

Project Safety – Starting and Sustaining a Strong Process

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Introduction

No matter the size or scope of the construction project, preparing to implement an effective safety process that includes essential safety systems has proven to be vital to preventing injuries and workers compensation costs. Some would go so far as to say it is an art. And experienced construction safety managers and client officials will quickly recount the projects that have been less than successful and explain how a shaky start followed by the inevitable dismal finish often is caused by inadequate planning and leadership support. The most successful construction firms have a regimented sequence that ensures key safety and health systems are initiated in a timely manner and that includes the aspects of behavioral safety and other keys to success.

This paper will identify procedures, techniques and practices that are integral to the planning, mobilization, and initiation of safety systems and keys to sustaining the process throughout the life of the project.

The Owner's Perspective

Owners or clients have a unique perspective with respect to how safety is influenced on a project. The most successful projects have a blended approach where the owner has a robust process and systems that provide an appropriate infrastructure for safety and health but carefully cross no legal lines with regard to co-employment issues. An owner is in the best situation to *influence* the contractor and not to *manage* safety for them. This can be achieved in five simple yet integrated processes—**Contractor Qualification, Contract Preparation and Award, Orientation, Monitoring Contract Compliance, and Performance Evaluation.**

Contractor Qualification

Owners are best postured for success when using a system that provides a method for the selecting of safe contractors. This can be achieved by using a third-party clearing house or internal processes that assess a contractor's safety and health systems. Only those contractors with a proven safety and health process should be allowed to bid. The screening criteria can vary from owner to owner, and the most sophisticated owners not only look at the obvious measures such as the lagging indicators (OSHA RIR, LTR, Citation History, or the EMR) but look at the strength of safety and health systems as well. This is an essential step that provides the owner with a level of control of the quality of contractor.

Contract Preparation and Award

This is the step in which the safety and health requirements and expectations are established and communicated during the contract bidding and award process. Owners should have the safety and health requirements clearly delineated in the contract language. Merely referring to federal, state and local requirements (while it is prudent to include this) in most cases does not establish the owner's specific expectations. By then holding successful contractors accountable to the terms and conditions of the contract, the owner is upholding the same standard for safety and health that they would hold for other areas of a contract, i.e., schedule, cost, etc.

Orientation

One step that could be overlooked is the review of the safety requirements of the executed agreements with the contractor, including any pertinent project specific information. This allows any questions to be addressed and clarifications obtained before any work starts. The contractor should make sure that each craft person is provided an adequate safety and health orientation as well.

Monitoring Contract Compliance

The owner cannot simply hire a contractor and turn them loose on the site without any oversight. A prudent owner will continually provide surveillance over the work that they are paying for and exercise their right to hold the contractor to meet the terms and conditions of the executed contract. Many owners will have non-compliance tools in their contracts to deal with errant contractors. The use of the tools is not pleasant but necessary in case of non-compliance. This part of a successful project does not have to be adversarial however, and many owners enter into a real partnership with their contractors realizing that it is in their best interest with respect to all areas of loss control.

Performance Evaluation

Owners must hold their contractors in compliance with all applicable regulations and to the terms and conditions of the executed contract. Additionally, it is prudent to ensure contractors are utilizing construction industry best practices, such as those promulgated by CII (Construction Industry Institute) and CURT (Construction Users Roundtable). By doing so, the owner has the best prospects for a successful project.

The Contractor's Perspective

Contractors have much to gain by establishing a zero-injury oriented safety process. Loyalty of their craft workers, greatly enhanced morale, reduced costs and improved opportunities with discriminating clients are but a few of the advantages of a strong safety process. While owners

will influence the contractor, the builders that are demonstrating safety, productivity and quality best serve the owner's interest no matter what the type or scope of the project. Similar to the owner, safety is initiated by implementing four simple yet integrated processes - **Contractor Qualification, Orientation, Ensuring Contract Compliance, and Continual Improvement.**

Contractor Qualification

Owners can strengthen their potential for making a short list of qualified contractors by preparing proposals that illustrate state-of-the art safety systems such as expressing that a value for safety is paramount and that careful attention is given to at-risk behaviors. This, coupled with concise but complete explanations of their process and a professional safety presence will help convince the most exacting owners that the company is worthy of trust. And, of course, OSHA incident rates that meet the owners' expectations are essential.

Orientation

The construction firm must readily accept the requirements and guidance expressed by the client during post-award meetings and orientation to the project. A sincere commitment to their process is essential and immediately upon learning of the requirements, writing of a project specific safety plan should be initiated. At this point, strong relationships with the owner are essential because it is inevitable that the contractor will need to ask for clarification or approval of safety systems. The contractor must adjust their project safety orientation to comply and of course, it is essential that the client be involved in approving the orientation. This is one of the critical steps as the project begins to mobilize and particularly on larger projects, sufficient resources should be dedicated to a very professional production.

