

## **A Model for a Quality Safety Program**

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The construction industry is one of the largest industries in the world, both in dollar volume and in number of people participating. As a result of the number of participants and due to the inherent danger in the work involved, it is also the industry with the highest accident and injury rate. With rising insurance costs and the increasing threat of injury related lawsuits, many companies find it difficult to compete, or even survive, in this highly competitive industry. The purpose of this research project is to illustrate how basic Total Quality Management principles can be used in developing a health and safety plan that any typical construction company could adopt and implement.

**Key Words:** Total Quality Management, TQM, Construction Safety, Quality Safety Program

### **A Model for a Quality Safety Program**

Total Quality Management (TQM) is a management tool involving strong commitment to two basic principles: customer satisfaction and continuous improvement.<sup>(3)</sup> There are a number of elements common to most TQM programs as follows:

- The senior management of the company are strong supporters of TQM and completely understand its functions and values. They are willing to commit resources, especially for training, to implement the program.
- Employees have more say in how work gets done and they are encouraged to participate in the decision-making processes that affect them. They know they are welcomed, even encouraged, to make recommendations and observations at any time. In addition, they are encouraged to question policies and procedures that prohibit them from doing their job properly.
- Employees receive training in quality awareness. Technical training is provided to improve existing skills and develop new ones.
- Middle management understands the value of a well informed, highly competent, trained and motivated work force. They are trained to relinquish some of their power and behave more as coaches or mentors.

The end result from a successfully implemented TQM program within a company is increased customer and employee satisfaction, better relationships with other members of the team, lower cost of doing business, less litigation and a better prospect of being in business in the future.

The same TQM principles can be integrated into a health and safety program regardless of whether a company has implemented an entire TQM program. The most important aspects are

for senior management to recognize the need and value of a well-implemented quality safety plan, be a strong advocate of it and sell it to the employees to make them realize the need and value of it. Just as with a TQM program, everybody must constantly strive for improvement. With respect to safety, the goal should not be to have less accidents and injuries than the previous year, but, to have zero accidents and injuries every year. An important feature of a quality safety program is to be proactive in preventing accidents by training employees in safety awareness to identify potential hazards and prevent accidents before they happen.

### **Quality Safety Program Model**

Contained herein is a proposed model for establishing a Quality Safety Program. Figure 1 gives a simple overview of a typical program and the subsequent figures provide greater detail to each section of the program. All the figures will be discussed in detail. Everything discussed throughout this model is recommended or proposed. Any company that chooses to use this model will find items that may not necessarily apply to their company or may determine that some of the items need to be molded to fit their company.

Management takes the lead role in establishing a Quality Safety Program. Notice in Figure I that the first two actions are developing a mission statement and committing resources. By commencing with these two steps, management has already determined its commitment to improvements related to safety performance. The mission statement is created to provide direction for the safety program. It is simply a level of achievement to strive for. It should be a realistic and attainable objective, such as eliminating all lost time accidents and injuries. Even though a desirable goal is to eliminate accidents and injuries altogether, lesser, intermediate benchmarks should be established as a way to measure improvement.

The next step for management is to commit the resources necessary to develop and carry out the Quality Safety Program. The initial commitment should be to name a Company Safety officer and provide him the freedom to set up and administer the entire safety program. Upper management should remain involved in developing and approving the company safety program, but the administration of it should be left to the Company Safety officer. Putting the safety plan into operation is not a quick and cheap endeavor. Depending on the size of the company, it could take a year or more to get the entire staff trained and familiar with the safety program and teach them what is expected of them. With a resource commitment of this magnitude, management's dedication to the Quality Safety Program should become apparent to the employees of the company.

The next step by management is to determine where their most serious problems are. All companies are required by law to maintain OSHA 200 logs that record injuries and accidents that occur during each year. This log can be used to review the company's safety performance on a quarterly basis, as a minimum, and project whether goals will be met by the end of the year. If it appears that the safety objective may be met if the current trends continue, the indications are the safety program is succeeding. If it appears that the safety objectives will not be met, two things must be considered; first, are the objectives of the mission statement realistic, and second, how does the current safety program need to be revised?

