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Introduction

A construction company has equipment and systems (processes/procedures) as well as people with which to build its projects. Both these areas have inherent risks which if not identified and managed may result in delays, inefficiencies, injuries and losses. In this paper we are going to address worker injuries, and safety. The ultimate goal of the safety function is to assist in creating a safe work environment for the workers on the construction site. Traditionally, this has entailed complying with the organization’s safety program. Generally all safety programs have the same fundamental elements which reflect the accepted safety practices as well as the national safety standards. Some programs include additional specific elements unique to the organization or project such as a substance abuse program, a fleet program, a modified duty program, a wellness program, lifestyle interventions, and incentives, to name a few.

In many organizations safety is treated as a stand-alone program, and is in all likelihood "owned" by the safety department. This separation from operations tends to focus interventions on the worker in trying to accomplish better safety performance as well as creating a safer work environment. These traditional safety activities have included rewriting or modifying programs, training or retraining the workers, emphasizing certain aspects of the program, setting up priorities, an emphasis on audits and inspections, giving incentives, or enforcing disciplinary measures. These interventions work to some extent but eventually they all "plateau and we know they do not achieve lasting improved results.

If it is deemed that the worker is not performing to expectations and the worker is a “keeper” then it is management’s responsibility to bring that worker’s performance up to standards. If the worker is not a “keeper” then it is again management’s responsibility to make a change. Allowing “deficient” workers into the work force is not a safety or quality or efficiency issue it is a hiring problem. Workers with very few exceptions do a good job in working efficiently, safely, follow direction and try to meet project goals and objectives. They have virtually no control over the planning, coordination, sequencing, flow and other project management process and procedures as this is a management responsibility. Therefore the greater opportunity for improvement falls into the management arena.

Training

The traditional approach to create a safe work environment is training. Sometimes this evolves into more training and retraining. Training is a necessary tool if and when there is knowledge deficiency. It does little to address capability, behavior, involvement, human nature, or motivation; to name a few. Interventions directed at “improving” the worker; takes the focus of possible management shortcomings. If we assume that the worker is to some degree intelligent, then it begs the question as to why a reasonable intelligent person makes choices that leads to an incident with its resulting loss and injury. There must be other “forces” in play, than knowledge deficiency.

Changing human nature with training is misguided. People make mistakes, their attention wonders, they become complacent, they make decisions based on a vast array of information, they make choices, and the list goes on! Humans are fallible. The construction process needs
humans to get the work done. Given this reality, one would assume that management would be best served to try to make the work environment, processes, practices, and procedures as risk free as possible; so as to ensure that the resulting outcome of the fallible human’s errors will have benign rather than catastrophic outcomes.

An extension of this thinking brings into focus another traditional safety intervention – PPE. If humans are fallible and make mistakes then PPE usage is not “full proof” as workers are going to forget to use the PPE all the time, or use it improperly. So, again reducing or removing the risk tends to be a more effective intervention technique.

The Importance of Planning

An operational reason for poor safety performance can be attributed to management's failure to plan the work with safety in mind. Construction jobs are dynamic, ever-changing and froth with risk. Planning is a necessary management tool which should include risk assessment. Safety is a managed process, just like any other in the construction business. One would not dream of running the job without a plan; safety management should also be treated with the same respect and diligence.

Planning and risk assessment are critical elements of the project estimate. Therefore, to set the stage for an injury-free work environment, the estimate needs to address this in its assessments of time, productivity, quality, safety and risk in its pricing structure. The next step is for operations to devise a tactical as well as logistic plan which evaluates the risks associated with the planned activities and selects appropriate means and methods with minimal inherent risks. For the planning to be effective, the organization needs to broaden the traditional approach to safety, which involves looking at hazards and exposures. To truly achieve safe work, it needs to address risk as well.

Risk management consists of the logical process of identifying and analyzing loss exposures, examining alternative techniques for dealing with these loss exposures, selecting the most promising technique(s), as well as implementing and monitoring the results to see if, in fact, the loss exposure has been dealt with most effectively. A comprehensive risk management process not only looks at hazards and exposures to the worker, but at all the risks that reside in field operations, in the tactical work plan, in the means and methods employed to get the job done, worker selection, productivity goals, resource available as well as the processes and procedures for executing the work.