Ensuring Contract Compliance

Owner's oversight initiatives, hopefully, are a waste of their resources. A strong knowledge of the contract and especially the client safety requirements is essential. But "coasting" through the project without internal assessments is foolhardy. The goal should be to stay two steps ahead of the client in the identification of improvement areas. Management audits and project inspections must be regularly conducted and trends documented and corrected as warranted. Close liaison with the owner's representatives and their participation in safety committees and other activities will enable redirection without the threat of contract violations.

Continual Improvement

Contractors must know the owners' safety "hot buttons" and in part, exercise flexibility to build their process to maintain strong relationships with owners' representatives. Some owners place importance on OSHA incident rates, others demand a strong behavioral process, and yet others insist on no disruptions to the public or environmental incidents. Occasionally, an owner is adamant about all these systems and factors. As previously stated, owners stress construction industry best practices and construction firms who model their systems after these practices are most often successful as shown by CII research. If the contractor approaches the project as a "learning lab" and continually adjusts their systems to thwart adverse trends, the likelihood of zero injuries is much greater.

Planning

Many construction companies and owners have definitive processes for planning health, safety and environmental systems and sustaining the process during the life of a project. Experience has demonstrated that the level of planning can be influenced by many factors including project

scope, design complexity and lead time before mobilization, not to mention the nominal level of intensity of the company's pre-project planning effort.

There are four categories or stages of construction project planning,

First is the Design for Safety (DfS) effort that involves architects, designers, owners and sometimes the contractor if they have been selected in sufficient time to take part in the process. Although this process initially addressed safety of the end user's facility, recent efforts have been made to include or broaden the DfS to include safety and health during the construction phase. The reasons included research findings that showed an alarming statistic that identified that 61% European construction fatalities resulted from design decisions that were made before mobilization. For various reasons, including fear of liability, architects and designers are reluctant to contribute to DfS and the process is slow to evolve as an effective incident prevention tool.

The second stage of construction safety planning involves constructability which has been employed on a widespread basis as a result of the Construction Industry Institute (CII) emphasis and education on the process. It is utilized more commonly than DfS and rather than a review of safety and health during the design stage, and is defined by CII as:

A system for achieving optimum integration of construction knowledge and experience in planning, engineering, procurement and field operations in the building process and balancing the various project and environmental constraints to achieve overall objectives.

Safety, health and environmental considerations are now reviewed during the constructability effort and focus on such items as modular erection, sequencing of steel to enable installation of platforms and stairs, crane and lift conflicts, congestion, access and egress, emergency preparedness and many other issues. But this effort must involve key knowledgeable construction managers and safety professionals and be conducted sufficiently in advance of mobilization to enable corrections and redirection.

The active practice of constructability is much easier in design-build firms as the designers and contractors are in the same company and sometimes the same office building. But more often, an owner contracts with an engineering firm and, during the design phase, seeks bids from a building contractor. In so doing, the communication between the engineer and the contractor may be sparse and planning and coordination to enable safe construction may be lacking. The owner must guard against this lack of communication and should facilitate the safety reviews, although it is more common for the construction firm to emphasize planning to ensure the success of the project.

The third, and probably the most important system is utilization of a Pre-Project HSE Checklist or Construction Hazard Assessment (or other such name) before mobilization. This document helps identify considerations involving fall protection, confined spaces, excavations, PPE, permit systems, mobile equipment, dual language and environmental requirements, emergency contacts and medical providers, among other areas of interest. Typically, this checklist is between 3-25 or more pages and upon completion serves as an action plan for project implementation with the assignment of responsible persons and timelines. This serves as a training needs assessment and a source document for the development of the project specific HSE plan.

And the fourth is indispensable and is a standard requirement in many companies. The Job Hazard Analysis is conducted of specific risky operations and is designed to specify actions to

resolve hazards that may have been identified in earlier planning steps. The Job Hazard Analysis is utilized to identify risk and take actions to ensure reduction of the risk before the project starts. There are various formats including the AIA, Corps of Engineers, and National Safety Council standard forms but many construction firms have developed a specific version. The JHA should be kept on file and used to educate crews that will be involved in the specific task.