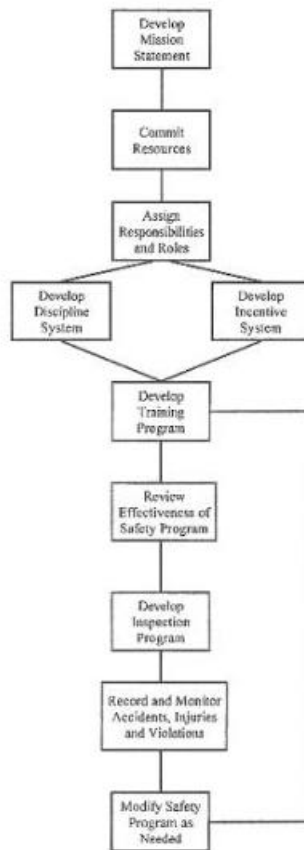


Figure 1. Overview of a typical program.

Information to revise and modify the Quality Safety Program must be compiled continuously, but formal changes to the program should be limited to only once or twice a year. The more frequent the changes, the more confusing the program becomes. The information from the OSHA 200 log can be used to look for trends in the accidents and injuries. Factors such as type of tasks, weather, time of day, time of year and type of equipment used may reveal areas of the safety program to address.

### *Roles of Management*

Referring to Figure 2, additional management functions can be seen. The next step is to assign roles and responsibilities to individuals within the company with their functions stated clearly within the safety program. As was discussed earlier, the most important role is that of Company Safety officer. His/Her primary responsibility is to develop and administer the safety program. It is essential that he/she has the authority to manage safety in the best interest of the company. Other roles and responsibilities are discussed later.



Figure 2: Role of management

The next step, led by the Company Safety officer, is to develop the training program. The training program should consist of a general review of safe work practices, specific training in areas where accidents and injuries historically occur, specific training in unique work activities and regularly scheduled training refresher classes. The training program should follow the guidelines required by OSHA's Occupational Safety and Health Standards for the Construction Industry, 29CFR Part 1926.

The next two steps are management's attendance in the training sessions and management's participation in inspections. These roles are important for two reasons. First, they illustrate their commitment to the safety program by involvement. Second, management receives valuable background information in hazard recognition and abatement and aids in the evolution of the safety program. What follows next is the quarterly review of accident, injury and violation reports and the annual review of the overall effectiveness of the Quality Safety Program. Based on the results of these reviews, the safety program can be modified as needed. Then, as Figure 2 illustrates, any revision to the safety program is incorporated back into the training program.

### *Assignment of Roles and Responsibilities*

Referring back to Figure 1 (and as briefly discussed in Figure 2), the next step is to assign the roles and responsibilities of individuals within the company. This is illustrated by Figure 3. The first and most important role to establish is that of Company Safety officer. His/Her function is to develop and administer the company's safety program. In addition, he/she is involved with the creation of the training program and site inspections.

Next, the company must decide how to divide responsibilities among field personnel. Some companies, especially smaller ones, elect to include the safety duties under the Site Superintendent. Other companies prefer to have a Site Safety officer on site. Together, the Superintendent and the Site Safety officer direct the progress of the project in a safe and efficient manner.

Led by the Company Safety officer, all the individuals involved in some aspect of safety need to provide input into the development of the Quality Safety Program. Whether it is through observations during inspections, accident and injury reports or accident investigations. Historical company records and the wide range of individual experiences and training provide the best sources of information during the formation of the safety program.

Two important elements of the safety program are the development of a discipline plan and a reward plan. The discipline plan is a method for handling those employees who disregard the safety policies and endanger other employees. An example would be a simple write up and hazard abatement on the first violation, a written warning on the second violation, possibly accompanied by an unpaid day off or termination on the third violation. The incentive plan can be used to recognize individuals who demonstrate good safety practices or safely accomplish an extremely difficult task. Incentive could include additional paid vacation, prizes or awards. Once the safety plan is accepted by management, it is to be incorporated into the training program. In the training sessions, the employees are made familiar with what is expected of them as they perform their jobs from the safety perspective.



Figure 3. Roles and responsibilities.

### *Training and Education*

The primary training guide to be used is The Occupational Safety and Health Standards for the Construction Industry, 29 CFR Part 1926 manual, which is published by the Occupational Safety and Health Administration.

Employee training is as follows:

- Management receives general, comprehensive training, updated as required.
- Superintendents receive general training, updated as required, and specialized training as specific tasks may require.
- Employees receive general training, updated as required, and specialized training as specific tasks may require.

Most formal training is required to be updated annually or every other year and it is a good idea to conduct a brief refresher at the onset of a risky activity. Usually, weekly "toolbox" safety meetings at the jobsite can serve this purpose.