Another reality of construction is that the work almost never goes according to plan, all the time. Changes, delays and disruptions, during the life of a project are almost guaranteed. This aspect of the inherent nature of construction impacts the “risk” picture. The greater the variability the higher the risk, which dictates the need to reassess risk every time change is encountered. So a good plan is one that is flexible and responsive to change and assesses risk.

So an integrated risk sensitive operational planning process, when applied to the project delivery plan, will take a holistic approach to the construction process. This kind of outside the box thinking will not only look to the worker for safe performance, and the physical conditions in which the worker works, but to everything under the control of management. The integration of risk management into the strategic as well as tactical planning will effectively address the loss sources and allow the contacting firm to approach the creation of an injury-free work environment in a systematic, objective way, while making the best decisions given available resources and information.
The Importance of Execution

Many injuries at the work site do not result from a poor quality safety program but from poor or ineffective execution. So another aspect of creating an injury free work environment is in the area of execution, where choices or decisions are made in the name of production to the detriment of safe work practices. Field management (superintendent) fails to adhere to the requirements of the safety program, and allows workers to take shortcuts in the name of productivity. Line managers (foremen) may "look the other way" when "productive" workers do not follow good safe work practices. All this may seem like it's benefiting the organization, but in the long run, the negative results are much more detrimental and insidious in nature. To create an injury-free work environment, operations must "own" safety and safe work procedures, must ensure that planning accounts for inherent risk and that workers diligently follow the required safe work practices at all times.

So it would seem that this is an area rife with opportunities for improvement. Almost all work in the field utilizes foremen. The sad reality is that management does not fully utilize this resource to its fullest extent in the area for safety. Traditionally foremen are given training is safety standards, when in fact what they really need is an education in management tools, techniques and leadership skills.

At the task level, the key position with the greatest impact in creating an injury-free work environment in construction field operations is the person having direct oversight of the work crews, responsible for carrying out the work, meeting productivity goals, planning the daily tasks and motivating the workforce. That usually is the foreman. It is the foreman who is with the crew most of the time and has the greatest opportunity to observe the workers' behavior, and has the authority to direct the work and make necessary changes. It is this person who should be held responsible to ensure that only safe work practices will be allowed on the worksite, that proper planning and risk assessment has been conducted, and that a safe work environment can and will be attained.

The Foreman's Role

Building on this obvious conclusion, the next question is, is the foreman capable of taking on this important and critical task. Hopefully the foreman has the necessary technical skills to effectively plan the work, understand and engage in risk assessment, and effectively execute. The foreman obviously will have to become fairly familiar with the content of the safety program, to be held accountable for the safe work practices of the workers under his or her supervision, as well as meet the operational goals.

Before the foreman is given the responsibility of managing the workers' safe behavior, let's assess the foreman's capability to take this on. There are three levels of expertise/experience in both the workforce and management. The workforce stratification starts at the bottom with the unskilled worker (helper), the semi-skilled worker (apprentice), and the skilled worker (journeyman). Management starts with the line manager (supervisor/foreman), the middle manager (superintendent/project manager), and senior management (executives). Within each group, advancement in the ranks is a progression from the bottom to the top. The lowest level manager (foreman) in construction traditionally comes from "the trades" or the workforce.

One becomes a supervisor (foreman) by being exceptionally good in doing one's job as a "tradesman." The tradesman must be a good technician, know the skills of the trade, be self-directed, productive, show initiative, and be a problem solver, to name a few. The requisite skill set for a supervisor are these same technical skills, as they must oversee other possibly less experienced tradesmen, but they also need additional skills. A few important new skills required
to be a successful supervisor are planning, organizing, controlling, risk assessment, administration, and human relations. These skills are not typically learned while practicing one's trade.

The Importance of Management Training

Newly promoted supervisors in construction are usually not given any management training. It is expected that they somehow can do this intuitively. Only a small percentage, however, have the innate ability to seamlessly make the transition. Most struggle to some extent, and some fail. This shortsightedness creates inefficiencies as well as increases the inherent risks in the work environment. No one would dream of tossing their kids into a lake and ask them to swim across without training, protection, encouragement and supervision yet in industry; we routinely do this to our employees!

