and IV that are the ones that are dealt with sporadically and are the most difficult to follow-up on. In the construction industry Levels III and IV are critical to a successful training program. At these levels the training and the performance come together.

Onsite Follow-up

How does one accomplish Level III measurement? This is where the culture of a company comes into play. Recall above we alluded to the notion that safety was perceived as counter to productivity? This is manifested by workers being keenly aware of when the safety guy is in the area. When the word goes out, everyone becomes more vigilant – safety glasses and hard hats go on and other safety behaviors kick in so the safety guy won't find anything wrong. Let's think about this – if we are to ensure that learning has occurred and is applied in the workplace shouldn't there be an environment where the safety guy is welcomed in the context of helping a crew transfer their classroom experience properly to the workplace? Typically the safety guy is best suited to explain the classroom material and how that information should be used in the field. To play games and fulfill the bureaucratic requirement creates a counter-beneficial impact – healthy behaviors are not being cultivated. In reality, the opposite is being created, a culture of deception. Onsite follow-up is essential to a successful training program and should be viewed as constructive and beneficial to the success of the job.

Ongoing assessment

Assessment is essential, but it should not and cannot be confused with Onsite Follow-up. If it is, the process breaks down. The historic culture is one of 'gotcha.' That fosters the behaviors of deception. Assessment takes on several forms and is a very involved issue. There is assessment of people, behaviors, process, training effectiveness and program compliance to name a few. There must be an overall safety assessment program plan. This plan outlines the various types of assessments, how they will be conducted, and all the other implementation issues associated with such an overall plan. People need to know where assessment fits in, what the consequences of non-compliance are, and when and how they can expect them to happen. Separate the onsite help with assessment. Have a strategy for assessing all aspects of safety within the organization.

Feedback and change

In the context of an integrated safety initiative, the only way to convert assessment to changed behaviors is to take the results of the assessment and determine some form of corrective action. If something isn't working, then it is essential that changes be made within the system to rectify those aspects of the overall program that are not yielding the expected results. This change requires analysis and a mechanism to constructively affect those areas requiring change. A healthy feedback and change component ensures ongoing improvement to safety performance and safety culture.

Keeping the data

In the world of construction workers, keeping track of them can be a monumental effort. They tend to be migratory, based on the type of work, geographic area, and seasons of the year. With large nationwide construction companies, a worker or crew may work in the northwest in the summer and the southwest in the winter. They hear of a big project in some part of the country that could be a long-term job and they go there. The difficulty arises in distinguishing the good workers from the bad ones. It is not uncommon for a marginal worker who exposes the company to safety problems to move from one area to another unnoticed, repeating his bad behaviors. On the other hand, it is important to know a good

worker's training and performance from a data management system, so if he is available, you know he is the person you might want for a particular job. This concept requires an integration of human resources information and training information. It also represents a departure from the historic notion that a company can go to the union hall and get a qualified worker for any job. Companies are finding that they need to take more responsibility for training and managing their human resources. By keeping data on both good and not so good workers and making that available to regional offices, mid-level managers can hire workers who they know have been properly trained and who understand the culture. In addition to these benefits, think of the cost implications. Think of it in terms of not repeating training that has been administered, efficiencies of hiring and the speed at which a good worker can be on the job. Once again we are demonstrating indirect cost savings and benefits with a well designed and implemented safety initiative.

Conclusion

While this is a brief article, we hope that we have built a compelling argument that safety, along with a viable and well-designed training and data recording system, converts to worker and business well-being. Claude and I have been dealing and working with these issues for a long time (Claude for all his adult life). We know that if safety and training are integrated into the business and culture of an organization, workers are happier, their families will know their loved ones work for an organization that values their well- being, and business is better. The big challenge is making it happen. To do what we are suggesting takes hard work, but we also feel there is a significant body of data and results that reinforce the positions we ascribe to here. If you want more information or specific data we have collected please contact us.

Real World Example

Claude and I believe in viable and energetic industrial safety programs and the importance of training that enhances technical knowledge and skills as well as safety behaviors. What is important here is translating good thinking into reality and results. Therefore, to reinforce the positions we are suggesting herein we are providing specific outcomes that we experienced as a result of formalized performance based training in the electrical construction industry.

First let's talk about grounding training. One company was experiencing injuries and even fatalities attributed to incorrect and inadequate understanding of grounding procedures. We designed a grounding training program based on performance based training methods. One of our major concerns was that learning occurred; plus we wanted to ensure that each training session was responsive to the needs of each class. While our training materials were based on the broad needs of the industry, each class was tailored to the strengths and weaknesses of those in the class for a specific day. Our approach was to have three different versions of a pre-test scenario. These scenario pretests set forth a set of job conditions along with the tasks to be performed. Each student was asked to sketch the grounding setup based on the conditions. We collected these pretests and checked them against correct diagrams for each scenario. Based on collective results of the scenarios we were able to identify where the training session should focus. A special note here; this approach requires a higher level of technical knowledge and instructional skills. Following the pretest we administered the training. Following the training session we administered a more generic multiple choice and fill-in-the-blank post training test. The post test was scored with a passing grade set at 70%. We trained over 800 linemen, apprentices, and laborers with the following results. We noted that only 49% of these linemen, apprentices and laborers were able to correctly diagram the grounding scenarios. On the post test, 91% of the same population scored greater than 70%. We also recognize that this is immediately following training and does not take into account retention issues. The overall performance improvement strategy was to follow-up in the field. That follow-up field work has started.

Another component of work was to maintain a rigorous database of those trained, and their scores. The one thing not mentioned thus far is what happens with those who do not pass the post test? One more thing we had to deal with was those individuals who passed the test, but missed questions that because answered incorrectly could result in injury or even death. Our reasoning is as follows, what good is it to pass a test and not understand such key concepts that could result in injury? To deal with this issue we flagged those individuals in our database and scheduled remediation sessions with each of these individuals. This typically was a one on one session so the instructor could be assured that these critical concepts were understood. Each individual was required to sign a sheet verifying that they completed the remediation session and understood the specific item they scored incorrectly.

The database we established maintained the complete spectrum of an individual's training – pre tests taken and results, post test questions and results as well as remediation training completed. This information is essential to ensure that no person would be assigned to a work crew without being properly trained or to not repeat training unnecessarily or too frequently. The field workplace follow-up is a major part of the success of performance based training.

Author Profile

Claude Chapman graciously agreed to co-author this article with me. We had been talking about this for quite a while, and we finally did it. Claude has a wealth of electrical construction experience. His industry work began in 1959. He completed an approved IBEW apprenticeship at the top of his class and taught the class for several years after graduation. He has been involved in developing many safety manuals in several locations including California and Colorado. Claude holds an advanced safety training certificates from the National Safety Council and for teaching on excavations and confined space along with OSHA 501 and 500 certifications. Claude has completed several college level safety training programs and more recently he developed the grounding of high voltage training programs for Transmission, Distribution and Substations discussed in this article. He is presently a Manager of Safety for the MYR Group.

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