Mobilization

When we finally get the go-ahead to start construction, the intensity of effort dramatically increases and many activities are accomplished simultaneously. Construction managers are assigned, equipment is ordered, and safety systems are initiated. The mobilization process will be accomplished far more smoothly if the planning process was carefully conducted. A list of mobilization activities follows:

- A safety manager or designee is assigned/appointed
- The safety orientation is developed
- Arrangements are made with an occupational medicine clinic
- Administrative trailers are moved to the site and training spaces are established
- Supervisors receive first aid and CPR training
- Emergency evacuation posters are erected and emergency phone numbers are listed
- Safety training is planned and the key training requirements are prioritized
- A training lab with scaffolding mock-ups, fall protection and other displays is constructed
- The project specific safety plan is published and sent to subcontractors who bid work
- Supervisory responsibilities are clearly explained
- Teambuilding sessions are conducted with contractors and client personnel
- Substance abuse testing capability is coordinated
- PPE, fire extinguishers, spill kits, atmospheric monitors, barricade tape, first aid supplies, safety signs and pertinent company forms are ordered
- Subcontractors are integrated into the project
- Toolbox talks, safety committees and pre-task safety checklists/forms are initiated
- Incident reporting and investigation capability is established

Making a list of mobilization tasks is but the first step. Knowing the pitfalls that can occur during mobilization is also important. One of the most prevalent is starting some tasks without qualified equipment operators, competent persons and craft workers without the requisite safety training.

Other pitfalls include subcontractors who install trailers and others who are not properly trained and have a minimal safety culture. Incidents often result during these operations. Other deficient operations, such as poor traffic control during mobilization have presented hazards and incidents have resulted. And of great concern during mobilization is the feeling by all craft workers that safety is not valued because there has been little opportunity to develop a safety culture and reinforce the concept that supervisors and managers take safety seriously and fully support the process.

Initial Implementation of Safety Systems

The mobilization phase ends when the construction work begins. And many of the immediate needs as described above should be established. But, inevitably, some systems may remain to be started or at least “polished” to the standards expected within the company and by the client.

Commitment

After mobilization, and when a significant number of craft workers are on site, all managers and supervisors must jointly meet to agree on a total commitment to project safety and health. Whether a hard hat decal with their signature made by a Sharpie is used to show their commitment or a banner or poster is signed by all and posted in a conspicuous location, the workforce will be constantly reminded that they have given their full commitment to the prevention of incidents. When conducting the commitment meeting(s), providing a lunch and perhaps a token such as a ball cap or tee shirt with a safety slogan that denotes their commitment is a motivator. On large projects with more than 100 or so workers, it is also an opportunity to bring a guest speaker to address the workers and it may be necessary to conduct more than one commitment meeting as the various construction crafts join the project. Make no mistake, this is but a small part of the zero incident process, but when combined with other initiatives, it has been shown to contribute to the workers’ feeling of support by management and may instill a belief that all incidents can be prevented.

Staffing

Perhaps one of the most controversial issues when initiating safety on a project is the professional support that workers need to achieve zero injuries. On industrial projects, particularly in the process chemical and refinery sector, it is common to assign a safety professional to support each 50 workers on the project. However, on commercial building projects, it is rare to find a full-time safety professional on jobs that have fewer than 100 or even as many as 150 workers. On government projects, particularly those managed by the Corps of Engineers, specific thresholds of worker populations and BCSP certifications are needed depending on the complexity and duration of the project.

No matter what the influence by the client, each project, no matter what the size, must have assistance from a safety professional. In some cases, it might be the company’s insurance safety engineer that helps once a month or the construction company may have a safety consultant on retainer. Better yet, a safety professional will be assigned in the company and will be monitoring the safety process and actively participating to redirect activities when needed, even though they might not be present full-time on the project. But the larger companies and those engaged in industrial or Corps of Engineers work will most likely be required to have a safety professional assigned, and even those smaller firms that work in process chemical and other industries will most often have a degreed safety professional with a safety certification to manage health, safety and environmental programs.

When no safety professional is assigned on a project, it is common to appoint a safety representative from the workforce to perform safety duties on a part-time basis. It is generally understood that the worker must have, at a minimum, the OSHA 30-hour construction course and a full understanding of company safety procedures as well as a value for safety and strong motivation.

Safety Training

During the planning phase, a training needs assessment should have been conducted to organize the training that to be budgeted and prepared for the workforce. The key is preparing the course materials or purchasing an on-line or video package in time to train newly assigned employees. Some of the training that applies to all workers must be done during safety orientation but other subjects, such as competent person training and specialty training in excavations, confined spaces and fire watch qualification may be done after hiring before the task is initiated.

One of the oft neglected issues is the qualification and experience of the trainer. Whenever possible, highly qualified outside trainers, often from vendors, insurers, AGC or ABC, or consultant firms are a better choice than marginally effective company resources.

Testing is mandatory for most, if not all, training subjects. But testing should not be used for validating that the worker understands every detail; rather testing should be done to reinforce key concepts and requirements that we want the worker to remember. And it is critical that the test always be corrected to 100% so the worker understands the subject matter.