If we assume that almost all of our workers are reasonably rational individuals, then the question is: Why do they sometimes act in such unpredictable ways? A simple response to that is that people and their personalities and behaviors are a product of their learned and life experiences. Though some of the employee's actions may seem irrational to the supervisor, they are perfectly logical to the worker. To really understand employees, the supervisor should be able to fairly accurately predict the employee's reaction to criticism, the assignment of a new task, or some change in operations or procedures. This is an important part of the supervisor's job.

Motivation

So, an important element in managing people is to understand the basics of motivation. People strive to satisfy a hierarchy of five basic needs (Maslow's theory), with the most elemental or compelling ones coming first. The first is the need to be, and stay, alive (biological). To satisfy this need we eat, breath, sleep, see, hear, etc. The next is the need to feel safe. We like to feel safe from accidents, pain and suffering, criminals, an uncertain future, a changing present, etc., and to this end we have laws, contracts, insurance, social security, etc. to protect us (security). The third need is the need to be social. Since the beginning of time, we have lived in social groups of one kind or another. This need is carried over to our family and work life. The fourth need is the need to feel worthy, respected, and valued (esteem). Since the other three needs are easily met in modern life, this one becomes increasingly important to the individual. And the last, being the need to do work that we like to do, and to do it well (self-actualization). The degree of the importance of these may vary in individuals, but basically they are operative at all times.

The supervisor needs to understand that the lowest order need that is not satisfied is the strongest at that moment in time. And once that need is satisfied, it no longer motivates or drives the individual to persevere. So if we want our employees to exert greater effort, we then need to address the next unsatisfied employee's need. People tend to move to a lower need level if they perceive that there is a threat there, this may include such things as change in general, and specifically shutdowns, layoff, acquisitions, new supervisors, policies, procedures, initiatives, to name a few.

Many people are happier at work than at home. The job may be challenging, the peers may be cooperative, and the supervisor supportive. Herzberg's theory, places the above five needs into two general categories. The organization generally provides for the first two levels of needs. The income provide for the necessary life needs and safety in providing a safe work environment. To have the social contact, be appreciated as well as enjoy one's work is more often a function of the individual's supervisor's actions and behaviors, management, and leadership style. A good
supervisor can go a long way toward satisfying the individual's need by the way they manage. This can be accomplished by treating the worker with respect and dignity, by making the work meaningful, being empathic, expressing appreciation of their efforts, providing challenging assignments, and being supportive, honest, and fair.

To achieve an injury-free workplace, we need the people in the organization behaving in such a manner so as to enable the achievement of the injury-free workplace goal. This applies to all levels within the organization. In construction, generally the only people whose behavior is scrutinized are the workers. The worker can control his/her behavior. But this is only one aspect of achieving an injury-free workplace. This, to some degree is addressed in some of the more progressive companies. They have instituted some form of behavioral safety. They manage worker behaviors through feedback and consequences. This can only be fully successful if all levels of management also behave appropriately and ethically.

If we look at the project delivery process, it is management who controls everything on the project. Management to some extent also controls the worker though hiring practices, task assignment, oversight, training and education, recognition and incentives, etc. Management controls the time, the speed, shift duration, the place the worker works, productivity goals, crew size, equipment, tools, etc. The worker really has two choices: to work or not to work. And since the worker has to earn a living, they will generally do what management wants them to do, sometimes even if it is not safe. Another aspect of this scenario is that if a worker willfully or unintentionally engages in unsafe behavior, then it is the responsibility of the supervisor to intervene and stop it. Therefore the first-line manager (supervisor) plays a key role in ensuring that the workplace is injury free.

To meet the organization's goals and objectives, management must manage performance. To manage performance, managers need to establish objectives, create standards, and targets. Employees must clearly know the organization's expectations and must be empowered and enabled to achieve these goals. So workers and all levels of management must have clearly established expectations and must be held accountable for them. Of course, it is understood that the organization must provide the resources, the knowledge, the information, the tools, and equipment to enable the employees to be successful.

The foreman is a grossly underutilized resource when it comes to managing safety effectively on the construction site. With a little education, some practical training, guidance, coaching, and support, the foreman can become a highly effective extension of management in the effort to create and injury-free work environment.