Periodic monitoring of the OSHA 200 log, as described earlier, is a good indicator of the success of the training program. Reoccurring accidents will point out areas needing more rigorous

training. In addition, when there is a particularly dangerous or highly unusual task to perform, a Job Safety Analysis (JSA) is a very helpful training tool. The superintendent or their employees actually performing the work will review the activity by describing in detail each step of the activity and the problems and hazards expected to be encountered. They will then meet with the Project Manager and Safety Coordinator to review the JSA and the entire activity. The discussion will include preparation for the hazards to be encountered, as well as how to deal with various problems they may face. Alternate methods to perform the activity are also investigated.

Referring back to the overview of the safety program in Figure 1, the next action is to develop a training program. Figure 4 illustrates the training in greater detail. As previously discussed under the category of roles and responsibilities, the training program is developed as part of the Quality Safety Program by the Company Safety officer and endorsed by management. Upper management then receives comprehensive training while the Superintendent and the Site Safety officer get an additional specific training pertinent to the activities performed in the field. All the employees receive the same general training and specific training as the Superintendent plus more training for any special or unique task they may be required to perform.

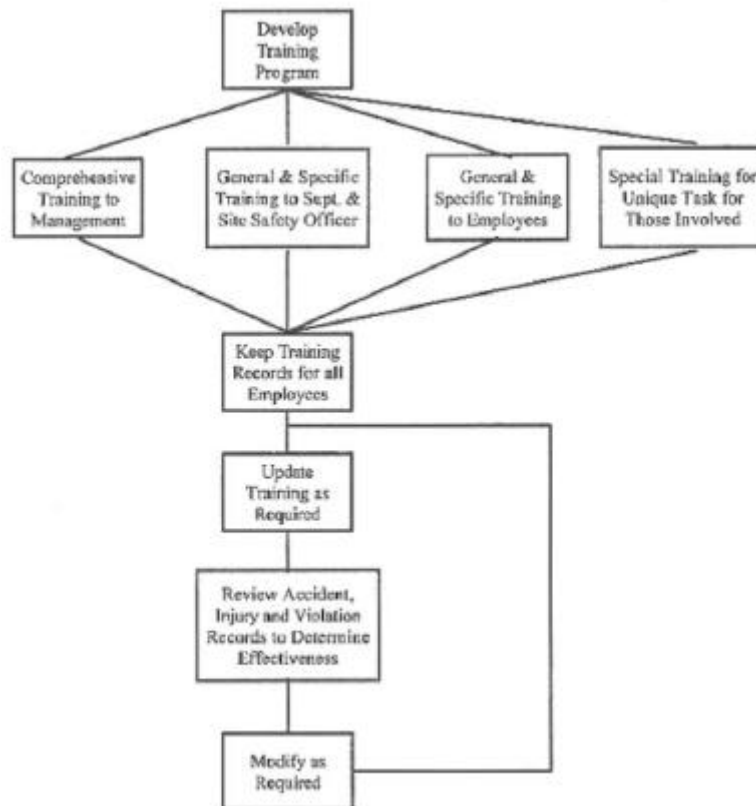


Figure 4: Training program

It is critical that the company keeps accurate records of all training sessions conducted for the employees for several reasons. First, a project may come along, especially a government funded project that requires proof of training for the owner to award a contract. Another example is during an accident investigation by OSHA, the inspector may request training records. Equally as important is to keep the training up to date. Some training require refresher courses annually

or every other year. Some may be updated as frequently as every new project or during weekly toolbox safety meetings at the site.

As briefly mentioned under responsibilities, management needs to monitor accident, injury and violation reports quarterly, looking for repeated problems or trends, and determine the effectiveness of the training program. They must judge if the information they wish to impress upon the employees is being effectively communicated. The training program can then be modified accordingly. While planning the modifications can be a continuous process, it is probably best to formally change the program only once a year. Once the changes have been made, the loop returns back up through reviewing records and determining effectiveness.

### *Inspection Program*

Continuing down Figure 1, the next action is to develop an inspection program. This is further illustrated in Figure 5. Part of the inspection program is the establishment of an inspection frequency and assigning of an inspector. One possible scenario is: for the Company Safety officer, monthly; for the Project Manager, weekly; for the Superintendent and Site Safety officer, continuously; for the workers, daily. The purpose of these inspections is to confirm that all the preventative controls are in place and the workers are working safely. They should occur at random, unannounced times. Also, as previously discussed, it is just as important to note conditions that are maintained exceptionally well as opposed to only noting the unsafe ones. Take pictures of both good and bad conditions to use in training sessions and praise those who deserve it.