Behavioral Safety

Very few construction companies implement the full behavioral-based observation system, but many use behavioral safety principles in the leadership training provided to supervisors. A behavioral safety topic that is often neglected is training workers in safety to understand what causes them to take shortcuts and exhibit at-risk behaviors. Reasons such as seeking a promotion and trying to impress the boss or striving to avoid criticism for lax productivity can result in unsafe behavior when the boss's back is turned. Peer pressure can be another factor when a good worker cannot resist succumbing to other workers who want to push productivity to higher levels. The goal is to instill a value for safety, and when workers understand what tempts them to adopt at-risk behaviors, their decisions can be controlled, especially if they understand the consequences of their behavior.

It is common knowledge that all key construction safety systems and management support must be in place and functioning at a high level before any behavior-based observation system is implemented on a construction site. Once again, training is the key. Supervisors must understand the system and workers who are selected as observers must have comprehensive training as well.

Often forgotten is the need to train all workers on the site, since as an observer approaches a worker for an observation, they will tend to cooperate with advance awareness of the system and intent.

Safety Systems

Aside from the systems already mentioned, many are mainstays in construction safety and are routinely implemented by most companies. All have the potential to enable employee involvement when managers are creative. Among these are:

- **Pre-task Safety Planning.** This has been a key system in all large construction firms and has spread to many subcontractors in the last ten years. The Construction Industry Institute promotes this as one of the nine elements of their Zero Injury Study.
- **Mass Safety Meetings.** Often used for special occasions such as safety celebrations, guest speakers, reinforcement of key topics or, unfortunately, stand-downs after a serious incident, they can be very effective in highlighting management support.

- **Toolbox Safety Talks.** Also known as weekly safety meetings or tailgate meetings, these are used to relay key safety information and may serve as a platform for mandatory training. They are almost always scripted, presented by a foreman in a small-crew setting and documented with a sign-in sheet and summary of the training to keep a record.
- **Safety Committees.** Depending on the union or non-union status, these can be managed in different ways, but the key is to secure a motivated representative from each craft and subcontractor company, although on very large projects, a separate subcontractor safety committee may be formed. A key part of the committee is accountability. Issues surfaced by members must be addressed and either corrected or explained to the project population and minutes are essential. They must be posted for all to see.
- **Safety Inspections.** Most companies have a procedure that outlines who inspects, how they are trained and how often inspections are completed. Many companies also have standard checklists and systems to record the results and determine trends. The important element is that once a deficiency is identified that it is recorded and corrected, remembering that imminent danger risks must be fixed immediately or guarded to prevent exposure.
- **Incident Investigation and Reporting.** Every company must have an established procedure to facilitate incident investigations by trained personnel. The goal, of course, is identifying the root causes and the corrective actions that will prevent recurrence. In the author's opinion, much can be learned from attending a training course for a sophisticated commercial root cause incident investigation process, but realistically, very few companies have the capability or resources to consistently implement complex investigations. The key is understanding the basic concepts and always asking "Why?" after each cause to get to the root and identify the corrective actions. Then, and most importantly, following up to make sure the corrective action is complete.

Sustaining the Safety Process

One unique aspect of construction as compared with general industry is the continual changes that are evident as the work proceeds. Craft workers flow in and out depending on the stage of the project in most industrial and building construction projects, and even transportation infrastructure has turnover depending on the activity. This presents continual challenges to managers, supervisors and safety professionals throughout the project but there are several techniques that are employed to keep the zero-incident goal viable throughout the project.

The best practice is to keep the safety process fresh throughout the project. In other words, new initiatives every month or two are needed to ensure the workers focus on safety and health. A few of these initiatives are:

- Slogan contests that result in use of the slogan on hard hat safety decals, banners, posters and tee shirts
- Measurements of involvement in the safety process that culminate in celebrations and recognition of workers who contribute to safety
- Frequent management and supervisory presence on the project with development of strong relationships between supervisors and workers
- Safety luncheons with interesting (and informative) outside guest speakers
- Initiation of a recognition program that is used to reward workers for observed safe behaviors

- Monthly luncheons held regardless of safety performance; when an incident occurs the results of the investigation are briefed but when no incident happens, the workers are recognized for their performance
- After a few months on a project, hire a consultant to assess the systems or bring a corporate or insurance representative to the site to determine if redirection is needed
- Special emphasis programs using promotional materials to help reduce trends such as hand and finger injuries
- Retraining when weaknesses are detected. For instance, if pre-task safety checklist accomplishment is deficient as a trend, everyone must be retrained
- Stand-downs when it is apparent that redirection of the process is needed

As a project winds down, it is certainly prudent for owners to evaluate their contractors for several reasons. The most evident reason is to ensure that the scope of work was met with regard to cost, schedule, and safety. These evaluations are also helpful in determining which contractors are to be considered for future work. Obviously, many owners are more apt to use the same contractors as they see a successful track record.

Summary

Careful planning and adherence to a proven safety process will enable zero injuries on any project with experienced professionals in leadership positions who believe in safety as a value.

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