Regardless of who conducts the inspection, the next step is always the same; correct the violation and eliminate the hazard immediately. If the violation is an isolated occurrence, determine if it should be incorporated into the next revision of the safety program. If it is a reoccurring violation, monitor the activities for a period of time to determine if it is activity related or employee related. If it is activity related, either modify the activities to eliminate the hazard or increase the awareness of the hazard and provide additional precautions to reduce the possibility of injury. If the violation is employee related, discipline the employee as dictated by the disciplinary program. Whatever the root cause of the repeated violation, incorporate it into the next revision of the safety program.

Once the violation has been noted and corrected, record the information on the appropriate form (an example is attached) in a manner that allows data to be compiled and evaluated periodically. Then, as mentioned in each figure, evaluate the effectiveness of the safety program. In addition to monitoring the violations, it is an excellent idea to recognize exceptional examples of safety noted during the inspection. Now, taking into consideration the violations and good practices noted, modify the safety program as deemed appropriate and incorporate the new changes into the training program.

Keeping records of training and tracking hazards and corrective actions are an important activity in the evolution of the Quality Safety Program. It is imperative to keep records of formal, structured employee training at the jobsite (as well as a main file) as a reference to determine personal qualifications for various tasks. It is also necessary to keep records of jobsite toolbox



safety meetings both at the jobsite and in a main file. Subjects of toolbox meetings can include a wide range of topics from ladder safety, electrical safety, heat exhaustion to winter driving safety. Other, more involved topics can include information resulting from accident investigation, revisions to the safety program or safety precautions to be taken as new work commences.

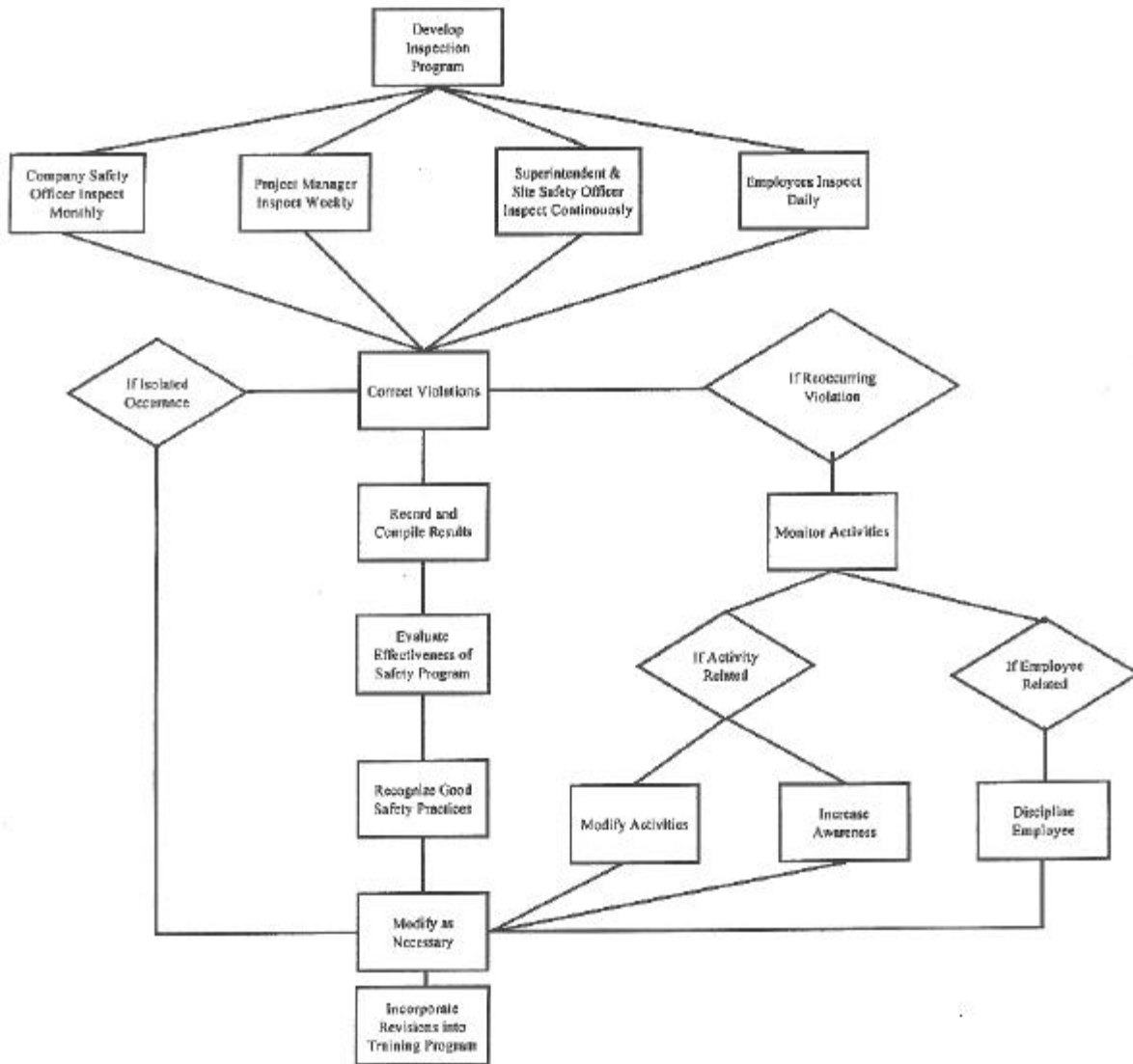


Figure 5. Inspection program.

Returning once more to Figure 1, the final step has been discussed in almost every aspect and is the key to integrating TQM principals into a company Quality Safety Program. In keeping with the idea of continuous improvement, the effectiveness of the safety program is constantly monitored, revised and updated as needed and looped back up to be incorporated into the training program so all the employees become increasingly aware of what is expected of them from a safety standpoint.

Although the ultimate goal is to eliminate accidents, it is unrealistic to believe it can be achieved initially. Therefore, one additional figure, Figure 6, has been included to illustrate the flow of activities if an accident occurs.



Fig. 6: In case of an accident

*In Case of an Accident*

The first two steps occur immediately following an accident. It must be reported to the Superintendent or Site Safety officer and treatment must be provided to the injured person. If the

injury is minor, the employee can be treated at the site and then returned to work. If the accident is serious, the employee should be treated at the hospital.

Regardless of the severity of the injury, the accident is investigated following the treatment of the employee. The investigator, usually the Superintendent or Site Safety officer, visits the scene of the accident, interviews witnesses, inspects tools, equipment or materials involved and determines the cause of the accident. As previously discussed, if the accident is deemed to be an isolated incident, a determination is made to the potential for future accidents. If future accidents seem likely, the situation is corrected. If the accident seems to be a reoccurring problem, the activities need to be monitored to determine if it is activity related or employee related. If the problem is activity related, the activities will be modified to eliminate the danger. If the problem appears to be employee related, those employees who are working unsafely are disciplined as directed by the disciplinary program. Regardless of the cause or source of the accident, the circumstances are discussed with the employees during the weekly toolbox safety meeting so everybody is aware of the hazard and satisfied that corrective action has been taken to make the workplace safe.

Meanwhile, the employee who has been seriously injured is likely to be pursuing a worker's compensation or disability claim. His/Her position will probably be filled until he/she is able to return to work.

The next important element to an accident case is the follow up inspection. This is to assure the situation that caused the accident is not reoccurring. It is also to insure that the modifications made to the safety program to eliminate the hazard are being followed. Once again, management has to evaluate the effectiveness of the safety program and recommend modifications.

### **Conclusion**

It is important to observe that a critical feature of any TQM model is continuous improvement. This is achieved every time the effectiveness of the Quality Safety Program is evaluated. The changes and improvements are always tied back into the training, thereby continuously increasing employee awareness of hazards and teaching them new and better ways to perform their work.

Another key element to the success of the Quality Safety Program is the dedication of upper management. The eagerness and excitement displayed is monumental in terms of employee moral and willingness to accept the program. Once the employees accept the program, implementation becomes much easier.

Reporting incidents, accidents, violations and hazards has been shown to be a valuable tool in assessing the success of the safety program. It is also an extremely important source for determining where unsafe conditions exist and, thus, provides information for structuring training programs.

This Quality Safety Program is intended to be an example for companies to use as a guide to establish and build their own safety program. However, it is also general enough to be adopted in its present form for a company to use as its safety program. It is strongly recommended for any company that wishes to develop a quality safety program to use this as a model to create their own program that is specifically suited to their particular type of work and company structure.

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